

## Patent Abstracts

John Woodruff

**Patents are a rich source of information for the cosmetic formulator. They express ideas, are full of background information and often illustrated with formulae and protocols for proving claims. If they have been filed by a material supplier then it is quite possible that the ideas and formulations shown are available for use but beware those filed by a cosmetic or pharmaceutical company.**

**Over the years I have abstracted several hundred patents; what follows is a number of these in no particular order but they may be searched by keyword and hopefully you will find them useful.**

**Title: Sun screening agents in the form of oil/water micro emulsions**

**Publication No. USP 6,207,140**

**Application No. 254946**

**Date of filing 19/03/1999**

**Applicants: Cognis GmbH**

The applicants identified a need for transparent sun protection products that enable relatively large amounts of UV filters to be incorporated without any phase separation or sedimentation occurring during storage. Also, many UV filters are capable of interacting with the other ingredients of the formulation, resulting in a chemical reaction and a reduction in storage stability. It is the aim of the applicants to provide sun protection compositions that are transparent, stable on storage and compatible with sensitive skin.

Claimed are oil-in-water microemulsions, comprising an oil phase, a monoglyceride (ether) sulfate, and at least one ultraviolet filter. The oil phase may be present at from 9% to 90%, and may include Guerbet alcohols, esters or branched chain fatty acid esters, C<sub>6</sub>-C<sub>10</sub> fatty acid triglycerides, vegetable oils, branched primary alcohols, substituted cyclohexanes, or silicone compounds.

The emulsifying system is typically a monoglyceride sulfate such as sodium cocomonoglyceride sulfate with an alkyl ether sulfate in association with a non-ionic glucose derived surfactant such as lauryl glucoside. The UV filter can be any of those permitted for topical application, including microfine titanium dioxide. Illustrative examples show sodium cocomonoglyceride sulfate at 6.0% with sodium laureth sulfate at 3% and lauryl glucoside at 2% - 4%. The oils are present at 35 – 40% and the UV absorber at 5%. Emulsification is a cold process; the dispersed emulsion droplets are in the range 50 to 300 nm and the composition is in the form of an optically isotropic, thermodynamically stable microemulsion. The final composition may include preservatives, antioxidants and other additives to improve stability and perfume to enhance aesthetic appeal.

**Title: Stiff-feel hair styling compositions**

**Publication No. USP 6,214,328**

**Application No. 391561**

**Date of filing 08/09/1999**

**Applicants: Rohm and Haas Co.**

Hair styling products, such as hair sprays, styling gels, spray gels and mousses are used on hair to hold the hair in a particular shape or configuration. The hair styling products, when

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applied, form a thin film of resin on the hair in the seam between adjacent hair fibres or at a point where the fibres cross one another, and, as a result, hold the hair in a particular shape or configuration. In order for a resin to be suitable in a hair spray composition it must spray as a uniform mist, impart satisfactory high humidity curl retention, give satisfactory stiffness on the hair, have low tackiness and short dry times, leave no visible residue on the hair and be readily removed by shampooing.

In order to deliver satisfactory performance most of the resins currently available for hair styling require significant levels of volatile organic compounds (VOCs), for example ethanol, dimethyl ether and hydrocarbons, in the composition. However legislation in the USA restricts the levels of VOC that may be present in hair styling products. The applicants claim to have overcome the problems of formulating low VOC hair styling products while still delivering satisfactory performance characteristics and in particular to provide a stiff-feel to the hair.

The composition claimed contains a preferred maximum of 55% VOC and typically from 25% to 70% <sup>w/w</sup> water and from 1% to 15% <sup>w/w</sup> of an acrylic polymer hair fixative resin. The resin is a polymer consists of at least one alkyl acrylate with an alkyl methacrylate, a hydroxyalkyl methacrylate, an unsaturated dicarboxylic acid monomer and at least one neutralizer. The applicants believe that the alkyl acrylate component of the hair fixative resin reduces the brittleness of the composition; that the alkyl methacrylate component imparts hardness to the film and reduces tack; that the hydroxyalkyl component improves wash-out and that the dicarboxylic acid component provides enhanced stiffness. The resin is neutralised in the final composition using a suitable base and the degree of neutralisation may be varied to impart the properties desired.

The resin is typically used at 5% <sup>w/w</sup> for pump spray application and 2.5% <sup>w/w</sup> in an aerosol and to reduce product viscosity a surfactant may be added. A plasticiser such as dimethicone copolyol, dimethicone, phenyltrimethicone or a trialkylcitrate is added and the composition may contain up to a total of 55% of ethanol or isopropanol. Additives to preserve the product and to enhance its appeal may also be included.

**Title: Process for bleaching chemically tanned skin and discoloured nails**

**Publication No. USP 6,117,118**

**Application No. 009373**

**Date of filing 20/01/1998**

**Applicants: Laughlin Products, Inc**

This patent is of interest because it seeks to claim new and novel uses for existing proprietary products. Greater awareness of the harmful effects of solar radiation, along with a continued desire by many to be tanned, has led to increased tanning by means of chemical agents. The chemicals used include dihydroxyacetone, juglone, lawsone and soluble dyestuffs. Because of the difficulties in obtaining an even tan using chemicals, a need exists for a procedure to lighten streaks, blotches and other excessively dark areas resulting from the tanning process. The bleaching effect must be gradual so that excessively dark areas are readily blended with surrounding areas. Nails may also become discoloured when using chemical tanning agents or from nail disorders and fungal

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infections so there is also a need for a bleaching process to restore discoloured nails back to their natural colour.

In its simplest form the bleaching composition is an aqueous solution of 3% hydrogen peroxide. However a more gradual lightening of the skin is obtained if the hydrogen peroxide is incorporated in a suitable cream base stabilised with phenacetin and phosphoric acid and activated with ammonium bicarbonate just before application. The applicants claim that the addition of fine abrasive particles facilitates the gradual lightening of skin or nail. This makes it easier to blend the discoloured area with the surrounding skin or restore the nail to its natural colour. In particular, formulations containing fine abrasive particles were found to enhance the bleaching process of thick or callous skin when rubbed continuously over the treatment period.

Cosmetic products that contain hydrogen peroxide are readily available and several that are recommended for bleaching facial hair by their manufacturers are cited as suitable for bleaching areas of discoloured skin. Other products that are on sale that contain fine abrasive particles as exfoliants are cited as suitable for use as skin bleaching aids if mixed with hydrogen peroxide or combined with proprietary products that contain hydrogen peroxide. The ingredients incorporated in the proprietary brands are listed and the methods by which they are used for skin lightening or nail restoration are described.

**Title: Quaternised hemp seed oil**

**Publication No. USP 6,063,369**

**Application No. 040269**

**Date of filing: 16/03/98**

**Applicants: Alterna, Inc**

Claimed is a method of making cosmetic compositions containing quaternised free fatty acids obtained by hydrolysis of Cannabis sativa (hemp) seed oil. Hemp seed oil is heated under pressure in the presence of a catalyst in a nitrogen atmosphere at 180C to saponify the oil. The catalyst may be zinc oxide, magnesium oxide, calcium oxide or lithium, sodium or potassium hydroxide or ammonia, used at 2 – 4%. The process is carried out under nitrogen to avoid avoiding cross-linking or oxidizing the free fatty acid products of hydrolysed hemp seed oil. The free fatty acids are then reacted with a tertiary amine, preferably dimethylcetylamine, to form a quaternary ammonium salt. Dimethylcetylamine is preferred for hair formulations because it exhibits excellent substantivity to the hair at low concentrations, it leaves the hair with a soft feel after rinsing off, and lubricates the hair to make it easy to comb.

The fatty acid profile of hemp seed oil is as follows; -

Palmitic acid	5.8%	saturated
Stearic acid	2.6%	saturated
Arachidic acid	0.8%	saturated
Behenic acid	0.3%	saturated
Palmitoleic acid	0.2%	monounsaturated
Oleic acid	11.4%	monounsaturated
Linoleic acid	54.7%	polyunsaturated, omega-6

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Linolenic acid 2.6% polyunsaturated, omega-6

Linolenic acid 18.4% polyunsaturated, omega-3

Omega-6 linoleic acid, omega-3 linolenic acid and omega-6 linolenic acid are termed essential fatty acids because mammals lack the enzymes necessary to synthesise them, and they must therefore be exogenously supplied. Their use in hair and skin preparations has been limited by their propensity to undergo oxidising degradation and to become rancid. Because their biological activity has not been substantially impaired by the method of preparation the quaternary ammonium salts of the free fatty acids obtained from hemp seed oil can be used to provide shine and strength to hair and suppleness and moisturisation to skin. In addition to essential fatty acids, quaternised hemp seed oil contains amino acids and minerals, the combination of which is claimed to provide superior conditioning effects because it is substantive to hair and skin.

**Title: Stable gelled composition with high electrolyte content**

**Publication No. USP 5,922,764**

**Application No. 787604**

**Date of filing: 23/01/97**

**Applicants: L'Oreal**

Topical compositions in the form of an aqueous gel or emulsion are well known in the cosmetic, dermatological and pharmaceutical fields. These compositions contain gelling agents, which impart consistency and stability to the gel. Most of the gelling agents currently used are carboxyvinyl polymers, which are neutralised with a base. Electrolytes cannot be used in these compositions because they are incompatible with neutralised carboxyvinyl polymers and destroy the gel structure. However electrolytes are particularly useful in gel compositions where the active agents have an irritant side effect when applied alone because they may reduce the irritating nature of these active agents.

Claimed is a gel composition, comprising: at least one cosmetic and/or dermatological active agent selected from the group consisting of  $\alpha$ -hydroxy acids,  $\beta$ -hydroxy acids,  $\alpha$ -keto acids and  $\beta$ -keto acids; at least one electrolyte; cetylhydroxyethyl cellulose; and water. The acid may be citric, malic, glycolic, tartaric, mandelic, lactic or salicylic acid and derivatives thereof. The electrolyte may be selected from a wide range of metallic ion salts but most preferred are strontium chloride and neodymium chloride.

For the purpose of this patent the term "gel composition" includes an aqueous gel, an aqueous-alcoholic gel, a water-in-oil emulsion and an oil-in-water emulsion. The gelling agent is cetylhydroxyethyl cellulose used at from 0.1 to 10% but most preferably at 0.5 to 1.5% by weight.

Various formulae illustrate the scope of the patent including the following one for a Moisturising Gel

Strontium chloride.6H<sub>2</sub>O 6.00%

Glycolic acid 1.00%

Glycerin 5.00%

Cetylhydroxyethyl cellulose 1.00%

D-panthenol 1.00%

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Sodium PCa            1.50%  
Perfume & Preservatives            qs  
Demineralised water qs    100%

**Title:**        **Gelled composition of elastomeric organopolysiloxane combined with a fatty phase, for removing make-up from around the eyes**

**Publication No.**    **USP 6,143,308**

**Application No.**    **996252**

**Date of filing**        **22/12/97**

**Applicants:**        **L'Oreal**

Existing compositions for removing make-up from around the eyes are generally in the form of a lotion or milk. They contain surfactants and oils for the removal of makeup and preservatives to prevent the growth of microorganisms. Although effective, they can run between the fingers, they leave an uncomfortable and annoying residual film on the eyes and eyelids and the presence of preserving agents and surfactants can cause irritation.

The applicants' claim that a combination of a solid organopolysiloxane with a fatty phase containing isohexadecane or isododecane is capable of effectively removing make-up from around the eyes and that such compositions do not cause either discomfort on the eyes and eyelids or leave an oily residual film. The organopolysiloxanes used are partially or totally crosslinked and of three-dimensional structure. When included in a suitable fatty phase they become converted, depending on the level of fatty phase used, from a product of spongy appearance into a homogeneous gel.

Suitable organopolysiloxane elastomers are insoluble but swell in silicone oil and in isohexadecane or isododecane. They are obtained by addition of an organohydrogenopolysiloxane (1) and of an organopolysiloxane (2) having unsaturated aliphatic groups, such that the amount of hydrogen or of unsaturated aliphatic groups in (1) and (2) respectively is between 1 and 20 mol % when the organopolysiloxane is non-cyclic and between 1 and 50 mol % when the organopolysiloxane is cyclic. In powder form the organopolysiloxane elastomers have a particle size of not more than 1  $\mu$ m. Preferably, the organopolysiloxane elastomer is present in the composition in an active material concentration ranging from 0.1% to 30% and more preferably from 3% to 25% of the total weight of the composition. The fatty phase may consist of isohexadecane or isododecane with liquid petroleum jelly, squalane, and short-chain fatty acid esters such as octyldodecyl neopentanoate or mixtures of these materials.

Organopolysiloxane elastomers do not cause the skin around the eyes to dry out and they provide good cosmetic properties. They form compositions that are comfortable when applied, soft, non-sticky and pleasant to the touch. This softness is due to the texture of the organopolysiloxanes and to their properties, which are comparable with those of microsponges that trap the oils, in particular the make-up-removing oils, in the composition. The compositions have a high make-up-removing power without the need for surfactants. They can be used several times a day, if necessary, even by individuals with sensitive eyes and are effective against water-resistant make-up.

**Title: Wax combination and cosmetic compositions containing same**

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**Publication No. USP 5,885,561**

**Application No. 811615**

**Date of filing 5/03/1997**

**Applicants: Wella, Germany**

Claimed is a wax composition comprising a combination of apple wax, orange wax and/or citric wax and jojoba oil and cosmetic compositions for treating skin or hair, which contains these wax combinations in free form or as a complex of effective ingredients, which is formed by enclosing the wax combination in a capsule.

Waxes can be natural, mineral, chemically modified or synthetic but all have disadvantages when used for cosmetics. Mineral and chemically modified mineral waxes come from non-renewable resources and synthetic waxes do not meet today's consumer demand for natural materials. Although natural, beeswax, candelilla and carnauba waxes vary in composition and availability and the later two are hard, brittle and difficult to emulsify. According to the applicants a combination of apple wax, orange wax and jojoba oil does not have these disadvantages. In addition the combination has a synergistic skin and hair protecting action.

The wax combination comprises: from 2 to 70 % apple wax; from 5 to 70% orange and/or lemon peel wax; and 10 to 70% jojoba oil. These may be in free form in the composition or encapsulated in water-insoluble polymers of cellulose with hydroxypropylmethylcellulose and lactose as auxiliary agents. The three materials are melted together and can be used in the free form for protection of skin and hair. The encapsulated version can be added to various products including surfactant-based cleansing products.

The wax combination may be used in skin care, preferably at up to 20% by weight in an oil-in-water emulsion for topical application. As hair care product ingredients they are said to improve wet and dry combability and protect the hair during chemical treatments such as bleaching, and permanent waving. The wax mixture can be incorporated into a permanent wave composition and applied as a gel, emulsion or aerosol mousse and it is said to greatly improve the condition of the hair when compared to other permanent waving processes. Various formulation examples are given in the patent, the following one is for a lip care stick.

Wax Combination: Apple wax 8.0g, Lemon peel wax 40.0g, Jojoba oil 26.0g

Lip Care Stick

Ricinus Communis (Castor) Oil 26.00% w/w

Orbignya Oleifera (Babassu) Oil 4.00%

Paraffinum Liquidum (Mineral Oil) 19.00%

Cera Microcristallina (Microcrystalline Wax) 28.00%

Decyl Oleate 14.00%

Wax combination as above 7.00%

Water 2.00%

**Title: Cosmetic skin cleanser based on natural active substances**

**Publication No. USP 5,993,857**

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**Application No.** 091975

**Date of filing** 26/06/98

**Applicants:** Lancaster Group GmbH

The stated objective is to develop a skin cleanser that contains natural materials as the active ingredients and which yields a mild but sufficiently intense skin cleaning effect. This is achieved with an aqueous suspension of a vegetable oil encapsulated in microspheres of polyoxymethylene urea in combination with aloe vera gel and Lipacids PVB, which is a mixture of sarcosine, wheat amino acids and palmitic acid. The composition also contains one or more natural emulsifiers and natural cleansing substances.

A preferred vegetable oil is Simmondsia chinensis (jojoba) seed oil and the preferred emulsifier is cetearyl glucoside, present in a concentration of approximately 1 to 7% by weight. The gluco-lipid structure is free of chemical impurities and has both emulsifying and moisturizing properties. Decyl polyglucose and acyl glutamate, which are also derived from natural substances, are the preferred surface-active agents and are included at 3 – 10%.

The micro-spheres are in the form of a soft powder with a slightly granular texture. They are hollow on the inside and filled with the vegetable oil; they have a mild abrasive effect when rubbed on wet skin. The hollow spheres break and the oil is released to develop its moisturizing and soothing skin care effect. Other active ingredients that may be present in the preparation include d-panthenol, hyaluronic acid, phospholipids and honey extract and it may also contain allantoin, rheology modifiers, preservatives, perfume oils and chelating agents. Various example formulations are given and the results of skin studies using a Corneometer show a significant improvement in moisture content.

**Title:** Lipid vesicles formed with alkylammonium fatty acid salts

**Publication No.** 5,874,105

**Application No.** 594175

**Date of filing** 31/01/96

**Applicants:** Collaborative Laboratories

Claimed is a liposome for use in encapsulating both hydrophobic and hydrophilic substances, which is capable of delivering its load upon the occurrence of a trigger or control condition. The liposomes of the delivery vehicle are stable in a particular environment but become unstable or permeable if passed to a changed or destabilising environment.

Liposome formation is a natural result of the amphipathic nature of the molecules of which they are comprised. Amphipathic molecules are those molecules with distinct regions having hydrophilic character and distinct regions of the same molecule having hydrophobic character. When dispersed in water, amphipathic molecules form three types of macro-molecular structure: micelles, hexagonal phase and lipid bilayers. The exact macro-molecular structure formed depends on the relative sizes of the hydrophilic and hydrophobic regions of the molecule.

Micelle formation is favoured when the cross sectional area of the hydrophilic region of the molecule is greater than that of the hydrophobic part. The formation of hexagonal phase structures is favoured when the cross sectional area of the hydrophobic region is

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greater than that of the hydrophilic part. If the two portions are approximately equal the formation of bilayers is favoured. Phospholipids are an example of such molecules. Phospholipids are an amphipathic type of lipid that contains one phosphate, a glycerol and one or more fatty acids in its molecular structure.

In an aqueous environment the hydrophobic region of phospholipid molecules turn inward, and the hydrophilic portions face outward. These bilayers are two-dimensional sheets in which all of the hydrophobic portions, e.g., acyl side chains, are shielded from interaction with water except those at the ends. An energetically unfavourable interaction of the acyl chains with water results in the folding of the bilayers to form three-dimensional vesicles. These vesicles are referred to as "liposomes".

Liposomes may be formed as a single bilayer enclosing a single aqueous space or as concentric bilayers with many aqueous spaces alternating with the bilayers. These are multilamellar vesicles. Liposomes can be used to encapsulate both hydrophobic and hydrophilic materials. Hydrophobic payloads are typically partitioned within the bilayers whereas hydrophilic payloads are typically trapped within the aqueous compartments.

The advantage of using liposomes as a carrier or encapsulation system is that they are stable and can protect their payload from degradation. However the patent claims a liposome delivery system that becomes unstable with a change in the environment. This may be a change in temperature, ionic strength or pH. Such changes are typical at the surface of human skin, which is anionic in nature, contains dissolved salts and is acidic. This may be sufficient to destabilise the liposomes and yield the payload to the site of application.

**Title:       Cosmetic compositions**

**Publication No.   USP 5,863,546**

**Application No.   824337**

**Date of filing     02/03/97**

**Applicant:        J. Swinehart**

Claimed is a hypoallergenic, non-comedogenic, non-acnegenic cosmetic composition that is oil free, lanolin free, fragrance free and free of formaldehyde releasing preservatives. The composition contains only ingredients rated 0 with respect to comedogenicity and irritancy. Further claims are that the composition is a moisturising cream comprising emulsifying wax, cetyl palmitate, behenic acid, methylparaben, propylparaben, C12-15 alkylbenzoate, sorbitan sesquioleate, polysorbate 20, allantoin, sodium PCA, hyaluronic acid gel, and distilled water and may include an alpha-hydroxy acid, preferably glycolic acid. Additional claims are for shampoos, cleansers and makeup including foundations, concealers and powders.

The inventor is a practicing dermatologist and dermatological surgeon whose objective it is to design products containing effective concentrations of pertinent chemicals while avoiding components known to be allergenic, irritating, acne causing, or comedogenic. The compositions are to be aesthetically pleasing and yet avoid common clinical problems such as acne scarring, irritant dermatitis, photosensitivity, or permanent allergic contact sensitisation.

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The claimant states that many chemicals, though not comedogenic, frequently cause contact dermatitis and that many products on the market contain ingredients that are included in the North American Contact Dermatitis Society's standard patch test tray of 20 allergens. Ingredients such as cetearyl alcohol, lanolin, propylene glycol, laureth-4, steareth-16, vitamin E, and other alcohols are claimed to be frequent causes of contact dermatitis and irritant dermatitis. Imidazolidinyl urea and Quaternium-15 are releasers of formaldehyde, the chemical responsible for some of the most severe cases of contact dermatitis seen by a dermatologist. Fragrances, including Balsam of Peru, cinnamic alcohol and aldehyde and numerous natural plant products and extracts are the most common causes of contact dermatitis originating from cosmetics.

Although according to the claimant, no product can, be "non-allergenic" and that even water can cause a form of hives known as *aquagenic urticaria* it is possible to formulate a range of cosmetics as hypoallergenic as possible by avoiding the use of chemicals listed in the master list of comedogenic and/or /irritating chemicals<sup>1</sup>. Described are a number of compositions and their method of manufacture. The claimant's reasons for using certain materials are given, as are the reasons for avoiding many others.

Fulton, J.E. Comedogenicity and Irritancy of Commonly Used Ingredients in Skin Care Products. JSCS, Vol. 40, 321-333, November 1989

**Title:        Conditioning cosmetic cleanser compositions**

**Publication No.    USP 6,120,753**

**Application No.    093804**

**Date of filing        09/06/98**

**Applicants:        Chesebrough-Ponds**

Described is a skin cleansing composition with skin and scalp moisturizing properties. It is claimed that many common anionic surfactants such as lauryl ether sulfates found in personal cleansing products can be harmful to skin or scalp. These surfactants can penetrate the stratum corneum and remove lipids, leading to dry rough skin. Cleansing products should not only contain mild surfactants but should provide protective ingredients such as moisturizers. Two-in-one body products have come to the market to address these needs but the moisturising additives can have an adverse effect upon foam properties.

It is the stated objective of the patent to provide a cleansing composition with improved moisturising and skin feel benefits combined with a thicker, richer and longer lasting foam and to deliver the composition from a pressurised pump or aerosol applicator.

The composition comprises a mixed surfactant system in conjunction with a silicone compound. Preferred anionic surfactants are sodium cocoyl isethionate and sodium lauroyl sarcosinate, preferably in association with an alkyl ether sulfate. The preferred amphoteric is cocamidopropyl betaine and a non-ionic material such as an alkyl polyglycoside. may be included. An essential component is a non-water soluble emollient such as an isoparaffin, mineral oil, petrolatum or hydrocarbon waxes such as polyethylenes. Esters and silicone compounds may also be used. The ingredients are combined in an oil-in-water emulsion and the total composition will include viscosity regulators, preservatives, perfume and moisturising and other active ingredients. The emulsion maybe further stabilised by the

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addition of cosmetic waxes, fatty acids and fatty alcohols and the final product may be dispensed from a low-pressure aerosol container. An illustrative formulation is as follows:

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Phase A

Sunflower Seed Oil	20.00	
Maleated Soybean Oil	5.00	
Polyderm PPI-Si-WS (Silicone Urethane)		1.00

Phase B

Diisostearoyl Polyglyceryl-3 Dimer Dilinoleate		1.00
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Phase C

Sodium C14-16 Olefin Sulfonate	15.00	
Sodium Laureth Sulphate (25% Active)	15.00	
Sodium Lauroyl Oat Amino acid	15.00	
Cocamidopropyl Betaine (30% Active)		15.00

Phase D

DC 1784 (Silicone Emulsion)	5.00	
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Phase E

Deionised Water	7.00%	
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Polyquaternium-11 1.00

Perfume and preservatives as required.

The concentrate is prepared by metering water to form Phase A in a main vessel. Phase A is stirred and heated at 50°C. Phase B and C are then added and allowed to slowly dissolve. The remaining phases are separately prepared, each added in the listed order and allowed to dissolve. Heating and stirring are continued until a uniform mixture is obtained. The concentrate is then filled into steel pressure cans fitted with spray nozzles and charged with propellant.

**Title: Honey Preparations**

**Publication No. USP 6,171,604**

**Application No. 348301**

**Date of filing 07/07/99**

**Applicant: Mousa; Mahmoud A**

The composition of honey is unique, as it encompasses a large profile of nutrients including sugars, amino acids, vitamins such as biotin, nicotinic acid, folic acid, pantothenic acid, pyridoxine and thiamine, enzymes such as diastase invertase, glucose oxidase and catalase, and minerals such as potassium, iron, magnesium, phosphorous, copper and calcium.

Honey exhibits pronounced microbial activity against most pathogenic bacteria and fungi regardless of their susceptibility or resistance to different antibiotics. The antimicrobial activity is attributed to its high sugar content and low acidity, but honey has been shown to have stronger antimicrobial activity than corresponding sugar concentrations of similar pH. The antimicrobial activity has also been attributed to the enzymatically liberated

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hydrogen peroxide activity known as inhibine. However, some types of honey exhibit marked antibacterial activity in the absence of peroxide activity. Honey has also proven effective in treating cold sores and herpes simplex on the lips, skin allergies and insect bites and also appears to promote wound healing with replacement of sloughs with granulation tissue.

However while honey has proven effective as a treatment, topical application of honey is inconvenient. The stickiness, thinning and liquefaction accompanying existing honey applications are major restrictions to their topical application and a need exists for honey-based treatments having physical characteristics conducive to topical application. The patent describes a honey formulation for topical application. It includes the active ingredients of honey and related products and may take the form of a cream, gel, ointment, paste or lotion. It has reduced stickiness and irritation potential and a controlled consistency and may be conveniently applied topically at desired doses for therapeutic, cosmetic and nutritional purposes.

The patent describes the mixing of honey or active ingredients of honey with oil, gelling agent, emulsifier and other components. In preferred embodiments, cold or warm mixing is used to avoid undesirable changes due to heating the honey and to maintain the integrity of all the components. Honey is mixed at about 40°C or below with an oil base selected to suit the intended application, and to control the thickness, the spreadability and the stickiness of honey. The base may include oils, waxes, polymers, emulsifiers, and other optional components. Any component which is of use in therapeutic or cosmetic topical applications, and which is compatible with the desired formula, may also be included.

Many formulations illustrate the patent. The following is an anhydrous a low viscosity product.

Olive oil	25.00%
Glucose sesquistearate	3.00
Methyl glucose dioleate	2.00
Honey	70.00

Water may be added to this formula in a ratio to suit the intended application. An alternative composition suitable for spray application, as follows: -

Freeze dried honey	10.00%
Cyclopentasiloxane	3.40
Quaternium-18 Hectorite	0.80
Ethanol anhydrous	0.80
Propellant A-46	75.00
Fragrance	QS

**Title: Cosmetic composition pressurized in an aerosol device and the resulting foam**

**Publication No. USP 6039933**

**Application No. US1998000043220**

**Date issued: 21/03/00**

**Applicants: L'Oreal, Paris**

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Aerosol foams are used to apply styling products to the hair. Their physical form makes them easy to use with good distribution through the hair and minimal wastage. The foam must be sufficiently stable not to liquefy too quickly but must disappear rapidly on application. Such products generally contain a polymer, which contributes fixing properties to the hair and a foaming agent. Because the compositions have to be massaged through the hair they cannot be applied to hair that has already been shaped into a style. Also because they are essentially aqueous and their application wets the hair a subsequent blow-drying is necessary to shape and fix the hairstyle. It is possible to speed the drying process by substituting ethanol for all or part of the water-content but this destroys the foaming characteristic of conventional compositions.

It is the applicants claim that the patent provides cosmetic compositions packaged in an aerosol device in the presence of a propellant and capable of forming a foam comprising, in a cosmetically acceptable medium, at least one fixing polymer, at least one oxyalkylenated silicone and at least 30% by weight of a water-soluble solvent having a boiling point of less than 85° C for the cosmetic treatment of keratinous fibres, such as hair or eyelashes.

Of the many fixing polymers listed as suitable, acrylates/acrylamide copolymer neutralised with AMP present at between 5% and 5% is preferred. Of the many oxyalkylenated silicones cited up to 5% dimethicone copolyol or alkyl dimethicone copolyol are particularly effective. The solvent is a low boiling alcohol and between 40% and 55% ethanol with a glycol or glycol ether is suitable. Optional additives include those ingredients commonly found in such products like fragrance, thickening aids and panthenol and the balance is water. All %ages are by weight of the total composition, not including the propellant, which may comprise 10% to 15% by weight of the final product.

### Typical Formula

VA/Vinyl Butyl Benzoate/Crotonates copolymer 8.00%

AMP 0.80

Ethanol 49.50%

Cetyl dimethicone copolyol 2.50%

Water to 100%

90g of the above are packaged in aerosol form and pressurised with 10g of a mixture of n-butane, isobutane and propane in the ratio 23/55/22. The result is a copious foam that imparts good hold, gloss and volume to the hair

**Title: Compositions for temporarily colouring the hair**

**Publication No. USP 6042619**

**Application No. US1997000950855**

**Date issued: 28/03/00**

**Applicants: Bristol-Myers Squibb, USA**

The patent describes a product for temporarily colouring the hair that is readily removed by shampoo. The colouring agent is an iron oxide or titanium dioxide coated mica, which is typically 51% to 61% mica, 34% to 40% titanium dioxide, and 5% to 9% iron

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oxide .It should have a mean particle size in the range 25 - 50 microns and may comprise up to 9% by weight of the composition

The pigment is suspended by polyquaternium 37 polymer, sold under the trade name Salcare SC96, which also contains propylene glycol dicaprylate/dicaprate and PPG-1 trideceth-6 so it is also an emulsifying agent. Polyquaternium-37 swells in water and provides suspending properties. The composition contains up to 5% cyclomethicone plus optional ingredients such as preservatives and fragrance.

The product has an approximate viscosity of 130,000cps at room temperature .It is applied to the hair, combed through and then the colour is fixed by spraying with a polyvinyl methacrylate/ maleic anhydride copolymer in ethanol, which renders the colour more resistant to loss by abrasion.

An illustrative formulation is prepared by adding 0.50% (by weight) cyclomethicone to water in the mixing vessel. The coated mica pigment is added at 2.5% and mixing is continued until the pigment is fully dispersed with water and the cyclomethicone. 2.5% Salcare SC 96 polymer is then added to the aqueous mixture and the stirring is continued for about 15 minutes and the temperature is maintained at 32C throughout the process. Additional ingredients in the example are preservative, EDTA tetrasodium salt and benzophenone-4.

A particular benefit of the composition is said to be that it does not form fuzzy balls on combing!

### **Title: Skin and hair aerosol foam preparations containing an alkyl polyglucoside and vegetable oil**

**Publication No.   USP 6039933**

**Application No.   US1996000693273**

**Date issued:       04/04/00**

**Applicants:       Henkel, Germany**

In the introduction the applicants claim that both the washing of hair with shampoos and the decorative treatment of hair, for example by colouring or permanent waving, are actions that influence the natural structure and properties of the hair. Wet and dry combability may become more difficult and the number of split ends can be increased. This has led to the widespread use of after-treatments like hair rinses and conditioners and more recently, to the rapid growth in 2-in-one preparations whereby a conditioner is applied as part of the shampoo process. The applicants believe that there is a continuing needs for active washing substances and combinations thereof which combine greater effectiveness with ready biodegradability and which do not remove hair dyes from the hair. The applicants claim the discovery that preparations that contain a combination of an alkyl polyglucoside, a polymer and a vegetable oil effectively satisfy this need.

The alkyl polyglucoside may be lauryl, decyl or coco-glucoside and is normally present at about 5% by weight. The polymer may be any from an extensive list of cationic, anionic and zwitterionic polymers and there are materials named as particularly preferred in each group. However the non-ionic PVP and Vinyl pyrrolidone/vinyl acetate copolymers are the most preferred and particularly vinyl caprolactam/PVP/dimethylaminoethyl methacrylate copolymer. The polymer is generally present at 0.05% to 2.00% by weight.

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The third component is an oil. Almost all vegetable oils are said to be suitable but *Aleurites moluccana* (kukui) seed oil is said to be particularly suitable. In addition the composition may contain up to 20% additional surfactants including alkyl sulphates and alkyl ether sulphates, cocoamidopropyl betaine and cationic quaternary ammonium compounds and mixtures of these. The choice is dependant on the intended application and the composition. It may also contain water and about 5% alcohol and the usual cosmetic additives for, shampoos, hair rinses, hair conditioners and hair setting preparations which may be formulated as solutions, lotions, emulsions, microemulsions, creams, gels or foam aerosols.

**Title: Hair manageability and styling composition and method**

**Publication No. USP 6,013,249**

**Application No. 799391**

**Date of filing 11/02/97**

**Applicants: Helene Curtis, Inc**

Described is a mild wave and hair styling composition for permanently waving or straightening human hair while minimising hair damage. The composition includes a cationic and an anionic compound that complex in solution to provide synergy in waving efficiency. At least one of the ionic compounds functions as a reducing agent for hair, capable of breaking the disulfide bonds in the hair so that the bonds later can be reformed via oxidation, when the hair is in the desired configuration.

Permanent waving of human hair is usually achieved by chemically breaking the sulphur-to-sulphur or disulfide cystine bonds occurring naturally in human hair with a waving lotion containing a reducing agent. The bonds are then reformed while the hair is wrapped or curled on rods by the application of an oxidizing agent, such as hydrogen peroxide.

The most commonly used reducing agents for hair waving are mercaptan compounds. The reducing action of mercaptans on keratin is due mostly to the dissociated form of the thiol groups, the thiolate anion. Acceptable waving efficiency is usually obtained by working near the pKa of the active reducing agent. Thus ammonium thioglycollate, which has a pKa=10.4 only works efficiently if the pH of solution exceeds 9 whereas glycerol thioglycollate has a pKa=7.8 and is effective at neutral and slightly acid pH.

The use of diammonium dithiodiglycollate in permanent wave lotions minimises the possibility of over processing because the reaction of thioglycollic acid with hair keratin is an equilibrium process. By including diammonium dithiodiglycollate in the wave lotion, the rate of the reaction of the thioglycollic acid with hair keratin is decreased and is prevented from going to completion.

The applicants claim that combinations of the anionic thioglycollic acid or its salts, together with the cationic cysteamine or thiocholine complexed in approximately equal molar ratio, provide synergistic waving efficiencies at a pH in the range of about 5.5 to about 8.0. Best results are obtained at a concentration of 0.73 M for each ionic compound and this combination is effective at pH 6.0 - 7.0. Thiocholine and N-acetylcysteine can be formed by the in-situ reaction of an acetylthiocholine and cysteine to produce thiocholine, N-acetylcysteine and cysteine.

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**Title: Hair dressing composition**

**Publication No. USP 5,985,256**

**Application No. 897961**

**Date of filing 21/07/97**

**Applicants: Helene Curtis, Inc**

Claimed is an aqueous hairdressing or hair styling composition that comprises about 5.0% Salcare 96 with about 2.5% isopropyl palmitate and about 1.5% isopropyl myristate. The compositions described are said to impart good hair styling and manageability properties without tackiness.

The patent claims that the majority of hair dressing compositions applied by hand leaves the hands greasy or tacky. It is claimed that the composition described overcomes this by using a polymer as the styling aid. The polymer is available as Salcare 96, which consist of polyquaternium 37, propylene glycol dicaprylate dicaprinate, and PPG-1 trideceth 6 in an aqueous dispersion. Fatty acid esters may be added to impart spreading and glossing properties and to further reduce the tackiness of the composition. It is also claimed that the styling properties can be varied by varying the level of Salcare 96 and that it can be used to reduce the fly-away tendencies of thin hair and if exposed to high humidity it does not cause the hair to feel sticky. Included in the claims are compositions in the form of a cream, mousse, gel, a spray-on leave-on product, and a spray-on spritz and a method of application whereby a small amount of the composition is applied by hand. (prior art surely?)

**Title: Monohydric alcohol-free composition for topical use comprising solubilised ethylcellulose**

**United States Patent 5,908,631**

**Assignee: L'Oreal S.A.**

**Appl. No.: 807062**

**Filed: February 27, 1997**

When used in cosmetic applications ethylcellulose is typically dissolved in monohydric alcohols such as ethanol, butanol, methanol or isopropanol. However these are irritants and volatile, and consequently may be harmful to the skin after repeated use. To overcome these disadvantages the applicants claim a monohydric alcohol-free composition for topical use as a lipstick, lip gloss, lip rouge, hydrophobic pressed powder binder, hair gloss, hair conditioning agent, blusher or eye shadow. The composition includes a commercially acceptable carrier and ethylcellulose, which is substantially solubilised in at least one solvent. This may be a natural oil, a triglyceride, a propylene glycol ester, a neopentyl glycol ester, a fatty alcohol or mixtures thereof. The solvent with up to 20% by weight of ethylcellulose is heated in excess of 80C until the ethyl cellulose is dissolved.

It is claimed that solubilised ethylcellulose functions as a hydrophobic film forming agent and a water-insoluble polymer component of cosmetic and pharmaceutical compositions and that it enhances their adhesion, durability and viscosity and imparts water-resistance. It renders lip products transfer resistant, increases film formation on the skin and may increase the SPF of sunscreens.

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The patent carries many illustrating formulations; the following is a water resistant sunscreen gel.

Ethylcellulose	4.00% <sup>w/w</sup>
Propylene Glycol Dicaprylate/Dicaprate	33.00
Dioctyl Malate	45.00
Octocrylene	10.00
Butyl Methoxydibenzoylmethane	3.00
Ethylhexyl Methoxycinnamate	5.00

The system can be used to prepare clear, rigid gels. A high viscosity gel composition follows:

Ethylcellulose	18.50% <sup>w/w</sup>
Propylene Glycol Dicaprylate/Dicaprate	40.75
Dioctyl Malate	40.75

After dissolution of the ethylcellulose in the solvents and cooling to room temperature, a rigid, clear gel is formed.

**Title: Stable gelled composition with high electrolyte content**

**Publication No. USP 5,922,764**

**Application No. 787604**

**Date of filing 27/01/97**

**Applicants: L'Oreal**

Claimed is a gel composition containing an at least one cosmetic or dermatological active agent, at least one electrolyte, cetyl hydroxyethylcellulose and water. Topical compositions in the form of an aqueous gel or emulsion are well known in the cosmetic, dermatological and pharmaceutical fields. Most of the gelling agents currently used are carboxyvinyl polymers, which are neutralised with a base. However, electrolytes, i.e., inorganic or organic salts, cannot be used in these compositions because they are incompatible and break the gel structure.

However it is sometimes desirable to incorporate electrolytes in clear, aqueous gels so the need remains for gel compositions which overcome the disadvantages of known gelling agents: lack of consistency, instability, lumpy appearance, unpleasant sensation to the touch and incompatibility with electrolytes, and it is the claim of this patent that cetyl hydroxyethylcellulose stabilises gel compositions containing active agents and large quantities of electrolyte. Cetyl hydroxyethylcellulose is the ether of cetyl alcohol and hydroxyethylcellulose and is available as Natrosol Plus CS from the Aqualon Bv.

Of the many electrolytes cited those preferred are calcium, manganese, and strontium nitrate, borates of calcium and magnesium; calcium, sodium, magnesium, strontium, neodymium and manganese chloride; magnesium and calcium sulfate and calcium and magnesium acetate or mixtures thereof and they may be present at up to 40% by weight of the composition. The active agent may be any commonly found in topical preparations and include alpha-hydroxy and beta-hydroxy acids, retinoids and peroxides such as benzoyl peroxide. Some of these active agents may have an irritant side effect when applied directly to the skin, scalp, hair mucous membranes or nails. One advantage claimed for the

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gel composition is that these active agents may be used to treat sensitive subjects, particularly subjects with sensitive skin and/or scalp, when applied as a gel. The patent is not restricted to clear gels and may include emulsions, lotions, creams and pastes. An example formulation for a moisturising gel follows:-

Strontium chloride 6H <sub>2</sub> O	6.00%
Glycolic acid	1.00%
Glycerin	5.00%
Cetyl hydroxyethylcellulose	1.00%
D-panthenol	1.00%
Sodium PCa	1.50%
Preservatives, perfume and colour to suit	
Deionised water to	100%

**Title: Cosmetic formulation and method for amelioration of skin keratoses and striae distensae**

**Publication No. USP 5,928,659**

**Application No. 031366**

**Date of filing 26/02/98**

**Applicants: Moy; Lawrence S**

Described is a method for treating skin keratoses or skin distensae by the topical application of a dermatologically acceptable composition comprising a concentration of between 1 and 15% of unsaponifiable lipids from avocado fruit or seed. The background to the patent describes keratoses as regions of scaly, exfoliating skin caused either by sun damage or by simple aging of the skin. They may be surgically removed or chemically destroyed using topical applications of retinoic acid and alpha-hydroxy acids. Striae distensae, or stretch marks, are most prevalent on females appearing in the form of white lines and are a frequent complication of pregnancy, resulting from the excessive stretching of the skin caused by rapid weight gain.

It is the claim of the applicants that a topical preparation containing between 1 and 15% unsaponifiable avocado lipids in an emulsion that also contains either zinc amino acid chelate or copper amino acid chelate or a mixture of both will ameliorate both conditions.

A clinical study is described in the patent application whereby female volunteers with stretch marks on their thighs were instructed to apply the test sample to one thigh and a control cream to the other. After six weeks of twice-daily applications the thighs of the volunteers were evaluated both by experts and by the patients themselves. Out of the 40 participants 28 showed mild or moderate improvement, while 4 showed marked improvement. Various other studies were undertaken with positive results and skin biopsies showed a significant increase in skin thickness. An example formulation is given as follows: -

Unsaponifiable fraction of avocado oil	8.00%
Oleic acid	6.00%
Corn oil	5.00%

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Mineral Oil	4.00%
Propylene glycol	3.00%
Polysorbate-80	3.00%
Microcrystalline wax	1.00%
Lanolin alcohol	1.00%
Carbopol 940	0.50%
BHA and BHT	0.02%
Methyl and propyl paraben	0.005%
Deionised water	to 100% by weight

Although not shown in the illustrative formula the addition of certain metal chelates appears to significantly augment the effect of the unsaponifiable avocado lipids on damaged skin.

**Title: Liquid personal cleansing composition which contain a lipophilic skin moisturising agent comprised of relatively large droplets**

**Publication No. USP 6,066,608**

**Application No. 716753**

**Date of filing 23/09/96**

**Applicants: Procter & Gamble Co.**

Liquid personal cleansing compositions or cream body washes as they are also known are increasingly popular. To be successful they must meet a number of criteria, claim the applicants. They must exhibit good cleaning and lathering properties, must be mild to the skin and preferably should provide moisturising benefits. Described are compositions that comprise a moisturising phase and an aqueous cleansing phase. The moisturising phase consists of about 1% to about 30% by weight of the composition of lipophilic skin moisturising agents and at least 10% by weight of the droplets have a minimum diameter of 200 microns. The aqueous cleansing phase comprises consists of a stabiliser, a lathering surfactant, and water.

It is claimed that the greater the droplet size of the internal moisturising lipid phase the greater the deposition on the skin. Preferably at least 80% of the droplets have a droplet size in excess of 550 microns. The moisturising lipids can be selected from a wide range but fatty acids, water-soluble polyols and fatty acid soaps are specifically excluded. The stabiliser is present to prevent the droplets coalescing and trihydroxystearin, sodium polyacrylate in combination with ethylene glycol distearate; hydroxyethylcellulose, cetyl hydroxyethylcellulose and Polyquaternium-10 are those preferred. Fumed silica and Bentonite clays may also be used and multifunctional ingredients that add to product rheology and skin feel such as guar gum derivatives are also mentioned.

The lathering component is a mixture of anionic, amphoteric and non-ionic surfactants and the composition may contain additives such as humectants, preservatives, perfume, botanical extracts and other commonly used materials. It is claimed that product rheology plays an important part in formulating a successful composition. Ideally the viscosity should be between 10,000 cps. and 40,000 cps. with a yield point ranging from about 11 to 30 dynes/sq. cm.

**Title:**        **Anhydrous matte cosmetic**  
**Publication No.**   **USP 6,027,738**  
**Application No.**   **962097**  
**Date of filing**     **31/10/97**  
**Applicants:**      **E-L Management Corp.**

Claimed is an anhydrous makeup composition for topical application to the skin comprising an organopolysiloxane elastomer dispersed in a silicone-compatible vehicle and a silicone-oil base, which produces a matte appearance when applied to the skin.

The applicants state that in recent years, there has been a strong trend toward the use of silicone fluids in makeup compositions and a major reason for their popularity is the elegant feel provided by the silicones. An aspect of silicone oils is their tendency to produce a shiny appearance on the skin and while often desirable for cosmetics a glossy product that tends to directly reflect light emphasizes the fine lines and wrinkles that characterise a more mature skin. There is therefore a need for silicone oil-based formulations that will scatter or diffuse light, thereby providing a "soft focus", which blurs lines and hides blemishes.

The patent claims to provide silicone oil-based formulations that retain the elegant feel of a silicone oil-based product while achieving a soft, non-shiny, or matte, appearance on the skin. This is achieved by forming a silicone gel with an organopolysiloxane elastomer and a silicone-compatible oil vehicle. Preferably, the elastomer is a reaction product of an organopolysiloxane having an unsaturated group bound to a terminal Si-atom and an organohydrogensiloxane, which reaction product is at least partially cured.

Many organopolysiloxanes elastomers are suggested but one that is particularly preferred is polysilicone-11. The vehicle may be a silicone oil, a combination of silicone oils, or a combination of a silicone oil with an ester. The silicone oil may be any volatile or non-volatile silicone oil but preferred is a low-volatile silicone oil, such as dimethicone, phenyltrimethicone, or trimethicone, or a mixture of such oils. The elastomer is dispersed in the vehicle by homogenisation and provides a soft, stable, viscous gel, or gel-like material. The amounts of elastomer and vehicle may vary; depending on the desired viscosity, but generally should be in the range of 5-60%, elastomer and 40-95% vehicle. Additional components of the cosmetic compositions of the invention include any cosmetically acceptable pigments plus further oils and waxes, fillers, flavours and fragrances and other additives common to the type of makeup being produced.

**Title:**        **Cosmetic compositions comprising nanopigments**  
**Publication No.**   **USP 6,004,567**  
**Application No.**   **819083**  
**Date of filing**     **18/03/97**  
**Applicants:**      **L'Oreal**

Claimed are new cosmetic compositions, based on pigment nanoparticles and on fillers, which are completely transparent and free from whitening when they are applied on the skin, which possess sufficient UV screening properties for the addition of organic

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screening agents to be unnecessary, which are better dispersed than the compositions of the prior art and which are outstandingly stable. These compositions, when they are used in makeup, are claimed to exhibit greater homogeneity of the colour and a colouring that is both transparent and more intense. Methods of imparting these properties to makeup compositions are also described.

The use of metal oxides in makeup is long established and if used in micronised form where the mean size of the unit particles ranges from 0.01 to 0.15 microns, referred to as nanopigment in this patent, UV protection is afforded the user. The claim is for new cosmetic compositions comprising at least 2% by weight of pigment in the form of nanopigment, a filler and a fatty binder. The concentration of the pigment by volume (CPV) of the combined nanopigment and filler is less than or equal to the critical concentration of pigment by volume (CCPV). The volume of the filler  $V_f$ , is greater than or equal to twice the volume of the nanopigment  $V_n$ . It is claimed that the addition of filler improves the dispersion and stability of the dispersion of the nanopigments.

The oil uptake of powders is the volume that is just sufficient to fill the interstices between the powder particles. If the oil content is defined this value is the CCPV of a composition which is then designed such that  $CPV = CCPV/3 \pm 10\%$ .

The fillers that can be used may be inorganic or organic, preferably 10 microns or greater in size and selected from a list that includes talc, silica, mica, boron nitride, nylon powder, silicone powder and polymethyl methacrylate powder. The fatty binder is selected from oils and waxes of animal, vegetable or synthetic origin and their mixtures. In the case where the binder is solid at room temperature, such as, for example, in the case of waxes, the oil uptake is measured at the melting temperature of the binder. Up to 10% of a volatile oil is said to improve the spreading properties of the product and cyclomethicone, low-viscosity dimethicone, fluorinated oils or an isoparaffin is preferred.

The cosmetic composition can be anhydrous, or an oily dispersion, a water-in-oil emulsion or an oil-in-water emulsion. The nanopigment plus filler is from 5 to 15% by weight of the composition. When the composition is a W/O or O/W emulsion, in order to optimise the dispersion of the nanopigment and of the filler, they are passed through a triple roller miller using just sufficient binder to form a soft paste before being dispersed in the remaining oil phase.

**Title: Smear-resistant cosmetic**

**Publication No. USP 6,001,374**

**Application No. 819083**

**Date of filing 15/06/96**

**Applicants: Lip-Ink International**

Claimed is an improved cosmetic employing a colouring agent and a plasticiser in a volatile solvent that includes a film-forming agent, ethyl cellulose and a cosmetic pigment. The resultant cosmetic is water insoluble and will not smear and come off on beverage receptacles, fabrics or the human skin once it dries. It can be applied in at least three successive layers without caking up or cracking and the product is said to moisturise and condition the lips.

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The critical component is an alcohol-soluble and water-insoluble resin that functions as a transparent sealer. Five performance tests were conducted on a variety of resins to determine their suitability and the tests and results obtained are described in the patent. The material preferred for the smear-resistant lip colour composition was Octylacrylamide/Acrylates/Butylaminoethyl Methacrylate Copolymer, available as Amphomer LV-71 from National Starch. The volatile solvent is preferably denatured ethanol; ethyl cellulose gives viscosity and film-forming properties and a silicone compound may be used as a plasticiser. Cosmetic pigments commonly used for lipsticks are added as castor-oil dispersions and the composition, which is fluid, is applied in layers by brush. Additional ingredients include flavouring, moisturising ingredients and silicone compounds and the composition may be gelled by substituting a silicone compound for the ethanol and gelling it with aluminium magnesium hydroxide stearate

**Title: Depigmenting dermatological and/or cosmetic composition**

**Publication No. USP 5,869,031**

**Application No. 913742**

**Date of filing: 23/09/97**

**Applicants: Pierre Fabre Dermo-Cosmetique (FR)**

A dermatological and/or cosmetic composition containing a de-pigmenting active extract of mouse-ear hawkweed and the use thereof in a cosmetic treatment method is described. Agents that whiten the complexion are chemical compounds that are capable of acting at the tissue, cellular or sub-cellular level. They act on melanin itself or on the existence of melanocytes. The general modes of action may be as follows: inhibition of the formation of melanosomes, adverse change in the structure of melanosomes, inhibition of tyrosinase biosynthesis, inhibition of melanin biosynthesis, interference of the transfer of melanosomes into the keratinocytes, chemical effect on melanin with an increase in the degradation of melanosomes in the keratinocytes. Following the restrictions on use of hydroquinone cosmetic skin lightening compositions are generally based on kojic acid, ascorbic acid and arbutin and fundamental to success is sufficient protection from solar radiation.

Mouse-ear hawkweed, *Hieracium pilosella*, belongs to the family of Compositae. It is a small herbaceous ground-covering plant 10 to 30 cm in height found in dry locations throughout Europe, North Africa and Northern America. The applicants have found that an ethanol-extract of the whole plant may be used for de-pigmenting the skin. The active ingredient is umbelliferone and this may be concentrated in the final extract by evaporation and further solvent extraction. The extract is used in conjunction with keratolytic compounds, for example salicylic acid, lactic acid, glycolic acid or malic acid and a suitable sunscreen is added to the composition.

The extract has sun-screening and anti-free radical properties and has an inhibitory activity on the activity of tyrosinase, the main enzyme involved in the pigmentation process. Trials were undertaken using an extract standardised to contain 5% umbelliferone with encouraging results. Many example formulations illustrate the patent of which the following for a keratolytic lotion is an example.

Extract of mouse-ear hawkweed 0.1 to 10%

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Salicylic acid	0.1 to 5%
Vitamin C PCA	0.1 to 10%
Batyl alcohol	0.05 to 1%
Ethanol	10 to 75%
Isopropyl adipate	5 to 15%
Oleic acid	0.01 to 1%
Propylene glycol	5 to 40%
Klucel MF	0.1 to 2%
Water qs	100

**Title:** Anti-acne cosmetic compositions

**Publication No.** USP 5,976,521

**Application No.** 836231

**Date of filing** 28/02/97

**Applicants:** The Procter & Gamble Co

Claimed are stable tinted cosmetic compositions that provide excellent moisturising, together with improved anti-acne activity and skin anti-ageing benefits and colour stability. The compositions are multiple phase water-in-oil-in-water emulsions that comprise two or more aqueous phases. At least one aqueous phase comprises an anti-acne active in the form of an aqueous/alcoholic solution in which is dissolved an anti-acne agent, preferably salicylic acid at from 0.5% to 3% by weight. The pH of the solution is adjusted by the addition of sodium citrate to be within the range 2 – 4. It may also contain propylene glycol, sodium chloride and PVP, described as an anti-coalescing agent, and the ethanol content is about 25- 40% by weight.

The oil phase comprises a mixture of volatile and non-volatile silicones and dimethicone copolyol. Suitable volatile silicone oils include cyclic and linear volatile polyorganosiloxanes. Incorporated in this phase is a suitable humectant, glycerin being preferred. Suitable iron oxide pigments, talc and other common constituents of liquid make-up preparations such as titinated mica, nylon and microfine titanium dioxide or zinc oxide are dispersed in the silicone-based oil phase and any waxes or higher melting point constituents added before this phase is cooled and mixed with the primary aqueous phase to form a water-in-oil emulsion. This is homogenised and then emulsified into a second aqueous phase consisting of water, PVP, glycerin or propylene glycol plus sodium citrate and sodium chloride. This second emulsion is formed cold without the use of high shear. The total composition may contain other cosmetic ingredients for added appeal including perfume, preservatives, rheology control agents and water-soluble additives such as aloe vera extract.

The following is provided to illustrate the product concept. The patent shows these example formulations in more detail.

#### Silicone, Oil, Pigment & Powder Phase

Ceteylethylhexanoate	1.00	0.0	0.0	0.0	0.0	0.0	2.0
Cyclomethicone	10.07	9.5	9.8	10.5	13.5	10.07	10.07
Cyclomethicone/dimethicone copolyol (90:10)							

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12.00	12.5	11.5	12.1	12.3	11.00	12.1			
PG-Dicaprylate/Dicaprate	0.0		0.0	0.0	4.0	0.0	5.0	0.0	
Isopropyl Palmitate			3.0	0.0	3.0	0.0	4.0	0.0	0.0
Powders & Pigments approx 10.0%w/w to suit.									
Synthetic Wax		0.1	0.5	0.5	0.1	0.0	0.0	0.0	
Arachidyl behenate			0.3	0.0	0.0	0.3	0.5	0.3	0.3
Stearic Acid			0.0	0.0	0.0	0.0	0.0	0.0	2.5
Palmitic Acid			0.0	0.0	0.0	0.0	0.0	2.5	0.0
Trihydroxystearin		0.3	0.3	0.5	0.6	0.0	0.0	0.0	
Beeswax		1.5	1.2	0.0	0.0	1.3	0.0	0.0	
Ethylene brassylate			0.05	0.0	0.0	0.0	0.0	0.05	0.05
Internal Aqueous Phase									
Deionised water		7.55	7.6	7.7	7.65	7.6	7.4	7.63	
Ethanol		4.0	5.5	4.0	8.0	4.5	5.0	4.0	
Salicylic acid			1.0	1.0	1.0	2.0	2.0	2.0	0.0
Azeleic acid			0.0	0.0	0.0	0.0	0.0	0.0	5.0
Dipropylene glycol			6.0	5.0	6.5	7.0	8.0	6.0	5.0
Polyvinylpyrrolidone			1.0	2.0	1.5	1.0	1.0	1.0	2.0
Sodium citrate		0.3	0.3	0.3	0.2	0.4	0.3	0.4	
External Aqueous Phase									
Sodium chloride		0.4	0.5	0.4	0.5	0.4	0.5	0.5	
PVP			0.5	0.0	0.0	0.6	1.0	0.8	0.0
Glycerin		10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Sodium Citrate		0.1	0.0	0.1	0.2	0.0	0.0	0.0	
Perfume and other additives to suit.									
Water to 100% w/w									

**Title: Nail Bleach**

**Publication No. USP 5,935,557**

**Application No. 797992**

**Date of filing 12/02/97**

**Applicants: Avon Products, Inc.**

Claimed is a hydrogen peroxide composition for bleaching stained fingernails. It does not require premixing, is stable and will also soften and remove dead cuticle skin but it is not harmful to the nail or to healthy cuticle. The grade of hydrogen peroxide used is Ultra Cosmetic Peroxide (35%) from Solvay Interlox and this is important to the success of the composition. Usually hydrogen peroxide solutions are stabilised by maintaining a low pH of between 2.5 and 4.0; this grade is chemically stabilised by a propriety mixture and is diluted to give between 3.0 – 3.5% hydrogen peroxide in the final composition. The pH is adjusted to 8.0 – 8.5 using sodium hydroxide and the composition thickened with a suitable additive of which Salcare SC90 is the most preferred. Additional ingredients may

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include a surfactant such as sodium lauryl sulfate or Pluronic F127, a polyoxypropylene/polyoxyethylene block copolymer from BASF, which will aid wetting of the nail and cuticle and help maintain viscosity stability. Other optional additives include glycerin and fragrance.

**Title: Hand and body cream for the treatment of skin ailments**

**Publication No. US 5,997,889**

**Application No. US1998000027003**

**Date of filing 20/02/1998**

**Applicants: Omnipotent Skin Products**

Described are compositions for a hand and body cream made substantially from naturally occurring ingredients and which are claimed to be highly effective in clearing eczema and other common skin ailments. In one embodiment, the composition is an anhydrous mixture of almond oil, cocoa butter, jojoba oil, vitamin E oil, a beeswax derivative, hydrogenated soybean flakes, pure beeswax and vitamin A oil. In addition up to 2% by volume of essential oils may be added and other possible additives include shea butter, honey and up to 5% water.

The following table summarises the ingredients and their limits.

	Minimum	Maximum
Beeswax	2.00%	6.00%
Almond Oil	25.00%	35.00%
Jojoba oil	18.00%	28.00%
Cocoa butter	18.00%	28.00%
Vitamin E	5.00%	10.00%
Beeswax derivative	5.00%	10.00%
Hydrogenated soybean flakes	2.00%	6.00%
Vitamin A	0.20%	1.0%

The beeswax derivative may be siliconal beeswax, PEG-beeswax, hexanediol beeswax or a propriety mixture of beeswax, fatty acids, alcohol and glycerides sold as Rosswax by the Frank Ross Co. USA. The method of manufacture forms part of the patent and involves heating the waxes to about 50C in a blender and introducing a cold mixture of the oils while high speed mixing under vacuum.

It is claimed that jojoba oil is included for the temporary relief of the symptoms of eczema, dermatitis and psoriasis, and as a carrier for the remaining ingredients. Vitamin E and vitamin A for their skin restorative and healing properties and for the relief of dry or chapped skin, the reduction of scar tissue, the healing of burns and abrasions, and wrinkle reduction. The other constituents are for improving the application properties of the product and for their emollient and moisturising properties.

**Title: Cationic cellulose derivatives of controlled charge density useful in cosmetic preparations**

**Patent Abstracts**  
**John Woodruff**

**Publication No. USP 6,071,505**

**Application No, US1999000286814**

**Date of filing 6/04/1999**

**Applicants: Louisiana State University**

Water-soluble quaternary ammonium cellulose derivatives of controlled charge density are described. These derivatives are useful in cosmetic preparations as hair conditioners and film formers. They are added to formulations to improve hair combing and manageability and to add body and curl retention by binding ingredients to keratin. The compounds are also useful as antistatic agents, bactericides, flocculating agents, and as drug binding or drug delivery agents.

The applicants wished to produce a quick-drying hair fixative product, resistant to humidity but to be easily removed by shampooing. It was intended for low VOC application and to achieve this the polymer was required to have a greater affinity for hair than for the aqueous solvent in which it was applied. According to the applicants there are three important factors that determine the binding of a polymer to hair.

The affinity of the polymer for keratin, which is influenced by polymer charge and molecular size, the pH of the composition and the isoelectric point of hair.

The strength of interactions of the polymer with the solvent phase, which is affected by the hydrophilic or hydrophobic properties of the polymer.

The diffusion of the polymer into the hair, which is controlled by the molecular size of the polymer, pH and temperature. Adsorption of a polymer onto keratin can vary with changes in the pH or in the polymer structure. Cationic polymers primarily bind to keratin through ionic bonds, enhanced by van der Waals forces, the strength of which increases with the number of repeat units in the polymer.

Cellulose is a polymer formed of repeating  $\beta$ -1, 4 D-glucose units. Numerous hydroxyl groups participate in extensive intra- and inter-molecular hydrogen bonding and the applications of cellulose derivatives are greatly influenced by the degree of substitution along the cellulose chain. The degree of substitution is defined as the average number of hydroxyl groups that have been substituted per anhydroglucose unit in the polymeric backbone. Each anhydroglucose unit has three hydroxyl groups, located at the C2, C3, C6 positions. The C2 and C3 positions are secondary alcohols, and C6 is a primary alcohol. The three hydroxyl groups exhibit different rates of reactivity to different reagents. The patent describes the many cellulose derivatives that may be obtained, their properties and their applications.

Of particular interest for hair care compositions are diquats in which carboxymethyl groups are replaced by diquaternary ammonium groups and polyquats where carboxymethyl groups are replaced by polyquaternary ammonium groups. The diquats are said to impart much greater viscosity to aqueous and aqueous-alcoholic solutions than the corresponding monoquats and are recommended for preparing hair styling gels and similar products. The polyquats are said to be effective in low-VOC hair sprays.

**Title: Cosmetic or cosmetic product for firming and soothing the skin in particular in the case of cellulite**

**Publication No. USP 6,071,526**

## Patent Abstracts

John Woodruff

**Application No.** US1999000256854

**Date of filing:** 2/02/1999

**Applicants:** S.W. Patentverwertungs GmbH., Germany

Claimed is a method of treating cellulite comprising the topical application to skin of an aromatase inhibitor originating from soya glycins, which inhibits the formation and action of estrogens in the area of application.

Cellulite is a term for non-inflammatory adiposis associated with mild lymphatic blockage and formation of oedema in the connective tissue zone. Cellulite is found in particular in women in the hip, thigh and buttock region. In most cases it results in reticulate dimpling of the surface and the so-called orange-peel effect. There is an increase in the lipids found in the fat cavities but cellulite symptoms are not pathological. Because a reduction in the functioning of the vascular system is held to be responsible for cellulite, treatments are based on stimulating the microcirculatory system within the affected areas. Typically this is attempted by a combination of massage techniques and the use of topically applied ingredients, for example seaweed extract, caffeine, theophylline and lipid-degrading enzymes. Other actives include extracts of *Elizabethae*, a coral species and of *Calluna vulgaris* (Heather), *Centella asiatica*, milk proteins and vitamin A.

The applicants claim that these methods of treatment are unsatisfactory because massaging irritates the cells causing them to produce more elastase and collagenase. These enzymes degrade connective tissue, tending to make it go limp rather than firming it. Instead a treatment is proposed that comprises one or more ingredients that inhibit the formation and action of estrogens. It is claimed that in females connective tissue filaments extend straight downwards so that the fatty tissue is subdivided into roughly columnar chambers. In males the filaments are more in parallel with the dermis and as a result, the connective tissue paths are markedly shallower and a large number of smaller fat cavities are present. By applying an aromatase inhibitor, which inhibits the formation and action of estrogens in the subcutaneous fatty tissue, there is a restructuring of the fatty tissue into the male pattern. Because the lipid deposits are spread over a much greater area in much smaller deposits there is a visible smoothing of the skin. This also results in a lower degree of replenishment in the existing adipose cells of the subcutaneous fatty tissue and in an improvement in the local blood circulation.

Aromatase is a key enzyme in the biosynthetic pathway of oestrogen. Steroid and non-steroid aromatase inhibitors are used in the treatment of breast cancer but it has been discovered that an extract of glycine soja has been found suitable for cosmetic application. Topical application inhibits only the formation of oestrogen in the peripheral subcutaneous fatty tissue. An androgen action was not to be expected, nor was it detected. The substances employed in accordance with the invention act only locally, not systemically. No intolerance was observed in any of the treated females. A preferred embodiment is the use of a cosmetic for dermal application with a combination of one or more aromatase inhibitors and one or more anti-estrogens at a total concentration of about 0.50% by weight of the composition. Illustrative formulae are given and the results of controlled application described.

**Title:** Cold wax depilatory composition

**Publication No.** USP 5,698,187

**Patent Abstracts**  
**John Woodruff**

**Application No.** 804502  
**Date of filing** 27/03/97  
**Applicants:** Carter-Wallace, Inc.

Various patents exist that describe the preparation of compositions that may be used for the mechanical removal of hair from human skin, including the following mixtures: -

Honey, rosin and beeswax combined with citric acid.

Sugar, citric acid, gelatine and water.

Sugar, lemon juice, glycerine, boric acid, sodium chloride and water.

Honey, sugar and citric acid.

Corn syrup and water.

Common to each is that the composition is applied to the skin and the hair becomes strongly adhered to it. The applicants state that it is highly desirable that the composition can be readily applied with the fingers over a closely controlled area to uniformly and firmly adhere to the hair, and should be readily removed by grasping and pulling quickly away from the skin. It should effect the complete removal of hair over the applied area without repeating the process and the composition should not cause swelling or other irritation to the skin.

The patent claims a composition that fulfils the function of a depilatory and that also exfoliates dead skin cells, without causing skin irritation or redness. It consists of sucrose, maltodextrin and citric acid stirred together at 125°C. The sucrose content is between 45% & 70% by weight. The maltodextrin is an aqueous syrup with 70% - 75% solids content and the citric acid or lemon juice is added at up to 1% of the total composition. Other additions may include 5% glycerine to improve product consistency, potassium sorbate as a preservative and perfume and colour as desired. The resultant mass is clear when hot and after cooling it has a soft putty- like consistency that is pliable between the fingers and which strongly adheres to hair but does not adhere to skin.

**Title:** Compositions for freshening nostrils and sinus cavities

**Publication No.** USP 6,083,525

**Application No.** 152151

**Date of filing** 11/09/98

**Applicants:** Charles A Fust, USA

Claimed is a composition for freshening sinus cavities, containing an antiseptic, a counter-irritant and a masking agent for concealing or eliminating odours emanating from the nostrils. The introduction describes mouthwash rinses that are used to flush the mouth with antimicrobial agents and additives designed to freshen the mouth and mask odours.

Bacterial elimination is normally accomplished by the use of alcohol and/or various dilutions of saline solution. However the use of alcohol often causes a burning sensation and although saline solutions are effective the taste is not well received by most consumers. The composition described is for a composition that is applied directly to the nostrils and sinus cavities and is designed to supplement or replace conventional mouthwashes for the control of halitosis. It is of particular use for persons who smoke as the smoke invades the nostrils and sinus cavities when it is inhaled.

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The composition includes a dilute saline solution as the carrier that also provides a mild antibacterial effect and is safe for use in the nasal passages and sinuses. Odour control is achieved by masking agents such as peppermint or spearmint oil, eucalyptol, methyl salicylate or agents having a fruity or citrus essence. A small quantity of alcohol may be used to provide an antibacterial effect and to facilitate mixing of the other components. Benzalkonium chloride is added as a preservative. The following formula is provided as an example of the composition and the effects claimed for each ingredient.

Ingredient	% w/w	Effect
Sodium Chloride	0.65%	Base ingredient also acting as a moisturiser
Benzalkonium Chloride	0.002%	Preservative
Thimerosal	0.001%	Preservative
Eucalyptol	0.03%	Flavouring agent with antibacterial effect
Methyl Salicylate	0.02%	Flavour, counter-irritant and local analgesic
Menthol	0.015%	Flavour and counter-irritant
Alcohol	0.07%	Aids solubility plus antibacterial effect

A further example buffers the composition with sodium borate and improves the antimicrobial effect by the addition of cetylpyridinium chloride and domiphen bromide with an increased alcohol level. Either composition is applied via a nasal spray.

**Title: Bubble bath composition**

**Publication No. USP 5,773,397**

**Application No. 652122**

**Date of filing 23/05/96**

**Applicants: Kao Corporation**

Claimed is a bubble bath composition said to be relaxing to use because of its rich and persistent foam and its moisturising sensation on the skin. The preamble suggests that bathing in a "bubble bath" is supposed to relax and clean a bather, however because the major components of bubble bath compositions are detergents, natural moisturising components present in the skin are lost during bathing, causing a dry sensation of the skin. Many available products do not foam as well as desired and the addition of lipids to the composition may depress foam and cause it to rapidly break. Increasing the amounts of surfactants may increase the amount of foam produced but the presence of significant amounts of surfactants further enhances the dry sensation of the skin after bathing.

The composition described comprises between 10.00% & 30.0% of an alkanolamide or of a betaine. Between 5.00% & 20.00% of an anionic surfactant such as sodium laureth sulfate, and up to 80% by weight of a polyol. The viscosity should be less than 1000cps to facilitate rapid dispersal of the composition in the bath water and assist good foam generation. Suitable alkanolamides are lauramide DEA, cocamide MEA, or myristamide DEA. Suitable betaines are lauryl betaine or myristyl betaine. Preferred anionic surfactants are alkyl sulfates and alkyl ether sulfates and the polyol can be a dihydric or trihydric alcohol such as glycerol, 1,3-butylene glycol, propylene glycol or a polyethylene glycol having a molecular weight of 400-20,000 or a mixture of two or more of these.

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Essential to the composition described is 5-20% of a non-ionic surfactant having an HLB =>13, preferably a polysorbate ester. Up to 1% of a horny layer intercellular lipid or a structural analogue thereof such as a ceramides, a sugar ceramide, cholesterol, a long-chain fatty acid or a cholesteryl ester. Also included is 0.5-10% of a polyglycerol fatty acid ester having an HLB => 10, for example polyglycerin-10, polyglycerol-10 decalinoleate or polyglycerol-10 decaoleate. An extract of a plant belonging to the Gramineae family, the Rutaceae family, or the Araceae family is also present at from 0,20 – 1,00% as a counter-irritant.

The patent is well illustrated with example formulations and is of particular interest because of the design of the test procedures used to evaluate each formulation for physical and sensorial effects. A typical example of the base composition described follows.

Ingredient	% w/w
Lauramide DEA	20.00
Sodium Laureth Sulfate	10.00
Menthol	0.50
Propylene glycol	10.00
Glycerol	15.00
Methylparaben	0.20
Butylparaben	0.20
Perfume	1.00
Colour	qs
Water, suitably treated to 100%	

The above composition should also include a lipid such as a suitably solubilised ceramide; a plant extract from the Gramineae family, the Rutaceae family, or the Araceae family and a polyglycerol fatty acid ester having an HLB => 10.

**Title:        Conditioning cosmetic cleanser compositions**

**Publication No.    USP 6,120,753**

**Application No.    093804**

**Date of filing        9/06/98**

**Applicants:        Chesebrough-Pond's USA Co**

Claimed is a skin cleansing composition with skin and scalp moisturizing properties. The introduction suggests that many common anionic surfactants such as lauryl ether sulfates found in personal cleansing products can be harmful to skin or scalp. These surfactants can penetrate the stratum corneum and remove lipids, leading to dry and rough skin. It states that cleansing products should contain mild surfactants and they should also provide protective ingredients such as moisturisers but moisturising additives can have an adverse effect upon foam properties.

It is the stated objective of the applicants to provide a cleansing composition with improved moisturising and skin after feel benefits with a thicker, richer and longer lasting

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foam and which can be dispensed from pump devices, especially from aerosol pressurized containers.

An essential ingredient of the composition is a water-soluble or water-dispersible urethane siloxane copolymer prepared by the reaction of a diol with an organic diisocyanate.

Suitable diols include dimethiconol and polydimethyl siloxane. Commercially available diisocyanates are isophorone diisocyanate (IPDI), methylene diisocyanate and toluene diisocyanate and a preferred material is polydimethyl siloxane-PEG ether/IPDI copolymer, known by its chemical name as polydimethylsiloxane-polyoxyalkyleneoxide polymer with 3-isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate.

The surfactant system may be a combination of anionic, non-ionic and amphoteric. The primary anionic may be drawn from a wide range of such materials but sodium C<sub>14</sub>-C<sub>16</sub> olefin sulfonate, sodium laureth sulfate, sodium cocoyl isethionate and sodium lauroyl sarcosinate, either alone or in combination, are preferred. The non-ionic may be an alkyl glucoside, a polysorbate ester or other commonly used material and the preferred amphoteric is cocoamidopropyl betaine.

Emolliency is conferred by a water-insoluble material such as sunflower seed oil, soy sterol esters, borage seed oil, maleated soybean oil and mixtures of these and may also include silicone quaternium-8 and a suitable fatty acid. Pelargonic, lauric, myristic, palmitic, stearic, isostearic, hydroxystearic, oleic, linoleic, ricinoleic, arachidic, behenic and erucic acids are mentioned. The composition may optionally include glycerin and other humectants, preservatives, colours, fragrances and opacifiers and water-insoluble vitamins such as vitamin A palmitate, vitamin E acetate. The final composition is an oil-in-water emulsion of low viscosity, suitable for either a pump operated dispenser or an aerosol.

**Title: Body cleansing composition providing protection against sunburn after rinsing**

**Publication No. USP 6,043,204**

**Application No. 187085**

**Date of filing 5/11/98**

**Applicants: Kaufman; Stacy R. (USA)**

Disclosed in a body cleansing composition with sunscreen filters providing upon a single application, an SPF of at least 15 as applied and SPF of at least 4 after rinsing. The preferred sunscreen compounds are a mixture of a ethylhexyl methoxycinnamate, and a second sunscreen compound able to absorb at least 50% of incident radiation at wave lengths from 290 to 320 nanometers. This is selected from a group consisting of benzophenone-3, octyl salicylate, octocrylene, zinc oxide and mixtures thereof.

The cleansing aids are a combination of at least two surface active agents including an anionic agent which can be an alkyl sulfate or an alkyl ether sulfate, and a second agent which can be non-ionic, anionic or zwitterionic; cocamidopropyl betaine is preferred.

SPF is enhanced by the inclusion of polyquaternium-10 to impart skin-substantivity to the sunscreen materials and the composition contains petrolatum with C<sub>12</sub>-C<sub>15</sub> alkyl benzoate and a water-immiscible volatile hydrocarbon, for example pentane. The composition is designed for use as a cleansing aid in the shower. The pentane causes the product to froth

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in the hand and on application to give a pleasing refreshing sensation and the inclusion of oils, petrolatum and polyquaternium-10 ensure that sufficient sunscreen adheres to the users skin to impart a final SPF of at least 4 after rinsing and drying.

Example compositions are as follows, all quantities are %<sup>w</sup>/<sub>w</sub>: -

Material	Example 1		Example 2		Example 3		Example 4	
	Min	Max	Min	Max	Min	Max	Min	Max
Ethylhexyl methoxycinnamate	4.00	8.00	4.00	8.00	4.00	8.00	4.00	8.00
Octyl salicylate	3.00	8.00	0.00	6.00	0.00	6.00	3.00	6.00
Benzophenone-3	0.00	6.00	3.00	8.00	3.00	8.00	0.00	6.00
Sodium laureth sulfate	3.00	6.00	3.00	6.00	3.00	6.00	3.00	6.00
Cocamidopropyl betaine	2.00	5.00	2.00	5.00	2.00	5.00	2.00	5.00
Polyquaternium-10	0.30	0.60	0.30	0.60	0.30	0.60	0.30	0.60
Petrolatum	3.00	10.00	3.00	10.00	5.00	10.00	3.00	10.00
Pentane	3.00	10.00	3.00	10.00	3.00	10.00	3.00	10.00
C <sub>12</sub> -C <sub>15</sub> alkyl benzoate	0.00	19.00	0.00	19.00	0.00	19.00	0.00	19.00
Preservatives, colours etc	qs		qs		qs		qs	
Water to 100%								

The compositions may also include other surfactants such as sodium cocoyl isethionate; further sunscreen additives such as microfine zinc oxide and additional oil components such as fatty acid esters.

**Title: Extra-mild shower gel and hair shampoo formulation with low tenside concentration**

**Publication No. USP 6,056,948**

**Application No. 093804**

**Date of filing 23/12/92**

**Applicants: Benckniser N.V.**

The invention relates to shower gels and hair shampoos containing a neutralised tenside combination of an alkyl polyglycol ether carboxylate and alkyl ether sulphate with a fatty acid amidopropyl betaine and the customary auxiliary and base substances. The objective is to provide a composition containing a mild tenside combination for skin and hair care, which contains ether-sulfate and has good foaming properties. Additionally the composition is to be highly viscous with a surfactant concentration less than 10% and a

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minimum of electrolyte salts and without additional thickeners. It is also required to be biodegradable and non-polluting.

It was found that the following combinations met these requirements.

Material	Example	Min. % w/w	Max. % w/w
Alkyl polyglycol ether-carboxylate	Sodium trideceth-8 carboxylate	2.00	5.00
Fatty alcohol ether-sulfate	Sodium laureth sulfate	2.00	7.00
Fatty acid amidopropyl-betaine	Cocamidopropyl betaine	1.00	3.00
Protein hydrolysate	Hydrolysed collagen	0.30	1.50
Lauryl alcohol-ethoxylate	Laureth-3	0.10	0.50
Conditioning additive	Polquaternium-7	0.00	2.00
Electrolyte	Sodium chloride	2.00	10.00
Perfume, preservatives and other optional additives etc.		qs	
Water to 100% w/w			

The above limits on concentration are wider than the typical example formulations that illustrate the patent. In particular the sodium chloride level is typically below 3% w/w and the combined total surfactant concentration is below 10.0% w/w

**Title: Hair removal system**

**Publication No. USP 6,425,891**

**Application No. 624309**

**Date of filing July 24, 2000**

**Applicant: Tapper; Robert, USA**

It is common practice among most of the world's population to remove hair in order to improve personal appearance. The most popular means of hair removal is by shaving but other methods include tweezers, wax and chemical depilatories. All these methods are only temporary and must be repeated endlessly.

Currently, the most commonly used chemical depilatories are mercaptans, particularly salts of thioglycolic acid mixed with alkali such as sodium hydroxide or calcium hydroxide. Hair is composed primarily of the chemical keratin. One of keratin's building blocks is the sulphur-containing amino acid cystine, which makes up 15 to 17% of the hair. The alkali and the thioglycollate attack the cystine and break the disulfide linkages that hold the keratin molecules together. The hair absorbs water, swells, loses its strength, becomes almost like jelly, and can easily be scraped away from the skin. Because approximately eight times more keratin is found in the hair than in the skin, the depilatory cream will preferentially act more readily on hair than skin.

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Thioglycollate depilatories are marketed as pastes, lotions, or creams. A thick layer is applied so that the depilatory does not dry out and lose effectiveness. Depending on the formulation, the depilatory is left on for between two and fourteen minutes. After the preparation is removed, the hairs that remain are typically wiped away with a washcloth. Adverse effects occur occasionally; thioglycollate is a known contact allergen and the alkalinity of certain preparations can cause an irritant dermatitis if left on the skin too long. A permanent means for hair removal is by way of electrolysis needle. This latter process is costly, painful, subject to scarification and extremely tedious since it treats only one hair at a time. Those concerned with the development and use of hair removal systems and procedures have long recognized the need for improvements in hair removal methods to enable more rapid, reliable, comfortable, convenient, economical, and long term or permanent removal of hair.

Patent USP 6,425,891 claims to provide a new and improved hair removal system for iontophoretically delivering a depilatory agent into a site where hair removal is desired and, further for enhancing penetration efficiency. Non-metallic iontophoresis electrodes and a chemical depilatory of low viscosity are utilised for enhanced efficacy. The depilatory is preferably contained within felt storage pads adjacent to the electrodes or the depilatory agent may be topically applied directly to the hair site. Iontophoresis is used to drive the depilatory into the site for controlled hair root destruction. The magnitude of the electrical current and the duration of treatment may be manipulated to effect varying degrees of hair root damage and thereby selectively accomplish either long term or permanent hair removal. Typically, iontophoresis currents vary from approximately 0.5 ma. to approximately 1.0 ma. and treatment lasts for a few minutes to approximately fifteen minutes. The system accomplishes hair removal over a wide area, limited only by the size of the iontophoretic applicator.

**Title: Depilatory composition**

**Publication No. USP 6,479,043**

**Application No. 678924**

**Date of filing October 4, 2000**

**Assignee: Del Laboratories, NY**

The patent describes a hair-removing composition in the form of a lotion, gel or cream comprising from about 2% to 10% of a depilating agent, e.g., a thioglycollate compound, and about 0.1 to about 20% by weight of particles or beads composed of a polyethylene material or of a wax such as jojoba, carnauba or candelilla. In a most preferred embodiment, the composition comprises about 0.1 to about 5.0% by weight of the polyethylene or wax particles. The solid particles are most preferably about 30 to about 100#. The composition is said to be highly effective as a depilatory because of its ability to rapidly lift and thoroughly saturate each hair shaft.

Preferred depilating agents include sodium thioglycollate, calcium thioglycollate and potassium thioglycollate, singly or as mixtures. The composition may optionally include a variety of conventional additives and adjunct ingredients. In particular buffering agents such as sodium silicate; viscosity increasing agents such as acrylate or methacrylate copolymers; emulsion stabilisers such as stearyl and cetearyl alcohol and mixtures

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containing the same; pH adjusters such as sodium or calcium hydroxide; chelating agents and preservatives may be utilised.

Example formulation

Ingredients	% w/w
Aqua (Water)	73.45
Sodium Silicate	3.00
Calcium Hydroxide	5.00
Calcium Thioglycolate	5.00
Acrylates/Ceteth-20	0.60
Paraffin Liquidum (Mineral Oil)	6.00
Cetareth-20/Cetearyl Alcohol	4.00
Stearyl Alcohol	1.25
Squalane	0.10
Sesamum Indicum (Sesame) Seed Oil	0.10
Tocopheryl Acetate	0.10
Parfum (Fragrance)	0.40
Hydrogenated jojoba oil or Polyethylene beads	1.00

**Title: Wax-stick hair removal device**

**Publication No. USP 6,478,493**

**Application No. 678924**

**Date of filing November 12, 2002**

**Assignee: Cepeda; Daniel Mario, USA**

A cosmetic hair removal technique involves the application of warm wax to a hairy area. The wax is allowed to cool and harden, whereupon it enmeshes the hair and the hardened wax is then stripped from the skin, pulling out the enmeshed hair by its roots. New hairs will generally not appear at the skin surface for a period of weeks. This method is usually applied to large areas of the body.

Described is a depilatory wax stick about 10 cm long with a slightly tapered shape with a 1.8 cm diameter base and a 1.5 cm diameter free end which is rounded to form about a 1.0 cm application tip. It is used for the removal of hair in localised, delicate areas such as facial hair above and below the lips, toes and bikini line.

The container is filled with a depilatory wax, which may be any combination of waxes in normal use as depilatory wax. Such materials are often mixtures of rosin and beeswax, sometimes with the addition of honey. An alternative composition is triethylene glycol hydrogenated rosin with an equal quantity of glyceryl hydrogenated rosin and approximately 8% beeswax.

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The stick is used by heating the tip with a flame or other source of heat immediately prior to application of the wax. The tip surface consistency becomes soft and semi-viscous to permit deposition of the wax onto the selected surface. After the applied wax is allowed to cool and harden, it is removed with the entrained facial hair.

**Title:       Cosmetic composition and method of use**

**Publication No.   USP 6,403,108**

**Application No.   540589**

**Date of filing     March 31, 2000**

**Assignee:   Sheikh Ahmed Abdullah**

According to the applicants human skin is subject to abuse by many extrinsic and environmental factors, as well as coronal ageing or intrinsic factors. Common extrinsic factors include ultra violet radiation, pollutants, trauma and other exogenous agents. These extrinsic and intrinsic factors lead to wrinkling of skin. For many people, skin wrinkles are a reminder of aging and elimination of wrinkles has become an important concern. Treatments for reducing wrinkles range from cosmetic creams and moisturisers to aesthetic surgery.

The applicants claim to provide a cosmetic composition for treating the condition of coronal aging, such as wrinkling and fine lines, leathering, yellowing, sagging, hyper-pigmentation and general signs of aging. The cosmetic composition enhances the general tone, glow and firmness of the skin. It comprises Aloe Vera gel, alpha-hydroxy acid (AHA), Vitamin C and vitamin A.

Aloe Vera gel is the largest single component of the, preferably comprising between 48% and 50% by weight of the total composition. An AHA is provided as a keratolytic agent for assisting in the exfoliation of skin and sufficient is present to adjust the pH to 2.3 - 3.7. Glycolic acid is the preferred AHA, present at approximately 10.5%.

Between 2 % and 3% Vitamin C is provided for enhancing skin collagen metabolism and rejuvenation. Vitamin C tends to oxidise in the presence of an AHA so encapsulated Vitamin C is used in order to reduce such oxidation. The encapsulated Vitamin C is in the form of beads and it is believed that these beads either rupture or dissolve upon application and release Vitamin C to the skin.

Approximately 1% Vitamin A is an optional component for enhancing exfoliation and collagen activation and Vitamin E at about 0.1% may also be added to enhance collagen stimulation and address scar tissue formation. Other ingredients may be included to enhance the aesthetic qualities and product preservation and stability.

**Title:       Cosmetic salt scrub product**

**Publication No.   USP 6,551,603**

**Application No.   713468**

**Date of filing     November 15, 2000**

**Assignee:       Unilever Home & Personal Care USA**

Described is a cosmetic salt scrub composition which does not exhibit any gross separation of liquid and solid components. Salt scrubs based on sea salt tend to separate

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into two phases, making them visibly unacceptable and difficult to apply. The applicants claim that the use of sodium sesquicarbonate overcomes these problems. Separation is avoided, dispensability from the container is easy and dispersion onto the skin is highly uniform. Unlike sea salt, sodium sesquicarbonate does not float in the oily liquid phase. Much of the oil is absorbed onto the salt and albeit not powdery is relatively dry in feel.

Salts other than sodium sesquicarbonate may be included, examples being sodium tripolyphosphate, sodium aluminosilicate, silica, alumina, clays, talc, calcium carbonate, calcium sulphate, magnesium chloride and combinations thereof. The optimum proportion of sodium sesquicarbonate is 60% to about 80% by weight. Other salts when present will optimally be no higher than from about 0.01 to 5% by weight.

The oil-phase may comprise almost any combination of water-insoluble liquids commonly found in cosmetics, including mineral and vegetable oils, polyolefins, esters, volatile cyclomethicones and linear dimethicones. Waxes may be incorporated to thicken the oil phase and 0.5% to 1.2% pistachio wax is a preferred addition. Although not essential, it is useful to formulate a water-soluble polymer mixed within the oil phase. Illustrative substances are polydimethylsiloxane-PEG, dimethicone copolyol phosphate, dimethicone sulfosuccinates, glyceryl polymethacrylate and a variety of polyalkoxylated silicates. Optimal amounts of the polymer range from about 0.5% to about 2% by weight.

An illustrative composition of the oil phase is given as

C12-C15 Alkyl Benzoate 22.22% w/w

Stearyl Palmitate 16.67

Sunflower Seed Oil 5.56

Mineral Oil (70 cs) 50.00

Polydimethylsiloxane-PEG 5.55

When mixed with sodium sesquicarbonate the optimum ratio was found to be between 75% to 85% salt and 25% to 15% oil phase by weight.

**Title: Increasing skin cell renewal with water-soluble Vitamin E**

**Publication No. USP 6,645,514**

**Application No. 325326**

**Date of filing: December 19, 2002**

**Assignee: Access Business Group International**

Claimed is a method of enhancing the rate of skin exfoliation by incorporating a water-soluble Vitamin E derivative into a cosmetic composition that contains water and is suitable for application to mammalian skin.

In normal skin, it takes about 14 days for the basal cells to move from the basal layer to the end of the granular layer and to become corneocytes, and another 14 days for the corneocytes to reach the outermost layer of the stratum corneum, where they are naturally shed or exfoliated. Thus, it takes about 28 days for cells of the basal layer to move outward to the surface in the course of skin renewal.

Two common methods are used to improve the appearance of the skin through the application of topical compositions. In the first, a composition is applied that protects the living portion of the skin from damage. In the second, a composition is applied that

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increases the natural exfoliation rate of the skin, thus increasing the rate at which the outer layers of dead cells are replaced.

Naturally occurring Vitamin E and its oil-soluble derivatives are believed to improve the appearance of skin by reducing oxidative damage to living cells however they do not increase skin cell-renewal rate. DL-.alpha.-Tocopheryl Phosphate is a water-soluble vitamin E derivative prepared by reacting vitamin E with sodium phosphate and this and other water-soluble derivatives are believed to increase cell exfoliation and are present, alone or in combination, at up to 30% by weight of the total composition, although 5% is particularly preferred.

The water-soluble vitamin E derivative is applied in a water-based cosmetic composition that may be formulated as an emulsion, a gel or aerosol foam. It may contain a suitable sunscreen and if in the form of an emulsion it will contain various oils, waxes and emulsifiers. It may contain from 1% to 4% of an AHA but the pH should not be lower than 4.5 and preferably no lower than 5.6. In fact exfoliation rates increase with rising pH but the maximum pH should be 7.9 to reduce possible inflammation and irritation. Illustrative formulations include those below.

Ingredients	A	B	C	D
Water	80.25	75.00	79.00	81.65
VEP	0.50	1.00	2.00	2.00
Butylene Glycol	2.00	1.00	3.00	3.00
PEG-8		2.00		
Glycerin	1.00	2.00	2.00	4.00
Glycereth-26	1.00	2.00	2.00	
Sodium Hyaluronate (0.5% soln)	0.20	0.40		0.20
Dipotassium Glycyrrhizinate	0.01			
Panthenol	0.25	0.25		0.50
Oat Extract	2.00		1.00	
Cucumber Extract	2.00		1.00	
Alcohol	2.00	8.00	4.00	
Thickeners, extracts, preservatives, emulsifiers, skin conditioners etc.	8.79	8.35	6.00	8.65

**Title: Methods and compositions for improving sun protection from sunscreen formulations**

**Publication No. USP 6,165,449**

**Application No. 587236**

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**John Woodruff**

**Date of filing**      **16/01/1996**

**Assignee:**            **Stepan Co.**

Deployment of the sunscreen molecules over the surface of the skin determines to a major extent the protection delivered by various sunscreen formulations. Ideally, the sunscreen formulation should be applied to yield a film of uniform thickness on the skin with the sunscreen molecules homogeneously distributed within the film. The base formulation determines the manner in which the sunscreen molecules are deployed on the skin and also affects the ability of a sunscreen to protect skin after prolonged water exposure.

The most common formulation type for topical sunscreens is an emulsion, either oil-in-water (o/w) or water-in-oil (w/o). It is important that the emulsification system be capable of creating stable emulsions with a variety of polar and non-polar sunscreen agents as well as cosmetic oils. The patent claims methods and compositions for increasing the sun protection factor of sunscreen emulsions by adding a phthalic acid derivative in an amount effective to increase the sun protection factor of the composition.

Most preferred sunscreen emulsions of the invention comprise about 1 to 5% of the phthalic acid derivative by weight and examples of these are sodium soyaamido benzoate, sodium oleylamido benzoate, potassium cocoamido benzoate, and sodium stearylamido benzoate.

The emulsions may be either w/o or o/w and may include any permitted sunscreen active, alone or in combination. The patent describes various test formulations and results show a significant improvement in SPF when sodium benzoate and other phthalic acid derivatives are included in the compositions.

**Title:**            **Sun screening agents in the form of oil/water micro emulsions**

**Publication No.**    **USP 6,207,140**

**Application No.**   **254946**

**Date of filing**      **19/03/1999**

**Assignee:**            **Cognis, Germany**

Micro-emulsions are optically isotropic, thermodynamically stable systems that contain oil components, emulsifiers and water. The transparent appearance of micro-emulsions is attributable to the small particle size of the dispersed emulsion droplets. In the range from 100 to 300 nm micro-emulsions are brown-red in transmitted light and a shimmering blue in reflected light. They are clear when the droplet size is below 100 nm in diameter.

The applicants claim that there is a continuing need on the market for sun protection products with an improved performance spectrum. Of particular interest in this regard are compositions that enable relatively large amounts of UV filters to be incorporated without any phase separation or sedimentation occurring during storage. Where relatively large quantities of titanium dioxide are incorporated, a formulation produced by the phase inversion temperature (PIT) method tends to separate the dispersed solid very quickly. Another problem is that many UV filters are capable of interacting with the other ingredients of the formulation, resulting in a chemical reaction and also in a reduction in storage stability. Finally, consumers prefer transparent formulations, which show high skin-cosmetic compatibility, even when applied to very sensitive skin.

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It is the objective of the applicants to provide sun protection compositions that exhibit phase stability, stability in storage, transparency and compatibility with sensitive skin. This is achieved by the use of micro-emulsions comprising oils, mono glyceride (ether) sulfate and UV filters.

Suitable oils are, for example, Guerbet alcohols based on fatty alcohols containing 6 to 18 and preferably 8 to 10 carbon atoms, esters of linear C6-20 fatty acids with linear C6-20 fatty alcohols and esters of branched C6-13 carboxylic acids with linear C6-20 fatty alcohols. Other suitable oils include 2-ethyl hexanol, vegetable oils, branched primary alcohols, substituted cyclohexanes, and silicone compounds. The oils may be present in quantities of 1 to 90% by weight, preferably 5 to 75% by weight and more preferably 10 to 50% by weight, based on the non-aqueous component.

Monoglyceride sulfates and monoglyceride ether sulfates are anionic surfactants normally produced from triglycerides that are trans-esterified to the monoglyceride, optionally after ethoxylation, and then sulphated and neutralised. These may be used in association with alkyl ether sulfates and/or non-ionic polyglycosides as co-emulsifiers. The following formulations are each described as stable and clear and illustrate the principal claims of the patent.

INCI Name	R1	R2	R3	R4	R5	R6
Sodium coco monoglycerol sulfate	12.0	6.0	6.0	6.0	6.0	3.0
Sodium laureth sulfate	6.0	3.0	2.0	4.0	--	--
Dodecyl polyglucose	6.0	3.0	4.0	5.0	--	--
Glyceryl oleate	6.0	--	--	--	--	--
Octyldodecanol	3.0	15.0	--	--	--	15.0
Dicaprylyl ether	--	15.0	--	--	--	20.0
Decyl Oleate	--	--	35.0	--	--	--
Caprylic/capric triglyceride	--	--	--	35.0	--	--
Cetearyl isononanoate	--	--	--	--	35.0	--
OMC	5.0	9.0	--	--	--	--
Methylbenzylidene camphor	--	--	5.0	--	--	--
Octyl triazone	--	--	--	5.0	--	--
Titanium dioxide	--	--	--	--	5.0	--
Tocopherol	--	--	--	--	--	10.0
Water to 100%						

**Title: Sunscreen composition**

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**Publication No. 6,267,949**

**Application No. 423852**

**Date of filing 15/11/1999**

**Assignee: Soltec Research PTY Ltd**

Zinc oxide provides a high level of UV protection for the skin in the UV-A region. A commercial sunscreen formulation should also provide protection in the UV-B region. Described is a sunscreen composition including conventional UVB sunscreen agents and zinc oxide having an average particle size in the order of 150 to 800 nm but preferably in the order of 200-400 nm. The composition has an SPF greater than 30 and is substantially transparent upon application to the skin.

It is generally thought that only when zinc oxide particles have an average particle size of less than, 50 nanometers do the particles lose their white appearance and be invisible on the skin after application. Such formulations may contain approximately 4-6% by weight of microfine zinc oxide. However, the applicants claim that the use of nano particles of zinc oxide has the disadvantage of high cost and they show a tendency to agglomerate, which reduces the SPF of the product. The applicants use pigment grade zinc oxide, preferably of 200 to 400 nm in diameter.

The applicants discovered that when pigment grade zinc oxide is combined with magnesium aluminium hydroxystearate the resultant sunscreen formulation does not impart the expected whiteness or pigmentation after application onto the skin. Preferably the zinc oxide is present in the range of 0.5 - 15% by weight. According to the patent such compositions have a synergistic action when UVB agents are added and are sufficiently waterproof without the addition of a waterproofing polymer.

The compositions are preferably emulsions and the zinc oxide is suspended in the oil phase. Other ingredients commonly used in sunscreens may be added to improve the stability and aesthetics of the composition. Such additives include emollients, dispersants, emulsifiers, stabilisers, moisturisers, anti-oxidants, preservatives and agents which provide water resistance, enhance skin feel and aid film formation, plus perfumes and colouring.

The magnesium aluminium hydroxystearate cited in the patent is specifically Gilugel OS from BK Giulini Chemie GmbH, which also contains ethylhexyl stearate. Various formulations are shown that illustrate the formulation concept.

**Title: Wet wipes having skin health benefits**

**Publication No. USP 6,440,437**

**Application No. 491898**

**Date of filing January 24, 2000**

**Assignee: Kimberly-Clark Worldwide, Inc**

Wipes can be used for a variety of purposes including cleaning, cosmetics removal, and sanitation. Described are wipes or wipe-type products combined with an oil-in-water emulsion composition comprising a natural fat or oil, sterol or sterol derivative, humectant, emulsifier and water that cleans the surface of the skin and provides enhanced health benefits.

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Diaper dermatitis, in infants and adults, is a genre of skin conditions that originate from impaired barrier function, which can result from a variety of factors, including; increased skin hydration due to the occlusion of the skin caused by diapers, enzymatic skin damage due to faecal and urinary enzymes, physical abrasion caused by diapers, washcloths, and wet wipes, and removal of skin lipids by surfactant associated with bathing and cleaning.

The inventors identified a need for products that help maintain skin barrier function, particularly in the diapered skin environment, such as a wet wipe or wipe-type product that deposits suitable materials on the skin to enhance skin barrier and minimise physical damage to the skin due to wiping. It should leave the skin feeling soft and supple and provide a long lasting benefit while still providing effective cleaning. The inventors claim to satisfy this need by providing a wet wipe combined with an oil-in-water emulsion.

The emulsion comprises natural fats or oils, a sterol or sterol derivative, a humectant, an emulsifier and a mixture of water and alcohol, preferably ethanol or isopropanol and it should have a pH between 4 and 7. The natural fat or oil may include borage oil, avocado oil, or sunflower oil. The sterol may include soy sterol, avocado sterols, or cholesterol. The humectant used in the composition may include glycerine, sorbitol, or propylene glycol. The emulsifier may include glyceryl stearate SE, emulsifying wax NF, or propylene glycol oleate SE. The composition may also include petrolatum or mineral oil.

One embodiment of the composition comprises about 1% borage oil, about 0.8% soy sterol, about 5% glycerine, about 3% glyceryl stearate SE, and about 90.2% water and it has a pH of about 5.5 An alternative example comprises about 10% sunflower oil, about 1% cholesterol, about 3% glycerine, about 5% emulsifying wax NF, and about 81% water with a pH of about 5.5. In preferred embodiments the emulsion is about 75% of the total weight of the wet wipe.

**Title: Formulations including hydrolyzed jojoba protein**

**Publication No. USP 6,649,177**

**Application No. 841544**

**Date of filing April 23, 2001**

**Assignee: MGP Ingredients, Inc**

Claimed is the inclusion of hydrolysed jojoba protein in cosmetic and personal care formulations. To quote the applicants; more particularly, it is concerned with hydrolysed jojoba protein, which is preferably in the form of a mixture of amino acids, peptides and protein fractions derived from the hydrolysis of naturally occurring jojoba protein; such mixtures, when used in cosmetic products provide enhanced properties.

The hydrolysed jojoba protein is typically in the form of a mixture having an amino acid, peptide or protein fragment molecular weight range of from about 75-5,000, with an average molecular weight of from about 1,500-2,500. Higher molecular weight fractions have an average molecular weight of 3,000-4,000 while lower molecular weight fractions have an average molecular weight of about 100-300. Although the hydrolysed jojoba protein and derivatives thereof can be produced as a dry powder, normally the product is in the form of an aqueous dispersion containing jojoba protein or derivatives, preferably from about 23-27% by weight.

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An amount of hydrolysed jojoba protein or derivative thereof is incorporated in cosmetic formulations at a level of from about 1-10%, more preferably from about 3-8% by weight. The preferred jojoba protein products are in the form of liquid dispersions and it is said to be a simple matter to add it to the cosmetic formulation during preparation.

### Ingredient Amino Acid Profile

Aspartic Acid	2.82%
Threonine	1.41%
Serine	1.53%
Glutamic Acid	3.36%
Proline	1.44%
Glycine	2.45%
Alanine	1.19%
Cystine	0.80%
Valine	1.54%
Methionine	0.35%
Isoleucine	1.03%
Leucine	2.02%
Tyrosine	1.07%
Phenylalanine	1.23%
Histidine	0.61%
Lysine	1.45%
Arginine	1.95%
Tryptophan	0.32%

**Title: Cleansing compositions comprising highly branched polyalphaolefins**

**Publication No. USP 6,699,824**

**Application No. 889950**

**Date of filing July 24, 2001**

**Assignee: The Procter & Gamble Company**

Claimed are mild personal cleansing compositions which display improved deposition of skin care actives such as antimicrobials, sunscreens and vitamins. In addition, it is claimed the compositions display improved rinse feel in combination with good skin feel attributes, and foaming properties which are suitable for simultaneously cleansing and conditioning skin and hair and that may be used, for example, in the form of foam bath preparations, shower products, skin cleansers, hand, face and body cleansers, shampoos, etc.

The applicants suggest that cosmetic cleansers should cleanse the skin or hair gently, without defatting or drying the hair and skin and without irritating the ocular mucosa or leaving skin taut after frequent use. Certain synthetic surfactants are known to be mild.

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However, a major drawback of some mild synthetic surfactant systems is that they have what can be described as a "slippy" or "non-draggy" rinse feel which is not liked by some consumers. The use of certain surfactants such as potassium laurate, can yield a "draggy" rinse feel but at the expense of clinical skin mildness. These two facts make the selection of suitable surfactants in the rinse feel and mildness benefit formulation process a delicate balancing act. Thus a need exists for personal cleansing compositions which deliver a "draggy" rinse feel while at the same time having excellent skin mildness, in addition to excellent product characteristics such as lather, cleansing, stability, thickening, rheology and in-use skin feel attributes. It is claimed that compositions comprising water, surfactant, hydrophobic skin active component, and water-insoluble oil meet this need. The water-insoluble oils, which comprise up to about 5% of the total composition, are preferably hydrogenated polyalphaolefin polymers, examples of which include polydecene oils such as those commercially available under the trade names Puresyn 40 and Puresyn 100. Hydrophobic skin actives include antimicrobial agents, sunscreens, vitamins, perfume oils, insect repellents, anti fungal agents, and mixtures thereof. The total level of surfactant is preferably from about 5% to about 20% and is a mixture of anionic with zwitterionic and amphoteric surfactants, the anionic element being about 15% of the total composition. Almost all known surfactants are named either individually or by class within the patent but preferred examples of the anionic are ammonium laureth sulfate, ammonium xylene sulfonate and ammonium lauryl sulfate in combination with sodium lauroamphoacetate, sodium lauroyl sarcosinate and cocamide MEA.

**Title: Single-phase transparent aqueous cosmetic composition**

**Publication No. USP 6,500,441**

**Application No. 816520**

**Date of filing 26/04/2001**

**Assignee: L'Oreal (Fr)**

Claimed is a process for dissolving an alkyl parahydroxybenzoate in an aqueous cosmetic composition that is at least 90% water and which does not contain a primary alcohol. The applicants report that single-phase transparent aqueous liquid compositions are often used for cleansing and make-up removal lotions. Generally they contain alkyl parahydroxybenzoates, also known as parabens, as preservatives. However parabens have low water-solubility and if they are not entirely dissolved they have a tendency to crystallise, which is unacceptable.

The applicants made the unexpected discovery that the addition of as little as 0.02% sodium metabisulfite to the aqueous solution was capable of dissolving parabens. The metabisulfite, preferably sodium metabisulfite is added in an amount ranging from 0.001 to 0.02%, preferably from 0.002 to 0.01%, by weight with respect to the total weight of the composition. The paraben is preferably methylparaben, alone or as a mixture with one or more other parabens and/or with another preservative, such as phenoxyethanol. The amount can range, for example, from 0.01 to 1% and preferably from 0.05 to 0.5% by weight with respect to the total weight of the composition.

The composition should be ethanol-free but may contain a polyol such as propylene glycol, butylene glycol, glycerol, hexylene glycol, polyethylene glycols and their mixtures.

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The amount of polyol(s) in the composition is preferably from 1 to 5% by weight. A surfactant may also be present to improve the removal of make-up. The surfactant is generally present in an amount ranging from 0.01 to 5% and more preferably from 0.05 to 2% by weight and a simple example formulation follows:-

#### **Lotion for Cleaning the Face and Eyes**

Glycerol	3%
Sodium metabisulfite	0.002%
Methylparaben	0.1%
Demineralised water q.s. to	100%

**Title: Cosmetic composition for adding fullness to the lips and surrounding area**

**Publication No. USP 6,514,505**

**Application No. 755307**

**Date of filing 28/12/2000**

**Assignee: Paula Dorf, USA**

Traditionally, wearers of lipstick and other coloured lip products have encountered difficulty with fine facial lines that commonly form around the lips. These facial lines often cause lipstick to "bleed" into them and the lipstick then settles into the lines and emphasises their existence by depositing colour in the crevices. It is the claimed objective of this patent to provide a cosmetic composition for application to the lips and surrounding skin area to fill in superficial cracks, crevices, and wrinkles and to add fullness and smoothness to the appearance of the lips and other skin area. This ensures that the application of lipstick and other makeup is smooth, seamless, and long lasting. The composition is clear on application and appropriate for use around the mouth. It imparts a desirable feel on the skin and is applied in one smooth stroke and can also be used for eyeliner, eye shadow, and other cosmetics.

The composition utilises cyclomethicone as a solvent and to provide a smooth feel to the user's skin. It includes vitamin A as an anti-aging compound for keeping the user's skin young looking and vibrant and ascorbyl palmitate, and dioctyl malate as moisturising oils. It may contain other oils and either minerals or waxes as viscosity modifiers. Mica is added to soften the appearance of the skin. A preferred embodiment comprises a composition made from cyclomethicone, paraffin wax, polybutene, dioctyl malate, C<sub>30-45</sub> alkyl methicone, mica, pershea butter, aloe vera extract, vitamin A, PEG-8, tocopherol, ascorbyl palmitate, ascorbic acid, citric acid and propyl paraben. No limits on their levels are suggested.

**Title: Plant-based anti-perspiration cosmetic**

**Publication No. USP 6,534,046**

**Application No. 202696**

**Date of filing 25/07/2002**

**Assignee: Coty B.V. (NL)**

Described is a plant-based antiperspirant composition comprising a mixture of 0.01 to 5% by weight of an extract of Equisetum Arvense (Horsetail) Extract with the essential oil of

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Salvia Officinalis (Sage) Extract; 0.01 to 5% by weight of a mixture of the extracts of Hamamelis Virginiana (Witch Hazel) and Quercus infectoria plus 0.5 to 15% by weight of pulverised, bamboo wood (Bamboo Powder). The bamboo powder is the pulverised medulla of Bambusa Aruninacea having a preferred medium particle size of about 5 microns and approximately 60% of the particles being in the range of 2-6 microns. This particular bamboo species is native to some Indian mountain woods and is said to be particularly suitable for absorbing sebum and adding texture to cosmetic products. The bamboo powder preferably makes up 4-12% by weight of the total composition.

Other ingredients may include 0.01 to 2% by weight of an active agent selected from the essential oils of Eucalyptus Globulus, Citrus Medica Limonum (Lemon), Commiphora Molmol (Myrrh), Sandalwood (Santalum album) and mixtures thereof. Zinc ricinoleate may also be added in a solubilised form together with propylene glycol, triethanolamine and lactic acid. The composition also contains up to 15% of kaolin with titanium dioxide and methyl methacrylate/ethylene glycol bismethacrylate copolymer is added to improve skin feel.

Additional cosmetic ingredients to improve product stability and aesthetic properties are included and the product may be a cream, a powder, a make-up or a foundation. The composition is not primarily intended to directly conceal odours, but to absorb sweat to a high degree by means of plant-based active agents alone.

An example formula follows:

#### Body and Face Cream

Phase A	%w/w
Glyceryl Stearate	5.0
PEG100 Stearate	1.0
Vaseline	1.5
Paraffin	0.5
<b>Phase B</b>	
Water ad	100
Glycerine	5.0
Bamboo Powder (Bambusa arundinaceae)	10.0
<b>Phase C</b>	
Extract of Equisetum arvense	0.01
Extract of Hamamelis virginia & Quercus infectoria	3.2
Eucalyptus Oil	0.2
Mixture of Equisetum arvense & Salvia officinalis	0.3
Preservative	0.2

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Method: Phases A and B are separately heated to 70-80C and combined with stirring then homogenised and cooled down to approximately 4C. Phase C is prepared separately by mixing the individual ingredients, which are added to the mix at 30-35C with stirring. In a variant of this example, 0.5% by weight of zinc ricinoleate was added to Phase C.

**Title: Breath freshening lipstick**

**Publication No. USP 6,383,475**

**Application No. 437520**

**Date of filing 10<sup>th</sup> November 1999**

**Assignee: FD Management, USA**

Traditionally bad breath has been inhibited through use of toothpaste and oral rinses. It is the applicants claim to provide products for freshening breath and reducing oral malodour through a specially formulated lipstick.

The lipsticks described release a constant stream of oral malodour reducing agents for extended periods of time. Free menthol combined with a bound menthol substance serve as the actives. Just subsequent to application of the lipstick, the free menthol is released to the oral cavity. As free menthol concentration within the lipstick decreases, the bound menthol substance begins to release its menthol component therefore extending the activity period.

Free menthol amounts may range from about 0.01 to about 2%, preferably from about 0.05 to about 1%, optimally from about 0.1 to about 0.5% by weight. Bound menthol is a physical combination of free menthol encapsulated by polysaccharides such as starch or modified starch; or by synthetic polymers and copolymers such as polyvinyl alcohol, acrylics or polyurethanes; or by vegetable gums such as gelatine, guar or carrageenan gums. Most preferred are complexes of menthol with cyclodextrin.

Cyclodextrins are cyclic oligosaccharides with the capability of forming inclusion complexes with a variety of materials. They vary in ring size from 6 to 12 glucose units. The most common are the 6, 7 or 8 glucose built rings commonly referred to as alpha-cyclodextrin, beta-cyclodextrin and gamma-cyclodextrin, respectively and beta-cyclodextrin is the most preferred embodiment. Amounts of the bound menthol substance may range from about 0.1 to about 10%, preferably from about 0.2 to about 2%, optimally from about 0.5 to about 1% by weight.

Other components of the lipstick include anethole as a secondary breath-freshening material, optimally present in the ratio of menthol:anethole of from about 30:1 to about 10:1. Essential to all lipsticks is the mixture of oils and waxes that constitute the basic stick material, which provides structure to the stick. The composition may also include an antibacterial compound and the applicants prefer hydrated zinc citrate for this purpose. Antioxidants, flavouring, pigments and sunscreens may also be included.

Advantageously the lipstick also contains a small amount of water, about 3% to 8% is mentioned, which is useful for releasing menthol from the bound menthol mixtures. Water soluble complexing agents such as cyclodextrin or encapsulating agents such as polyvinyl alcohol are soluble in water. The small amount of water dissolves encapsulating material or acts as a transfer media for menthol complexed cyclodextrins.

**Title: Ultra-stable composition comprising moringa oil and its derivatives and uses**

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**Publication No. USP 6,667,047**

**Application No. 964988**

**Date of filing 26 September, 2001**

**Assignee: International Flute Technologies LTD**

In recent years there has been an increasing attempt in many commercial fields to use natural products from renewable sources or at least naturally derived products. In part this effort has been through use of natural biodegradable materials that require a minimum amount of processing initiated to help reduce pollution of the environment. In addition to the feel of an emollient, cosmetics and their ingredients must exhibit stability, both in storage and in use.

Interest in the oil extracted from *Moringa oleifera*, has existed for well over a century. The first recorded study of the composition of the oil was carried out in 1848, which revealed a fatty acid with a high melting point. This was subsequently called behenic acid. The oil produced is pale yellow in colour, non-drying with a mild, characteristic nutty flavour. The seed kernel contains on average 35% by weight oil. The oil has a great degree of slip yet does not feel greasy. It is recommended for all cosmetic applications where emolliency is required

One of the more common susceptibilities of natural oils to ambient damage is from oxidation, leading to rancidity. Compositions or fluids comprising oils or waxes derived from the moringa plant, bean, seed and nut can be provided with a surprisingly large increase in oxidation stability by their combination with tocopherol. Even more surprising is the dramatically large increase in oxidation stability when a supplemental additive selected from the group comprising malic acid, kojic acid, and ascorbic acid, is further included into the combination. Tocopherol is preferably present in an amount of from 0.01 to 5% by weight of the composition and the supplemental additive is preferably present in an amount of from 0.01 to 2% or more by weight of the composition.

**Title: Cosmetic and skin care sticks with high water contents**

**Publication No. USP 6,613,338**

**Application No. 284369**

**Date of filing 14 April, 1999**

**Assignee: Beiersdorf AG**

Claimed are cosmetic sticks that are characterised by high water content. In particular, they can be lipsticks, lip salves, and stick formulations that are suitable for use against acne, as sunscreen sticks, eye shadow sticks and similar products.

From a technical viewpoint, most stick formulations are anhydrous fatty mixtures of solid or semisolid waxes and liquid oils. Hydrous preparations are also known, which are sometimes in the form of w/o emulsions. The ideal requirements of a stick-type composition include smooth application without substantial friction. Such a formulation must also satisfy the requirements that the stick must be resistant to breaking and to temperature and the formulation must not lose oil. A lipstick in particular, should leave a non-greasy, but nevertheless highly adherent lipid film on the lips, which should make the lips smooth and soft.

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The amount of water can be up to about 85% although optimum water content is usually in the range between 50 and 75% by weight. The formulation may contain a number of oils and waxes selected from a wide range of cosmetic materials but fundamental to the composition is the use of w/o emulsifiers and particularly preferred is polyglyceryl-3 diisostearate and PEG-45/dodecyl glycol copolymer is cited as a co-emulsifier in several illustrations. Of the many oils and emollients suggested caprylic/capric triglycerides, octyldodecanol and dicaprylyl ether are particularly preferred.

The following formula for a sunscreen stick is one of many that illustrate the patent.

PEG-45/dodecyl glycol copolymer	0.90% w/w
Polyglyceryl-3 diisostearate	1.80
Caprylic/capric triglycerides	5.00
Octyldodecanol	5.00
Dicaprylyl ether	5.00
Butylmethoxydibenzoylmethane	2.00
Methylbenzylidenecamphor	4.00
Microfine Titanium Dioxide dispersion	2.00
Sodium Hydroxide solution	0.20
C <sub>20-40</sub> Alkyl stearate	15.00
Glycerin	2.00
Aqua (water)	to 100%

**Title:       Composition and method to whiten and exfoliate skin**

**Publication No.   USP   7,029,709**

**Application No.   342497**

**Date of filing     January 15, 2003**

**Assignee:         Desert Whale Jojoba Co.**

The applicants claim that an even-looking skin tone and a more youthful appearance is highly desired in today's society. Many people desire to modify their skin tone, to reduce age spots excessive expression or accumulation of melanin in the skin. One of the principal enzymes involved in the melanin pathway is tyrosinase and the applicants claim a composition comprising tyrosinase inhibitors and melanin cell synthesis inhibitors in combination with skin exfoliating agents that is useful in topically applied cosmetic and pharmaceutical formulations to whiten and exfoliate skin.

The composition comprises one or more extracts from one or more jojoba plant parts in combination with one or more acidic compounds. The acidic components are selected from the group consisting of alpha-hydroxy acids and beta-hydroxy acids, and combinations thereof. The jojoba extracts comprise one or more jojoba proteins, one or more jojoba peptide fragments and one or more Simmondsin derivatives and various amino acids.

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Jojoba materials are extracted from various parts of the jojoba plant, including but not limited to jojoba seed, pressed jojoba seed, jojoba roots, jojoba bark, jojoba leaves, and combinations thereof and they may be used in combination with jojoba oil. The solid material remaining after removal of jojoba oil from jojoba plant parts is sometimes referred to as "jojoba meal." This jojoba meal comprises up to about 12 percent residual jojoba oil in addition to a complex mixture of jojoba proteins, sugars, Simmondsin, and other phytochemicals.

Various means of extracting material from jojoba plant parts are described and the extract may be centrifuged, filtered or otherwise treated before being acidified to about pH 4. The acidic extract is used to formulate skin whitening and exfoliation compositions. The extract comprises tyrosinase inhibitors, and melanin cell synthesis inhibitors. After topical application tyrosinase and melanin cell synthesis inhibition results in skin whitening. Topical application promotes dissolution of adhesions between cells in the upper layers of the skin and results in exfoliation. Such exfoliation stimulates the growth of new skin thereby providing a rejuvenated, fresher complexion.

**Title: Compositions and methods for delivery of skin cosmeceuticals**

**Publication No. USP 6,984,391**

**Application No. 366845**

**Date of filing February 14, 2003**

**Inventors: Hydron Technologies, Inc.**

The epidermal surface is acidic and has been the subject of studies on epidermal permeability and formation. Skin homeostasis normally is maintained at about pH 5 allowing lipid barrier repairs. At more neutral or alkaline pH, skin repair is inhibited.

Described are cosmetic compositions that are effective both as moisturisers and skin sloughing agents. The compositions contain neutralised weak organic acids that when applied in appropriate formulations will gradually increase in acidity without causing skin irritation while exhibiting increasing activity in skin renewal effects.

The applicants report that the majority of marketed skin treatment preparations use emulsifying agents that are non-volatile and accordingly remain on the skin until removed by cleansing. Most facial care cosmetics are formulated with about 5-7% emulsifying agents, at a pH of 6.5-8.0 to insure product stability, and contain on average about 75% water. This high level of emulsifying agent is capable of emulsifying the natural lipids in the skin, which may then be removed by cleansing. The net result is detrimental to the skin for two reasons: a pH of 6.5 to 8.0 is not favourable for the repair of the skin's lipid barrier layer and the residual high level of emulsifying agents is conducive to removal of the natural lipids in the skin leading to an even drier skin condition.

It is suggested that if the ammonium salts of hydroxy acids are incorporated into products the initial pH is about 6 to 7 but as ammonia gradually evaporates from the product, the pH drops and the moisturiser turns into an active acid for enhancing skin sloughing and turnover. In the case of salicylic acid it becomes an active agent for the treatment of acne. The advantage of this system is that the pH drop occurs over time and the activity increases with time, typically over three to four hours, and so the product is never irritating to the skin.

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It is also possible to build into these systems salts of skin protective polymers that are water soluble at pH 6 to pH 7 but which become insoluble at pH values below pH 5. Thus ammonium carboxymethyl cellulose, ammonium alginate, ammonium carrageenane, ammonium polyacrylate, ammonium VA/Acrylate and the like are water soluble but after application to the skin the ammonia evaporates and a thin layer of water insoluble polymer is left on the skin, which acts as a barrier to protect it. It enhances skin moisturising and, because it is water insoluble, holds other important ingredients in contact with the skin.

**Title: Desquamation/epidermal renewal of the skin and/or combating skin aging**

**Publication No. USP 6,936,266**

**Application No. 397274**

**Date of filing March 27, 2003**

**Assignee: L'Oreal**

Claimed is a method for stimulating epidermal renewal of human skin using a cosmetic or dermatological composition comprising an effective amount of cinnamic acid ester formulated into a dermatologically acceptable vehicle for topical application.

The cinnamic acid or derivative thereof can be of natural or synthetic origin. It is naturally present in trans-form in the essential oils of basil and of cinnamon, in Peruvian balsamine and in cacao leaves. The cis-form is present in the oil from *Alpinia malacensis* or it can be prepared via chemical synthesis or biotechnology.

The cinnamic acid ester is incorporated into suitable products for topical application and they may contain additional active and other ingredients to improve the product, its aesthetics and its shelf-life. An example formulation is given as follows:-

Liquid petroleum jelly	7.00%
Cinnamic acid	2.00
Glyceryl stearate (&) PEG-stearate	3.00
Carboxyvinyl polymer	0.40
Stearyl alcohol	10.70
Soybean proteins	3.00
Sodium hydroxide	0.40
Preservative	qs
Water qs	to100%

This composition is described as being in the form of facial milk having good cosmetic properties and mild and comfortable to use. The pH of the composition is about 5.5.

**Title: Ascorbic acid composition and method for treatment of aging or damaged skin**

**Publication No. USP 6,217,914**

**Application No. 356142**

**Date of filing: 19/07/1999**

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**Applicants: Bioderm, Inc**

Superoxide and the subsequently generated hydrogen peroxide and hydroxyl radical are oxygen-containing free radicals produced within human skin under a variety of normal and pathological conditions. These radicals have been implicated as causative agents for everything from sunburn to aging and are believed to destroy lipid membranes, break down DNA, and inactivate enzymes. It is possible to improve the appearance of skin using agents known to stimulate the growth and proliferation of epidermal cells by use of an irritant or chemical peel, which slough off the uppermost layers of the epidermis. Newly proliferated cells provide more structure and hold more moisture, giving the skin a younger appearance but this does not prevent free radical generation affecting the dermis.

L-ascorbic acid has many known biological functions and at higher concentrations it is known to react with both superoxide and hydroxyl radicals. Currently available ascorbic acid compositions lack the desired combination of efficacy, non-irritability and stability for products designed for topical application. It is not practical to use more than 15% ascorbic acid in a formulation for cosmetic use because its low pH of 2.0 to 2.5 is often quite irritating to the skin and poor stability leads to undesirable discoloration and eventually loss of efficacy of the composition.

By providing a proportion of the total ascorbic acid as the ascorbate salt the applicants claim to meet the need to improve the efficacy and stability of skin treatment formulations containing ascorbic acid. The concentration of active ascorbic acid is maintained at a high concentration and there is a decrease in the overall irritant nature of the composition without loss of efficacy or desired biological effect. The compositions are claimed to be particularly effective for topical application to reduce epidermal wrinkling resulting from intrinsic aging or photo damage and product stability is improved.

A 20% solution of ascorbic acid in water is heated to between 60°C and 90°C and this is used as up to 50% of the total ascorbic acid content of at least 5% and as high as 25%. Other constituents include 0.5% to 2% zinc sulphate and either tyrosine, N-acetyl-tyrosine, tyrosine ethyl ester hydrochloride or tyrosine phosphate. The pH is adjusted to 3.7 – 4.0 by the addition of a suitable base. The composition may be an aqueous solution, a hydrophilic lotion, an ointment, cream or gel and it may include an anti-inflammatory compound, fragrance and other ingredients commonly found in skin care products.

**Title: Hair treatment compositions containing reducing sulphur species and zinc compound**

**Publication No. USP 6,231,846**

**Application No. Quest 388376**

**Date of filing: 01/09/1999**

**Applicants: Quest International**

Hair depilatory, hair straightening and permanent waving products typically contain reducing sulphur species such as sulphides and thioglycollates that generate a variety of sulphur-containing volatiles and consequently, an unpleasant odour. The applicants of this patent claim that incorporating zinc compounds, particularly zinc oxide, in such hair treatment compositions substantially reduces malodour production, both on storage and in use.

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The applicants found that during depilation using thioglycollate-based compositions methanethiol was released and that methanethiol and hydrogen sulphide are released with perming products. Headspace analysis above thioglycollate-based hair treatment products showed that the presence of zinc compounds, particularly zinc oxide, substantially reduced the production of methanethiol. Subjective odour evaluation tests showed a corresponding reduction in malodour on storage and in use when products included zinc compounds.

The zinc compound, preferably zinc oxide, is most preferably 0.3 to 3%, typically about 0.5%, of the total weight of the composition. Fragrance compounds can also reduce the perceived malodour and it was found that one or more acetal fragrance ingredients are particularly effective in this regard. Odour evaluation experiments using a gel depilatory formulation having the following composition are described:

Potassium thioglycollate (30% aq.) 10.0%

Structure 2001\* 5.0%

Urea 8.0%

Sodium hydroxide to pH 12.5

Purified water to 100% <sup>w</sup>/<sub>w</sub>

- 30% solution of Acrylates/Stearth-20 Itaconate Copolymer ex National Starch

Various zinc compounds were added to the gel and headspace analysis showed that of the compounds tested, zinc oxide was the most effective at reducing the release of methanethiol. Panel testing experiments showed that 0.60% zinc oxide substantially reduced the malodour of the product in use. Further experiments illustrated the value of incorporating a fragrance that included at least 5% acetal compounds to further reduce malodour of thio compounds when used for hair removal or permanent waving.

**Title: Hair and skin treatment product**

**Publication No. USP 6,264,930**

**Application No. 351826**

**Date of filing: 12/07/1999**

**Applicants: Lizzi; Joseph**

It is the stated objective of this application to provide a novel hair treating preparation that can be used as a component in hair dyeing and bleaching and for use in hair conditioning using hydrogen peroxide and *Aloe vera*. It is also claimed to provide a novel skin care preparation for use in treating skin conditions, such as a rash or eczema, using known, acceptable components including hydrogen peroxide and *Aloe vera*.

The preparation described contains hydrogen peroxide, water, a silicon component, preferably silica gel, and *aloe vera*. In addition, the preparation contains active components from *Aloe vera* leaf that has been steeped in a mixture of the other components for at least twelve hours at ambient temperature in order to dissolve active components from the leaf. In a preferred form, the preparation is made using 6% hydrogen peroxide solution and then diluted with water to give about 3% hydrogen peroxide.

The *aloe vera* preparation in dilute hydrogen peroxide solution is added to existing hair colouring compositions to provide hair colouring preparations that have improved shelf life and are better able to cover grey hair. It is claimed to increase the length of time that the colouring lasts and to reduce chemical damage to the hair. It is also claimed that when

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used alone or in combination with a hair conditioner, the preparation leaves the hair soft, manageable and easy to comb.

When the preparation is for use in treating skin conditions the hydrogen peroxide content should be about 1.5% - 3% at the time of application. It is claimed that regular use can relieve itching and reduce redness and help to soften rough, damaged skin. In one test of the preparation, regular application to a user's hands, which were dry and cracked, over a period of eight days resulted in substantial improvement.

The patent describes many uses of the preparation and trials that show that it is the inclusion of the extract of *Aloe vera* leaf by dilute hydrogen peroxide solution that provides the improved results in hair colouring, hair conditioning and skin treatment.

**Title: Cosmetic depilatory compositions comprising a continuous aqueous phase and an oil phase**

**Publication No. USP 6,306,380**

**Application No. 462331**

**Date of filing April 7, 2000**

**Assignee: Reckitt & Colman France**

Claimed are depilatory compositions in the form of improved oil-in-water emulsions; their preparation and their use in degrading hair keratin. The compositions comprise a continuous aqueous phase, a depilatory agent and an oil phase and are substantially free from tertiary amines.

Preferably, the composition comprises from 2.0% to 6.0% w/w of the keratin-degrading substance in order to obtain a satisfactory depilation time of about 5 minutes. Of the numerous examples listed the applicants prefer a thioglycollate compound, in particular, potassium thioglycollate. The depilatory action is improved by the presence of about 8% of an accelerator such as urea, thiourea, dimethyl isosorbide, ethoxydiglycol, methylpropyldiol and mixtures thereof.

The oil phase comprises one or more non-polar oils, which may include paraffin oil, sweet almond oil, isohexane, sunflower seed oil, apricot kernel oil or shea butter. Also present is a polar oil or oils drawn from a list including olive oil, macadamia nut oil, avocado oil, calendula oil, wheat germ oil and cyclomethicone optionally admixed with PPG-15 stearyl ether. The preferred emulsifier is non-ionic such as cetearyl phosphate, cetearyl alcohol, cetearyl glucoside, cetearyl alcohol and cetareth-20. The non-polar oils are present at about 2 – 6%, the polar oils at 0.4 – 1% and the emulsifier at about 3 – 8%.

The pH of the composition is very important and is adjusted to be within the range 12.1 – 12.5 by the inclusion of calcium hydroxide and L-arginine. Also included are rheology modifiers, perfume, humectants and other materials to improve the aesthetics and stability of the product. Sodium magnesium silicate is useful as it provides thickening properties and sodium and magnesium ions, which aid the buffering system and improve depilation.

An example formulation is shown as follows:-

<b>Ingredient</b>	<b>%w/w</b>
Cetearyl alcohol	8.00
Sodium magnesium silicate	1.00

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Ca (OH) <sub>2</sub>	0.50
Urea	8.00
L-arginine	2.00
Polyethylenimine	1.00
Magnesium trisilicate	0.50
Titanium dioxide	0.33
Potassium thioglycollate (30% )	10.00
Shea Butter	0.50
Perfume	0.50
Paraffin oil	3.50
Propylene glycol	0.26
Acrysol 33 Opacifier	0.01
PPG-15 stearyl ether	1.00
Ceteareth 20	3.00
Deionised water	To 100%

**Title: Depilatory composition**

**Publication No. USP 6,479,043**

**Application No. 678924**

**Date of filing October 4, 2000**

**Assignee: Del Laboratories, Inc**

Described is a depilatory composition in gel, lotion or cream form comprising a thioglycollate or thiol depilating agent, and about 0.1 to about 20.0% by weight of solid particles of non-expanded polyethylene, jojoba wax, carnauba wax or candelilla wax. The solid particles in the composition are most preferably about 30 to about 100 mesh and are said to provide significant abrasiveness, yielding more efficient lifting of the hair to be removed. They allow complete and rapid wetting, and are readily washed off with water, are safe to use, non-toxic and relatively inexpensive.

Preferred vehicles contain about 50 to about 85% by weight of deionised water mixed with other cosmetically acceptable solvents in which the components of the composition are soluble or miscible. Preferred depilating agents include sodium thioglycollate, calcium thioglycollate and potassium thioglycollate and more than one may be present in the composition.

The compositions optionally may include emollients, skin conditioners, buffering agents, viscosity increasing agents, emulsion stabilizers such as stearyl and cetearyl alcohol, pH adjusters, chelating agents, fragrance, colour, lubricants, propellants or biological agents.

An example formulation of a depilatory gel follows:-

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<b>Ingredients</b>	<b>%w/w</b>
Deionised water	73.70
Acrylates/Stearth-20 methacrylate copolymer	6.00
Sodium hydroxide	2.50
Tetrasodium hydroxide	0.10
Sodium silicate	1.00
Sodium thioglycollate	6.00
Potassium thioglycollate	3.50
Calcium thioglycollate	0.50
Glycerin	6.00
Aloe Vera gel	0.10
Fragrance	0.50
Hydrogenated jojoba oil	0.10

**Title: Preparation protecting skin from mechanical irritation**

**Publication No. USP 6,436,385**

**Application No. 269407**

**Date of filing April 2, 1998**

**Assignee: Cultor Corporation**

Skin is subjected to mechanical irritation and is scratched, abraded, chafed or cut, in many situations. Cut, sore skin aches, smarts, and feels tight; microwounds are subjected to inflammation; and application of common cosmetic preparations to the skin does not necessarily ease the discomfort, nor protect the skin. On the contrary, application of a preparation on cut, sore skin often adds to smarting and skin irritation.

The applicants claim to have discovered that trimethylglycine protects skin from cutting, scratching, abrasion, chafing, and other mechanical irritation and the patent describes the use of trimethylglycine as an agent protecting skin from mechanical irritation in cosmetic preparations, particularly in skin care products, shaving preparations, and depilatory preparations.

Trimethylglycine is also known as betaine and it is a naturally occurring quaternary ammonium type compound. It is readily water-soluble and in plants it functions as an osmolyte and thereby protects cells from the effects of osmotic stress. Trimethylglycine has a bipolar structure, and it contains several metabolically reactive methyl groups, which it can donate in enzyme catalyzed reactions. Most organisms are able to synthesize small amounts of trimethylglycine but are not able to produce it, nor store it, in large amounts. The best known organisms producing large amounts of trimethylglycine are plants of the genus Chenopodiaceae, such as sugar beet, and some microbes and marine invertebrates. From 2 – 6% trimethylglycine may be incorporated into skin care products, shaving preparations, depilatory preparations, and products for personal hygiene, such as skin

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tonics and milks; skin creams and lotions; cleansing creams, milks and gels; liquid cleansers; foot creams and baths; hand creams; refresher and moisturising tissues and sprays; after-shave lotions; shaving lathers, gels and balms; and foam preparations.

The effect of trimethylglycine on the skin was studied by measuring its effect on the thermal conductivity of the skin of a number of volunteers. A preparation containing trimethylglycine diluted at a concentration of 4% w/v in water was effective against mechanical erythema after normal application. The results show that the preparation is effective against skin irritation when the damage is relatively superficial. In addition, cutting of the skin causes erythema and probably enhances penetration of the preparation, which in turn adds to the effect of the preparation.

A representative formula for a baby lotion follows:-

### **Baby lotion**

<b>Ingredient</b>	<b>%w/w</b>
Mineral oil	26.00
Lanolin	1.04
Stearic acid	0.94
Triethanolamine	0.52
Water	65.68
Trimethylglycine	4.00
Stearyl alcohol	0.94
Cetyl alcohol	0.52
Sodium alginate	0.36
Perfume	q.s.

**Title: Heat-safe hair preparation and method of using same**

**Publication No. USP 6,156,295**

**Application No. 240862**

**Date of filing May 10<sup>th</sup> 1994**

**Assignees: Neutrogena Corporation**

Blow-drying, and other means of heat-treating hair is conventionally believed to damage it. Described is a hair treatment preparation which, when applied to human hair, exhibits both high moisture retention and hair strengthening while preventing further damage to hair resulting from the excessive use of heated hair styling equipment, coarse brushes and chemical treatments. It is claimed that the composition repairs damaged hair when used in conjunction with blow-drying.

The formulation described comprises a mixture of hydrolysed wheat protein and oligosaccharides with wheat amino acids and panthenol in aqueous solution and is suitable for spray application. The hydrolysed wheat protein and wheat oligosaccharides will generally comprise from about 2.5% to about 5%<sup>w/w</sup> of the total composition; the wheat amino acids comprise from about 0.2 to about 1%<sup>w/w</sup> and panthenol from about 0.5% to

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about 2% <sup>w</sup>/<sub>w</sub>. Panthenyl ethyl ether may be added up to about 0.25% <sup>w</sup>/<sub>w</sub>. Other additives include sodium polystyrene sulfonate, a chelating agent, perfume and suitable preservatives and the formulation is a water-based solution.

Wheat amino acids with a molecular weight of 150 exhibit powerful moisture binding properties, retaining up to four times its weight in moisture at high humidity. Amino acids have been found to penetrate hair and panthenol penetrates into the cortex and provides long lasting moisture retention. The increase in moisture retention prevents excessive drying of hair when heat styling equipment is used. Panthenol increases tensile strength of hair and once inside the hair shaft, panthenol is retained in hair over several washes. The optional panthenyl ethyl ether also provides enhanced moisture retention and also penetrates deep into the hair. The optional sodium polystyrene sulfonate helps prevent flyaway and adds body for better manageability, enhanced lubricity and easier wet combing.

The following illustrative formulation shows the % range of ingredients covered by the patent.

Hydrolyzed Wheat Protein (&) Wheat Oligosaccharides	2.50% <sup>w</sup> / <sub>w</sub>	5.00 <sup>w</sup> / <sub>w</sub>
Wheat Amino Acids	0.20	1.00
Panthenol	0.50	2.00
Panthenyl Ethyl Ether	0.00	0.25
Polysorbate-20	0.20	0.50
Preservatives as required	qs	qs
Tetrasodium EDTA	0.02	0.05
Fragrance	0.10	0.20
Glycerin	0.00	4.00
Sodium Polystyrene Sulfonate	0.00	2.00

Water to 100%

The patent describes various tests for proving the efficacy of the product and provides the results obtained.

**Title: Hair styling gels**

**Publication No. USP 6,274,129**

**Application No. 596997**

**Date of filing June 20th 2000**

**Assignees: Helene Curtis Inc.**

Hair styling gels containing a carboxylated polyurethane resin, a viscosity enhancer, and an optional second hair fixative resin in an aqueous hair styling gel are described. The compositions claim to impart excellent hair styling, conditioning, and hair set retention properties to treated hair.

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The introduction states that the inherent problem encountered in hair setting is the natural tendency of hair to return to its natural shape and conditions of high humidity accelerate the process. Hair is an elastic structure and the slight deformations resulting from setting the hair are completely reversible. This process may be delayed by applying compositions containing film-forming polymers. The polymeric film promotes cohesion and gives stability to the hair set, and also acts as a moisture barrier. The principal objective of a hair styling composition, therefore, is to cover the styled hair with an invisible polymeric film that gives the styled hair a degree of rigidity, protects the hairstyle against wind and humidity, retains the hairstyle, and imparts a good feel and conditioning to the styled hair.

The applicants claim carboxylated polyurethane resins form flexible, elastic films that give treated hair a natural feel, while retaining the desired hairstyle. They have good tear strength, excellent washability, good adhesion, and are soluble in water and polar solvents. In addition, the polyurethane resins, alone or in combination with an optional second hair fixative resin, form clear, transparent, compositions in neutral to slightly basic aqueous solvents. The carboxylated polyurethane resins also possess thermal properties that allow styling of the hair with curling irons and blow dryers.

The polyurethane resins are linear, hydroxyl-terminated copolymers having pendant carboxyl groups. The carboxyl group can be a carboxylic acid group or an ester group, wherein the alkyl moiety of the ester group contains one to three carbon atoms. The hydrophilic polyurethane resins typically are ethoxylated and/or propoxylated at least at one terminal end. The carboxylated polyurethane resin also can be a copolymer of polyvinylpyrrolidone and polyurethane and have the INCI name PVP/polycarbamyl polyglycol ester. The resins can be solubilised in water, or in a hydro-alcoholic solution, in the absence of a base.

The polyurethane resins are hydrophilic materials that give hair a soft, natural feel, yet are adhesive to the hair and impart excellent hair set retention. A combination of a conventional hair fixative resin and a polyurethane resin retains the desirable properties of each resin, and allows a desired degree of stiffness to be imparted to the hair. The second fixative may be any of those in common use in hair styling products and a rheology modifier is included to provide a gel-like consistency to the composition, which may also contain the usual cosmetic additives to enhance product aesthetics and stability.

### Example Formulation

Water, deionised to 100% w/w

Ethyl alcohol        10.00

Polyurethane resin 0.75

Hydroxyethylcellulose    1.50

PVP K-120 0.25

Preservatives, fragrance, colour    qs

Water to 100%

**Title:        Liquid composition used for dissolving fingernail polishes**

**Publication No.    USP 6,379,656**

**Application No.    769167**

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**Date of filing**      **Jan. 25th 2001**

**Assignee:**          **Tevco, Inc.**

Described are two-layer and three-layer nail polish removers. The bi-phase composition contains two separate layers: a solvent phase top layer and an aqueous phase bottom layer. The tri-phase product contains an oil phase top layer, a solvent phase middle layer and an aqueous phase bottom layer. It is claimed that the compositions condition and protect nails and cuticles while removing the nail enamels simultaneously.

The preferred oil is mineral oil or castor oil and benzophenone-1 is added as a UV stabiliser; the solvents are methyl acetate and tert-butyl acetate and the glycols may be a polypropylene glycol or polyethylene glycol. In a tri-phase product the middle layer consists of the glycol in combination with the solvents and benzophenone-1 is added as a UV-stabiliser. The aqueous phase requires a suitable preservative and each phase may be coloured with a suitably soluble dyestuff to enhance the look of the composition.

A simple illustrative formulation follows:-

Mineral Oil	19.621% <sup>w</sup> / <sub>w</sub>
Methyl Acetate	25.868
Tert-Butyl Acetate	8.74
Deionised Water	31.00
P425 PPG	14.634
Benzophenone-1	0.006
Benzophenone-4	0.002

A two-phase composition, which does not have an oil layer is also claimed.

**Title:**            **Cosmetic effervescent cleansing compositions**

**Publication No.**    **USP 6,506,713**

**Application No.**   **635377**

**Date of filing**      **Aug 9, 2000**

**Assignee:**          **Unilever Home & Personal Care USA**

Claimed is a cosmetic for cleansing body surfaces, comprising a sachet having at least one water permeable wall, and an effervescent cleanser composition in the form of an anhydrous dry solid within the sachet.

According to the applicants various methods of providing anhydrous effervescent materials exist but there are problems of degradation through contact with the atmosphere. The applicants found that dried plant solids can be interspersed with the powdered composition to act as a stabilising agent against premature activation. Plant solids in particle form having sizes preferably from about 10 mm to about 15 mm are suggested. As long as they are dried, almost any portion of a plant may be employed including stems, flowers and leaves although leaves are most desirable. Plant solids represent from about 10 to about 30% by weight of the total composition.

These solids need not be fragrance emitting, as aroma chemicals may be added separate from the plant solids. In a preferred embodiment, the aroma chemicals and fragrances are

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sprayed onto a solid substrate, preferably a polysaccharide, and the mixture is then incorporated with the alkaline and acid powdered materials.

The acid is optimally present from about 20 to about 45% by weight of the total composition. Said to be appropriate for this purpose are any acids in dry solid form but most preferred is citric acid. The alkaline material is a substance that can generate a gas such as carbon dioxide, nitrogen or oxygen when in contact with water and the acid. Suitable alkaline materials are anhydrous salts of carbonates and bicarbonates and alkaline peroxides but preferred is sodium or potassium bicarbonate, which comprises from about 25 to about 35% by weight of the total composition. Compositions can include a surfactant, preferably sodium cocoyl isethionate and other additives may be included such as emollients, antiaging actives, antimicrobials and fungicides, skin lighteners, sunscreens and combinations thereof.

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**Title: Methods for improving the aesthetic appearance of skin and hair**

**Publication No. USP 6,551,581**

**Application No. 635377**

**Date of filing Dec 27, 2001**

**Assignee: Avon Products, Inc**

Claimed is a composition comprising methylthioadenosine in an amount effective to increase skin pigmentation when applied in a cosmetically acceptable vehicle. The methylthioadenosine is present in an amount of about 0.05% to about 5% based on the total weight of the composition. The composition may also contain dihydroxyacetone (DHA) up to about 3% and the composition then provides self-tanning of skin.

Typically self-tanning products contain DHA, which imparts a brown colour by binding to proteins on the outer layer of skin. Since the outer layer of skin continually sloughs off, the results are temporary. In addition, tans obtained by DHA often appear unnaturally orange or yellow, as well as uneven or streaky. Self-tanning compositions based on DHA do not provide sun protection. Consumers of self-tanning products would prefer a product that imparts a more natural looking, more aesthetically pleasing tan and sun protection would be an additional advantage.

Methylthioadenosine, 5'-deoxy-5'-methylthioadenosine or MTA stimulates an increase in pigmentation of skin by increasing, the activity of certain enzymes in the melanin synthesis pathway. In particular, it has been found that MTA increases the conversion of tyrosine to dihydroxyphenyl-alanine ("DOPA") by stimulating tyrosinase. It increases the conversion of DOPACHrome to 5,6-dihydroxyindole-2-carboxylic acid ("DHICA") by accelerating DOPACHrome tautomerase ("DCT"), and it increases the polymerisation of DHICA to DHICA-melanin by accelerating DHICA polymerase. By modifying the activity of these enzymes the present invention provides increased pigmentation, even without exposure to ultraviolet radiation, and increased photoprotection by increasing melanin levels.

The MTA is present preferably in an amount about 0.02% to about 10 % and more preferably in an amount about 0.05% to about 5%, based on the total weight of the composition. Compositions may be formulated in any convenient form suitable for topical application to the skin.

In self-tanning preparations, the compositions may also include about 0.5% to about 3% DHA. The combination of DHA and MTA in a self-tanning product is particularly useful to give the skin immediate colour by the DHA. As the quantity of melanin increases, it is believed that the natural tone provided by MTA will provide a superior and aesthetically pleasing tan as compared to DHA-only self-tanning products presently on the market.

**Title: Method for delivering ascorbic acid and acetone to the dermal layer of the skin**

**Publication No. USP 6,602,906**

**Application No. 683994**

**Date of filing March 9, 2002**

**Applicants: Rodney Charles Ruhe; Ca.**

## Patent Abstracts

John Woodruff

Ascorbic acid, synonymously referred to as vitamin C, is essential in the human diet and human skin is particularly sensitive to its availability. By stimulating and regulating the synthesis of collagen, vitamin C increases the elasticity and structural integrity of human skin and inhibits the formation of wrinkles. It is suggested that supplementing dermal tissue with ascorbic acid delivered percutaneously through the stratum corneum can result in improved skin tone and lustre, a decrease in fine lines and wrinkles, and improved elasticity.

Ascorbic acid also has a protective effect against oxidative damage to the skin. It is a critical component of the non-enzymatic antioxidant defence system and at higher concentrations, it is known to neutralise singlet oxygen, superoxide anions, and hydroxy radicals in the skin before they can cause damage.

The direct delivery of a high concentration of ascorbic acid through the stratum corneum barrier would be beneficial, however because of its hydrophilic nature, vitamin C is not absorbed well into the skin, which naturally repels water and water-soluble substances. Depending on the vehicle used, only about 8% of topically applied ascorbic acid is actually absorbed into the skin. In addition, ascorbic acid is very unstable in aqueous solutions at neutral pH and the lack of stability and poor cutaneous absorption of ascorbic acid limit the effectiveness of most topical vitamin C preparations.

Acetone in low concentrations is said to have beneficial effects in the skin. It has been shown to have anti-inflammatory effects in cases of contact dermatitis. However, acetone applied directly to the skin in high concentrations can disrupt the structural integrity of the epidermis and cause dryness, resulting in skin irritation.

The applicants claim a method of increasing the concentration of ascorbic acid in the dermal layer of the skin by topical application of 5,6-O-isopropylidene-L-ascorbic acid (IAA). They also provide a method for decreasing inflammation of the skin by increasing the acetone concentration of the dermal layer of the skin.

The IAA is solubilised in a dermatologically acceptable carrier and applied to the skin. The IAA molecule is much more lipophilic than unmodified ascorbic and its lipophilic nature and relatively small molecular size allows it to traverse the stratum corneum and to be absorbed efficiently into the dermal layer of the skin. In the dermis, non-specific esterases hydrolyse the ester bonds and the hydrolysis products are ascorbic acid and acetone.

A simple example follows:

Deionised water	57.5% by wt.
Zinc Sulfate	0.125
2-Phenoxyethanol	2.5
Propylene Glycol	20.0
Glycerin	20.0
5,6-O-isopropylidene L-ascorbic acid	(IAA) 5.0

**Title: Stabilized ascorbyl compositions**

**Publication No. USP 6,162,419**

**Application No. 756461**

**Patent Abstracts**  
**John Woodruff**

**Date of filing:** November 26, 1996

**Assignee:** Perricone, N.V.

Where skin is damaged from aging or chronic exposure to sunlight, free radical-induced damage also appears to be involved and collagen content is diminished. The external appearance of aging individuals is affected not only by changes in the epidermis, but also by subcutaneous changes in underlying muscle tissue. The combination of sagging muscles and aging skin contributes to the overall cosmetic changes typically observed, such as wrinkling.

When muscles are at rest, a certain amount of tautness usually remains. In aging individuals, the degree of contraction relaxes, and this loss of muscle tone is particularly obvious in the face. Topical application of acetylcholine precursors such as dimethylaminoethanol in association with fatty acid esters of ascorbic acid help shorten subcutaneous muscles, resulting in a lift in tissue on the face, chest or other area of application. However compositions containing ascorbic acid and its esters have a tendency to deteriorate on storage, typically by combining with oxygen in the atmosphere and/or in the aqueous solvent to yield inactive forms such as dehydro derivatives and the compositions discolour.

The applicants claim to overcome the instability of ascorbic acid and its esters by employing solvent systems that provide greater stability and solubility than that observed in typical water-based systems. The patent describes typical compositions that contain from about 1% to about 25% by weight of a saturated fatty acid ester of ascorbic acid such as ascorbyl laurate, ascorbyl myristate, ascorbyl palmitate, ascorbyl stearate and ascorbyl behenate, and a solvent selected from the group consisting of polyethylene glycol, ethoxydiglycol, propylene glycol, butylene glycol, propylene carbonate, glycerine, a capric glyceride, a caprylic glyceride, an alkyl lactate, an alkyl adipate, an isosorbide, and mixtures thereof. They also contain from about 0.1% to about 5% by weight dimethylaminoethanol, L-tyrosine, an antioxidant and a penetration enhancer such as oleic acid or urea.

The application is extensively illustrated with formulations and the results of studies, which show the enhance stability of ascorbic acid, its salts and esters when incorporated in the systems described.

**Title:** One-step system for cleansing, conditioning, and treating the skin

**Publication No.** USP 6,358,516

**Application No.** 471538

**Date of filing:** December 23, 1999

**Inventors:** Harod, N.R.

Described is a skin care system that cleanses, therapeutically conditions, and provides additional beneficial treatment to the skin in a simple, one-step application. The system comprises pre-moistened soft cloths impregnated with treatment compositions prepared from a combination of surfactants, humectants, emollients, antimicrobial agents, and other beneficial ingredients in a no-rinse, self-drying formulation that promotes effective absorption into the surface layers of the skin.

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**John Woodruff**

The cloths are made of a soft, pliable fabric with a porous structure so that it retains the composition therein during manufacture and storage, but easily releases it when wiped gently across the area of skin to be cleansed. The fabric also picks up and carries away dirt, dead skin flakes, and excess skin oils, while depositing a thin layer of the composition on the skin surface. A number of cloths are packed in a suitable dispenser.

The treatment compositions include one or more ingredients from each of the following groups:-

1. Amphoteric cleansing agents e.g. cocamidopropyl betaine, alkyl polyglucosides and lauryl glucoside.
2. Anti-inflammatory agents or agents known to reduce skin reddening, including aloe vera, allantoin, cocamidopropyl betaine and beta glucan.
3. Skin-compatible silicone-based anti-foaming agents such as dimethicone copolyol.
4. Agents that stimulate or promote cell growth, e.g. aloe vera, allantoin, and beta glucan and polyphenolic compounds that contain quaternary compounds derived from grapefruit or other bioflavonoids.
5. Agents that enhance and/or stimulate the skin's immune system and/or help provide a secondary immune system, including aloe vera, beta glucan, colloidal silver and allantoin.
6. Fast-acting, skin-compatible antimicrobial agents including colloidal silver, grapefruit seed extract, pycnogenol and grape seed extract.
7. Agents that facilitate absorption into the second layer of the skin or dermis, including beta glucan, aloe vera, colloidal silver, allantoin and grapefruit seed extract.
8. Compatible humectants and emollients, including aloe vera, allantoin, tocopherol, beta glucan and cocamidopropyl betaine.
9. Free radical scavengers including grapefruit seed extract. beta glucan, allantoin, tocopherol, pycnogenol and grape seed extract.
10. Biocompatible fragrances, including natural orange, lemon and lavender oils.

Some ingredients exhibit a spectrum of useful effects and may appear in more than one group but would only be selected once with an alternative material being selected from the other group. The applicant claims that the ingredients, when carefully selected from the illustrative groups, act in synergy to promote healing, reduce inflammation and cleanse and moisturise the skin. In particular it was found that a composition that includes aloe vera and water-soluble beta glucan is surprisingly effective in cleansing the skin and stimulating its natural immune system.

**Title: Neem oil microemulsion without cosurfactants or alcohols and a process to form the same**

**Publication No. USP 6,703,034**

**Application No. 016243**

**Date of filing: December 10, 2001**

**Assignee: University of Florida**

## Patent Abstracts

John Woodruff

The Indian Neem Tree (*Azadirachta indica* A. Juss) has been recognized as a promising source of a plurality of biologically active chemicals. Neem Oil is obtained mainly from its seeds and may be obtained by press or solvent extraction from Neem seeds/kernels. Neem Oil consists primarily of fatty acids and bioactive meliacins.

Neem Oil is reported to be effective for treatment of cuts, bruises, skin disorders and acne and to remove skin blemishes. Neem Oil also has a large number of medical applications and is reportedly effective for treating psoriasis. It has been shown to be antimalarial, antitubercular, antiviral, antiallergic, antiperiodontic antiseptic, antimicrobial and antihyperglycemic. Neem Oil has been shown to be an effective analgesic, especially for earaches and headaches. Neem leaf is regarded as a traditional herb for treating diabetes and is also an effective insecticide.

The applicants claim that current methods for delivering the benefits of Neem oil to consumers are unsatisfactory and compositions containing it are frequently unstable. They claim product benefits by providing Neem oil as a thermally stable microemulsion, which is co-solvent and alcohol free.

The microemulsion requires the inclusion of a surfactant selected from the group of alkyl phenol ethoxylates, where the alkyl group contains 8 to 12 carbons and the ethoxylate contains an average of 4 to 12 ethoxylate groups. The surfactant can be a nonyl phenol ethoxylate and the surfactant comprises 0.003 to 25% by weight of the composition. The surfactant to oil ratio is preferably at least 3:1. To prepare a 10% Neem Oil microemulsion concentrate, 10 grams of the oil, 40 grams of the surfactant and water are blended together to form a nearly clear mass. When diluted in water a stable, clear, and transparent microemulsion of the desired strength is obtained.

**Introduction:** *Alpha and beta hydroxy acids are used in cosmetic compositions for the gentle exfoliation of the skin to improve skin clarity, colour, and tone, and reduce the appearance of wrinkles and fine lines. The exfoliating effect is due to the acidity of the materials but this acidity may also cause skin irritation and dryness. In general, the acidity of a hydroxy acid will depend upon the number of hydroxyl groups present on the molecule and placement of the hydroxyl and carboxylic acid groups, this glycolic acid tends to be more acidic than salicylic acid because the hydroxyl and carboxylic acid groups are closer to each other on the molecule. The following three patents describe different methods of achieving a balance between effectiveness and mildness.*

**Title:** Use of honey as keratolytic agent for improving the radiance and the complexion of the skin and treating wrinkles

**Publication No.** USP 5,965,145

**Application No.** 901522

**Date of filing** 28/07/1997

**Applicants:** L'Oreal

The patent describes a composition in which honey is the keratolytic agent in a cosmetic or dermatological composition for improving the radiance of the complexion, for smoothing the skin and for treating wrinkles and fine lines.

Conventional anti-ageing active ingredients, such as retinoids and hydroxy acids, exhibit the major disadvantage of causing stinging, itching or tightness after they have been

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applied, making them unsuitable for sensitive skin. To overcome this disadvantage, hydroxy acids from natural products, such as fruit or fermenting honey have been used, which are less irritating than synthetic acids, however they still exhibit a degree of discomfort when applied to the skin. The applicants claim that non-fermenting honey exhibits keratolytic properties and does not have the irritation potential of fermenting honey.

Honey generally includes from 72 to 75% of the mixture of glucose and laevulose, 15% water, 10% dextrin, 2.5% sucrose and 1% proteins. To be effective as a keratolytic agent the amount of honey can range from 0.1 to 2% or more of the total weight of the composition. In addition at least one fatty alcohol at 0.5 to 5.0% is included to improve product stability. An *alpha*-, *beta*- or *keto*- acid is included at a preferred level of 0.1 to 5% and the composition is buffered to pH 5.

The total composition must be dermatologically acceptable and may include anti-wrinkle active agents other than honey, and tensioning products such as plant proteins and their hydrolysates. The soya protein extract sold under the name of Eleseryl by the company LSN or the oats derivative sold under the name "Reductine" by the company Silab have special mention.

A representative formula is given as follows:

Oily phase:

Cetyl alcohol 4%

Paraffinum liquidum (Mineral oil) 15%

Glyceryl stearate 3%

PEG-40 stearate 2%

Sorbitan tristearate 0.9%

Aqueous phase:

Sodium hydroxide 0.4%

Glycerol 3%

Sodium citrate (buffer) 1%

Fruit acids (lactic acid, glycolic acid, citric acid and malic acid) 1%

Honey 2%

Demineralised water q.s. for 100%

**Title: Cosmetic makeup composition**

**Publication No. USP 6,159,480**

**Application No. 990460**

**Date of filing 15/12/1997**

**Applicants: Neostrata Company, Inc**

Claimed are a water-in-silicone emulsified cosmetic makeup compositions comprising at least one hydroxy acid plus sunscreen agents; moisturising agents; antioxidants; cosmetically acceptable pigments; silicone-containing compounds and water. When applied topically the composition it is said to reduce the appearance of lines and wrinkles, to protect the skin from the harmful effects of ultraviolet light from the sun, to moisturise and soothe and to leave the skin attractively coloured.

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The hydroxy acids are selected from the group consisting of polyhydroxy acids, *alpha*- and *beta*-hydroxyacids and *keto*-carboxylic acids and related compounds. Preferred is the polyhydroxy acid, gluconolactone, and alpha-hydroxy glycolic acid. These compounds are used from about 4 to 8% by weight and neutralised to about pH 3.8 with ammonium hydroxide or other suitable base. The preferred sunscreen agents are microfine titanium dioxide coated with aluminium stearate or C9-C15 polyfluoroalkyl phosphate; polymer coated zinc oxide, ethylhexyl dimethyl PABA, benzophenone-3, ethylhexyl salicylate, menthyl anthranilate, and phenylbenzimidazole sulfonic acid. A combination of two or more are used to give at least SPF 8, preferably 15 and more preferably SPF30<sup>+</sup>.

The moisturising agent may be 1 – 5% glycerin, butylene glycol or other polyhydric alcohol and the antioxidant is preferably a natural one such as tocopheryl linoleate incorporated at from about 0.5 to about 1% by weight. The cosmetically acceptable pigments (2 – 15%) and silicone compounds (10 – 25%) may be any in common use although iron oxide pigments and cyclomethicone and dimethicone and its derivatives are preferred. The silicone-containing compounds can also function as the emulsifier, especially when selected from dimethicone copolyol or cetyl dimethicone copolyol. Materials in common use in cosmetic compositions to improve emulsification, stability and aesthetic properties comprise the balance of the formulation. Representative formulations and methods of mixing illustrate the patent.

**Title: Methods for treating skin with 3-hydroxy benzoic acid and related compositions**

**Publication No. USP 6,235,297**

**Application No. 326932**

**Date of filing 7/06/1999**

**Applicants: Revlon Consumer Products Co.**

The stated objective of this patent is to provide a cosmetic composition that improves skin texture, colour, clarity, and tone without the undesired effects of skin dryness and irritation. A representative formula is described as 20-70% water, 0.5-10% 3-hydroxybenzoic acid, 0.1-15% of a non-ionic silicone surfactant or an organic surfactant having an HLB of 2-12, and mixtures thereof; 0.5-15% of a sunscreen, 0.5-8% co-solvent, and 0.5-8% aqueous thickener.

Salicylic acid is 2-hydroxybenzoic acid and although effective as an exfoliating agent in skin care its acidic nature can cause irritation. The applicants claim that 3-hydroxy benzoic acid is also an effective keratolytic agent but because it is a *gamma*-hydroxy acid, the undesirable effects sometimes associated with hydroxy acids, such as dryness and skin irritation are minimised. It is preferably used at up to 10% by weight of the total composition incorporated in a cosmetically suitable emulsion.

The non-ionic surfactant may be silicone or an organic surfactant; suitable silicone surfactants are polymeric organosiloxane emulsifiers with an HLB of 2 to 12 and preferred are dimethicone copolyol and dimethicone copolyol methyl ether. The preferred organic emulsifiers include ethoxylated fatty alcohols, alkoxyated carboxylic acids and alkoxyated sorbitan and alkoxyated sorbitan derivatives. Organic sunscreen and physical sun blocks are added to provide protection from solar radiation.

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Because 3-hydroxybenzoic acid is not readily soluble in water, one or more co-solvents are incorporated at up to about 8% by weight. Suitable co-solvents include monohydric and dihydric alcohols, ethers and block copolymer ethers formed by the polymerisation of monomeric alkylene oxides; most preferred are PPG-14 butyl ether and PEG-6.

To improve texture and stability the composition is thickened with suitable rheology modifiers and ideally contains both an inorganic salt thickener and a gum/hydrocolloid thickener, in a ratio of about 2 to 1 respectively. Most preferably the inorganic thickener is magnesium aluminium silicate and the hydrocolloid thickener is xanthan gum. The final composition may contain various additives to improve texture, stability and aesthetic properties and many ideas and formulations illustrate the patent.

**Title: Method of using optically-activated particles in cosmetic preparations**

**Publication No. USP 6,586,013**

**Application No. 872648**

**Date of filing June 1, 2001**

**Assignee: Lipo Chemicals, Inc.**

Described are optically activated particles for use in cosmetic preparations that are able to absorb ultraviolet radiation and emit visible light in a diffuse manner in order to reduce the visual appearance and perception of skin imperfections, such as shadows, skin discolorations, wrinkles and cellulite when applied to the skin surface.

The optical brightener is selected from, but not limited to, the group consisting of Tinopal 5BM, Calcofluor White RC (Stilbene 4), Calcofluor CG (Stilbene 3) and Leucophor BSB Liquid, or equivalents.

The substrate is pre-treated with a swelling agent to make it electrostatically and ionically available for bonding and the particles are less than 30 microns in diameter, and they are preferably colourless or translucent and invisible to the naked eye. The optically-activated particles are bonded at least one molecule thick to the substrate by Van Der Waal's forces or ionic bonding or covalent bonding.

The substrate is selected from the group consisting of nylons, acrylics, polyesters or other plastic polymers, natural materials, regenerated cellulose, metals, minerals or other suitable materials, and have an index of refraction greater than 1 in order that the image of the skin imperfection is bent away from the viewer's visual axis. The particles may be encapsulated with a UV transparent coating, such as, polyoxymethylene urea (PMU), wherein each capsule acts as a diffusion lens which increases the diffusion of emitted and reflected light to reduce the visual perception of skin imperfections.

**Title: Cosmetic skin care compositions and containing gum mastic**

**Publication No. USP 6,623,728**

**Application No. 872925**

**Date of filing June 1, 2001**

**Assignee: Unilever Home & Personal Care**

Claimed are compositions that provide control of sebum secretion, improved oil control and improved skin feel, which prevent shine and stickiness while providing anti-aging benefits. This includes a reduced appearance of wrinkles, improved skin colour, and an

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improvement in skin radiance, clarity and finish, and an overall healthy and youthful appearance of the skin.

Sebum is produced by sebocytes and is then secreted to the skin surface. A frequent, undesirable skin condition is "oily skin," which results from an excessive amount of sebum on the skin. Oily skin is associated with a shiny, undesirable appearance and a disagreeable tactile sensation and affects various age groups.

Inhibition of sebocyte lipogenesis reduces secretion of sebum, thereby reducing and/or controlling oily skin. Enhancing collagen production aids in preventing skin wrinkles and laxity. The applicants claim that solubilised gum mastic unexpectedly possesses sebum suppression activity through inhibition of sebocyte lipogenesis as well as providing anti-aging benefits through enhanced collagen production.

Gum mastic is the oil-soluble resin from the species *Pistacia lentiscus* L., an evergreen shrub of the *Anacardiaceae* family, found on the island of Chios, Greece. To be effective it is dissolved in a volatile water-miscible solvent such as ethanol, methanol, propanol, isopropyl alcohol and mixtures thereof. Ethanol is preferred and the ratio of gum mastic to solvent can vary from 1:75, preferably from 1:50, and most preferably from 2:1. The solubilised gum mastic is present in the inventive compositions at up to 10% by weight of the composition but most preferably from 0.01 to 0.05%. The gum mastic solution constitutes part of an oil-in-water emulsion, of which 60% to 80% is preferably water. The aqueous phase also contains a humectant such as propylene glycol or sodium hyaluronate. The oil phase may consist of the usual cosmetically acceptable oils, silicones, fats and waxes and the final composition includes rheology modifiers, preservatives, fragrance and other additives to improve product aesthetics and stability.

Although gum mastic is claimed to provide the product benefits also claimed is the possible inclusion of up to 20% benzoyl peroxide, 0.025%-0.05% retinoids, up to 2% salicylic acid and up to 8% sulphur. The term "retinoids" as used in the patent includes retinoic acid, retinol, retinal, and retinyl esters and their isomers where applicable. A UV-absorber may also form part of the final composition.

An example formulation follows:

DI Water	71.20%
Xanthan Gum	0.20
Disodium EDTA	0.10
Glycerin	5.00
Butylene Glycol	2.00
Methylparaben	0.30
Gum Mastic	2.00
Isopropyl Myristate	5.00
Octyl Palmitate	3.00
Cetyl Alcohol	1.00
Dimethicone, 100 cst	0.50
Steareth-2	0.40

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Steareth-2 1	3.00
Propylparaben	0.10
Germall II	0.10
Fragrance	0.10

**Title: Skin treatment using a new retinoid**

**Publication No. USP 6,586,013**

**Application No. 039745**

**Date of filing November 9, 2001**

**Assignee: Avon Products, Inc**

Described is a topical composition and method for improving the aesthetic appearance of skin, particularly, preventing, ameliorating, treating and reducing fine lines and wrinkles, without the skin irritation typically associated with topical application of a retinoid.

The applicants claim that retinoids in topical compositions have been found to irritate the skin. Such irritation is acute, especially when the amount of retinoid in the composition is high and some consumers with sensitive skin cannot even tolerate a small amount of retinoid. The irritation can manifest itself in the form of physical discomfort, dermatitis or erythema.

However retinoxytrimethylsilane, a retinol derivative, delivers retinoid efficacy without skin irritation, dryness or erythema typically caused by the topical use of a retinoid. The composition is preferably applied topically once or twice daily. The daily application can be for periods up to four weeks or more. Approximately ten times the concentration of retinoxytrimethylsilane is required to provide the same efficacy as retinol and the preferred level is 0.5% to 5% by weight in the final composition. Although retinoxytrimethylsilane is said to be more stable than retinol it is formulated in anhydrous compositions and must be protected from water.

Preferred embodiments of the claimed compositions also include at least one of the following: a surface smoother, a skin plumper, an optical diffuser, a sunscreen, an exfoliation promoter, and an antioxidant. A surface smoother provides the functional benefits of enhancing skin smoothness and reducing the appearance of fine lines and coarse wrinkles. Examples include silicas, talcs, isopropyl myristate, petrolatum, isopropyl lanolate, silicones, polymethylmethacrylate (PMMA), or any mixtures thereof. A skin plumper serves as a collagen enhancer and preferred is palmitoyl oligopeptide. Examples of optical diffusers that can be used are boron nitride, mica, nylon, polyurethane powder, sericite, silica, silicone powder, talc, Teflon, titanium dioxide, zinc oxide, or any mixtures thereof. The sunscreen should provide the user with both UVA and UVB protection and will also reduce the photodegradation of retinoid while in the package or on the skin. The present compositions may also have one or more exfoliation promoters; preferred are 3,6,9-trioxaundecanedioic acid, glycolic acid, lactic acid, or any mixtures thereof.

**Title: Use of essential oils to repel and treat head lice**

**Publication No. USP 6,342,253**

**Application No. 574188**

**Patent Abstracts**  
**John Woodruff**

**Date of filing**      **May 18, 2000**

**Assignee:**            **K.I. Whitledge**

Claimed is a method to repel head lice, comprising an effective amount of a mixture of natural active ingredients in a suitable carrier for topical application to human heads. The active ingredients are essential oils of anise, tea tree and lemon oil.

Lice are external parasites of warm-blooded animals. Head lice infestation (*Pediculosis capitis*) is a major problem in the United States, throughout Europe and in Asia with 10 million cases a year being reported in the USA. The life cycle of the head louse falls into three phases, egg, nymph and mature louse. Louse eggs are usually laid at the base of hairs, where they hatch after seven or eight days. The empty eggshell is called a nit and the nymph resembles the adult louse apart from size. It is mature about ten days after hatching. If neglected a population of head lice will reach a steady state, where the death rate equals the birth rate, and some two hundred lice of all post-ovum stages are present. Pediculicides, selectively kill lice, which invade the epidermis. Although a number of brands contain either carbaryl or malathion, lotions containing phenothrin and permethrin are now most frequently used. These pyrethroid compounds are highly effective insecticidal neurotoxins, with efficacy against both adult lice and their eggs. Other actives are benzyl benzoate and crotamiton. However strains of lice resistant to these materials are being found and it is suggested that a lice repellent would be preferable to treating infestation.

Accordingly the applicants claim that a combination of three essential oils: anise (*Pimpinella anisum*), tea tree (*Melaleuca alternifolia*) and lemon oil extracted by cold compression of the peel is a very good repellent and may be used for treatment of pediculosis capitis. Preferably, anise oil is present from about 3.5% to 10% for repellent, and 9% to 20% for treating pediculosis capitis. Tea tree oil is present from about 3.5% to 7% for repellent, and from 7% to 20% for treating pediculosis capitis and lemon oil is present at about 2% to 7% for repellent, and 4% to 9% for treatment. The preferred carrier is an aqueous-alcoholic solution with an ethanol content of about 60% by weight. Other examples are gels, creams, rinses, powders, sprays, shampoos, conditioners and hair styling mousse. They may also include antioxidants, antimicrobial compounds, preservatives, fragrances, and other cosmetic additives.

**Title:**            **Methods of exfoliation using N-acetyl glucosamine**

**Publication No.**    **USP 6,413,525**

**Application No.**    **306314**

**Date of filing**      **May 6, 1999**

**Assignee:**            **Color Access, Inc**

Desquamation is one of the processes by which skin maintains its health and vitality as nutrients and moisture are continuously replaced on the surface of the skin when dead skin cells are removed. When fully keratinised tissue loses its cellular structure and reaches the surface of the stratum corneum, it breaks up into microscopic squames and sheds off the surface of the skin. The process of desquamation has been estimated to cause a loss of tissue in an amount of up to 14 grams per day. When desquamation does not take place regularly, the surface of the skin tends to become rougher and more wrinkles and other

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**John Woodruff**

undesirable effects appear. As an alternative to the natural desquamation process, exfoliation is often used to rejuvenate and enhance the health of the skin.

Exfoliants in common use include alpha hydroxy acids ("AHA"), beta hydroxy acids ("BHA"), retinoic acid ("retin A"), and enzymes. Chemical exfoliants such as AHA break the bond holding individual squames together and allows them to detach and shed. The patent describes the use of from 1% to 5% N-acetyl-D-glucosamine, N-acetylgalactosamine, or a combination thereof as a natural and effective alternative to the exfoliation process. These may be incorporated in a cosmetically acceptable vehicle within which they are soluble and which will not cause harm to the user.

Optional components of the composition include additional exfoliants, preservatives, fragrances, emollients, antiseptics, anti-inflammatory compounds, antimicrobial compounds and other additives to improve the aesthetics or stability of the product. Examples of additional exfoliants include AHAs, for example, lactic acid, or BHAs, for example, salicylic acid, or physical exfoliants such as pumice, polyethylene, walnut shell powder, and the like, or combinations thereof.

### Example Composition

Material	Weight %
Butylene Glycol	1.00
Citric Acid	0.10
Cyclomethicone	15.00
Cystamine Bis-Lactamide	0.30
Dimethicone	5.00
Germall 115	0.50
N-acetyl-D-Glucosamine	1.00
Pantethine	0.10
Polyacrylamide	2.00
Sodium Dehydroacetate	0.10
Sodium Hyaluronate	0.20
Steareth-20	3.00
Tocopheryl Acetate	0.50
Purified Water to	100%

**Title: Formulations and methods for reducing skin irritation**

**Publication No. USP 6,455,076**

**Application No. 860206**

**Date of filing June 23, 1997**

## Patent Abstracts

John Woodruff

**Inventors: Hahn; Gary S, Thueson; David O**

This patent is of interest because of its detailed descriptions of skin irritation and methods of reducing it and of measuring this reduction in clinical trials.

According to the applicants it would be highly desirable to identify compounds with anti-irritant activities that would reduce the irritation caused by a wide range of otherwise safe and effective topical products, or to reduce the intrinsic irritation associated with various skin conditions caused by exposure to irritating chemicals or environmental conditions such as antigens, sun, wind, cold air or extremes in humidity. Claimed are compositions and methods for inhibiting skin irritations attributable to chemical irritants or environmental conditions by the application of anti-irritant amounts of aqueous soluble divalent tin cation.

Many substances are applied topically to the skin or mucous membranes of humans in order to alter the subject's appearance, to protect the subject from the environment, or to produce a biological change in the skin or other tissue for therapeutic, preventive or cosmetic purposes. These include such topically applied substances as cosmetics, topical drugs, and a variety of other products such as soaps and detergents. In many cases, topical products contain chemicals, which may produce irritation, including various inflammation symptoms or signs, when applied to the skin. The occurrence, frequency and nature of topical-product-induced irritation often varies from user to user. Typical symptoms of irritation include itching (pruritus), stinging, burning, tingling, tightness, erythema or oedema. The irritation response may be to the direct effect on the skin of certain topical product chemicals or to a response by the immune system directed toward the chemicals alone or in combination with skin components such as antigens.

Irritating ingredients include fragrances, preservatives, solvents, propellants, exfoliants and skin cell renewal agents, anti-acne drugs, antiperspirant compounds, antihistamines, anti-inflammatory agents, skin protective agents, insect repellent chemicals, sunscreens and many others. Where more than one chemical irritant is present, their irritating effects may be additive. In addition some chemicals indirectly cause the skin to become more sensitive to other chemicals or environmental conditions, which would not normally cause irritation.

Described is the use of the cations aluminium ( $\text{Al}^{3+}$ ) and tin ( $\text{Sn}^{2+}$ ) and their salts as ingredients to provide fast-acting, efficient and safe topical skin anti-irritant effects, which can suppress skin irritation due to chemical or environmental exposure, or due to tissue inflammation, injury or other skin pathology. Especially preferred cation-anion pairs include aluminium chloride stannous chloride and stannous nitrate and they are typically incorporated in compositions from about 3% to about 12% w/v.

Extensive background data and clinical trials results are provided. A summary of the results of a trial on 150 subjects found the average inhibition of cumulative irritation for various cation salts at 3.4% is shown in the following table.

Cation Salt	Percent Inhibition
Stannous chloride	50%
Stannous fluoride	15%
Aluminium chloride	46%

## Patent Abstracts

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Further trials showed that there were optimum levels of the metal salts for maximum inhibition and higher levels reduced the materials effectiveness.

**Title:** Sunscreen composition containing sol-gel microcapsules

**Publication No.** USP 6,238,650

**Application No.** 318828

**Date of filing** 26/05/1999

**Applicants:** Sol-Gel Technologies Ltd

The patent describes the use of inert sol-gel microcapsules encapsulating ultraviolet absorbing compounds. The encapsulation process reduces or even prevents contact between the sunscreen compounds and human tissue and this makes the compositions safer for use. Encapsulation also reduces or prevents cross reactivity between sunscreen compounds and packaging materials and between the sunscreen compounds and any other component present in the composition, thus improving product stability. By selecting suitable precursors and reaction conditions it is possible to control the hydrophobic or hydrophilic character of the sol-gel microcapsules making them suitable for all types of cosmetic vehicle, including oil free compositions.

The size of the microcapsules can be controlled to the range 0.1-10  $\mu$ m., and can be incorporated into the cosmetic vehicle in the form of an aqueous suspension of the sol-gel particles, or as a dried sol-gel powder. In a preferred embodiment the capsules consist of the encapsulated materials and silica, in particular methyl modified silica. The dried sol-gel silica powders may contain 50 to 80% by weight of sunscreen compound and may encapsulate a single sunscreen or several to obtain a composition with the desired UV absorption spectrum. The final product may take any cosmetically acceptable form and there are said to be no manufacturing problems associated with incorporating the capsules in the preferred cosmetic vehicle.

The patent is extensively illustrated with examples of encapsulated actives, with formulations and with the results of phototoxicity testing and of Plasmid DNA Nicking Tests, which clearly illustrate the safety of the system.

Example formulations follow.

Oil in Water Composition Containing Hydrophilic Suspension of Encapsulated Sunscreen in Silica; in-vitro SPF 10.4

INCI name                      % w/w

### PHASE A

- |   |                           |      |
|---|---------------------------|------|
| 1 | Paraffinum liquidum       | 5.00 |
| 2 | Decyl oleate              | 5.00 |
| 3 | Dimethicone               | 1.00 |
| 4 | Cetearyl alcohol          | 1.00 |
| 5 | Glyceryl stearate         | 3.00 |
| 6 | Potassium cetyl phosphate | 2.00 |

### PHASE B

- |   |              |       |
|---|--------------|-------|
| 7 | Aqua (water) | 47.25 |
|---|--------------|-------|

## Patent Abstracts

**John Woodruff**

- 8 Xanthan gum 0.15
- 9 Propylene glycol 5.00
- 10 Preservatives 0.05

### PHASE C

- 11 Lactic acid 88% (in water) 0.10

### PHASE D

- 11 Silica/OMC (25% OMC in the water suspension) 30.00

Water in Oil Composition Containing Hydrophilic Suspension of Encapsulated Sunscreen in Silica; in-vitro SPF 12.8

INCI name % w/w

### PHASE A

- 1 Caprylic/capric triglyceride 9.00
- 2 C12-C15 Alkyl benzoate 7.50
- 3 Diisostearoyl polyglyceryl-3 diisostearate 3.00
- 4 Hydrogenated castor oil 0.30
- 5 Cera alba (Beeswax) 0.20

### PHASE B

- 6 Aqua (water) 47.25
- 7 Magnesium sulfate 1.00
- 8 Glycerin 1.00
- 9 Preservatives 0.50%

### PHASE C

- 11 Lactic acid 88% (in water) 0.10

### PHASE D

- 12 Silica/OMC (25% OMC in the water suspension) 30.00

**Title: Water resistant sunscreen and insect repellent composition**

**Publication No. USP 6,284,227**

**Application No. 736766**

**Date of filing 12/12/2000**

**Applicants: Iguana, LLC**

Claimed is an improved sunscreen protection and insect repellent combination composition with good water-resistant properties. It is recommended for use in rainy conditions or prolonged periods of high humidity, such as in a tropical or sub-tropical rain forests, or the like, and after the wearer has been underwater. [TRUE – That is what it says] The composition includes a sunscreen agent, an insect repellent, including p-menthane-3, 8-diol, an emulsifying agent, and a film former. It is claimed to form a stable emulsion that forms a thin film on the skin, is non-greasy to the touch and is easily removed by scrubbing with soap and water.

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The preferred insect repellent agent is N,N-diethyl-m-toluamide ("DEET") present in an amount ranging from about 12 wt % to about 22 wt %. by weight Other insect repellents, such as citronella, can be used and recently, the Environmental Protection Agency (EPA) has approved IR3535 produced by EM Industries, Inc., as a biochemical pesticide. Chemically, IR3535 is 3-[N-Butyl-N-acetyl]-aminopropionic acid, ethyl ester. Also recently approved by the EPA is p-menthane-3, 8-diol, which has, as its target pests, mosquitoes, deer ticks, body lice, and biting flies. P-menthane-3, 8-diol can be used together with IR3535 and/or DEET, and/or instead of IR3535 or DEET in the present invention.

Three sunscreens are preferred that have different absorption peaks: ethylhexyl methoxycinnamate, ethylhexyl salicylate and benzophenone-3 to give broad-spectrum protection with a preferred SPF of 15 – 30. The emulsifier is acrylic acid-stearyl methacrylate copolymer, commonly known by its trade name, Pemulen TR-1, with a carbomer for added stability. An example of an appropriate film former is given as poly/vinyl pyrrolidone/1-triacontene, added at about 3%. This compound contributes film forming and waterproofing qualities to the composition and the patent names many alternatives to the sunscreens, emulsifiers and film-former shown above. Several formulations illustrate the patent of which the following is an example.

#### PHASE A

Deionised water	to 100% by weight
Propylene glycol	2.50
Carbopol 940 (2% Solution)	5.00
Pemulen TR-1 (2% Solution)	15.00
Seamollient	1.00
Tetrasodium EDTA	0.10

#### PHASE B

N,N-diethyl-m-toluamide (DEET)	17.00
Cetearyl alcohol	3.50
Ethylhexyl methoxycinnamate	7.50
Ethylhexyl salicylate	5.00
PEG 40 stearate	0.15
Oxybenzone	6.00
Poly/vinyl pyrrolidone/1-triacontene	3.00
Vitamin E Acetate	0.25

#### PHASE C

Triethanolamine 99%	0.11
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#### PHASE D

Citronella Java	0.01
Fragrance & preservatives	qs

**Title: Methods for protecting skin from damaging effects of ultraviolet light**

**Publication No. USP 6,036,946**

**Application No. 998238**

**Patent Abstracts**  
**John Woodruff**

**Date of filing** 24/12/1997

**Applicants:** Shaklee Corporation

Prostaglandins are formed from arachidonic acid upon oxidation via the lipoyxygenase pathway and are a mediator of inflammation produced by skin damage as a response to ultra violet radiation and the release of reactive oxygen species within the skin cells. Additionally, there are other messenger systems in skin cells that could increase the amount of prostaglandins that are activated by reactions involving reactive oxygen species.

Since sunscreens are unable to completely protect the skin against the adverse effects of ultraviolet radiation, alternative modes of protection have been proposed. Vitamins, such as Vitamin E acetate, have been shown to make the skin softer and smoother after topical application, which can offset some of the damaging effects of the sun. Vitamin A palmitate, hyaluronic acid and pyrrolidone carboxylic acid (PCA) have been shown to create smoother skin and help enhance the process of cellular turnover.

The patent claims to provide a therapeutic or cosmetic composition containing new antioxidants, or agents that reduce sun induced skin damage and inflammation by aborting the production of prostaglandins in the skin. The composition is described as an antioxidant composition, which includes beta-glucan in a sufficient amount to protect the skin from the damaging effects of ultraviolet radiation. The composition also includes panthenol, grape seed extract, Vitamin C, and superoxide dismutase, which act synergistically with the beta-glucan to improve cellular viability and reduce the production of inflammatory prostaglandin PGE<sub>2</sub> in skin exposed to ultraviolet radiation. The composition can also include Vitamin A (retinol) and Vitamin E (tocopherol), which also act synergistically as an antioxidant in the skin. Tests for determining the antioxidant properties of the proposed compositions are described and the patent provides illustrative formulations; the following is an example of a liquid product. The figures show the % by weight range of the ingredients incorporated in the patent.

Purified Water	19.00000-98.71330%
Surfactants	0.50-5.00
Witch Hazel Distillate	0.01-20.00
Humectant	0.50-5.00
Fragrance	0.001-1.00
Preservatives	0.20-3.00
Sequestering Agent	0.01-0.50
Menthol	0.005-1.00
Vitamin A Palmitate	0.0005-0.50
Vitamin E Acetate	0.05-30.00
Magnesium ascorbyl phosphate	0.0001-3.00
Beta Glucan	0.005-5.00
Superoxide Dismutase	0.0001-1.00
Grape Seed Extract	0.00001-1.00
Panthenol	0.005-5.00
Total	100.00000%

**Title:** Semi-permanent hair dyeing system using soluble vat dyes

**Patent Abstracts**  
**John Woodruff**

**Publication No. USP 6,592,632**

**Application No. 867278**

**Date of filing May 29, 2001**

**Assignee: Aveda Corporation**

The introduction states that there are a number of goals that are routinely considered in the development of a successful semi-permanent hair dye formulation. The dye should provide a natural looking, durable and even deposit of colour on the hair. It must be able to penetrate the cuticle, and not wash out easily and the colouring process must not be harsh or damaging to the hair. These goals are not simple to achieve. Depending factors are the class of dyes being used, the formula the dye is in, and process of the dye application.

Claimed is a colouring system based on vat dyes. These are described as natural materials that have been used for thousands of years, examples being the naturally occurring indigo and tyrian purple. Dyes of this type are now made synthetically, and are widely used in the textile industry for dyeing of cloth, both natural and synthetic. The dyes are aromatic compounds containing two or more carbonyl groups that are joined by conjugated double bonds. Vat dyes already contain their chromophore, and therefore do not require the presence of an oxidative agent to generate the chromophore on the hair.

Soluble vat dyes are in the reduced form, and have the unique feature that they will not oxidize on exposure to air. They are esters of the leuco vat dyes, which in presence of the acid at elevated temperature, the ester will hydrolyse to yield the leuco acid of the vat dye. On application, the solubilised vat dye penetrates the hair and is then oxidized back to its insoluble form by simple exposure to the air, causing the dye to be entrapped within the hair shaft and thereby colouring it.

Vat dyes encompass two chemical classes, the indigoids and the anthraquinone derivatives, with a preference for the anthraquinones because of their colourfastness. Examples of useful solubilised vat dyes include, but are not limited to, Solubilised Vat Brown 5 (CI 73411), Solubilised Vat Black 1 (CI 73671), Solubilised Vat Red 1 (CI 73361), Solubilised Vat Green 2 (CI 59831), Solubilised Vat Violet 8 (CI 73601), Solubilised Vat Yellow 4 (CI 59101), Solubilised Vat Brown 1 (CI 70801), and Solubilised Vat Red 3. They are used alone or in combination and the amount of dye used is dependent upon the final shade desired, preferably in a range of about 1% to about 5%, by weight of the composition.

To optimise the process and produce improved colour intensity an anti-oxidant is included. A preferred combination is sodium metabisulphite and erythorbic acid in a ratio of about 2:1. Benzyl alcohol is added at about 0.5-5% to improve dye solubility and hair penetration. It was found that the most intense and vibrant colour with greatest wash fastness was seen with a solution containing 5% benzyl alcohol, 4% solubilised vat dye, 2% sodium metabisulphite and 1% erythorbic acid, the pH being adjusted to pH 10 with ammonium hydroxide.

An example formula for a natural indigo shampoo follows:-

Material	% w/w
Deionised Water	22.75
Xanthan Gum	0.75

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Sodium	2.50
Erythorbic Acid	1.50
Cocamide DEA	6.00
Cocamidopropyl	20.00
Saponins	10.00
Benzyl Alcohol	5.00
Rosemary Extract	0.10
Comfrey Leaf	0.10
Horsetail Extract	0.10
Matricaria Extract	0.10
Decyl Polyglucose	15.0
Avocado Oil	0.10
Solubilised Vat Dye	5.00
Polyquaternium-10	10.00
Acetamide MEA	1.00

**Title: Method for colouring hair with removable hair colour**

**Publication No. USP 6,599,330**

**Application No. 245160**

**Date of filing November 4, 2002**

**Assignee: Revlon Consumer Products**

The stated objective of the applicants is to provide a composition and method for colouring hair to the same degree as permanent hair colour, but which can be removed from the hair when desired. This is achieved by colouring the hair with an aqueous composition comprising in combination, a reducing agent capable of reducing the --S--S-- bonds on the hair fibre surface to form reactive --SH groups and a dye molecule containing chemical groups reactive with the --SH groups to form --S--S-- bonds between the dye molecule and the hair fibre surface. Colour may be removed from the hair with an aqueous based composition containing a reducing agent capable of disrupting the --S--S-- bonds between the dye molecule and the hair fibre.

Any chromophore that provides colour to the hair is suitable provided it has been derivatised such that it contains at least one free --SH group. Suitable compounds include Acid dyes, Basic dyes, Disperse dyes, and HC dyes, as well as dyes typically used for oxidative dyeing of the hair such as aminophenols and nitrophenols. Particularly preferred chromophores are monoazo chromophores.

A variety of reducing agents may be suitable for use including ammonium bisulphite, and ammonium sulphite, thioglycollate, or thiolactate but the preferred reducing agents are glyceryl thioglycollate or thioglycollic acid. A variety of additives may be included to improve the efficacy, stability and aesthetic properties of the composition or to minimise damage to the hair. These include humectants, urea is preferred; solvents, ethanol is

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preferred, and cationic conditioning agents. The colour removing composition is preferably sodium sulphite in a shampoo-type formulation.

Example colouring formulation

Glyceryl-thioglycollate	4.00%
Urea	10.00
Polymeric dye compound	8.40
Ethanol	8.43
Acetic acid QS to pH 7.00	
Water QS to 100	

**Title: Method and compositions for colouring hair**

**Publication No. USP 6,669,933**

**Application No. 852982**

**Date of filing May 10, 2001**

**Assignee: Revlon Consumer Products**

It is the object of the invention to provide a method and compositions for permanently colouring hair in ten minutes or less without damaging or drying hair. To do so it is necessary to both bleach the melanin out of the hair fibres and colour the hair in the desired colour in the given time frame.

The applicants claim that time required to achieve lift and to colour the hair can be significantly reduced if the composition has a total concentration of hair dyes limited to 2.0% w/w, the free alkalinity concentration is 0.20-0.75 eq/gram, and the hydrogen peroxide concentration is 4.0 to 6.0% w/w. The composition is provided in two parts: an aqueous dye mixture comprising an oil-in-water emulsion plus primary intermediates and colour couplers and free alkali, preferably ammonium hydroxide, and a developer composition containing hydrogen peroxide plus suitable additives to improve stability and ease of use.

In the preferred embodiment of the invention, about 1 part of dye mixture is combined with 1.5 parts of the developer mixture to form the aqueous hair colour composition. This combination is then immediately applied to hair. After ten minutes the hair is rinsed thoroughly with water. Since the process both lifts and colours the hair, it is possible to colour the hair in whatever shade is desired without restriction. The level of colour is determined by the dyes used, the free alkalinity and the concentration of hydrogen peroxide.

The patent includes extensive details about the compositions and process and those interested should study the complete document.

**Title: Wax free transparent lipstick composition**

**Publication No. USP 6,468,510**

**Application No. 754457**

**Date of filing 4<sup>th</sup> January 2001**

**Patent Abstracts**  
**John Woodruff**

**Assignee:           Cosmetic Essence, Inc**

Gelling oils is a common requirement in cosmetic formulation for which there are a limited number of materials available. This application describes a method of gelling oils for use in lipstick and lip gloss compositions.

N-acyl amino acids, and specifically n-acyl glutamic acid amides and esters, are used as gelling agents for the non-volatile oil-base of transparent candles. The candle is formed from a clear gel obtained from hydrogenated polyisobutenes of different viscosities with the N-acyl glutamic acid diamide gelling agent. The applicants have transferred this technology to cosmetics and describe a wax-free lipstick that uses an oil-gelling agent in place of the usual waxes to be found in lipsticks and that is used to impart a transparent or translucent coloured film to the lips.

The composition also comprises oils and esters, a firming or bulking agent and various additives to improve the aesthetic appeal of the product. The preferred oil mix is about 40% polybutene with about 40% trimethylpropane triisostearate with about 4% diisostearyl maleate to give a moisturising feel. This is mixed with about 4% hydroxystearate to give the composition firmness, and about 5% dibutyl lauroyl glutamide as an oil-gelatinising agent. Polyethylene is added as a bulking agent and the composition is completed with colour, flavour and an optional pearl additive.

**Title:           Gelled cosmetic remover composition**

**Publication No.   USP 6,475,496**

**Application No.   640266**

**Date of filing     17<sup>th</sup> August 2000**

**Assignee:           Revlon Consumer Products**

Transfer resistant make-up and nail enamels are difficult to remove by washing or with conventional cosmetic cleansers. In order to overcome this compositions based on various solvents that are strong enough to dissolve the film formed by the cosmetic composition are available. However such compositions are usually in liquid form and the remover may drip onto other parts of the body or onto clothing or household objects, causing discomfort to the user or damage to clothing and furniture. Also the organic solvents used tend to be drying to the skin. Commercially available gelled compositions exist, but because these do not contain conditioning or moisturising ingredients they tend to be as drying in use as the liquid formulas.

Thus, state the applicants, there is a need for cosmetic remover compositions that are gelled to a viscosity that permits easy application and minimises dripping, which at the same time provide superior moisturising and conditioning to skin. This is achieved by using at least one organic solvent selected from a group comprising low viscosity hydrocarbons, organic alcohols, ketones, esters of organic alcohols, glycols and ethers. The solvent is present at from 15% to 60% by weight. Suitable ketones include acetone, propanone, butyrolactone, and methyl ethyl ketone. Suitable esters include butyl acetate, ethyl acetate, benzyl acetate, benzyl benzoate, dibutyl phthalate, dibutyl sebacate, isobutyl acetate and isoamyl acetate and suitable ethers include methyl ether, ethyl ether, propyl ether and suitable glycols are benzyl glycol and butoxydiglycol. Suitable hydrocarbons are the isoparaffins such as isodecane and isohexadecane. The organic solvents selected

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depend on the type of remover composition that is being formulated. In nail enamel remover compositions, the preferred organic solvents are esters or ketones, either alone or in combination with C1-4 aliphatic or aromatic alcohols. Preferred organic solvents for use in compositions for removal of makeup from the eyes and face are paraffinic hydrocarbons.

The gelling agent is a synthetic metal silicate and sodium lithium magnesium silicate, available as Laponite XLS and XLG, is preferred, present at from 0.5-10% of the total composition. This may be used in conjunction with sodium stearate and other gelling agents. The final composition may contain surfactants, emollients, stabilizing agents, and other ingredients to improve its cosmetic qualities and the balance is water. An illustrative formula for gelled nail enamel is given:

Acetone	60.00% w/w
Methylgluceth-2	1.00
Water	38.17
Laponite XLG	0.75
Propylene carbonate	0.08

Combine the water and Laponite and mix well for 20 minutes. When the Laponite is dispersed, the methylgluceth-2 and propylene carbonate are added to the composition and it is mixed well for 5 minutes. The acetone is added and mixed well for an additional 10 minutes.

**Title: Organic toothpaste containing saponin**

**Publication No. USP 6,485,711**

**Application No. 104716**

**Date of filing 21<sup>st</sup> March 2002**

**Assignee: Olmstead; Michael J**

Claimed is organic toothpaste with saponin derived from the bark of the Quillaja or Yucca tree as the cleansing and foaming agent. Other organic products for whitening teeth, soothing irritated gums or other tissues, and fighting microbes are included and it is said to be free of synthetic surfactants, anti-microbial agents and cleansers.

The applicant states the natural ingredients include one or more of the following: calcium carbonate for a whitener; distilled water for a moisturiser; aloe vera for soothing irritated gums; silica for a whitener; baking soda for an acid neutraliser, Irish moss for a thickener and to soothe irritated gums; peppermint for flavour and as a breath freshener; Manuka oil for an anti-bacterial agent; grapefruit seed extract for an anti-microbial agent and green papaya for a cleanser. While saponin contributes to the flavour its primary function is that it produces foaming without the use of synthetic surfactants while providing superior cleaning attributes.

The following table illustrates the ingredients that may be used and the range of levels thought suitable, a specific example is given, the purpose of those ingredients and the source are also shown; all % are by weight.

Ingredient	Range % w/w	Example % w/w	Purpose	Source
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Calcium carbonate	15-50	26.00	Whitener	Mineral
Distilled water	3-18	9.37	Moisturiser	Distilled
Aloe Vera juice	0.5-20	6.00	Soothe irritated tissue	Organic extract
Fumed silica	0.1-7	1.65	Whitener	Mineral
Hydrated silica	0.5-10	4.30	Whitener	Mineral
Baking Soda	0.5-8	2.20	Acid neutralizer	Mineral
Quillaja (Saponin)	0.10 – 10.0	1.000	Cleansing & foaming	Organic extract
Carrageenan	0.1-3	0.715	Thickener, soothe irritated tissue	Irish Moss is harvested kelp
Peppermint oil	0.1-2	0.820	Flavour	Organic
Manuka oil	0.5-2	0.600	Anti-microbial	Wild harvested Leptospermum Scoparium oil from New Zealand
Grapefruit seed extract	0.1-3	0.375	Anti-microbial	Organic extract
Green papaya	0.01-2	0.400	Cleanser	Organic extract

**Title: Use of a composition bases on isostearyl glycoside and isostearyl alcohol as an agent that improves the resistance of a cosmetic composition to water**

**Publication No. USP 6,464,993**

**Application No. 937733**

**Date of filing 27<sup>th</sup> September 2001**

**Assignee:** Societe d'Exploitation de Produits pour les Industries Chimiques-Seppic

Cosmetic emulsions have relatively inadequate water resistance and for example the efficacy of sun formulations, mascaras or baby care products decreases considerably after they have come into contact with water. Different solutions have been tried for overcoming this disadvantage and prolonging the action of such compositions over time. Incorporating between 1 and 5%, of various hydrophobic polymers and more particularly

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of vinyl copolymers is one method but the polymers are said to be difficult to handle and have to be added to the hot oil phase. High-molecular acrylic copolymers are also used but there are problems of solubility and neutralisation to overcome.

Another means of improving water resistance is the incorporation of substantial amounts of fatty phase containing conventional mineral oils and silicone phases such as silicone gums and particularly high-molecular polydimethylsiloxanes, silicone resins or products of the phenyltrimethicone type but their incorporation often presents stability problems.

The applicants claim that in general terms, all the means which have so far been proposed for improving water resistance have produced emulsions which are difficult to spread and have a greasy and sticky feel. It is their claim that compositions comprising 10% to 25% by weight of an isostearyl glycoside with a degree of polymerisation of between 1 and 10.3, and 90% to 75% by weight of isostearyl alcohol are easy to use and can be applied cold and without additional stabiliser. They are preferably used at between 0.5% and 5% by weight, based on the total weight of the cosmetic composition and can be added to water-in-oil, oil-in-water or water-in-oil-in-water emulsions.

The patent describes the test protocols for measuring water-resistance and the sensorial properties of the compositions that incorporate 16.1% isostearyl glycoside and 83.9% isostearyl alcohol in various illustrative formulations, for example:-

Mascara

Isostearyl glycoside/isostearyl alcohol 10.0%

Ozokerite 10%

Beeswax 8%

Paraffin oil 5%

Water qs 100%

PVP 0.2%

Propylene glycol 7%

Black iron oxide 6%

MgSO<sub>4</sub> 0.7%

Preservatives qs

**Title: Cosmetic and skin protective compositions**

**Publication No. USP 6,497,892**

**Application No. 978597**

**Date of filing: October 18, 2001**

**Inventors: P& S Pugliese; PA 17901 USA**

Hydrogen peroxide is used in the oxidative dyeing of hair and also as part of the permanent waving process. Unfortunately in either case residual peroxide is likely to remain, even after rinsing, which can affect the colour and strength of the hair and also irritate the scalp of the client and the hands of the operator.

It is the stated object of the patent to provide a composition that may be sprayed or rinsed in the hair which will neutralise and destroy residual peroxides, following the colouring or other chemical treatments of hair that employ hydrogen peroxides, or other peroxides. It is

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to also provide a skin protective hand cream, containing catalase enzyme that will protect the skin with a water resistant barrier, while decomposing residual active peroxide and to also provide a method for more uniformly dyeing hair by adding augmented natural catalase compound activity to an oxidative hair dye.

A selected polymer, typically a polysaccharide, acts as carrier for the catalase enzyme but still allows it to react with the peroxide in the dyeing composition and the addition of a selected yeast extract increases catalase activity on a milligram for milligram basis. The catalase may be derived from both plant and animal sources, or from bacterial cultures or genetically engineered from bacterial sources.

The spray rinse consists of 1 – 3% catalase plus 0.01 – 0.1% yeast extract with a suitable water-soluble cationic conditioning agent. The scalp protective material may include PVP or guar and other natural gums, hydroxycellulose derivatives and acrylate derivatives. This provides a layer of protection on the scalp that will impede the hydrogen peroxide from reaching the scalp and for neutralising any peroxide that may break through the barrier. The patent is well illustrated with formula applications.

**Title: Hair colouring composition and method**

**Publication No. USP 6,506,374**

**Application No. 675838**

**Date of filing: September 29, 2000**

**Assignee: Hair Marker LLC**

Described is a semi-permanent hair colouring composition containing one or more hair substantive direct dyes, in a controlled evaporation rate vehicle that is reasonably free flowing yet does not drip or cause build-up on the hair. It is suitable for application through a wick or capillary-type applicator.

Claimed is a composition containing semi-permanent dyes capable of retention through a number of shampoos. The dyes are capable of penetrating the cuticle of the hair in a level fashion without leaving an undesirable coating. The composition is non-foaming and reasonably quick drying and can optionally contain a shielding component to safeguard against colour being transferred from the hair to pillows and other surfaces. It has a sufficiently, low viscosity so that it flows easily from an applicator and a pH that allows the desired degree of permanence on the hair.

Suitable dyes are generally water or alcohol soluble, and are safe for use on human hair. The ratio of water and alcohol or other volatile solvent can be adjusted to obtain a predetermined rate of evaporation. Particularly suitable semi-permanent dyes include azo dyes, diphenylamine dyes, quinone-imines containing a quaternary ammonium group, anthraquinones and nitro dyes. Such dyes are capable of being instantly deposited on the hair and repeated application provides increased coverage. They penetrate the hair shaft leaving a clean level of colour molecules on the hair and no unsightly mess is left on the hair or scalp on drying.

While the dye composition can contain a small amount of suitable cationic or non-ionic surfactant, its concentration should be low to avoid foaming. Level application can be promoted by the use of an alcohol solvent system, e.g., ethyl alcohol, isopropyl alcohol or

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butyl alcohol, this last improving penetration into the hair shaft. Butyl cellosolve is useful for improving the solubility of some of the dyes.

Polyvinylpyrrolidone or copolymers of vinyl acetate and vinylpyrrolidone monomers are optionally added to resist rub-off. They are not tacky and do not interfere with the free capillary flow of the dye liquids. A slight amount of a thickener such as a carbomer or a cellulose can be used to prevent a too rapid runoff from the applicator. A viscosity in the range of 10-100 cps is sufficiently free flowing and a pH from about 8 to about 8.5 is generally best for semi-permanent colouring of the hair.

A very dark brown shade is given by way of example:

<b>Phase A</b>	<b>%w/w</b>
Deionised Water	42.00
PVP/VA	2.00
Cocodimonium Hydroxypropyl Hydrolyzed Wheat Protein	0.20
PEG-12 Dimethicone	0.10
Triethanolamine 99% q.s. pH = 8.0-8.5	
<b>Phase B</b>	
Deionised Water	33.00
Basic Blue 99	1.20
Basic Red 76	0.30
Basic Yellow 57	0.60
Basic Brown 16	0.20
Basic Brown 17	0.20
<b>Phase C</b>	
Ethanol	20.00
Perfume	qs

Mixing Instructions: Mix Phase A items together until clear and adjust pH to 6.0 – 8.5. Dissolve Dyes in water and when completely dissolved combine with Phase A. Carefully add Ethanol with perfume to main mix.

**Title: Hair styling shampoos containing organic oil**

**Publication No. 6,248,315**

**Application No. 602794**

**Date of filing 26/05/2000**

**Applicants: The Procter & Gamble Company**

Described are hair shampoo compositions containing latex polymer particles, a water-soluble cationic polymer and an organic oil. The organic oil is a hydrocarbon oil or fatty ester, and is present to enhance deposition of the latex polymer particles onto hair in the presence of cationic polymer.

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Hair shampoo compositions containing styling polymers in a compatible shampoo base combine cleaning performance with some styling benefits. To aid dispersion of the polymer and deposition on the hair it may be dissolved in an organic solvent. To minimise the use of organic solvents, colloidal dispersions of water-insoluble latex polymers may be used but deposition onto the hair is substantially reduced. The applicants claim that by combining an organic oil and a cationic polymer into the shampoo composition deposition may be enhanced.

Suitable latex polymers may be non-ionic, anionic, cationic, zwitterionic or amphoteric provided they are compatible with the essential components of the shampoo and do not unduly impair its cleaning and styling performance. Typical polymers are listed as vinyl acetate, styrene, butadiene and acrylic acid esters and copolymers of these. They are added as a colloidal suspension and the dispersed particles preferably have an average diameter of less than 0.5 microns. A cationic polymer is used as a dispersion and deposition aid and the Polyquaternium polymers -6, -7, -11 or -16 are specifically mentioned, as are cationic gaur, cellulose and starch derivatives.

An organic oil is added to further enhance the deposition of the latex polymer on hair. It should not cause the hair to feel greasy nor affect the lather properties so its concentration is preferably from about 0.1% to about 1.5%. The optimum weight ratio of organic oil to latex polymer is about 1:15 to about 1:2. In this patent the term organic oil means any water-insoluble hydrocarbon oil, triglyceride or fatty acid ester that is a pourable liquid under ambient conditions. Examples of all classes are cited including the branched chain esters, isocetyl stearyl stearate, diisopropyl adipate, and tristearyl citrate. The shampoo base may be any suitable combination of anionic, non-ionic and amphoteric surfactants and may include common additives to enhance stability and product texture and aesthetic properties.

The patent is illustrated with example formulations that favour the use of ammonium laureth sulfate with cocamidopropyl betaine as the base surfactants. Test methods to show improved styling properties and deposition of the polymer are also described.

**Title: UV-protection formulation**

**Publication No. USP 6,235,271**

**Application No. 122554**

**Date of filing 24/07/1998**

**Applicants: Ciba Specialty Chemicals Company**

Current sun protection agents for use in products for topical application are either organic UV absorbers or microfine insoluble inorganic oxides. The former are limited in number and permitted concentration and the latter are difficult to incorporate at high levels into cosmetically elegant preparations, claim the applicants. The patent describes UV-protection formulations that comprise a combination of :-

- a micronised UV absorber
- an oil-soluble UV absorber
- and/or an inorganic micropigment.
- a polymeric hollow sphere additive
- and/or a polymer selected from xanthan and/or polyvinylpyrrolidone.

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The combinations exhibit a synergistic sun protection effect that is greatly enhanced by the polymeric hollow sphere additive.

The micronised organic UV absorber is produced by grinding either a triazine, a benzotriazole, a cinnamic acid amide or a sulfonated benzimidazole UV absorber in the presence of an alkyl polyglucoside. Of these methylene bis-benzotriazolyl tetramethylbutylphenol (MBBT) appears to be the preferred compound. The oil-soluble organic UV absorber may be any of those already approved and marketed for cosmetic use. Examples of the microfine inorganic component are given as titanium dioxide coated with aluminium oxide or silicon dioxide, zinc oxide coated with aluminium oxide or silicon dioxide, or mica. The polymeric hollow sphere component is preferably an aqueous dispersion comprising styrene/acrylic acid copolymer beads having a particle size below 1 micron, a solids content from 25 to 45%, by weight; a voids volume of 20 to 55%, a mean particle size of 0.1 to 1.5 microns and a wall thickness from 0.02 to 0.5 micron. Alternative suitable hollow sphere materials are copolymers of acrylonitrile with acrylic acid, methacrylic acid, styrene or vinylidene chloride.

The sunscreen composition may be formulated as a water-in oil or oil-in-water dispersion, an oil or oil-alcohol lotion, a gel, a solid stick or an aerosol formulation. A base formulation to which various sunscreens and combinations of sunscreens were added is described and the effects on SPF of adding the micronised organic UV absorber and hollow polymeric spheres are shown. The following table shows the improvement in SPF obtained when micronised MBBT and hollow spheres were added to a basic formulation.

Ethylhexyl methoxycinnamate	Micronised MBBT	styrene/acrylic acid copolymer spheres	SPF (in-vitro)
2.70%	-	2.50%	7.9
2.70%	5.0%	-	17.8
2.70%	5.0%	2.50%	23.0
2.70%	5.0%	5.0%	28.5
2.70%	5.0%	7.5%	58.5

**Title: Two-part hair dye compositions containing polyether polyurethanes and conditioning agents**

**Publication No. USP 6,156,076**

**Application No. 122554**

**Date of filing 16/01/1998**

**Applicants: Bristol-Myers Squibb Company**

Oxidative hair dyes are used for the permanent dyeing of human hair. The process is achieved by the reaction of certain primary intermediates with certain coupling compounds in the presence of a suitable oxidising agent. The procedure generally involves the use of a two-part system; one part contains primary intermediates and coupling agents as oxidation dye precursors. The other part is a developer formulation containing a suitable

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oxidising agent, typically hydrogen peroxide. Immediately prior to application to the hair, the two parts are mixed to form a thickened lotion, cream, or gel.

In use some of the natural melanin pigment of the hair may be bleached. The oxidation dye precursors penetrate into the hair, couple and are oxidised to produce the desired colour. Such systems generally contain a proportion of organic solvents and surfactants and contain relatively high levels of dye precursors to produce the desired colour.

In addition to providing a suitable colour and intensity after application to the subject's hair the dye must have virtually no dermal or systemic toxicity and must remain stable against external influences and against chemical agents for a suitable period of time. A number of parameters and conditions need consideration including the wash and light fastness of the resulting dye; the resistance of the dye to perspiration; the type of hair being dyed and the resistance of the dye to various hair treatments. It is common practice to add a polyacrylic acid derivative to the peroxide developer which, when mixed with the alkaline dye formulation, it becomes neutralised, which leads to an increase in viscosity and provides a suitable rheology for product application. However acrylic acid derivatives are anionic and are incompatible with the cationic conditioning polymers that are often used to enhance colour and condition.

The applicants claim to solve the incompatibility problem by the use of particular nonionic polymers in combination with one or more cationic conditioning agents to provide a hair colour composition with excellent rheology and superior conditioning properties and benefits for two-part oxidative hair dye systems. The preferred polymer is a block copolymer of polyurethane and polyethylene glycol or polypropylene glycol, preferably modified by the addition of starch, with which it forms a complex. It may added at about 0.2% to about 0.5%, by weight to either or both parts of the composition and a low HLB surfactant is added to assist dispersion of the polymer. A wide variety of cationic conditioning agents are cited as suitable additives and they may be added at up to 5% to either or both parts. Primary intermediates and couplers are those in common use in oxidative hair dye compositions and include phenylenediamine and aminophenol derivatives, phenols and resorcinol derivatives. The preferable pH range for the final composition mixture is between about 8.0 and about 10.5.

**Title: Hair removal system**

**Publication No. USP 6,206,869**

**Application No. 464591**

**Date of filing Dec 6, 1999**

**Assignee: Robert Tapper**

Generally hair removal from human skin is accomplished by shaving but tweezers, wax and depilatories are also used, particularly by females wishing to remove unwanted hair. These methods only have a temporary effect yet can be both painful and messy and there is a risk of irritation from the harsh chemicals employed. Claimed is a method and apparatus for selective long term and/or permanent hair removal by iontophoretic delivery of a chemical depilatory agent deeply into a hair removal site for effecting varying degrees of damage to hair roots.

Currently, the most commonly used chemical depilatories are mercaptans, particularly salts of thioglycolic acid. They work by hydrolysing the disulfide bonds between the

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cystine molecules that form 15% of keratin, which gives hair its strength. Depilatories are applied as strongly alkaline solutions, gels or pastes, which also hydrate the hair shaft, reducing it to a jelly-like consistency that is easy to wipe away. The only known permanent means for hair removal has been by electrolysis needle, which is costly, painful, and extremely tedious since it treats only one hair at a time.

The applicant claims a new and improved hair removal system for iontophoretically delivering a depilatory agent to promote substantial damage or total destruction of the hair roots whereby long term and/or permanent hair removal is selectively accomplished. A salicylate, e.g. sodium salicylate, may be delivered prior to or simultaneously with delivery of the depilatory agent to enhance skin permeability by increasing skin pore size. An iontophoretic apparatus with silicone/carbon electrodes and a low AC current of 0.5 – 1.0 ma is utilised to drive ions of the active chemicals of common depilatories to the root system of the growing hair and thus destroy or substantially impair the means to generate a new hair. In addition, the system can accomplish this over a wide area simultaneously to many hairs, limited only by the size of the iontophoretic applicator.

**Title: Smear-resistant cosmetic**

**Publication No. USP 6,395,263**

**Application No. 665885**

**Date of filing Sept. 20<sup>th</sup>, 2000**

**Assignee: Rosemarie Nichols**

The applicant claims that for many years, lipstick has been utilised as a cosmetic preparation for heightening or altering the colour of lips. Lipstick has the disadvantage of being readily transferable from a person's lips to other objects, necessitating further applications by the wearer. Although lipstick has many disadvantages, there has thus far been no suitable alternative.

Claimed is a smear-proof and waterproof liquid that dries quickly to an extremely sheer, soft finish that feels remarkably like bare skin. In one embodiment, the cosmetic comprises between about 0.1 and about 20 parts of an alcohol soluble and water insoluble resin, between about 0.1 and about 15 parts of a cellulose, between about 0.1 and about 15 parts of a cosmetic pigment, and between about 50 and 99 parts of an organic solvent. It is said to be smear-proof and waterproof and not to streak, smear, or rub off while swimming, smoking, or kissing.

The critical component of the invention is an alcohol soluble and water insoluble resin selected from the group consisting of octylacrylamides, acrylates, butylaminoethyl methacrylate copolymers and polyvinyl acetate copolymers. Five performance tests were conducted on a variety of resins to determine their suitability for use. A suspension test was employed to assess the ability of 4.4% of the test compound to be solubilised in a solution of 3.5% ethyl cellulose, 0.5% castor oil, 0.8% D&C Red #7 Calcium Lake pigment, and 90.7% ethyl alcohol. A rub test was designed to determine the test resin's ability to be retained on the skin. A colour test compared the colour of the composition on the lips, with and without the test resin. In the "feel on lips" test, the compositions were evaluated to determine whether they produced a tight shrinking feeling or cracked, dried the lips, or caked on the lips. The length of time the composition took to dry was also evaluated; preferentially, the compositions take about 20 seconds to dry. It appears that

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Amphomer LV-71 Ethylhexylacrylamide/Acrylates/Butylaminoethyl Methacrylate Copolymer) with ethyl cellulose gave the optimum results in the tests described.

**Title:       Cosmetic composition and method of use**

**Publication No.   USP 6,403,108**

**Application No.   464591**

**Date of filing     March 31, 2000**

**Assignee:         Sheikh Ahmed Abdullah**

As the skin naturally ages, there is a reduction in the number of skin cells and blood vessels that supply the skin. There is also a flattening of the dermal-epidermal junction, which results in weaker mechanical resistance to extraneous forces. As a consequence, aged people are more susceptible to blister formation, mechanical trauma and disease processes. Described is a cosmetic composition to improve the appearance of ageing skin that includes between 25% and 55% aloe vera gel, an effective keratolytic amount of glycolic acid to provide a pH between about 2.3 and about 3.7, and between about 5% and 20% encapsulated Vitamin C. All quantities are % by weight and are approximate.

The composition can include between about 0.1 % and 5% Vitamin A, between about 0.05% and 1% Vitamin E, a buffering agent to maintain the desired pH and conventional ingredients commonly found in cosmetic compositions including preservatives, colorants, fragrances, opacifiers, emulsifying agents, and stabilisers.

The aloe vera gel (Aloe barbadensis leaf juice) most preferably comprises 50% of the composition and about 10.5% of glycolic acid is incorporated to provide exfoliation. The pH of the composition is quite critical and the level of glycolic acid is adjusted to impart the desired pH of 2.3 – 3.7. Vitamin C (ascorbic acid) tends to oxidize in the presence of glycolic acid. According to the applicant the Vitamin C can be provided as encapsulated Vitamin C in order to reduce oxidation. The encapsulated Vitamin C either ruptures or dissolves upon application and releases Vitamin C to the skin. The cosmetic composition preferably includes Vitamin A for enhancing exfoliation and collagen activation. About 0.1% Vitamin E can be added to the cosmetic composition to enhance collagen stimulation and address scar tissue formation.

It is claimed that a once or twice daily application to the skin provides a cosmetic treatment for wrinkles and fine lines, skin leathering, yellowing, sagging, hyperpigmentation and general signs of aging and enhances the general tone, glow and firmness of the skin.

**Title:   Transparent or translucent emulsions, process for preparing them and cosmetic use thereof**

**Publication No.   USP   6,616,917**

**Application No.   138243**

**Date of filing     May 6, 2002**

**Assignee:         L'Oreal (Paris, FR)**

Described are transparent or translucent cosmetic emulsions comprising an aqueous phase, an oil phase and a surfactant, the said oil phase containing a miscible mixture of at least one cosmetic oil and at least one volatile fluoro compound.

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The introduction suggests that transparent emulsions have a strong aesthetic appeal but the methods commonly employed in their formulation are unsatisfactory. The applicants claim that it is possible to obtain excellent transparent or translucent emulsions by reducing the refractive index of the oil phase in order for it to be substantially equal to that of the aqueous phase, this being achieved by using a miscible volatile fluoro compound with a refractive index of equal to or less than 1.3. This is introduced to adjust the refractive index of the oil phase to within +/- 0.05 of that of the aqueous phase and more preferably equal to within +/- .001.

Various fluoro compounds are described; with perfluorocycloalkyl, perfluoroalkanes and perfluoromorpholine derivatives being preferred. They all have a refractive index of less than 1.43, and preferably less than 1.36; a boiling point between 25°C and 65°C and a density greater than 1.2. The oil phase may incorporate most oils commonly found in cosmetics but preferred are polydimethyl silicone compounds; volatile cyclic siloxanes; volatile hydrocarbon oils and isoparaffins, particularly isodecane.

Choice of surfactant is important and dimethicone PEG-7 phosphate is favoured for the preparation of o/w transparent emulsions and a dimethicone copolyol such as cetyl PEG/PPG-10/1 dimethicone is useful for preparing w/o types.

The applicants claim the transparent emulsions described have many cosmetic applications but they are particularly interested in the preparation of sunscreens, sunless tanning products and after-sun lotions. The patent describes the technique of matching refractive indices and is illustrated with example formulations. An example follows:-

#### Transparent o/w care cream

Aqueous Phase	
Dimethicone copolyol phosphate	2.40% w/w
Sodium hydroxide	0.06
Preserving agents	0.20
Water	75.30
Refractive index of the aqueous phase = 1.345.	
Oil Phase	
The oil phase was obtained by addition of nonafluoromethoxybutane to cyclohexasiloxane until the refractive index of the mixture matched that of the aqueous phase. The proportions were:	
Cyclohexasiloxane	8.91
Nonafluoromethoxybutane	10.88
The oil phase was added to the aqueous phase with vigorous stirring. The following were added immediately after combining the two phases.	
Xanthan gum	0.20
Sepigel 305	2.00
After continuing the stirring for a few minutes, an emulsion having very good transparency and excellent cosmetic properties was obtained.	

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**Title: Cosmetic composition and methods of use**

**Publication No. USP 6,521,668**

**Application No. 461448**

**Date of filing Dec. 14, 1999**

**Assignee: Avon Products, Inc**

Described are cosmetic compositions and methods for protection of keratinous tissue against environmental aggressors, such as smoke, smog and UV radiation. They may also protect the skin from sunburn damage by neutralising free radicals and protect chafed, cracked, sunburned or wind-burned skin from further damage. Essential to the compositions is a combination of the antioxidants, hesperetin, tetrahydrocurcumin, tetrahydrodemethoxycurcumin and tetrahydrobisdemethoxycurcumin. The compositions are preferably in the form of oil in water (o/w) emulsions and may optionally contain one or more emulsifiers, preservatives, thickeners, sunscreens, additional antioxidants, emollients, and protective agents for hair, skin or nails.

Additional antioxidants include gamma oryzanol, mixed tocopherols, ascorbyl monopalmitate, algae extract, tomato extract, rosemary extract, and decarboxy carnosine hydrochloride and any combinations thereof. Hesperetin may be isolated from grapefruit and is also found in lemons and oranges. In the compositions described it is preferably about 0.1 %, of the total weight of the composition.

The final composition includes a sunscreen, either Ethylhexyl methoxycinnamate, benzophenone-3, butyl methoxydibenzoylmethane, or any combination thereof, and at least one emulsifier, preservative, thickener, emollient, humectant and fragrance and about 60% water.

An example o/w emulsion skin treatment composition follows:-

<b>Ingredient</b>	<b>%w/w</b>
Water	60.00
Disodium EDTA	0.20
Carbopol 934	0.60
Glyceryl monostearate	0.75
Steareth-2	2.00
PEG-40 stearate	0.95
Stearyl alcohol	0.25
Benzyl alcohol	1.00
Methylparaben	0.20
Hesperetin	0.10
Mixture of tetrahydrocurcumin, tetrahydrodemethoxycurcumin and tetrahydrobis- demethoxycurcumin	1.00
q.s. conventional antioxidants, sunscreens, humectants, emollients, odour remover, pH adjuster and masking agent to 100.00%	

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**Title: Gelling agent and gel compositions**

**Publication No.** USP 6,585,986

**Application No.** 759342

**Date of filing** Jan. 16, 2001

**Assignee:** Shiseido Company, Ltd.

Claimed is a gelling and emulsifying agent that can be added to a wide range of oils to produce an emulsified composition with superior stability, safety and usability. The emulsifying agent is obtained by mixing a water-swelling clay mineral with a quaternary ammonium cationic surfactant and a fatty acid or a higher alcohol which is liquid at normal temperatures. Specifically described is an emulsifier system used to prepare w/o and non-aqueous sunscreen compositions containing micronised pigments.

The preferred swelling clay includes montmorillonite, saponite and hectorite (commercially available examples include Veegum, Kunipia and Laponite) and synthetic mica known under names such as sodium silicic mica and sodium or lithium tenorite (commercially available examples include Daimonait from Topi Kogyo).

The cationic surfactant may be selected from a wide range of examples including distearyldimethylammonium chloride and benzyldimethylstearylammonium chloride.

Bentone 38 is disteardimonium hectorite, available from Elementis Specialties Rheox Inc., which may be used instead of preparing the mineral clay with a quaternary ammonium salt *in-situ*.

Examples of the fatty acid which is liquid at normal temperatures include oleic acid, isostearic acid, linoleic acid, linolenic acid, eicosapentaenoic acid and docosahexaenoic acid. Examples of the liquid higher alcohol include oleyl alcohol, isostearyl alcohol, octyldodecanol, and decyltetradecanol. When the quaternary ammonium salt and the fatty acid or higher alcohol enter between the layers of the mineral clay, the interlayer spaces of the clay become expanded.

The balance of the oil phase may contain almost any oil, fat, wax, silicone compound, ester, fatty alcohol or fatty acid conventionally used in cosmetic compositions and the final composition may contain water, humectants, active ingredients including sunscreen agents, and materials to enhance the aesthetic appeal and long-term stability of the composition.

An example of a non-aqueous sunscreen follows:

<b>Ingredient</b>	<b>% w/w</b>
Veegum	2.0 0
Benzyldimethylstearylammonium chloride	1.00
Isostearyl alcohol	2.00
Isoparaffin	Balance
Petrolatum	10.00
Decamethylcyclopentasiloxane	20.00
Hydrophobic titanium oxide	10.00

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Ethylhexylmethoxycinnamate	5.00
Perfume Appropriate amount	

Veegum was dispersed in ethanol and benzyldimethylstearylammmonium chloride was added to this. After raising the temperature up to 50° C the mixture was dispersed with a high shear mixer. Ethanol was then removed by thorough drying to obtain the organic modified clay mineral. The rest of the ingredients were added and kneaded together using a roller mill to obtain the sunscreen gel

### **Title: Cosmetic composition**

**Publication No. USP 20060140891**

**Serial No. 534753**

**Date of filing November 13, 2003**

**Assignee: KAO Corp; Tokyo**

Claimed is a cosmetic composition based on water-absorbing particles in conjunction with an antiperspirant compound. The particles are described as surface-hydrophobated and comprise water-absorbing polymer particles coated with a silicone compound.

The particles are preferably spherical in shape with a diameter of less than 10 microns. This size prevents the appearance of a white powder on the skin and the feel is soft and pleasant. They should be capable of absorbing more than twice their weight of water but not more than three times their weight as this imparts a slimy feel. Polymer particles are preferably a cross-linked polymer or copolymer of hydrophilic vinyl monomers with unsaturated carboxylic acid monomers and the polymer is formed by partially neutralising the mix with sodium hydroxide.

The particles are rendered hydrophobic by treatment with a silicone compound having at least one kind of functional group, preferably an amino group or an ammonium group, capable of covalent chemical bonding to the surfaces of the particles.

The final composition may be in any of the usual cosmetic forms, including emulsions, oil-based products, spray cosmetics, stick-type cosmetics, and powdered and roll-on type products used for antiperspirants. The compositions contain an antiperspirant compound selected from the positive lists of aluminium-zirconium complexes that meet the legislative requirements for the USA, EU and Japan. To improve application and skin feel a silicone compound such as a dimethyl polysiloxane and cyclic silicones such as octamethyl cyclotetrasiloxane and decamethyl cyclopentasiloxane are incorporated, either alone or in combination.

A suggested formula for a roll-on antiperspirant based on the patent is as follows:

Octamethyl cyclotetrasiloxane	67.0%
Dimethicone 6cs	5.0%
Ethanol	5.0%
Water-absorbing polymer particles	3.0%
Aluminium zirconium pentachlorohydrate	20.0%

### **Title: Two-part Cosmetic Composition**

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**Publication No.**      **USP 20060140895**

**Serial No.**           **020612**

**Date of filing**       **December 23, 2004**

**Assignee:**    **A      von Products, Inc.**

Described are two-part cosmetic products used for imparting a filling and swelling effect to skin, lips, hair, eyelashes and eyebrows. They comprise an anhydrous liquid or semi-solid with a water-absorbent polymer and an optional oil-absorbent polymer as the first part, and a water-based second part composition containing a water-soluble or water-dispersible film former.

The anhydrous composition is applied as a base coat. It can be liquid or semi-solid and most preferably contains a water-absorbent polymer at about 5 % to about 25 % based on the total weight of the first part composition. Such polymers hold water within molecular chains and retain at least twenty times their dry weight of absorbed water, even under pressure

The oil-absorbent polymer is present at up to about 1% based on the total weight of the first part composition, its level being adjusted according to the end-use of the product. The oil absorbent polymers used in the anhydrous compositions absorb and retain at least 50% of their own weight of oil and provide elastic particles to fill wrinkles and fine lines on lips and skin instantly. Examples are silicone elastomers and polyamides, or any combinations thereof.

Preferably, the vehicle for the anhydrous compositions is either in a gel or a non-aqueous liquid: A representative gel is hydrogenated polyisobutene and a representative oil is polyglycerol diisostearate.

The water-based composition is an activator or top coat. Water comprises about 80 wt % to about 95 wt % based on the total weight of the second part composition and film formers comprise about up to 15%. Named film formers that can be used include one or more acrylic polymers or co-polymers, PVP, styrene polymers, starch, or any combinations thereof.

Optionally, either the anhydrous composition or the water-based top coat may contain one or more optical blurring materials, also referred to as soft focus materials. These materials include, but are not limited to, polymethylmethacrylate, nylon, silica, cellulose, and vinyl dimethicone/methicone silsesquioxane crosspolymer.

Both parts may optionally contain other active ingredients, rheological additives, pH adjusters, fragrance, colour, preservatives and other materials to improve the aesthetics and stability of the compositions. It is claimed that the products described provide instant wrinkle filling by the oil absorbent polymer, as well as swelling effect by the water absorbent polymer and offer excellent feeling aesthetics from the hydrocarbon gel and silicone elastomer.

**Title: Cosmetic and pharmaceutical foam**

**Publication No.**      **USP 20060140984**

**Serial No.**           **532618**

**Date of filing**       **October 24, 2003**

**Assignee:**           **Foamix Ltd., IL. USA**

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Claimed is an alcohol-free cosmetic or pharmaceutical foam carrier comprising water, a hydrophobic solvent, a foam adjuvant agent, a surface-active agent and a water gelling agent. The cosmetic or pharmaceutical foam carrier does not contain aliphatic alcohols, making it non-irritating and non-drying.

The base composition is formulated to be used in an aerosol dispenser. Various base compositions are described with the following minimum and maximum levels of ingredients, shown as % by weight of the base composition.

Ingredient	Formula A		Formula B		Formula C	
	Min	Max	Min	Max	Min	Max
Hydrophobic solvent	2%	5%	5%	10%	10%	20%
Water	80%	98%	75%	95%	60%	90%
Foam adjuvant agent	0.1%	5%	0.1%	5%	0.1%	5%
Surface active agent	0.1%	5%	0.1%	5%	0.1%	5%
Gelling agent	0.10%	5%	0.1%	5%	0.1%	5%

The alcohol-free foam carrier is formulated as an oil-in-water or water-in-oil emulsion, so that it is suitable for inclusion of either water-soluble and oil soluble active agents or both. The carrier, when admixed with a propellant in an amount of about 5-25% by weight of the total composition in an aerosol container, produces lightweight breakable foam, suitable for application onto the skin. Since the propellant, in the pressurised container is in liquid state, upon admixing the carrier composition with the propellant, a stable emulsion, comprising the oil and the propellant is formed.

The preferred hydrophobic oils include hydrocarbons, esters, silicone oils, vegetable oils, essential oils and polyunsaturated fatty acids and mixtures of these. The preferred foam adjuvant agents include a mixture of fatty alcohols, fatty acids and hydroxy fatty acids and derivatives thereof in any proportion. Almost any surface active agent may be used provided it has an HLB value greater than 9 to obtain foam that is stable, of low specific gravity and with a fine bubble structure. The gelling agents named include carbomers, polymers and naturally occurring gums.

The compositions may further include a variety of pharmaceutical or cosmetic ingredients, which are added in order to fine-tune the consistency of the formulation, protect the formulation components from degradation and oxidation and improve their cosmetic acceptability.

#### **Title: Shaving compositions containing particulate additives**

**Publication No.      USP 5,756,081**

**Application No.     778110**

**Date of filing       21/12/96**

**Applicants:         S. C. Johnson & Son, Inc**

Described are shaving compositions for use with a razor blade that include insoluble solid particulate additives and may also include emollients and wetting, lathering and cleansing agents. The solid additives are present to supply physical microscopic support for the razor assembly during shaving and it is claimed that they keep the razor blade parallel to the skin

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and above surface irregularities. The particulate additives are said to provide improved razor blade glide, thereby preventing nicks and cuts, and they also enhance exfoliation of dead skin and removal of grease and oils and to improve the overall quality of the shave. The compositions may be in the form of a gel, cream, solid, liquid or aerosol.

The particulate additives are insoluble inorganic or organic particles of about 50 microns to 200 microns in diameter and comprise from 0.1% to about 20% by weight of the composition. The particulates are present as a well-dispersed suspension throughout the composition and preferred are organic solids such as polymeric beads or cylindrical shaped polymeric particles, or synthetic organic fibres. Also cited are inorganic materials such as silica, pumice and calcium carbonate. The remaining ingredients are those commonly found in shaving compositions and the following formula for a foaming aerosol composition illustrates the principal features of the patent.

Potassium stearate	5.20% <sup>w/w</sup>
Sodium stearate	1.11
Lauric acid diethanolamide	1.60
Mineral oil	17.00
Stearic Acid	0.14
Coconut fatty acid	0.68
Glycerine	3.20
PVP K-30	0.12
Perfume	0.37
Water	57.58
Dichlorodifluoromethane	10.00
Particulate additive	3.00

#### **Title: Antiperspirant or deodorant compositions**

**Publication No.** USP 6,099,827

**Application No.** 991454

**Date of filing** 16/12/97

**Applicants:** Helene Curtis, Inc.

According to the applicants a principal disadvantage of many deodorants and antiperspirants is their perceived skin unfriendliness. The presence of carriers such as volatile silicones and ethanol is perceived to have a drying and tightening effect on a user's skin and the presence of astringent materials can result in a stinging sensation. Claimed is a non-skin drying antiperspirant or deodorant composition suitable for topical application to the human skin, comprising 5 to 30% of an antiperspirant or deodorant active with 0.1 to 50% of a moisturising cream and 20 to 90% non-polar hydrocarbon propellant. The moisturising cream comprises a humectant and a non-volatile emollient and the composition is ethanol-free.

The humectant may be sorbitol, glycerol, ethylene glycol or propylene glycol and the emollient is a fatty acid or fatty alcohol ester, an ether or alcohol, a hydrocarbon or polyorganosiloxane or a mixture of two or more of these. The moisturiser also contains a structurant selected from the group consisting of hydrogenated vegetable oil, hydrogenated castor oil, fatty acids, beeswax, paraffin wax, silicone wax, fatty alcohols, polymers, clays,

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natural gums, synthetic gums and mixtures thereof and the moisturiser is added as a prepared emulsion

The antiperspirant active is an aluminium salt or aluminium complex and preferred is activated aluminium chlorohydrate. Suitable carriers for the active include volatile low viscosity silicones and low molecular weight hydrocarbons selected to provide appropriate physical and sensory properties for the product and the composition is packaged in aerosol form.

**Title: Post foaming gel shaving composition**

**Publication No. USP 5,902,778**

**Application No. 933610**

**Date of filing 07/07/97**

**Applicants: Pfizer Inc.**

Claimed is a post-foaming gel shaving gel that can be discharged from an aerosol container as a clear, stable gel substantially free from foaming, which after application to the skin and beard produces a self-generating foam. It is said to provide a thicker and more stable lather compared to existing compositions with improved wetting of the skin and beard and a more lubricious feel to the skin.

The composition consists essentially of a water-soluble soap, a saturated aliphatic hydrocarbon, a water-soluble polyethylene oxide and a water-soluble gelling agent that forms a gel having a yield value sufficiently high to restrain the composition from foaming for at least 60 seconds. The soap ingredient is made by saponification of C<sub>12</sub>-C<sub>18</sub> fatty acids obtained from naturally occurring fats and oils with an alkali, preferably triethanolamine. The preferred fatty acid has an approximate 90% by weight palmitic acid content. The nature of the soap ingredient has an effect on the type of gel and lather produced and mixtures of various soaps may be used to obtain the desired properties.

The concentration and type of foaming agent used in the gel is determined by such factors as gel stability, foam profile, and post-foaming characteristics. Mixtures of hydrocarbons are added to provide the vapour pressure necessary to control the rate of foam development. The higher the vapour pressure of the gel, the more rapidly the foam develops, but the gel must be substantially free from foaming for at least 60 seconds when dispensed under static ambient conditions. The aliphatic hydrocarbon should be a liquid at room temperature and preferred is a blend of 85% isopentane and 15% isobutene; this mixture has a vapour pressure of 17.8 psi. and should be dispersed homogeneously throughout the gel.

The preferred emollients are propylene glycol isostearate and lanolin alcohol. A preferred humectant is sorbitol, available as a 70% solution, and the preferred gelling agent is a high viscosity grade of hydroxypropylcellulose, a non-ionic water-soluble propylene glycol ether of cellulose. A polyethylene oxide helps prevent the gel from foaming for the required period of time and also contributes to product clarity, enhancement of foam quality, and improved adhesion to the skin lubricity and stability. A specific preferred polyethylene oxide is PEG-14M, a non-ionic water-soluble polymer that hydrogen bonds strongly with water, and the resulting complex develops a high degree of stretch, thereby substantially restraining the post-foaming agent from volatilising under static ambient conditions.

Various additives such as surfactants, fragrances or flavours and menthol may be added to the composition before cooling to 2-8°C before filling into a two-part aerosol system whereby the

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aerosol propellant is kept separate from the product. A typical example of the composition is as follows:-

Ingredients	% by wt.
Water	77.95
Palmitic Acid	9.74
Triethanolamine	5.65
Propylene Glycol Isostearate	1.70
Sorbitol	1.46
PEG-14M	0.49
Fragrance	0.39
Hydroxypropylcellulose	0.02
Isopentane/Isobutane 85/15 Blend	2.60

**Title: Sunscreen composition containing sol-gel microcapsules**

**Publication No. USP 6,238,650**

**Application No. 318828**

**Date of filing 26/05/1999**

**Assignee: Sol-Gel Technologies Ltd**

Claimed are compositions that comprise at least one sunscreen active ingredient in the form of inert sol-gel microcapsules containing ultraviolet absorbing compounds. The microcapsules are prepared by emulsifying a hydrophobic solution comprising sol-gel precursors and at least one sunscreen compound in an aqueous solution under high shear. This is mixed with a second aqueous solution at a suitable pH to obtain an aqueous dispersion of the microcapsules containing the sunscreen actives. This may be dried to a powder. So they are compatible with the cosmetic vehicle the hydrophobic or hydrophilic character of the sol-gel microcapsules can be controlled by selecting suitable precursors and reaction conditions.

The sunscreen compositions can comprise any acceptable UVA and/or UVB absorbing compounds at any desired ratio to obtain a desired accumulative ultraviolet screening spectrum. Encapsulation of the ultraviolet absorbers reduces or even prevents contact between the sunscreen compounds and human skin, thus reducing any adverse effects that are associated with the use of sunscreens, such as photoallergy and phototoxicity. Encapsulation also reduces or prevents cross reactivity between the sunscreen compounds and the packaging material and between the sunscreen compounds and any other component present in the composition, thus enhancing stability.

The microcapsules are also said to be suitable for the encapsulation of sunless tanning actives, skin lightening actives, anti-acne actives, anti-skin wrinkling actives, vitamins, anti-inflammatory actives, anaesthetic actives, anti-pruritic actives, anti-microbial actives and mixtures of these additives and to be suitable for use in oil-in-water or water-in oil compositions; in oils, gels, lotions, creams and in aerosol sprays and foams. The hydrophilic or hydrophobic character of the capsules is determined by the encapsulating material, and not by the compound encapsulated within it. Hence, lipophilic compounds, which normally can be dissolved only in hydrophobic, lipid phases are readily

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incorporated in the aqueous phase of any composition, be it o/w or w/o emulsions, or in oil-free compositions like gels. The aqueous suspensions contain 20 to 40% wt. active compounds. The dried powder may contain 1 to 85% wt. of active compound.

**Title:       Compositions and methods for inhibiting photoaging of skin**

**Publication No.   USP 6,365,630**

**Application No.   615218**

**Date of filing     13/07/2000**

**Assignee:         Regents of the University of Michigan**

Claimed is a composition for inhibiting photo-aging of human skin, comprising a combination of an ultra violet blocker preventing penetration of light having a wavelength between about 360 nm and 400 nm (UVA), a blocker preventing penetration of light having a wavelength of between about 300 and 320 nm (UVB) and a matrix metalloproteinases (MMP) inhibitor to inhibit the UV-induction of increased MMP activity.

Matrix metalloproteinases (MMPs) are a family of enzymes that play a major role in physiological and pathological destruction of connective tissue, especially collagen. Various types of collagenase MMPs are known and UV radiation exposures that are insufficient to cause erythema can induce MMPs, which degrade dermal connective tissues.

The applicants have discovered that various compounds are useful in preventing photodamage by inhibiting the production and/or activity of MMPs. Though some of these compounds are termed "antioxidants" and may prevent erythema, they can also reduce the concentration of MMPs in UV-exposed human skin. These compounds may quench or otherwise reduce free radicals and reactive oxygen species, which initiate or lead to MMP induction, such as via the MAP kinase cascade. These compounds include glutathione and its precursors, such as N-acetyl cysteine or glutathione ethyl ester. However, the applicants prefer retinoids, which are useful for the treatment and repair of photodamaged skin and claim that retinoids can inhibit the elevated MMP levels due to UV-exposure and retinoids can be used prophylactically to prevent photodamage from occurring. For topical application retinoids in this application are used at concentrations of between about 0.1% and 1%. The UVA and UVB absorbers can be used in any combination at any concentration approved for cosmetic use.

**Title:       Sunscreens from vegetable oil and plant phenols**

**Publication No.   USP 6,346,236**

**Application No.   535826**

**Date of filing     28/03/2000**

**Assignee:         The USA as represented by the Secretary of Agriculture**

According to the background given in this patent, although no longer used benzyl cinnamate formulated as an emulsion with benzyl salicylate, was used as a sunscreen in 1928 Today, cinnamic acid derivatives are the most widely used UVB absorbing chemicals in sunscreen formulations, with four derivatives approved for use in the USA

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and 17 approved for use in Europe. The unsaturated C=C bond adjacent to the aromatic ring in cinnamates allows for a continuous, conjugated p-system throughout the molecule. An electron can be delocalised throughout the p-system by photo-excitation with energy corresponding to about 305 nm.

Most common cinnamic acids and short chain esters are water soluble, limiting their usefulness as waterproof sunscreens. Cinnamic acid derivatives, therefore, have been designed with long chain hydrocarbons (i.e. ethylhexyl methoxycinnamate), which render them water-insoluble and suitable for waterproof sunscreens. The -OCH<sub>3</sub> group of ethylhexyl methoxycinnamate acts as an electron-releasing group to improve the electron excitation process.

There is much interest in modifying fats and oils to form structured lipids with specific properties for nutritional and pharmaceutical applications. Modification methods include blending, distillation, fractionation, hydrogenation, inter-esterification with chemical catalysts, and more recently inter-esterification with biocatalysts. Enzymatic inter-esterification offers the advantage of mild reaction conditions, a wider variety of synthetic substrates, and region-selective specificity towards the acyl groups of the triglycerols.

The applicants claim that lipase-catalysed reactions are useful for synthesising ferulyl-substituted or coumaryl-substituted acylglycerols with properties suitable for use as possible sunscreen agents. These agents are readily produced in high yield by means of lipase-catalysed transesterification of a triglyceride and a ferulic or coumaric ester. Preferably the glyceride is a natural vegetable triglyceride, particularly soybean oil, corn oil, sunflower seed oil, coconut oil and other oils with fatty acid moieties ranging in length from C<sub>2</sub>-C<sub>24</sub>, and having varying degrees of saturation. The preferred lipase is one having region-selective specificity towards the terminal acyl groups of a triglyceride. One such lipase is produced by *Candida antarctica*.

The ferulyl-substituted triacylglycerols produced are characterised by having the UV absorption properties of a cinnamate ester and the water-insoluble properties of a lipid, thereby rendering them useful as sunscreen agents for the skin. The UV absorbance of these products extends from about 280 nm to about 350 nm, and is particularly effective in the range of about 310-350 nm. This is predominantly in the UVA range, but also covers part of the UVB range. For additional UVB protection, the subject compounds may be formulated with other sunscreen agents.

**Title: Tyrosinase inhibitors from plants**

**Publication No. USP 6,521,267**

**Application No. 719205**

**Date of filing June 8th, 2001**

**Assignee: Fytokem Prtducts, Inc, Canada**

The causal relationship of tyrosinase action to skin pigmentation was established many years ago. If this enzyme is not active, normal pigmentation does not occur, and skin loses or fails to acquire its normal tan-to-brown coloration. If tyrosinase activity is accelerated, as in sun-tanning or in some pathological conditions, the amount of melanin formed increases and skin colour darkens. If the new melanin is patchy or produced uncontrollably, the result is pathological. Skin melanomas are sites of localised hyperactivity by tyrosinase; they are often associated with cancerous cell modification.

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The patent relates to a product comprising a tyrosinase inhibiting extract derived from dicotyledonous plant species indigenous to Canada. Preferably, the extract is derived from one or more parts of the plant selected from leaves, twigs, flowers, flowering aerials, fruiting aerials, seeding aerials, roots and fruits from a plant species selected from Polygonaceae, Rosaceae and Onagraceae.

The patent identifies many species that may yield extracts that are capable of inhibiting the enzyme tyrosinase and describes a method whereby such plants may be identified. At least one plant extract in the composition is selected from the group consisting of:

- Fruiting aerials of *Rumex maritimus* (golden dock);
- Fruiting aerials of *Rumex occidentalis* (western field dock);
- Flowering aerials of *Rumex occidentalis* (western field dock);
- Fruiting aerials of *Rumex pseudonatronatus* (field dock);
- Fruits of *Rumex pseudonatronatus* (field dock); and
- Fruits of *Rumex stenophyllus* (narrow-leaved dock).

The extracts are available as stabilised mixtures, for example

Purified Water	45-50%
Glycerol	45-50%
Plant extract solids (Canadian <i>Rumex</i> species) [ <i>Rumex occidentalis</i> , <i>R. pseudonatronatus</i> , <i>R. stenophyllus</i> and <i>R. maritimus</i> ]	4.0-4.3%
L-Ascorbic acid	0.9-1.1%
Phenoxyethanol (anti-fungal)	0.2-0.3%

It is suggested that *Rumex* extracts appear to inhibit tyrosinase by binding or deforming the enzyme molecule around the active site. Ascorbic acid contributes to the overall inhibition by maintaining the enzyme's copper atoms in their reduced Cu<sup>sup.+</sup> state.

**Title: Skin lightening composition**

**Publication No. USP 6,436,378**

**Application No. 795898**

**Date of filing Feb 28<sup>th</sup>, 2001**

**Assignee: Colgate-Palmolive Co**

Examples of skin lightening compounds include hydroquinone, arbutin, kojic acid, and ascorbic acid. Also used are tyrosinase inhibitors that inhibit the synthesis of melanin and the applicants claim that herbal extracts from aspergillus, songyi, liquorice, and bearberry are effective in this respect. Other agents are given as niacinamide, sodium ascorbyl phosphate, a herbal extract complex of scutellaria, saxifrage and grape mulberry (Biowhite) and a complex containing herbal extract complex of liquorice and aspergillus ferment (Gatuline). The applicants preferred "Biowhite" available from Coletica and a combination of niacinamide and Gatuline with sodium ascorbyl phosphate.

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Further, the applicants claim that agents which assist in maintaining youthful skin are generally antioxidants such as the vitamins, particularly vitamins E, A and C, and their precursor derivatives which are converted to the active vitamin by skin systems. Retinyl palmitate is the preferred precursor for vitamin A; tocopheryl acetate is the preferred precursor for vitamin E and sodium ascorbyl phosphate is the preferred form of vitamin C. Generally, Vitamin E and/or its precursor are present in quantities of from about 0.05 to about 5 wt. % while Vitamins C and A and/or their precursors are present from about 0.005 to about 0.04 wt. %.

Virtually any lotion or cream base compatible with the above active agents while maintaining an ease of spreading and good skin feel including a lack of greasiness is suitable for the composition. To prevent the skin from darkening on exposure to sunlight suitable UV filters are included. Ethylhexyl methoxycinnamate with benzophenone-3 is suggested, with or without microfine zinc oxide to give an SPF between 4 and 7.

**Example Formulations**

Ingredient	% w/w	% w/w
Stearic Acid	15.0	15.0
Isopropyl Palmitate	2.0	2.0
Propylparaben	0.1	0.1
Methylparaben	0.2	0.2
Sorbitol 70%	3.0	3.0
Potassium Hydroxide	0.7	0.7
Parfum (Fragrance)	0.6	0.6
Aqua (Water) qs	76.372	75.972
EDTA	0.1	0.1
Vitamin A Palmitate	0.018	0.018
Vitamin E Acetate	0.1	0.1
Sodium ascorbyl phosphate	0.01	0.01
Benzophenone-3	0.35	--
Ethylhexyl methoxycinnamate	1.25	0.6
Niacinamide	--	0.5
Tinosorb M (a)	--	1.00
Biowhite (b)	0.2	--
Gatuline Complex (c)	--	0.1

- (a) Tinosorb M = Methylene bis-benzotriazolyl tetramethyl butyl phenol.
- (b) Biowhite = Herbal extracts of scutellaria, saxifrage, grape and mulberry
- (c) Gatuline Complex = Herbal extracts of aspergillus ferment and liquorice.

**Title: Skin lightening compositions**

**Publication No. USP 6,497,860**

**Application No. 297654**

**Date of filing May 4<sup>th</sup>, 1999**

**Assignee: Children's Hospital Medical Center (Cincinnati, OH)**

Claimed are skin lightening compositions that are substantially free of hydroquinone or its derivatives and consisting essentially of from about 0.1% to about 5% by weight, of at least one water-soluble reducing agent: sodium sulphite, sodium hydrogen sulphite, sodium metabisulfite and mixtures thereof are preferred. The reducing agent is included in a cosmetically acceptable carrier comprising a liquid oil, a polyhydric alcohol, a solid fatty alcohol, a surfactant, water and lecithin, wherein at least a portion of these components form a liquid crystal.

The formation of melanin depends upon the availability of three substances: a suitable substrate such as tyrosine and dopa, molecular oxygen and the enzyme tyrosinase. If any of these substances are absent or reduced, the formation of melanin is impaired. The reducing agent retards melanin formation by the following three mechanisms:

- a) It sequesters some of the copper in the enzyme system and the enzymatic formation of melanin is reduced by sequestering copper since the co-enzyme tyrosinase is a copper protein complex.
- b) The necessary substrates for melanin formation (tyrosine and dopa) are formed from both bacteriological and enzymatic breakdown of protein. A decrease in the available bacteria would depress proteolytic destruction and thereby aid in decreasing melanogenesis since a reducing agent such as sodium sulphite is a bactericide.
- c) The strong reducing agent such as sodium sulphite itself gets oxidized in preference to the melanin substrates.

Compositions may also include sun-screening agents, anti-inflammatory agents, anti-oxidant/radical scavenging agents and chelating agents, in any compatible combination. In a preferred composition a retinoid, preferably retinoic acid, is included as an active along with the skin-lightening agent. The inclusion of a retinoid increases the skin lightening benefits of the composition. A safe and effective amount of a retinoid may be added to the compositions useful in the present invention, preferably from about 0.001% to about 2%, more preferably from about 0.01% to about 1% of the composition. An example formulation follows:-

	% by weight
Lecithin	3.00
Polyoxyethylene(40) monostearate	1.00
Cetyl alcohol	1.00
Caprylic/capric triglyceride	15.00
D-delta Tocopherol	0.10

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Glycerin	5.00
Propylparaben	0.10
Methylparaben	0.20
De-ionised water	72.13
Sodium hydrogen sulphite	0.08
Sodium sulphite	0.20
Sodium hydroxide	0.59
Carbopol 980	1.00
Benzyl alcohol	0.60

**Title:        Pharmaceutical compositions and methods for managing skin conditions**

**Publication No.   USP 6,383,523**

**Application No.   878231**

**Date of filing:    June 12, 2001**

**Applicant:        Howard Murad, CA 90292**

Claimed is a composition and method for the cleansing of skin to facilitate the prevention, treatment, and management of skin conditions, such as seborrhoeic dermatitis, psoriasis, folliculitis, rosacea, peri-oral dermatitis, acne, impetigo and other inflammatory skin conditions.

According to the applicant the principal functions of the skin include protection, excretion, secretion, absorption, thermoregulation, pigmentogenesis, sensory perception, and regulation of immunological processes. These functions are detrimentally affected by dryness, yeast, and structural changes in the skin due to aging and excessive sun exposure. The applicant claims a skin cleansing composition comprising an acidic component for exfoliation; hydrogen peroxide for cleansing, an antibacterial agent, an antifungal agent and an antiviral agent.

The preferred acidic components are citric acid and salicylic acid in combination and comprising up to about 10% by weight of the total composition. The citric acid is said to inhibit the breakdown of hydrogen peroxide, which should remain stable for a minimum period of three months when the product is stored at 40°C. The salicylic acid is the prime exfoliating material. The term "cleanse" is defined as the removal of dirt, debris, air pollutants, desquamating cells, and cutaneous secretions of the skin and this is affected by the hydrogen peroxide, present at approximately 1%.

The composition may also include Arnica Montana, any vitamin A source including retinyl palmitate or other retinyl esters, retinoic acid, or Retinol; and Vitamin K. Arnica Montana facilitates skin healing and acts as an antiseptic and local anti-inflammatory and is typically present in an amount preferably about 0.2 to 1%. The Retinol facilitates normal skin production, particularly epidermal normalisation, and, when used, is typically present in an amount from about 0.1 to 5%. The Vitamin K inhibits or suppresses inflammation and bruising and is typically present in an amount from about 0.1 to 0.5%.

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The patent is illustrated with many examples and the compositions shown contain extensive lists of natural ingredients as anti-inflammatory and anti-irritation agents. Test protocols and results are also included.

**Title:       Sprayable beautifying composition**

**Publication No.   USP 6,589,541**

**Application No.   861226**

**Date of filing:    May 18, 2001**

**Assignee:         Classified Cosmetics, Inc., Ca.**

Described is a sprayable composition that on application from a pressurised aerosol container, deposits a water-resistant film of make-up on the skin that conceals imperfections and accentuates natural features.

According to the applicants a common problem with many types of makeup is that they are detrimental to the skin. They have a tendency to clog the skin's pores, and facilitate the formation of pimples. Additionally components of the makeup, as well as the makeup removers that are necessary with many non-water-based cosmetics, tend to remove the skin's natural moisturisers and dry the skin. Other problems cited are the multi-stage nature of application and also traditional makeup is not suitable for those who have recently undergone cosmetic surgery because foundation does not adhere to skin that has been recently exposed to a laser procedure.

The composition may include: water; an electrolyte; a cyclomethicone and dimethicone copolyol compound; polyglyceryl-4 oleate, PEG-8 propylene glycol cocoate, quaternium-18 hectorite, propylene carbonate; micronised titanium dioxide, synthetic wax; cyclomethicone; metal oxides, preservatives and various botanicals. The composition may also optionally include panthenol, dipropylene glycol, tocopheryl acetate, retinyl palmitate, talc and silica silylate.

The composition is deposited as thin and extremely uniform film across the surface of the skin. The film is generated by a synergistic effect between the synthetic wax and the micronised titanium dioxide. The synthetic wax is water-resistant and assists in the drying of the solvent. The micronised titanium dioxide has a typical particle size of between 0.15 and 0.3 angstroms and provides sun protection with an SPF of 18-24.

It is claimed that the sprayable nature of the composition results in the application of makeup in fewer steps and since the degree of coverage may be varied by altering the length of spray time or number of spray strokes, there is no need for a primer or base coat. The composition is particularly useful for those who have seriously damaged their skin through accidents or surgical procedures such as cosmetic surgery. Because it naturally tapers during application towards the periphery of the area sprayed it allows the composition to blend easily with surrounding surfaces. As such if used to cover a scar it will not be possible to differentiate between the composition which is covering the scarred area and the surrounding undamaged tissue.

**Title:       Compositions for prevention of chemically induced irritation and discolorations and methods of using same**

**Publication No.   USP 6,719,964**

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**Application No.** 900652  
**Date of filing** July 7, 2001  
**Assignee:** Premier Specialties Inc, NJ

Claimed is a new and improved cosmetic composition containing a small but effective amount of ethyl p-methoxycinnamate derived from Kaempferia Galanga roots .and method of using the same to prevent and treat chemically induced skin irritation and discoloration and protect from the adverse effects of tyrosinase.

It has been discovered that Kaempferia Galanga roots contain ethyl p-methoxycinnamate and that this may be extracted in useful amounts with ethanol. It is shown to inhibit tyrosinase activity. Tyrosinase catalyses the oxidation of L-tyrosine to L-DOPA and L-DOPA to dopaquinone. These reactions are the initial steps of melanin biosynthetic pathways and tyrosinase is used as the target enzyme for the inhibition of melanin biosynthesis in the process of searching for anti-hyperpigmenting agents. A simple assay method uses L-tyrosine as substrate to examine the tyrosinase activity by the dopachrome in the presence or absence of test compounds and results show the Kaempferia Galanga root extract inhibits tyrosinase activity in a dose dependent manner.

Kaempferia Galanga root extract also inhibits chemically induced erythema. This was demonstrated on subjects that reacted to an application of lactic acid and it was shown that the application of a 1% solution of the extract was sufficient to significantly reduce the response to lactic acid over a 24 hour period.

The Kaempferia Galanga root extract may be incorporated into most cosmetic forms suitable for topical application and several illustrative formulae are given.

**Title:** Method of using optically-activated particles in cosmetic preparations  
**Publication No.** USP 6,946,147  
**Application No.** 385140  
**Date of filing** March 10, 2003  
**Assignee:** Lizo Chemicals, Inc.

Claimed are optically-activated particles encapsulated within a UV transparent coating that are able to absorb ultraviolet radiation and emit visible light to reduce the visual perception of skin imperfections, including cellulite, shadows, skin discolouration and wrinkles.

The optical brightener compound is selected from the group consisting Tinopal 5BM, Stilbene 4, Stilbene 3 and Leucophor BSB Liquid, or equivalents. It adheres to the substrate particle through Van Der Waal's forces, ionic bonding and covalent bonding and forms a layer at least one molecule thick. The bonded particles are less than 30 microns in diameter and are colourless, translucent, and non-visible to the human eye.

The particle substrate is selected from the group consisting of nylons, acrylics, polyesters or other plastic polymers, natural materials, regenerated cellulose, metals, minerals or other suitable materials, and has an index of refraction greater than 1 in order that the image of the skin imperfection is bent away from the viewer's visual axis. A final coating of a UV transparent material such as polyoxymethylene urea completes the encapsulation.

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A formula for a skin cream containing optically activated particles is shown.

Ingredient	% w/w
Deionised Water	27.70
Preservative system	1.72.
Xanthan Gum	1.62
Sesamum Indicum Oil	3.75
EG-150 Distearate	3.20
Cetyl Alcohol	3.32
Caprylic/Capric Triglyceride	3.50
Cetearyl Alcohol (and) Polysorbate 60 emulsifier	3.25
Glyceryl Stearate	3.50
Optically Activated Particles	48.44

**Title: Hair colour application using cluster-modified water**

**Publication No. USP 6,905,523**

**Application No. 387777**

**Date of filing March 13, 2003**

**Assignee: Aveda Corporation**

Described are methods of colouring hair with cluster-modified water to achieve enhanced colour and conditioning for hair that is colour-treated. The cluster-modified water can be applied to the hair as a pre-saturating or post-saturating treatment and claimed additional benefits are the ability to minimise the use of harsh chemicals and dyes while still achieving an enriched colour, and increased softness and smoothness to the colour-treated hair.

Water molecules have a tendency towards forming hydrogen bonds between each other causing them to aggregate in various sizes. Depending on the treatment applied to water different types of cluster-modified waters can be produced. Examples of treated water, whereby ionic clusters contained within water are manipulated, are found in U.S. Pat. Nos. 6,139,855 and 5,711,950 describing I and S structured water.

The use of cluster-modified water gives colour-treated hair a higher intensity of colour than with the same given amount of colorant without cluster-modified water. In addition, the resulting colour is more durable, and has a conditioned feel and lustrous look. These benefits are achieved with any type of cluster-modified water including electrically activated, magnetically clustered and any other structured water used as a treatment in conjunction with any kind of hair colour procedure.

Any dye or tint can be used to colour the hair permanently, semi-permanently, or temporarily and the colouring agent can be a dye that is oxidative or non-oxidative. However, in one embodiment a natural non-oxidative hair dye is used and the cluster-modified water is combined with a mordant salt to further enhance the colour fastness. The

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dye is a colouring compound derived from naturally occurring materials such plants, roots, spores, and fungi. The hair is pre-soaked with a combination of the cluster-modified water and the mordant salt. The small molecule of dye diffuses into the hair fibre then the mordant chelates with the dye to form a large metal-dye complex. After the dye-mordant complex forms, it is much larger in size than the original dye molecule, and remains trapped inside the hair fibre. The applicants believe that the formation of the dye-mordant complex is fortified by the ions that stabilise the cluster structures.

**Title: Method for colouring hair with removable hair colour**

**Publication No. USP 6,599,330**

**Application No. 245160**

**Date of filing November 4, 2002**

**Assignee: Revlon Consumer Products**

Claimed is a composition that will colour hair to the same degree as permanent hair colour but can be removed from the hair when desired. Also claimed is a method for colouring hair that provides the same degree of gentleness as found in semi-permanent hair colour, yet provides the relative permanence found with oxidative hair colour.

Hair is coloured with an aqueous composition comprising a reducing agent capable of reducing the --S--S-- bonds on the hair fibre surface to form reactive --SH groups and a dye molecule containing chemical groups reactive with the --SH groups. When the hair colour composition is applied to the hair at ambient conditions --S--S-- bonds are formed between the dye molecule and the hair surface. Atmospheric oxygen will cause the disulfide bonds to reform between the dye molecule and the hair surface, such that the dye molecule is bonded to the hair and is expected to remain so for a period of four to six weeks unless removed by disruption of the --S--S-- bond.

The dye molecules may be present in the form of complex molecules or polymers, or may be a chromophore compound substituted with the requisite --SH group or protected --SH groups as found in Bunte or isothiuronium salts. Any chromophore that provides colour to the hair is suitable for use, provided it contains at least one free --SH group. Suitable compounds include acid dyes, basic dyes, disperse dyes, and HC dyes, as well as dyes typically used for oxidative dyeing of the hair such as aminophenols and nitrophenols.

The hair colour composition comprises a reducing agent that is capable of reacting with the disulfide bonds on the hair fibre surface to cause formation of --SH groups. The preferred reducing agents are glyceryl thioglycollate and thioglycolic acid. The compositions may also contain other ingredients to improve the aesthetics of the formula, or provide other effects and include humectants, pH adjusters, hair conditioning agents and biological products.

The colour is removed from the hair with a composition containing a reducing agent in aqueous media and may be in the form of a shampoo, conditioner, or hair treatment product. In addition to the reducing agent the colour removing composition may contain one or more ancillary ingredients that improve the aesthetics and performance of the composition. Preferably, the reducing agent used is different from the reducing agent used in the hair colour composition and the most preferred is sodium sulphite.

Illustrative formulae include a hair colouring composition as follows:

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<b>Ingredient</b>	<b>%w/w</b>
Glyceryl-thioglycollate (reducing agent)	4.00
Urea	10.00
Polymeric dye compound*	8.40
Ethanol	8.43
Acetic acid QS to pH 7.00	
Water QS to 100	

A colour-removing shampoo is shown as follows:-

<b>Ingredient</b>	<b>%w/w</b>
Sodium lauryl sulfate (30% aqueous)	1.50
Sodium laureth sulfate (28% aqueous)	0.70
Lauramide DEA	0.15
Sodium sulfite	10.00
Fragrance	0.10
Methyl paraben	0.10
Propyl paraben	0.05
Guar hydroxypropyl trimonium chloride	0.10
Urea	10.00
Glycol stearate	0.01
Myristic acid	0.01
Citric acid	0.01
Hydrolyzed silk	0.01
Cocamidopropyl betaine (35% aqueous solution)	0.35
Dimethicone copolyol	0.03
Glycerin (96% aqueous solution)	0.01
Trisodium HEDTA	0.01
Methylchloroisothiazolinone/ methylisothiazolinone	0.04
Water QS 100	

**Title: Stabilized hair care products**

**Publication No. USP 6,165,454**

**Application No. 933521**

**Patent Abstracts**  
**John Woodruff**

**Date of filing**      **18/09/1997**

**Assignees:**          **Colgate-Palmolive Company**

While it is desirable to add high molecular weight silicone derivatives to shampoos to achieve conditioning effects, it can be difficult to formulate systems that are stable. Described is a low energy method for making stabilised hair care products comprising an anionic surfactant, a water-insoluble silicone and an acrylic stabilising agent.

The surfactant system comprises up to 50% of anionic surfactant selected from the group consisting of alkyl sulfates, alkylethoxy sulfates, acyl isethionates and alkyl sulfonates and mixtures thereof however sodium lauryl sulfate with sodium laureth sulfate is the preferred mixture. Also present is 0.10-5.0% of an anionic hydrotrope like sodium cumene sulfonate or sodium benzene sulfonate; 0.10-15.00% of an amphoteric surfactant like cocamidopropyl betaine and 0.1-4.0% of a non-ionic surfactant like cocamide DEA. The total weight of surfactant is preferably within the range 6-30% of the total composition. Suitable acrylic stabilising agents are acrylic acid derivatives and their copolymers and acrylates/steareth-20 methacrylate copolymer. The shampoo also contains 0.01-3.00% of a cationic polymer such as a quaternary cellulose polymer with a non-cellulose quaternary conditioning polymer. Preferred is Polyquaternium-10 with guar hydroxypropyltrimonium chloride.

The silicone compound can be drawn from a wide range of suitable materials but favoured is a low molecular weight dimethicone mixed with a high molecular weight dimethicone or silicon gum. The composition may also contain further conditioning agents, colours, preservatives and fragrance and other additives commonly used for shampoo.

The shampoo is prepared in the convention way without heat and then the acrylic stabilising material is stirred in followed by the silicone compound(s) and the pH adjusted to neutralise the acrylic thickening aid and to achieve the desired viscosity. The final viscosity is preferably about 4,500cps, the pH 6-7 and the specific gravity about 0.995.

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**Title:** Shampoo compositions

**Publication No.** USP 6,350,441

**Application No.** 933521

**Date of filing** 02/02/200

**Assignees:** Unilever Home & Personal Care

Claimed are hair conditioning shampoo compositions containing specific combinations of conditioning agents, emulsified silicones, cationic polymers and fatty acid polyesters of cyclic polyols and/or sugar derivatives, which give improved overall conditioning. Furthermore, it is said that hair softness is improved and the compositions are particularly suitable for hair that has been damaged through environmental exposure or harsh mechanical or chemical treatments.

The anionic surfactant and the zwitterionic compound may be any in common use for shampoos including sodium laureth sulfate and cocamidopropyl betaine. A non-ionic surfactant like cocamide DEA or an alkyl polyglycoside may be included to improve foam texture and stability. The total weight of surfactant is preferably between 20% and 25% of the total composition.

The silicone is insoluble in the shampoo composition and so is present in an emulsified form, with the silicone present as dispersed particles. Suitable silicones include amodimethicone, dimethicone and dimethiconol and silicone gums having a slight degree of cross-linking. These materials can impart body, volume and ease of styling to hair, as well as good wet and dry conditioning.

In general, the conditioning performance of the emulsified silicone tends to increase with increased viscosity of the silicone itself, not the emulsion or the final shampoo composition. For dimethicone and dimethiconol-type silicones, the viscosity of the silicone is ideally at least 1,000,000 cst. For amino functional-type silicones, the viscosity of the silicone is not particularly critical and can suitably range from about 100 to about 500,000 cst. In general, reducing the silicone particle size tends to improve conditioning performance and the average particle size of the emulsified silicone ideally ranges from 0.01 to 1 micron. Silicone emulsions having an average silicone particle size of <0.15 microns are generally termed microemulsions.

The cationic polymer may be any of a wide range but preferred is Polyquaternium-10 and guar hydroxypropyltrimonium chloride. A further essential component is up to 3% of a fatty acid polyester of a polyol selected from cyclic polyols, sugar derivatives and mixtures thereof. The preferred fatty acid is erucic acid from rapeseed oil and the preferred fatty acid polyesters are sucrose pentaerucate and sucrose tetraerucate. Other ingredients may include viscosity modifiers, preservatives, colouring agents, polyols, chelating agents, antioxidants, fragrances, antimicrobials and sunscreens. The patent has illustrating formulations and efficacy studies that show improved conditioning using the system described when compared with a control formulation.

**Title:** Water soluble dry foam personal care product

**Publication No.** USP 6,106,849

**Application No.** 010246

**Date of filing** 21/01/1998

**Assignees:** Dragoco Gerberding & Co

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The applicants claim that for travel and hotel use there is a need for a personal care product that can supply the small quantity of active ingredient needed for a single use, yet is of a sufficiently large size to be easily handled. The product should not require expensive bottling or inconvenient wrapping, and should not be associated with litter or waste products. It should be easy to handle, must be resistant to humidity yet be readily soluble in water, must not crumble, crack, or disintegrate upon application of mechanical forces typically associated with product manufacture and product handling, and should not leave any undesirable residue on the skin.

Broadly, this is accomplished by providing a product comprising an active ingredient and a lattice forming material, wherein the active ingredient is a personal care product such as a soap, a lotion, a shampoo, a hair conditioner, etc., and the lattice is a dry foam-forming polymer having high void volume and high dimensional stability, yet which easily and completely dissolves in water and leaves no unpleasant residue.

The polymer may be any polymer that can be dried or freeze-dried to a foam and when dried and containing a cleansing or cosmetic composition, it is able to withstand normal handling and is chemically inert to the personal care active ingredient. The personal care active agent is mixed with a hydrophilic-hygroscopic polymer, such as *acemannan* derived from *Aloe barbadensis* (Aloe Vera). The mixture is dispersed in a large volume of water and then freeze dried and the polymer forms a solid foam-like structure 25 to 50 times the volume of the non-foamed liquid polymer and personal care active agent mixture. The foamed product can be shaped by foaming in a mould, or can be cut or shaped after foaming. The product is completely consumed in a single ordinary use.

**Title:** Artificial tanning compositions comprising iron oxide nanopigments

**Publication No.** USP 6,033,648

**Application No.** 344354

**Date of filing** 15/06/99

**Assignee:** L'Oreal, FR

Claimed are cosmetic compositions that comprise at least one iron oxide nanopigment for artificially tanning human skin. Today, many desire a tanned skin but natural tanning requires prolonged exposure to UV-A radiation, which can induce detrimental changes, particularly in sensitive skin or skin continually exposed to solar radiation. It is therefore desirable to provide an alternative to natural tanning that is compatible with the requirements of such skin.

The majority of cosmetic products suited for artificial tanning of human skin are based on carbonyl compounds, which enable the formation of coloured species by interaction with the amino acids of the skin. Dihydroxyacetone, or DHA, is commonly used in cosmetics as an agent for artificial tanning and it is possible to obtain a tanning effect similar to natural tanning or from a UV lamp. However, the use of DHA can present certain disadvantages; it has a tendency to decompose over time and its ability to colour the skin may decrease. Another disadvantage of DHA is the slowness with which the coloration develops: three to five hours are generally required, and users often regard the effect as too yellow.

The applicants claim that iron oxide nanopigments, when formulated into a water-in-oil emulsion rapidly impart an artificial colouring similar to natural tanning which is

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simultaneously intense and transparent. The colorations provided are persistent over time and particularly resistant to water. The iron oxide nanopigments generally have a mean primary particle size from 5 nm to 50 nm and more particularly from 10 to 30 nm. They are present to a maximum of 10% and preferably from 3% to 6% by weight with respect to the total weight of the composition.

The compositions are formulated as water-in-oil emulsions and cyclomethicones, dimethicone and silicone waxes are incorporated to confer water resistance and particularly preferred are water-in-silicone emulsions with a silicone content from 5% to 45%.

**Title: Foaming oil-in-water emulsion based on non-ionic surfactants, a fatty phase and a crosslinked cationic or anionic polymer, and its use in topical applications**

**Publication No. USP 6,162,834**

**Application No. 344354**

**Date of filing 19/12/2000**

**Assignee: L'Oreal, FR**

Described is a foaming oil-in-water emulsion in the form of a cream comprising a non-ionic surfactant system in an aqueous medium. The oil phase contains at least one water-insoluble oil and, as a gelling agent, at least one crosslinked homopolymer or copolymer formed from at least one cationic or anionic monomer. The composition is useful as a base for cleansing products for the skin, the hair, the mucous membranes and the scalp.

Foaming creams for cleansing the skin, which have a smooth feel, are generally in the form of an oil-in-water emulsion containing cleansing surfactants and foaming agents. The oily phase makes it possible to soften the skin after rinsing. However, the oily phase has a tendency to inhibit the foaming properties of these formulations so the oil phase is generally less than 5% by weight. The surfactant systems used in foaming creams generally consist mainly of anionic surfactants. Despite their high foaming power and their good detergency, anionic surfactants have a certain irritant potential with regard to the skin and the eyes, and are incompatible with a large number of gelling agents.

The preferred non-ionic surfactant system is polyglyceryl-3 hydroxylauryl ether in association with one or more alkylpolyglycosides and this represents 10 to 12% of the composition. The oil phase may be as high as 25% or more and may include synthetic and natural oils and fatty acid esters. However the composition of the oil phase is critical and its constituents must have solubility parameters within limits specified by the patent if a satisfactory product is to be obtained.

The crosslinked homopolymers or copolymers include carbomers and polyquaternium-32 and the composition may also contain emulsifying non-ionic surfactants such as PEG-40 hydrogenated castor oil. Additional viscosity modifiers having a low yield value are included to improve product rheology and the usual cosmetic additives are added to improve the aesthetic qualities, cosmetic claims and stability of the composition. The patent is illustrated with example formulations and the foam height test results obtained from various combinations of suitable ingredients.

**Title: Walnut seed meal extract**

**Publication No. USP 6,395,261**

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**Application No.** 344354  
**Date of filing** 25/05/2001  
**Assignee:** Gattefosse S.A., FR

Claimed is an aqueous extract of walnut seed meal useful in cosmetic and dermatological compositions and various applications are described. Walnut trees belonging to the Juglandaceae family are widely distributed and cultivated in temperate countries. This includes in particular *Juglans regia* that are found in Europe and America. Various extracts of *Juglans regia* are used in cosmetics; for example extracts of bark and tree root are claimed to have germicidal properties and the outer fleshy part of the walnut contains a naphthoquinone compound (juglone) used as hair dye. However, the residue from the pressing of the walnut seed appears not to have been used.

The applicant has isolated a walnut seed cake extract and has observed that it exhibits a number of advantageous properties. The preparation of an aqueous extract can be accomplished by any of the usual techniques, including maceration, percolation, digestion, microwave, and ultrasonic waves. The temperature can vary depending on the process although high temperatures and long exposure times will result in partial destruction of active ingredients. With solvent extraction the ratio of walnut seed cake to solvent (water) is a balance between the amount of solvent needed for efficient extraction and the amount of solvent that must be subsequently removed. The applicants found that 5:95 is a good ratio and that the optimal extraction process is maceration, carried out at a temperature between 3° and 10°C and advantageously at about 4°C and maceration takes about twenty hours. The extract obtained is provided in the form of a concentrated aqueous solution that may then be freeze-dried to provide the extract in powder form.

The extract is claimed to provide protective activity toward intracellular oxidation caused by UVB-induced oxidative stress. This activity was proven using normal human keratinocytes isolated from foreskins obtained during surgical operations. Experiment also showed that the extract had anti-inflammatory properties and because it stimulates protein synthesis in the keratinocytes of the epidermis and fibroblasts of the dermis, the extract can be used in cosmetic compositions intended for combating skin ageing. Tests to prove these and other dermatologically useful properties are described and its use in the preparation of cosmetics for the protection and treatment of skin ageing is illustrated with example formulations.

**Title:** Hair cosmetic composition  
**Publication No.** USP 6,619,295  
**Application No.** 699482  
**Date of filing:** October 31, 2000  
**Assignee:** Kao Corporation

Described is a cosmetic composition for removing acid hair dye from the hair. Conventionally, in order to remove a hair dye composition from the hair, bleaching agents have been employed. However, bleaching agents damage the hair and decompose melanin. Claimed is a composition comprising a cationic surfactant and one or more organic solvents, a lower alcohol or lower polyol and an alkaline ingredient.

One or more cationic surfactants may be included and behenyltrimethylammonium chloride is preferred in an amount of preferably 0.1%-5.0 % by weight. The organic

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solvent may be N-methylpyrrolidone or N-ethylpyrrolidone; ethylene carbonate or propylene carbonate or an aromatic alcohol such as benzyl alcohol, benzyloxyethanol, and phenylethyl alcohol. Of these, benzyl alcohol or benzyloxyethanol is more preferable in an amount 5.0% - 20.0% <sup>w/w</sup>.

The preferred lower polyol, present at about 5% - 30%, is either ethanol, isopropanol or 1,3-butylene glycol. When a water-soluble polymer is employed as a thickener ethanol and 1,3-butylene glycol are preferably present in combination as dispersing or solubilising aids. The preferred alkaline ingredient is triethanolamine in an amount sufficient to adjust the pH of the composition to 9 – 11.

Also included are appropriate amounts of widely used cosmetic ingredients, such as viscosity modifiers, non-ionic surfactants, paraffin oils, lanolin, higher alcohols, silicone oil, bactericides, preservatives, and perfumes to enhance the efficacy, aesthetic properties and stability of the composition.

A cream, gel, or paste is preferable, since they are easy to use, do not run and are less likely to come into contact with the skin.. An appropriate amount is applied to hair that has been dyed with an acid hair-dye composition and left for up to 30 minutes, and then the hair is rinsed.

Ingredient	Example A	Example B	Example C
Behenyltrimethylammonium chloride	1.00	1.60	2.00
Benzyloxyethanol 10	150	8.00	-
1,3-Butylene glycol	-	-	5.00
Ethanol	15.00	20.00	5.00
Monoethanolamine	1.00	1.00	1.00
Hydroxyethyl cellulose	1.00	0.50	1.00
Hydroxypropylmethyl cellulose	-	1.50	-
Purified water to 100%			

**Title: Dual phase cosmetic composition**

**Publication No. USP 6,649,174**

**Application No. 074051**

**Date of filing: May 7, 1998**

**Assignee: E-L Management Corp.**

Dual phase skin cosmetic compositions provide a broad range of cleansing and conditioning potential within a single product, and are also aesthetically appealing to the consumer. Typically, the dual phase product contains an aqueous phase and an oil phase, each adapted to removing a particular type of residue from the skin, or delivering a particular type of active

A number of factors must be considered in making a successful dual phase product. In order to mix and provide a homogenous composition the product must contain one or more

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surfactants or emulsifiers, which will render the two phases at least temporarily compatible during the mixing and application stage. Surfactants are also useful in the removal of waterproof makeup. Unfortunately, many such emulsifiers are drying to the skin and are irritating to users, and in particular cannot be routinely used in the eye area. It is also desirable that the two phases separate quickly after use, but separation times generally become more extended during the products lifetime. Thus to achieve both satisfactorily mixing and rapid phase separation in a single product, in a way that is both cosmetically acceptable and attractive to the user, is often difficult

Described is a liquid dual phase makeup removal composition comprising an oil phase and an aqueous phase, each phase being separate from the other before and after being mixed at the time of use. To promote rapid phase separation the composition includes an effective amount of non-cationic copolymers of vinylpyrrolidone. This is generally at between 0.01 – 1.0% by weight and the two phases are usually of equal volume.

Named oils include triglycerides, mineral oils, silicone compounds and esters. Preferred is a combination of volatile and non-volatile oils. In a particularly preferred embodiment, the oil phase contains a blend of oils comprising isododecane at 25-40%, a volatile C<sub>16</sub> isoparaffin at 15-30%, and non-volatile dimethicone at 0.1-1%. The aqueous phase may consist of water or floral waters. Other potentially useful components of the formulation include emollients, humectants, fragrances, preservatives, and pH buffers and a great variety of active agents may also be included.

The following formulation for a dual phase cleansing composition illustrates the patent:

MATERIAL	% By Wt.
Isododecane	30.00
Isohexadecane	20.00
Dimethicone	0.50
PVP/hexadecene copolymer	0.10
PEG-4 Dilaurate	0.40
Purified water	45.00
Sodium chloride	1.00
Potassium phosphate	0.20
Phenoxyethanol	0.50
Glycerin	0.20
Hexylene glycol	2.00
Methylparaben	0.10

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**Title: Cosmetic composition for stressed skin under extreme conditions**

**Publication No. USP 6,649,178**

**Application No. 880245**

**Date of filing: June 13, 2001**

**Assignee: Mohammadi; Fatemeh, Hebron.**

Environmental extremes generally induce considerable body discomfort. Hot and humid conditions cause reactions in the skin such as increased expiration through water evaporation. Ultraviolet radiation accompanying the heating phenomena may result in sun damage. Rashes and general erythema may arise from frictional contact with clothing in hot/humid conditions. Dry climates lead to body dehydration and the skin must be re-moisturised. Cold climates also disrupt the skin barrier leading to cracking and roughness.

Claimed is a cosmetic composition for calming skin stressed under a variety of extreme climate conditions consisting essentially of a mixture of aloe vera gel, sea parsley extract, red clover extract, kava kava extract, bittersweet extract, guava extract, sea pine extract, prickly pear extract, edelweiss extract and watercress extract as active botanical ingredients together with an organic sun screen agent active, a silicone fluid or hydrocarbon for retaining moisture within the skin, and a C<sub>6</sub> to C<sub>40</sub> carboxylic ester.

The patent lists many possible botanical ingredients and their physiological function and describes which part of the multi-tasking composition is vectored to protect the skin under different climatic conditions. Thus for hot climates, ingredients that soothe and cool and reduce erythema and irritation are selected. For cold climates a number of possible botanical extracts are listed, which are used in conjunction with silicone or hydrocarbon oils. A variety of formulations illustrate the patent.

**Title: Towelettes impregnated with a paint and nail polish remover formulation**

**Publication No. USP 6,960,266**

**Application No. 754281**

**Date of filing January 9, 2004**

**Assignee: Quick Clean Products, Inc.**

Claimed are towelettes impregnated with a paint and nail polish remover formulation that cleans paint, printing inks and adhesives from hands, or nail polish from finger nails. The remover formulation includes dimethyl ester, dimethyl sulfoxide and methyl soyate, which all act as solvents. Alcohol, ethyl lactate and a nonylphenyl surfactant are preferably included in the remover formulation. The alcohol acts as a solvent and a drying agent. The ethyl lactate acts as a solvent and the surfactant improves efficacy. The remover formulation also preferably includes aloe barbadensis leaf juice, propylene glycol and water. The aloe barbadensis and propylene glycol act as moisturisers to replenish moisture removed from the hands by the solvents.

The minimum and maximum levels of each ingredient are shown in the table: all quantities are % by weight.

Water	2.0	15.0
Alcohol	5.0	25.0
Aloe Vera	1.0	5.0

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Ethyl Lactate	1.0	15.0
Dimethyl Ester	5.0	63.0
Dimethyl Sulfoxide	2.0	18.0
Methyl Soyate	6.0	26.0
Nonylphenyl-surfactant	2.0	15.0
Propylene Glycol	1.0	9.0
Fragrance	1.0	2.0

**Title: Precipitated silicas**

**Publication No. USP 7,008,617**

**Application No. 295677**

**Date of filing: November 15, 2002**

**Assignee: J.M. Huber Corp**

Described is an amorphous precipitated silica that combines excellent abrasive performance, a relatively high degree of transmittance, and an index of refraction that is sufficiently low to allow it to be a component of a transparent toothpaste composition having a relatively high concentration of water.

The amorphous precipitated silica composition has a refractive index of less than about 1.4387, a light transmittance of greater than about 48%; and a Brass Einlehner abrasion value of greater than about 5 mg loss/100,000 rev. A dentifrice having a haze value of less than about 70 may be prepared using this abrasive, amorphous silica,.

The requirement that the refractive index of the silica match the refractive index of the toothpaste means that the concentration of water in the toothpaste must be maintained at relatively low levels. Water has a far lower refractive index than typical silicas, which generally have a refractive index of 1.438 to 1.451, while water has a refractive index of 1.332. Accordingly, in order for the refractive index of the silica to match the refractive index of the toothpaste, the water concentration in the toothpaste must be minimised and it is normally replaced by more humectant, which increases material costs.

In addition to the abrasive component, the dentifrice may also contain several other ingredients such as humectants, thickening agents, antibacterial agents, fluorides, sweeteners, and co-surfactants. Humectants serve to add body to a dentifrice as well as preventing the dentifrice from drying out. Suitable humectants include polyethylene glycol, propylene glycol, glycerine, erythritol, xylitol, sorbitol, mannitol, lactitol, and hydrogenated starch hydrolysates, as well as mixtures of these compounds.

Thickening agents are useful in the dentifrice compositions to provide a structure that stabilises the toothpaste against phase separation. Suitable thickening agents include silica thickener, starch, various gums and cellulose materials and mixtures of these compounds.

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The table shows some representative formulations based on the silica that forms the subject of this patent. Each one is said to be reasonably transparent and to give good performance as a toothpaste. All quantities are % by weight.

Sorbitol, 70%	59.70	60.00	0.000.00	0.000.00
Glycerin, 99.5%	0.00	0.00	60.870	59.296
Carbowax 1450	4.000	4.000	4.000	4.000
CMC-9M31F	0.700	1.250	1.350	1.146
Sodium Benzoate	0.200	0.200	0.200	0.200
Sodium Saccharin	0.200	0.200	0.200	0.200
Sodium Fluoride	0.243	0.243	0.243	0.243
Zeodent ® 167 silica	8.000	8.000	8.500	8.000
Silica from Patent	8.000	9.000	6.900	5.2000
Sodium Lauryl Sulfate	1.200	1.200	1.200	1.200
Flavour	0.650	0.650	0.650	0.650
Water (Deionised)	17.107	15.257	15.887	18.650

**Title: Treatment of skin damage using conjugated linoleic acid and ascorbyl fatty acid esters**

**Publication No. USP 6,296,861**

**Application No. 563169**

**Date of filing May 2, 2000**

**Inventor: Perricone; N**

Sunlight and chemical exposure wreaks far greater destruction on the skin than time itself, and intensifies and augments the ageing process. There is substantial evidence that ultraviolet radiation induces the formation of reactive oxygen species which are implicated as toxic intermediates in the pathogenesis of photo-ageing. Free radical damage to skin from sun and chemical exposure is manifested as lines, mottling, discoloration, pre-cancers and cancers. Ageing of both skin and other tissues is, in part, the result of constant free radical damage to cell membranes, leading to decreased cell function. This results in accumulation of waste products in the cells, such as lipofuscin; an increase in the potassium content of the cells, which results in dehydration of the cells; and decreased production of messenger RNA and proteins.

Early suggestions for dealing with aging effects in skin were predominantly aimed at lubrications and emollients through use of topical compositions containing soothing agents. More recently, attention has been directed to agents that address the underlying processes involved in skin damage, such as the free radical generation processes. In this regard, investigations have been made with respect to the antioxidants vitamin E and vitamin C to quench free radicals on the surface of the skin and to protect lipid membranes intra-cellularly.

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Claimed is a synergistic combination of conjugated linoleic acid and fatty acid esters of ascorbic acid that is topically applied to treat skin damage, such as contact dermatitis, atopic dermatitis, xerosis, eczema, rosacea, seborrhoea, psoriasis, thermal and radiation burns, other types of skin inflammation, and ageing.

Any synthetic or natural conjugated linoleic acid, more correctly known as 9,12-octadecadienoic acid, alone or in combination with linoleic and linolenic acid found in many essential fatty acid mixtures, and biological equivalent derivatives and isomers thereof, may be employed as one of the active ingredients in the compositions. Oils that contain high amounts of linoleic acid include cottonseed, soybean, peanut, corn, sunflower, safflower, poppy seed, linseed, canola, perilla and certain fish oils.

The more oxidation-resistant saturated fatty acid esters of ascorbic acid are preferred, including ascorbyl laurate, ascorbyl myristate, ascorbyl palmitate, ascorbyl stearate, and ascorbyl behenate, and their salts, e.g., magnesium ascorbyl stearate. The synergistic mixture is oil-soluble and can be applied neat to the skin but more commonly would be used in combination in a suitable vehicle for topical application. A particularly preferred composition contains from about 3% to about 11% conjugated linoleic acid and from about 3% to about 7% ascorbyl palmitate in emulsion form.

**Title: Method of using hydroxycarboxylic acids or related compounds for treating skin changes associated with intrinsic and extrinsic aging**

**Publication No. 6,060,512**

**Application No. 185608**

**Date of filing 04/11/98**

**Applicants: Tristrata Technology**

Human skin is prone to disorders such as dry skin, ichthyosis, eczema, hyperkeratoses, dandruff, acne and warts. The patent claims preventive measures for such disorders by topical administration of amphoteric compositions or polymeric forms of alpha hydroxyacids, alpha ketoacids and related compounds.

Alpha hydroxyacids (AHAs) and alpha ketoacids (AKAs) are effective for topical treatment of various skin disorders but the compositions containing them may irritate human skin on repeated topical applications due to lower pH of the formulations. The irritation may range from a sensation of tingling, itching and burning to clinical signs of redness and peeling. There are also formulation problems associated with preparing stable emulsions that contain the free acid form of the AHA. However if the free acid is neutralised to form a salt it is no longer effective because a material's efficacy depends on its bioavailability and its percutaneous absorption, penetration and distribution to the target site. A topical preparation containing 5% salicylic acid is therapeutically effective as a keratolytic agent, but its sodium salt is not because sodium salicylate cannot penetrate the stratum corneum of the skin. If, however the AHA or AKA is in combination with an amphoteric or pseudoamphoteric compound it has a suitable pH, and can release the active form of an AHA or AKA into the skin.

Amphoteric substances consist of at least one basic and one acidic group and may behave either as an acid or a base. The basic groups include amino, imino and guanido groups. The acidic groups include carboxylic, phosphoric and sulfonic groups. Some examples of suitable organic amphoteric compounds are amino acids, peptides, polypeptides and

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proteins. Pseudoamphoteric compounds are either structurally related to true amphoteric compounds or capable of inducing the same function. Some examples are creatinine, stearamidoethyl diethylamine and stearamidoethyl diethanolamine. Preferred amphoteric compounds are lysine and arginine-rich proteins but the patent describes many others that are said to be suitable.

The advantage of utilizing an amphoteric compound is association with an AHA or AKA is that the overall pH of the composition is raised, so that the composition becomes less irritating to the skin. Also some AHA or AKA molecules react with the amphoteric compound to form a quadruple ionic complex that acts as a buffering system to control the release of the AHA or AKA into the skin, eliminating the skin irritation and still retaining the therapeutic activity.

**Title: Boron compounds and complexes as skin-rejuvenating agents**

**Publication No. 6,080,425**

**Application No. 192814**

**Date of filing 16/11/1998**

**Applicants: Topgene Inc.**

Boron compounds, other than boric acid and boric acid salts, and complexes are claimed as skin-rejuvenating agents. The compounds and complexes have a central tetrahedral boron atom covalently bound to four ligands, which may be either identical or different from each other. Suitable ligands include an oxygen, nitrogen, carbon or sulphur atom and saccharides or amino acids that form stable five- or six-membered rings complexed with the boron atom and a sodium, potassium, magnesium or calcium cation are particularly preferred. Example compounds are given as calcium mannitol-borate, sodium serino-borate, sodium ascorbo-borate and sodium or calcium fructo-borate.

The boron complexes are said to decrease skin wrinkles, improve skin thickness, increase skin hydration, softness and elasticity, improve the skin colour and decrease the number and size of age spots. The compounds are preferably provided in a micro-emulsion based on neutral triglyceride oils, soybean lecithin, bile acid salts, PEG- triglycerides and other polyethylene glycol derivatives. They may also be incorporated in liposomes.

According to the applicants boron compounds are known to show a variety of different biological activities including inhibition of enzyme activity and several naturally occurring antibiotics contain boron as an essential structural element. It is suggested that the boron compounds stimulate skin rejuvenation through interaction with a broad range of enzymes and enzyme systems, as opposed to targeting a single enzyme or enzyme system. In particular the boron compounds are claimed to increase collagen production by increasing proline levels in the fibroblasts.

**Title: Skin care moisturisers and cleansers**

**Publication No. 6,099,849**

**Application No. 026016**

**Date of filing 19/02/1998**

**Applicants: Zari Mansouri**

The patent claims skin care products for cleansing and moisturising skin, which are antimicrobial, alcohol-free, contain no animal- or petroleum-based products, have a water base and include an absorption enhancer to promote rapid uptake of the composition by

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the skin. The compositions are described as non-irritating and non-greasy and they shield the skin from exposure to chemicals and detergents commonly found in the home and work place.

The skin serves a key role as a physical barrier to the entry of parasites and pathogens; excessive drying can lead to a breach of this barrier and infection by pathogenic bacteria and fungi. Cracks or openings in the skin serve as a portal of entry for pathogens and potential pathogens and even non-pathogens can result in opportunistic infection in immunologically compromised individuals.

It is the applicants claim that many existing skin cleansing products cause drying of the skin because they contain petroleum or animal derivatives whereas the compositions described are formulated not only for continued frequent use without problems but also, by the inclusion of one or more antimicrobial agents, they prevent the transmission and spread of pathogenic or potentially pathogenic micro-organisms.

The preferred antimicrobial compound is triclosan at from 0.10 to 1.0%; also included is 1% - 2% of sorbitol and an absorption enhancing material in the form of macro-porous spheres of ceramic hydroxyapatite. This is a chemically pure form of calcium phosphate that has been grown as small crystals 50-100 nm in diameter followed by sintering at high temperature. Each sphere is porous and can act as a miniature sponge that absorbs, carries and subsequently releases components of the composition with which it has been formulated. It is claimed that the absorption enhancing properties of ceramic hydroxyapatite is due to both its porosity and its affinity for various substances. It has the ability to bind water, charged molecules, lipids, proteins, and nucleic acids and then to slowly release a relatively large volume of liquid phase materials when in contact with human skin, with which it has a strong affinity. Because of this affinity for skin it forms a protective barrier that prevents dehydration and holds the active materials of the composition in contact with the skin surface for an extended time period.

**Title:        **Makeup compositions****

**Publication No.    **USP 6,299,890****

**Application No.    **22/12/1999****

**Date of filing      **1/06/2000****

**Assignee:         **Revlon Consumer Products****

A variety of ingredients are known to tighten loose skin and minimise the appearance of fine lines and wrinkles. Typical examples are animal derived proteins such as bovine serum albumin, and certain plant and vegetable extracts. Unfortunately, while they provide an excellent tightening effect to skin, they are not aesthetically pleasing to consumers. Such compositions must set in the appropriate period of time, have sufficient spreadability, have adequate adherence to the skin surface and the film must impart appropriate firming and toning of the skin but be sufficiently plasticised such that it does not crack or peel.

The stated objectives of the application are to provide a makeup composition that contains soy protein rather than the animal protein derivatives traditionally used in firming makeup. It should condition and moisturise skin, minimise the appearance of wrinkles and fine lines, provide a toning and firming effect, exhibit optimum spreadability and be adequately plasticised such that it does not crack or peel off the skin. It may also provide UVA and UVB protection to the skin.

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The composition comprises a water phase containing an effective amount of soy protein capable of forming a skin firming and toning film on the skin; an oil phase comprising silicone oil and one or more colorants and an emulsifier, which maintains stability at 50° C. for two weeks.

The preferred soy protein, comprising from 0.1% to about 8% of the composition, is soybean (*Glycine soja*) protein. It is available as a colloidal solution of non-hydrolysed albumin and globulin fractions obtained from leguminous seeds of *Glycine soja* with a total protein content of about 6% by weight. The protein has a molecular weight of about 250,000 to 700,000 Daltons and a structure similar to that of animal serum albumin. Additionally the aqueous phase may contain a polyhydric glycol and plant extracts. Particularly preferred are chamomile extract, and an extract sold by Coletica/Bioetica under the trade name Phytoclar, which is a mixture of water, mulberry root extract, butylene glycol, lemon extract, grapefruit extract, *Saxifraga sarmentose* extract, tannic acid, kojic acid, and xanthan gum.

The oil phase of volatile and non-volatile silicone oils comprises about 0.5-20% by weight of the total composition. The presence of the volatile silicone enables the makeup to dry on the skin in an appropriate period of time, and minimises the heavy, greasy feel that is occasionally found with non-volatile oils. The remaining oil phase, which may include compatible organic oils, acts to plasticise the film formed on the skin by the dried aqueous phase containing the solubilised soy protein. Dispersed in the oil phase of the composition are one or more inorganic or organic pigments and powders, preferably surface-coated to render them hydrophobic. In addition very fine particle zinc oxide and/or titanium dioxide are included to give SPF 15 to 20.

The emulsion is formed using a non-ionic surfactant, in particular, an alkoxyated alcohol; a silicone surfactant; and mixtures thereof and the compositions may contain other ingredients such as preservatives, antioxidants, vitamins, and so on. An illustrative formula includes dimethicone copolyol and polyglyceryl-4-isostearate as the emulsifier system, 3% soy protein, about 6% cyclomethicone and 8% dimethicone, about 28% of surface-treated pigments and numerous cosmetic additives.

**Title: Wet applicable, instant protection sunscreen and makeup and method of use**

**Publication No. USP 6,197,281**

**Application No. 868766**

**Date of filing 4/06/1997**

**Assignee: Stewart; Ernest G. (USA)**

Claimed is a sunscreen or makeup that can be applied to a person who is wet, or even underwater, {Don't ask me why?} which provides instant, waterproof protection upon application. It is claimed that the so-called "water resistant" and "waterproof" sunscreens of the prior art, must all be applied to dry skin, and then allowed to dry on the user's skin for a period of time, typically twenty minutes, before they are effective.

According to the applicants practically all sunscreen products sold in the United States are emulsions and virtually all of them are of the oil-in-water type. Unfortunately, these sunscreens are not inherently waterproof and when applied to wet skin the external (water) phase is diluted and the result is poor and uneven application. The claimed composition

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uses oil and silicones as the external phase with a lipophilic emulsifier and the result is a uniform and thick sunscreen film, which remains on the skin, even when it is applied over wet skin or underwater.

Suitable w/o emulsifiers include dimethicone copolyol, PEG-30 dipolyhydroxystearate and cetyl dimethicone copolyol with polyglyceryl-4 isostearate. A volatile silicone, low molecular weight dimethicone or a volatile hydrocarbon comprises from 5% - 20% of the total weight of the composition and the sunscreens are oil-soluble ones from the permitted list. Non-volatile oils or esters may be included and waxes are added to improve the product rheology. Siliconyl beeswax, at a level between about 0.25-5.0%, provides emulsion stability and waterproofing. Polyethylene hydrogenated castor oil, beeswax, silica, alkyl modified silicones, mineral waxes, and/or vegetable waxes may also be used to similar effect. PVP/Eicosene copolymer is added as a film former, SPF booster, and waterproofing agent. Decyl glucoside is added at up to 1% as an emulsion stabiliser and the final composition may contain various additives to improve product stability and aesthetic properties.

An illustrative formula follows:

Dimethicone/Dimethicone copolyol	8.00%
Cyclomethicone	5.00
Ethylhexyl methoxycinnamate	7.50
Diisodecyl Adipate	5.00
Benzophenone 3	4.00
Siliconyl beeswax	2.00
PVP/Eicosene Copolymer	2.00
Fragrance	0.25
Vitamin E acetate	0.50
Decyl glucoside	0.10
Sodium chloride	1.00
Germaben II	1.00
Deionised water to	100.00%

**Title:** Cosmetic formulations containing ethoxylated partial glycerides

**Publication No.** USP 6,306,410

**Application No.** 509382

**Date of filing** 1/06/2000

**Assignee:** Cognis Deutschland GmbH

Described are cosmetic formulations, particularly skin cleansers, which cleanse the skin in one step and completely remove make-up, mascara and eye shadow, that are easy to rinse off with water and which impart a pleasant feeling to the skin. The compositions preferably contain 25 to 35% by weight of ethoxylated partial glycerides and 15 to 75% by weight of oils plus water and typical auxiliaries and additives. The glycerides of palmitic acid, stearic, isostearic, oleic, behenic and erucic acid which have a monoglyceride content of 50 to 95% by weight, are preferably used and ethoxylated with about seven moles of ethylene oxide.

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The oils may be any of those in common use in cosmetic products, including Guerbet alcohols, hydrocarbons, silicones, vegetable oils and linear and branched chain esters. In addition the compositions may contain mild surfactants, superfatting agents, foam stabilisers, biological extracts, essential oils and fragrance compounds and other ingredients to regulate product consistency and to enhance its usefulness and aesthetic qualities.

#### Face cleanser

PEG-7 Glyceryl Laurate 25.0%

2-Ethylhexylic Glycerides 5.0%

1,3-Butanediol 7.0%

Parabens 1.0%

Water to 100%

The ingredients are melted by heating and stirred. After cooling, transparent formulations are obtained. The face cleanser is an effective liquid formulation and after cleaning, it is readily rinsed off with water and the skin feels fresh.

#### Title: Cosmetic firming formulation

**Publication No. USP 6,426,081**

**Application No. 723586**

**Date of filing 28/11/2000**

**Applicant: Chong; Myong Hun, Tx, USA**

Proposed are compositions that utilise pure botanical essences and vitamins to provide gentle, fragrant and soothing products that aid the skin's ability to heal itself.

The applicant claims that conventional treatment of normal tissue damage is currently confined to the application of bland creams designed only to minimise infection to the damaged site or to prevent itching and subsequent scratching by the affected individual. Such treatment can at best only offer symptomatic relief and a barrier to assist prevention of secondary infection at the affected site.

The applicant believes that a need exists for a cosmetic formulation that will treat all skin types deep beneath the surface layer of the epidermis to reduce pore size, renew the skin and create a smoother texture. It should stimulate melatonin production and counteract sun damage to the skin, thereby promoting healing and returning the skin to a normal, healthy level and it should relieve itching and other discomforts suffered after laser or face-lift surgery and glycolic or chemical peels and it should act swiftly to aid the healing process upon contact.

The composition comprises aloe vera extract, ginseng extract, camomile extract and a commercially available multi-fruit blend comprising bilberry extract, sugar cane, sugar maple, orange and lemon extract combined with sodium hyaluronate and ascorbic acid, tocopheryl acetate and retinyl palmitate in an aqueous glycolic serum, stabilised by polysorbate-20 and suitably thickened and preserved.

It is claimed that the beneficial properties of the aloe vera extract are the result of the synergistic actions of at least 75 known ingredients, including polysaccharides, steroids, organic acids, enzymes, antibiotic agents, amino acids and minerals, which stimulate production of the fibroblasts, activating faster growth and replication. Bilberry concentrate

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is prepared to specifically contain at least 25% anthocyanosides, which are effective natural antioxidants. Camomile extract supplies anti-inflammatory properties to the compositions and ginseng contains ginsenosides, protein, carbohydrates, sugars, vitamins and minerals in varying amounts, which are said to improve the activity of the product.

An example formulation follows:

<b>Ingredients</b>	<b>Preferred %w/w</b>
Aloe vera gel	16.00
Multi-Fruit Extract BSC	10.00
Propylene glycol	3.00
Sodium hyaluronate	2.00
Ascorbic acid	2.00
Hydroxethylcellulose	1.20
Chamomile extract	0.50
Ginseng extract	1.00
Polysorbate-20	0.50
Tocopheryl acetate	0.10
Retinyl palmitate	0.10

#### **Title: Shaving composition and method**

**Publication No. USP 6,461,599**

**Application No. 319131**

**Date of filing 06/10/1994**

**Applicants: Ruben; Bradley; NJ, USA**

In any shaving system, and particularly those that extend the hair prior to cutting, there is a likelihood that the cut hair will reside below the surface of the skin. In this condition, the hair is subject to growing back into the dermis or growing along and just below the surface of the skin rather than back out through the hair follicle. This abnormal growth can cause infections, skin bumps and general cosmetic unsightliness, technically referred to as pseudofolliculitis barbae.

The applicant claims a method for shaving which conditions the skin by first massaging the face with an abrasive composition and then shaving with a water-based lubricant. A preferred embodiment is a composite shaving lubricant that includes abrasive particles. The amount and fineness of the abrasive particles used will depend upon the abrasive effect desired, and will vary among people because of their differing skin types and facial structures.

The preferred abrasive particle compositions are ground shells, ground kernels, coarse flours and meals, brans and mixtures thereof, derived from cereals and other grains, nuts and legumes, fruit seeds and pits and wood and bark from trees and shrubs. Willow bark

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may provide both abrasive and keratolytic effects. The abrasives are suspended in a suitable shaving composition and additional ingredients can include those conventionally used in cosmetics, such as bodying agents, colorants, fragrances, emollients and optional ingredients including medications to combat inflammation and infection.

The composition and method of application is believed to alleviate pseudofolliculitis barbae most effectively when used on a continuing basis, which provides regular abrasion to the skin to promote the removal of dead skin cells and newly grown skin lying over hairs on the skin surface.

### **Title: Ginseng berry topical products**

**Publication No. USP 6,461,599**

**Application No. 298702**

**Date of filing 23/04/1999**

**Assignees: E Excel International, Inc.**

Claimed are novel combinations of ginseng berry juice and extracts combined with other skin nutrients and moisturisers, which may be used to soften and moisturise the skin while providing essential vitamins and nutrients to the skin in a natural way.

Natural skin care products and remedies are popular among health-conscious consumers and many people prefer to enhance their appearance and health with vitamins and other nutrients from naturally occurring sources.

Although the ginseng root is sometimes used as an herbal supplement, the ginseng berry has been overlooked due, at least in part, to its high seed content. Laboratory analysis of the juice from ginseng shows a high concentration of vitamins as shown in the table.

Riboflavin 171.9 ug/gram of product

Vitamin A 109 IU

Vitamin E 1.5 IU

Beta Carotene 16.9 IU

Ginseng berries contain a large number of seeds that must be removed in order to make a liquid suitable for use in topical skin applications. Whole ginseng berries are crushed in a press and the seeds are removed by filtration. The juice is blended with other natural ingredients, which may add moisturizing effects, provide UV protection, or provide other physiological benefits. Illustrative formulations include moisturisers, face masks, exfoliating creams, hair conditioners and toothpaste.

An example formulation follows:

### **Replenishing Masque for Dry Skin**

Ginseng (Panax Ginseng) Berry Extract	11.0 <sup>w/w</sup>
SD Alcohol 40B	10.0
Glycerin	7.0
Hybrid Sunflower (Helianthus Annuus) Oil	6.0
Polyacrylamide	5.0

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C13-14 Isoparaffin	5.0
Laureth-7	5.0
Cyclomethicone	5.0
Grape (Vitis Vinifera) Seed Extract	3.0
Ginseng (Panax Ginseng) Root Extract	2.0
Avocado (Persea Gratissima) Seed Oil	1.0
Cucumber (Cucumis Sativus) Extract	1.0
Jasmine (Jasminum Officinale) Extract	1.0
Orange (Citrus Aurantium Dulcis) Peel Extract	1.0
Flowery Knotweed (Polygonum Aviculare) Extract	1.0
Hibiscus Sabdariff Extract	1.0
Mulberry (Morus Alba) Leaf Extract	1.0
Riboflavin (Vitamin B2)	1.0
Tocopheryl Acetate (Vitamin E Acetate)	1.0
Niacin (Vitamin B3)	1.0
Pantothenic Acid (Provitamin B5)	1.0
Disodium EDTA	0.1
Preservatives	qs
Water to 100% by weight	

**Title: Hair dye fixatives, hair dyes and hair dyeing methods**

**Application No. USP 20010042276**

**Date of filing 19/03/2001**

**Applicants: Shiseido Co., Ltd.**

Hair may be coloured by the use of oxidation dyes, acid dyes or temporary pigments. Oxidation dyes, also termed permanent hair dyes, require patch testing prior to use and may result in hair damage by cleavage of the S-S bond. Acid dyes work by binding a positive-charged amino acid group within hair to the acid dye via an ionic bond. The pH of an acid hair dye is usually in the range of 1.5 to 4.5 at the time of use and the compositions are thickened with xanthan gum or cellulose derivatives to prevent them coming into contact with skin. Hair coloured with an acid dye usually retains the shade for two weeks or more before washing leaches it out.

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By forming a complex between an acid dye and trivalent aluminium and incorporating this into a suitable composition it is claimed that an improved product is obtained. It is necessary for the acid dye complex to remain in solution, which limits its maximum concentration to about 2% in an aqueous/alcoholic carrier and the composition is further improved if an organic solvent like benzyl alcohol is used to improve penetration of the hair shaft. Xyloglucan is added to thicken the composition and it also provides moisturising and conditioning properties and is non-irritating. Xyloglucan is obtained from tamarind seeds by crushing, washing, drying and further crushing to a powder. It has an average molecular weight of about 650,000 and its viscosity in solution is proportional to its concentration.

Secondary non-ionic thickeners may also be used; for example agar, guar gum, hydroxypropyl guar gum, or a cellulose derivative such as hydroxyethylcellulose and hydroxypropylcellulose. To maintain an acid pH glycolic acid is preferred. A silicone compound is incorporated to give improved hair condition and the formulation may include additives to improve its performance, texture and aesthetic properties and it may be formulated as a spray, gel, lotion or cream.

The total composition can be employed or it may be applied in two parts; the fixative is massaged through the hair after application of the dye or alternatively the fixative may be applied to the hair prior to the dye composition. It is believed that when a hair dye according to the present invention is applied to a hair the acid dye migrates into the hair cuticle and a part of a cortex where the aluminium ion and the acid dye forms an insoluble complex upon evaporation of the solvent. Thus, the apparent molecular weight increases and it becomes difficult to wash the pigment from the hair. The composition described is claimed to provide excellent hair dyeing performance without damage to the hair and to be non-irritating to skin.

**Title: Polymeric thickeners for oil-containing compositions**

**Application No. USP 20010018484**

**Date of filing 16/03/2001**

**Applicants: Sheldon & Mak, Inc.**

The applicants claim that a broad range of side chain crystalline (SCC) polymers can be used to thicken oils. It is necessary that the SCC polymer will dissolve in the oil at a temperature above the crystalline melting point of the polymer,  $T_p$ , and must crystallise when the solution of the polymer in the oil is cooled to a temperature which is below  $T_p$ , and at which the thickened oil composition is to be used. It is believed by the applicants that the SCC polymer crystallizes into a network of polymer crystallites connected to one another by semi-soluble chains.

The SCC polymers used contain one or more lipophilic groups, for example long chain alkyl or substituted alkyl groups. They should be substantially free of fluorine atoms, carboxylic acid groups, carboxylic acid salt groups, sulfonic acid groups, sulfonic acid salt groups, amido groups, pyrrolidino groups and imidazole groups. Numerous possible SCC polymers are named but n-alkyl acrylates and methacrylate polymers are preferred for most applications. For thickening silicone oils, it is preferred to use a block copolymer

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containing SCC blocks and polysiloxane blocks. Others polymers cited in the application include polyesters, polyamides like homopolymers and copolymers of caprolactone, and polyalkylene oxides like polytetrahydrofuran. The  $T_p$  of the polymer should be about 45°C and it should crystallise at ambient temperature

An advantage of using SCC polymers as thickening agents, particularly in water-in-oil emulsions, is that the need to use a surface-active agent is reduced or removed. In a w/o emulsion the SCC polymer should represent about 5% by weight of the oil phase and the water phase may be as high as 90% of the total composition. If the final composition is non-aqueous the SCC polymer may be 10% of the oil content.

**Title: Skin care composition with improved skin hydration capability**

**Application No. 346273**

**Publication No. USP 6,264,963**

**Date of filing 01/07/1999**

**Applicants: Leifheit et al.**

Claimed are skin care compositions for enhancing skin hydration and for providing excellent moisturising, conditioning, and cosmetically acceptable tactile properties to the skin.

The applicants claim that glycerin and a small quantity of plant-derived oil provides an improved composition, which upon application results in synergistic and unexpectedly superior short-term skin hydration. The hydration system comprises between 16% & 22% by weight of glycerin and vegetable oil, between 1% & 10% petrolatum sand/or mineral oil and between 2% & 12% of a quaternary ammonium emulsifier.

To obtain a synergistic effect it is claimed that the skin hydration system of glycerin and vegetable oil should comprise between 17% & 20% of the composition and that the ratio of glycerin to vegetable oil be between about 18:1 and about 20:1 Also included is at least one compound selected from sodium pyrrolidone carboxylate, beta-glucan, lactic acid, and lactic acid salts. The composition may also include between 1.5% to 5.0% of a fatty alcohol, 1% to 8% of a fatty ester emollient, dimethicone, fragrance, preservatives, dyestuffs and other additives to be commonly found in skin care compositions, with water providing the balance. A preferred emulsifier is distearyl dimethyl ammonium chloride, present at between 4% & 6% and which is claimed to provide emulsifying, skin softening and skin protective properties.

Two example formulations follow:

Water	58.34% w/w	61.58% w/w
Sodium Chloride	0.01	0.00
Glycerin	18.00	20.00
DSDMAC	5.00	5.00
DL-Panthenol	0.20	0.40
Colloidal Oats	1.00	1.00

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Ammonium Lactate	6.70	1.00
Petrolatum	4.00	4.00
Oat Oil	1.00	0.50
Isopropyl Palmitate	2.00	3.00
Dimethicone	1.25	1.02
Cetyl Alcohol	2.50	2.50

**Title: Shave gel composition**

**Publication No. USP 5,888,490**

**Application No. 938511**

**Date of filing 26/09/1997**

**Assignee: Colgate-Palmolive Co**

Described is a soap-free non-aerosol shave gel composition comprising an anionic surfactant, a betaine, a foam boosting non-ionic surfactant, an ethoxylated emollient and an ethoxylated glycoside ester of a diacid present as a gelling agent.

The type of anionic surfactant, which comprise from about 10% to 15% of the composition, is not critical but preferred are ethoxylated alkyl sulfates. The betaine, representing about 4% to 6% of the composition, is selected for low irritation and mildness and a long-chain alkyl amide alkylene betaine such as cocamidopropylbetaine is suggested.

Suitable non-ionic surfactants are foam boosters and preferably have thickening capabilities as well. The N-oxides satisfy these characteristics and dihydroxyethylcocoamine oxides and lauramidedihydroxyethyl and other long-chain alkyl amides are preferred. The non-ionic component is present at about 1.5% to 3%, by weight. The most preferred gelling agent is PEG-120 methyl glycoside dioleate, present from about 0.1% to 0.8% in the composition.

Other additives include polyethylene glycols with a molecular weight of 400 to about 1000, which improve the foam characteristics by making it creamier. Humectants, UV stabilisers, fragrances, dyestuffs, and the other materials compatible with the gel may be added to enhance stability and its aesthetic qualities.

Example formulation

Sodium laureth sulfate 12.00% w/w  
Cocamidopropylbetaine 5.00%  
Dihydroxyethylcocoamine Oxide 1.00%  
Lauramide DEA 0.75%  
PEG-120 methylglycoside dioleate 0.25%  
PEG-75 lanolin 1.50%  
Preservatives, fragrance, dyestuffs as required  
Water to 100% by weight

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**Title: Process for bleaching chemically tanned skin and discoloured nails**

**Publication No. USP 6,325,783**

**Application No. 938511**

**Date of filing 09/09/2001**

**Assignee: Laughlin Products, Inc.**

Claimed is a bleaching composition that is applied to the skin or nails, which may include hydrogen peroxide with ammonium bicarbonate as an activator. It may also include fine abrasive particles such as ground walnut shells, pumice or sand as an exfoliant. The composition is used for gradually lessening unwanted colouration of the skin resulting from the application of chemical tanning agents, and also for the bleaching of nails discoloured by fungal growth or other nail disorders.

The applicants claim that chemical tanning agents often result in streaking and blotching of the skin due to the application of uneven quantities or to areas of skin tanning to different degrees. A need exists for a process for bleaching chemically tanned skin that can be easily and conveniently used to lighten streaks, blotches and other excessively dark areas resulting from this tanning process. Preferably, the bleaching results obtained are gradual in nature so that the previously excessively dark areas are easily blended with the colouration of surrounding areas, or to the desired colour intensity.

Each application of the composition results in a reduction of the colouration of the area of the skin to which it is applied by about one or more shades. The process can be enhanced in the case of thickened or callous skin by the use of an exfoliating agent in combination with the bleach, along with continuous rubbing during the treatment period, which varies between about thirty seconds and ten minutes. The same composition can also be used to bleach discoloured nails. The application time in the case of nails is from about 5 minutes to about 30 minutes, with multiple applications sometimes required.

Various commercial formulations are listed according to standard INCI labelling protocol so it is difficult to determine on what grounds the patent has been filed. The applicants state that those skilled in the art will appreciate the fact that the compositions identified in the examples are commercially available products. However, the use to which these products are put as described above is entirely new and novel.

A typical example of a bleaching cream composition follows:

<b>Bleaching Cream</b>	<b>Activating Cream:</b>
Water	Water
Hydrogen peroxide	Ammonium hydroxide
Cetearyl alcohol	Cetyl alcohol
Cetareth-20	Sodium laurel sulfate
Mineral oil	Mineral oil
Stearic acid	Petrolatum
	Activating Cream:

**Title: Depilatory composition**

## Patent Abstracts

John Woodruff

**Publication No.** USP 6,479,043

**Application No.** 678924

**Date of filing** 04/10/2000

**Assignee:** Del Laboratories Inc.

There are many methods of removing unwanted hair from the body, including shaving, the use of wax or other substances to enmesh the hair prior to mechanical removal and various chemical depilatories. Each method has its drawbacks but to overcome those of the chemical depilatory the applicants claim a composition in the form of a lotion, gel or cream containing natural wax beads or non-expanded polyethylene pellets to confer mild abrasive properties, which enhances the efficacy of the product.

Described is a topically acceptable lotion, gel or cream vehicle comprising about 2.0% to about 10.0 % by weight of at least one depilating agent, and particles or beads of a polyethylene material or of a wax or wax ester such as jojoba, carnauba or candelilla wax. The most preferred composition contains about 0.1% to about 5.0% by weight of the polyethylene or wax particles that are about 30# to 100# (mesh) in size.

Preferred depilating agents include sodium thioglycollate, calcium thioglycollate and potassium thioglycollate, alone or in mixtures. Optional ingredients are emollients and skin conditioners, buffering agents such as sodium silicate; viscosity increasing agents such as acrylate or methacrylate copolymers and emulsion stabilisers such as stearyl and cetearyl alcohol. pH adjusters such as sodium or calcium hydroxide, chelating agents such as tetrasodium EDTA and biological additives such as aloe vera gel may also be included and fragrance, colour, lubricants and other additives may also be utilised.

The composition of the invention is highly effective as a depilatory because of its ability to rapidly lift and thoroughly saturate each hair shaft. It is applied to the skin surface to form a coating. After waiting for the active depilatory ingredient to break down the hair shafts, typically 5-15 minutes, the composition is thoroughly rinsed from the skin with water.

Example formulation for a depilatory gel:

Acrylates/Stearth-20	Methacrylate Copolymer	6.00%
Sodium Hydroxide	2.50%	
EDTA, Tetrasodium salt	0.10%	
Sodium Silicate	1.00%	
Sodium Thioglycollate	6.00%	
Potassium Thioglycollate	3.50%	
Calcium Thioglycollate	0.50%	
Glycerin	6.00%	
Aloe Vera Gel	0.10%	
Fragrance	0.50%	
Hydrogenated Jojoba esters	0.10%	
Water	73.70%	

**Title: Colouring agent-containing sunless tanning compositions**

**Publication No.** 6,482,397

**Application No.** 551342

## Patent Abstracts

John Woodruff

**Date of filing:** April 18, 2000

**Assignee:** Schering-Plough HealthCare Products, Inc

Di-hydroxy acetone (DHA), currently the most widely used of the self tanning agents, is believed to exert its effect through interactions between its hydroxy groups and the amino groups of amino acids and peptides naturally occurring in the stratum corneum of the skin. Such Maillard reactions lead to formation of brown pigments in the skin, thereby giving it an appearance similar to that of a naturally obtained tan.

The patent describes sunless-tanning compositions containing, in addition to a self-tanning agent and a cosmetically acceptable carrier, a colouring agent added to enhance the uniformity of application to the skin. The self-tanning agent is preferably DHA present at about 4% or 5% by weight. The colouring agent is most desirably caramel at a concentration of about 0.8% by weight.

The patent cites a wide-ranging variety of ingredients that may be used to provide a cosmetically acceptable carrier plus some particular additives, including about 5% ethoxydiglycol, about 2% inositol and a rheological modifier to add some viscosity to the product. Sodium metabisulfite is added at about 0.025% to stabilise the composition. The product may be formulated for any of the usual means of cosmetic application, from a spray to a cream. Subsequent to their application compositions are left remaining on the skin for periods of time dependent upon a number of factors, including the degree of tanned appearance desired, the concentration of self-tanning agent in the compositions, and the degree to which the compositions are rubbed into the skin, in the case of creams, lotions, gels and the like, or the degree to which the skin is otherwise induced to absorb the self tanning agent.

**Title:** Sunless tanning cream

**Publication No.** 6,630,130

**Application No.** 906184

**Date of filing:** July 16, 2001

**Assignee:** Pearl Grimes, Ca.

The objective of the inventors was to provide a sunless tanning cream that would produce an immediate tanned appearance and last for an extended period of time. In addition it was required to effectively camouflage the unsightly effects of vitiligo; a chronic pigmentation disorder that causes white patches or splotches on the patient's skin. Vitiligo affects people of all ethnicities and races, however its effects are particularly pronounced in African American patients due to the high contrast between their natural brown or black skin and the bright white splotches characteristic of vitiligo.

The composition described is a water-in-oil emulsion and comprises dihydroxyacetone (DHA), oil-soluble and water-soluble colouring agents, and a solvent system comprising silicone-based solvents. The emulsifying system preferably comprises PEG esters that are compatible with DHA and are not prone to acid hydrolysis. Compatible emulsifiers also preferably have no functional amino groups, particularly no primary amino groups. The preferred emulsifying system comprises PEG-30 dipolyhydroxystearate, sorbitan isostearate, dimethicone copolyol beeswax, and decyl glucoside.

## Patent Abstracts

### John Woodruff

The solvent system most preferably comprises cyclopentasiloxane with dimethicone copolyol and dimethicone and an emollient ester such as diisodecyl adipate. Diisodecyl adipate also aids solubilisation of oil-soluble makeup components in the silicone phase. The silicone-based solvent system spreads easily and evenly over the skin, has little or no objectionable feel, and effectively solvates oil-based makeup components for good colour longevity.

The colouring system preferably contains water and oil-soluble makeup components, natural pigments, synthetic pigments, plant extracts, fruit extracts, vegetable extracts, and/or other oil-soluble makeup components. The following table shows the ingredients that are most preferred and the approximate level of concentration.

It is claimed that the unique combination of oil and water-soluble colour components provides a formulation that instantly camouflages the effects of vitiligo upon application to the skin, while the DHA undergoes a chemical reaction with the epidermis to provide a more long-lasting effect, even after the skin has been thoroughly cleansed.

Ingredient	Approx %
Cyclopentasiloxane	8.00
Dimethicone Copolyol	5.00
Diisodecyl Adipate	5.00
Dimethicone	5.00
Dimethicone Copolyol Siliconyl Beeswax	0.40
Hydrogenated Castor Wax	1.00
PEG-30 Dipolyhydroxystearate	0.50
Sorbitan Isostearate	0.30
D&C Violet #2 (1% Solution)	0.40
D&C Green #6 (1% Solution)	0.30
D&C Red #17 (1% Solution)	0.82
Melanin (10% Solution)	0.01
Indigofera Tinctoria Black Root Extract	0.50
Junglens Regia (Walnut) Leaf Extract	2.00
FD&C Red #33 (1% Solution)	0.20
FD&C Yellow #5 (1% Solution)	3.00
FD&C Blue #1 (1% Solution)	0.80
Decyl Glucoside	0.10
Sodium Chloride	1.00
Germaben II Preservative System	1.00
Dihydroxyacetone	2.00
Water to 100%	

**Title: Stable/improved self-tanning compositions comprising amino-substituted 2-hydroxybenzophenone compounds**

**Publication No. 6,635,239**

**Application No. 906184**

**Date of filing: Dec. 9<sup>th</sup>, 2002**

**Assignee: Societe l'Oreal S.A.**

According to the applicants the majority of cosmetic products for the artificial tanning of the skin are based on carbonyl derivatives, which permit the formation of coloured compounds by interaction with the amino acids of the skin. These compounds include mono- or polycarbonyl compounds, such as, for example, isatin, alloxan, ninhydrin, glyceraldehyde, mesotartaric aldehyde, glutaraldehyde, erythrulose and, most commonly, dihydroxyacetone (DHA).

One disadvantage of DHA is the slow speed at which the colouration develops and the colour intensity is often regarded as inadequate. Another drawback of DHA-based compositions is that they tend to decompose over time. The applicants claim that by incorporating at least one selected amino-substituted 2-hydroxybenzophenone compound into the composition it provides self-tanning products, which are more stable, act rapidly and impart coloration similar to natural tanning.

The amino-substituted 2-hydroxybenzophenone compounds are described in detail and those interested are advised to refer to the full patent. Named in specific examples is N-Hexyl 2-(4-diethylamino-2-hydroxybenzoyl)-benzoate. The compounds are preferably present in proportions ranging from 0.1% to 10% by weight and most preferably from 2% to 8% by weight. An illustrative example follows:

Ingredient	% <sup>w</sup> / <sub>w</sub>
Xanthan gum	1.00
Acrylates/C10-30 Alkyl Acrylate Crosspolymer	0.40
Triethanolamine	0.40
C12-15 Alkyl benzoate	10.00
N-Hexyl 2-(4-diethylamino-2-hydroxybenzoyl)-benzoate	1.50
Glycerol	5.00
Dihydroxyacetone	5.00
Preservatives	q.s.
Demineralised water	q.s. for 100%

Many optional materials may be added to this basic formulation including at least one synthetic or natural direct dye such as an insoluble redwood extract of the genera Pterocarpus and/or Baphia and an iron oxide nanopigment colorant having a mean particle size of less than 100 nm. Other optional additives include UV absorbers and materials to improve the stability and tactile and aesthetic properties of the composition.

**Patent Abstracts**  
**John Woodruff**

**Title: Method for slowing the decomposition of a cosmetic composition**

**Publication No. USP 6,759,033**

**Application No. 046415**

**Date of filing October 25, 2001**

**Assignee: Access Business Group Int.**

Many skin whitening compositions rely on the use of tyrosinase inhibitors; for example on arbutin, extracts of bearberry, orange, lemon, cucumber, on mercaptosuccinic acid, mercaptodextran, kojic acid and its derivatives vitamin C and its derivatives, hydroquinone and its derivatives, glutathione, cysteine and its derivatives mulberry extract and its derivatives, liquorice extract and its derivatives, rosemary extract and its derivatives, and mixtures thereof and various other materials of botanical origin.

Many of these ingredients oxidise over time, causing them to darken and to develop an intense, undesirable odour. Magnesium ascorbyl phosphate and botanical whiteners such as bearberry extract and others are especially prone to premature oxidation and have limited shelf lives. Claimed is a method of slowing this decomposition using sodium magnesium silicate

The claimants discovered that the addition of sodium magnesium silicate, available under the trade name Laponite, to skin-whitening compositions prevents their premature darkening. The results are said to be especially impressive when the cosmetic composition includes skin-whitening agents prone to oxidation such as magnesium ascorbyl phosphate and botanical extracts.

The addition of from 0.5% to about 5% sodium magnesium silicate to compositions containing ingredients prone to rapid oxidation appears effective in all product forms, for example:

Sodium Magnesium Silicate	1.00% w/w
Bearberry Extract	2.00
Lactic Acid	2.00
Acerola Fermentate	3.00
Water and Optional Ingredients	q.s.

Example 2

Sodium Magnesium Silicate	1.00% w/w
Magnesium Ascorbyl Phosphate	3.00
Vitamin E	0.05
Water and Optional Ingredients	q.s.

Optional ingredients are commonly used cosmetic ingredients that improve the aesthetics and stability of the compositions.

**Title: Compositions and delivery methods for the treatment of wrinkles, fine lines and hyperhidrosis**

**Publication No. USP 6,866,856**

**Application No. 046415**

**Date of filing December 31, 2002**

## Patent Abstracts

John Woodruff

**Assignee: Avon Products, Inc**

The patent describes compositions and methods for treating or preventing fine lines and wrinkles and improving the appearance of skin. The compositions include limonoid constituents which inhibit acetylcholine release at neuromuscular junctions of skeletal muscle so as to relax the muscles involved with facial movement and expression. The limonoids preferably include the plant alkaloids toosendanin and azadirachtin. Also described are methods of delivery for such compositions so as to allow the active components to more readily reach the muscle layer and preferably function at the level of the neuromuscular junction of facial expression muscles.

Botulinum toxin is currently in vogue for treating wrinkles and fine lines by specifically inhibiting neurotransmission in nerve cells, thereby causing contracted muscles to relax. Alternative materials include limonoid constituents of the Maliaecae and Rutaceae families. Limonoids are a group of chemically related triterpene derivatives which are among the bitter principles found in citrus fruits. More specific examples of such plant materials include the plant alkaloids toosendan from *Melia Toosendan* (i.e. Chinaberry) and azadirachtin from *Melia Azadirachta*, (i.e. Neem). These plant materials provide treatment for wrinkles, fine lines and other signs of dermatological aging or sunlight exposure of the skin by their effect at the neuromuscular junction of muscle and nerve cells and tissue, and at the fibres of the sweat glands to inhibit cetylcholine release, thereby relaxing or decontracting facial expression muscles. The limonoid plant alkaloids can also be chemically synthesised.

The compositions described comprise one or more limonoid constituents in a pharmaceutically-acceptable cosmetic or dermatological formulation which is suitable for topical administration, with virtually no adverse physiological effect or irritation to the user and are especially suitable for sensitive skin. The compositions can be in any commonly used cosmetic format. A particular embodiment is the use of targeted delivery systems, for example, liposomes, microspheres and transdermal patches so that the limonoid actives can more readily reach and affect the muscle layer. Compositions comprising limonoid constituents, including liposome formulations, can also be administered by direct injection subcutaneously or intradermally to more precisely deposit the active agents at sites which require muscle relaxation or decontraction via acetylcholine release inhibition.

An example composition comprising limonoid constituents in the form of a gel is as follows:

Carbopol	0.01-3%	
Glycerin	0.1-30%	
Butylene glycol	0.1-30%	
Disodium EDTA	0.01-2%	
Methylparaben	0.01-2%	
Hydroxyethyl cellulose	0.01-2%	
Corn (Zea mays) starch	0.01-10%	
POE (20 M) methyl glucose ether		0.01-10%
Dimethyl polysiloxane	0.01-10%	

## Patent Abstracts

**John Woodruff**

PEG 50 Shea butter	0.01-10%
Sodium hydroxide solution	0.01-5%
Benzyl alcohol	0.01-5%
Neem seed cell broth	0.01-10%
Neem extract	0.01-10%
Ku Lian Pi extract	0.01-10%
Demineralised water	Q.S.

**Title: Method of skin care**

**Publication No. USP 6,919,306**

**Application No. 076686**

**Date of filing February 14, 2002**

**Assignee: Yaizu Suisankagaku Industry Co**

The patent describes a skin care agent comprising an ingestible carrier and natural-type N-acetylglucosamine obtainable by hydrolysis of chitin that is orally administered. It is claimed to improve moisture and tension of skin and promote the prevention and amelioration of rough skin and fine wrinkles.

Acidic mucopolysaccharides such as hyaluronic acid or chondroitin sulfate have high water retention. They bond to collagen, which serves as a column of intercellular substance matrix, and are mostly distributed in connective tissues, cartilaginous tissues and skin tissues, thereby being useful for maintaining the functions and structural form of skin cells. In skin tissues, the acidic mucopolysaccharides mostly exist in the corium layer and play a large part in water retention and resilience of skin. When the amounts decrease due to aging or the like, the water retention and resilience of skin is lost, thereby causing rough skin and fine wrinkles.

Besides the use of topically applied preparations to ameliorate rough skin and wrinkles various health and beauty care foods have been developed which enhance the above-mentioned effects by oral ingestion. The applicants claim that natural-type N-acetylglucosamine, orally ingested, is rapidly absorbed from the intestine and reaches the cutaneous layer where it promotes biosynthesis of mucopolysaccharides such as hyaluronic acid whereby the moisture and tension of skin can be improved and the rough skin and fine wrinkles can be prevented and ameliorated.

To obtain N-acetylglucosamine, chitin is partially hydrolyzed with an acid, and the hydrolyzed liquor is neutralised, and then deionised by electro dialysis with an ion exchange membrane. The recommended daily uptake of N-acetylglucosamine is from 0.5 to 1.5 g for an adult and the skin care agent may also contain other components recognised to have a skin care effect, preferably at least one selected from collagen, chondroitin sulfate and vitamin C.

**Title: Extra-mild shower gel and hair shampoo formulation with low tenside concentration**

**Publication No. USP 6,056,948**

**Application No. 960420**

**Date of filing 23/12/1992**

## Patent Abstracts

John Woodruff

**Applicants:** Benckiser N.V.

The introduction claims that the production quantity of shower baths and hair shampoos in the cosmetics industry in Germany is currently about 110,000 tonnes per year. The tenside content of the commercially available products is between 15 and 25% and about 20,000 tonnes per year of tensides thus pass to waste. A reduction in the washing-active substances is an aim worth pursuing from both the economic and the ecological aspect. Because of their high foaming power ether-sulfates can halve the tenside level but this decreases the viscosity of the mixture, which must be compensated by electrolyte additions or organic thickeners, which also cause pollution.

The objective of the patent is to deliver a mild tenside combination for cleaning skin and hair, which contains ether-sulfate and has good foaming properties. It is to be highly viscous at tenside concentrations of less than 10% with a minimum of electrolyte salts and without additional thickeners. The products should have a good biological degradability, so that they do not pollute the environment.

It was found that a combination of lauryl polyglycol ether-carboxylate, lauryl sulfate and laurylamidopropyl betaine processed with 2-10% of sodium chloride produces a shower gel that is well tolerated. Initially lauryl glycol ether-carboxylate with 8-10 ethoxy groups was used and in order to produce adequate foaming properties, a total tenside concentration of 15-20% was necessary and 4.5% of sodium chloride was added to adjust the viscosity. However it was discovered that alkyl ether-carboxylic acids having a low degree of ethoxylation (2-5), which are more aggressive when used by themselves, no longer exhibit skin irritations in this combination and that total tenside concentrations of less than 10% generate adequate foam.

The alkyl polyglycol ether-carboxylic acids are compounds of the formula

$R-O-(CH_2-CH_2-O)_n-CH_2-COOH$  in which R denotes an alkyl group having 12-14 C atoms, and n denotes a natural number from 2 to 5, preferably 2.5. The carboxylic acids are preferably neutralized with sodium, potassium or ammonium ions, in particular tris(hydroxymethyl)aminomethane.

The alkyl ether-sulfates described are ethoxylated sulphuric acid monoalkyl esters of lauryl alcohol and coconut fatty alcohols with 2-5 ethoxy groups, which have particularly good foaming properties under hard water conditions. The preferred betaine is lauramidopropyl betaine. Lauryl monoglyceride is proposed as an oil-restoring component and ethoxylated lauryl alcohol proved to be particularly appropriate for solubilising perfume oils. The final composition may have perfume, colour, conditioning aids and preservatives added to improve aesthetic appeal.

**Title:** Composition for treating skin conditions

**Publication No.** USP 6,248,763

**Application No.** 414849

**Date of filing** 12/10/1999

**Applicants:** Rosemarie Scivoletto

Disclosed are compositions for treating the skin that include nicotinamide, nicotinic acid, and nicotinic esters as active ingredients. The compositions are applied topically to treat skin conditions including acne, fine lines and age spots, itching and pain from insect bites and bee stings and fungal infections including athletes foot. They may also be used to treat

## Patent Abstracts

### John Woodruff

flaking and scaly skin including dandruff, seborrhoeic dermatitis, psoriasis, burns and heat rash. Different compositions are presented for use as an acne treatment, a face and body wash and a nail fungus treatment and they may also be used in makeup and lipstick.

Nicotinic acid, nicotinamide and methyl nicotinate are known for their rubefacient properties and their ability to improve blood circulation of the skin and scalp when topically applied. The applicants claim the discovery that methyl nicotinate and nicotinic acid are highly beneficial when combined with a skin moisturiser, a suitable carrier, an emollient, vitamin E and other ingredients and have surprising efficacy in treating various skin conditions.

An illustrative formulation for the treatment of acne, psoriasis and seborrhoeic dermatitis is shown as follows:-

Methyl nicotinate 0.01 to 1%  
Niacin 0.01 to 1%  
Glycolic acid 0.01 to 20%  
Aloe vera gel 35 to 45%  
Glycerin 0.8 to 1.8%  
DMDM hydantoin 0.02 to 0.25%  
Tetrasodium EDTA 0.05 to 0.15%  
Vitamin E 0.01 to 0.1%  
Polysorbate-20 0.5 to 1.0%  
Silk amino acids 0.01 to 0.1%  
Hydrolysed collagen 0.01 to 0.1%  
Water to 100% <sup>w</sup>/<sub>w</sub>

The following composition is intended as a general treatment and daily cleanser for face, body and scalp.

Methyl nicotinate 0.01 to 20%  
Niacin 0.01 to 1%  
Aloe vera gel 60 to 70%  
Ammonium lauryl sulfate 20 to 28%  
Cocamidopropyl betaine 3 to 5%  
Lauramide DEA 3 to 5%  
Glycerin 0.8 to 2.5%  
Methylparaben 0.8 to 1.2%  
Propylparaben 0.8 to 1.2%  
Propylene glycol 0.8 to 1.2%  
Imidazolidinyl urea 0.8 to 1.2%  
Guanine 0.1 to 0.15%  
Tea-lauryl sulfate 0.1 to 0.15%  
Isopropyl alcohol 0.1 to 0.15%  
Methyl cellulose 0.1 to 0.15%  
Vitamin E 0.01 to 0.1%

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Silk amino acids 0.01 to 0.1%

Hydrolysed collagen 0.01 to 0.1%

Chamomile 0.01 to 0.1%

Water to 100% <sup>w</sup>/<sub>w</sub>

**Title: Hair conditioning formulation for mending split ends**

**Publication No. USP 6,258,348**

**Application No. 384620**

**Date of filing 27/08/1999**

**Applicants: Bristol-Myers Squibb Co.**

Described is a hair formulation containing a polysaccharide gum in combination with a betaine based polyurethane surfactant and a polyurethane silicone for repairing split ends. Mechanical damage to hair can be minimised by reducing the tangling and abrasive effects of handling the hair by providing lubrication to reduce fibre friction. The repair of existing damage can be attempted by the deposition of substances that will restore axial cohesion to splits and that coat areas of shaft damage. Shampooing is the cosmetic process to which the hair is exposed most frequently. The conditioner is a popular method to make combing easier, thus reducing mechanical damage.

While both shampoos and conditioners that prevent damage are known, the applicants claim that there are no products in this category that effectively repair split ends. Cationic polymers such as guar and other polysaccharides are known for having good wetting and combing properties. Adsorbed polymers are effective in mending split ends and proteins have been used for many years in hair care products for their substantivity and mending effects.

Claimed is an aqueous hair conditioning composition comprising guar gum, a betaine based polyurethane surfactant and a silicone polyurethane. The composition is effective for mending split ends of human hair and is especially beneficial for coloured, bleached, or relaxed hair. The guar derivate preferred is guar hydroxypropyltrimonium chloride used at about 0.25% – 2.0%. The preferred betaine is ricinoleamidopropyl urethane betaine used at about 3% and the preferred polyurethane silicone is dimethiconol/IPDI copolymer incorporated at 0.75% - 2.0%. The composition can include other ingredients to improve the appeal, efficacy and stability of the product. The patent describes various compositions and the test protocols and results that prove the effectiveness of the formulations.

**Title: Pseudoceramides, and dermatological external preparations containing the same**

**Publication No. USP 6,221,371**

**Application No. 308031**

**Date of filing 10/05/1999**

**Assignee: Aekyung Industrial Co, Korea**

Although the patent is primarily intended to protect a process of synthesising pseudoceramides its description of their nature and possible uses make this of more general interest to the cosmetic formulator.

Ceramides are the most prominent lipids found in the stratum corneum, the outermost layer of epidermis, and play an important part in maintaining its barrier properties and

## Patent Abstracts

### John Woodruff

controlling transepidermal water loss (TEWL). Damage to this barrier through age, solar radiation or exposure to surfactants leads to increased skin sensitivity and potential irritation such as atopic dermatitis or psoriasis. Ceramides have a basic structure of at least two alkyl groups, at least two hydroxy groups and at least one amide bond. They may be extracted from plant or animal material or synthesised and are divided into six basic erythro structures. Pseudoceramides with a similar structure may be synthesised by reacting acyl chlorides with alkyl or alkenyl groups and triethylamine to form alkylketenes, which in turn are reacted with alkanolamines having one or more hydroxy groups. A variety of Type I and Type II pseudoceramides may be obtained.

Topical applications of ceramide- or pseudoceramide-containing compositions have been found effective in restoring the barrier function of the stratum corneum and are also claimed to exhibit therapeutic properties such as wound and ulcer healing through the promotion of cell restoration and growth.

Various formulation ideas illustrate the patent of which the following formula for a moisturising cream is an example.

Component	wt %
Carbomer	0.34
Propylene glycol	3.45
Methyl dibromoglutaronitrile	0.1
Phenoxyethanol	0.2
Triethanolamine	1.62
Cetareth-25	1.30
Glyceryl stearate	2.00
PEG-100 stearate	1.25
Stearic acid	1.30
Isopropyl myristate	5.00
Capric/caprylic triglyceride	7.00
Propylene glycol dicaprylate/dicaprate	4.00
Soysterol	0.50
Myristic acid	0.50
N-ethanol-2-tetradecyl-3-oxostearamide*	0.10
Perfume	0.20
Purified water	71.14

- Pseudoceramide

**Title: Personal wash compositions containing particle-in-oil dispersion**

**Publication No. USP 6,395,691**

## Patent Abstracts

John Woodruff

**Application No.** 796151

**Date of filing** 28/02/2001

**Assignee:** Unilever (USA)

The application relates to compositions for delivering hydrophilic solid particles and/or capsules (e.g., perfume-containing capsules) from wash-off liquid compositions. The solids are present as a particle-in-oil dispersion and range from 50 to 5000 microns in size and the composition remains stable for at least three months.

The composition comprises a surfactant system; a thickening system for the surfactant system and solid particles or capsules dispersed in oil. The surfactants in the composition may be anionic, non-ionic, amphoteric/zwitterionic, cationic or mixtures thereof.

Ammonium and sodium lauryl ether sulfates in association with an acyl isethionate are the preferred anionic components and together comprise about 6% to 12% of the composition. An amphoteric compound such as cocamidopropyl betaine, methyl sulphobetaine or an amphotoacetate or diamphotoacetate are optional components and a non-ionic polyglucoside may represent up to 10% of the final formulation. If a cationic surfactant is included the most preferred are stearylalkonium chloride, stearyltrimonium chloride, distearyldimonium chloride or mixtures thereof.

An essential part of the composition is the thickening aid. Many are cited but preferred is xanthan gum. The thickener aids suspension of the particle-in-oil dispersion and prevents physical separation for over three months. Stability of the dispersion is also dependent on the suspending power and the viscosity of the emollient oil, which is greater than 10,000 cps.

Suitable oils are petrolatum and mineral oils, triglycerides, alkyl esters and silicone oils. The oil is mixed with a suitable polymer to provide viscosity and suspending properties. Examples of possible polymers are polybutene, polyacrylate and its copolymer, and rubber thermoplastic block copolymers such as butadiene/styrene or styrene/butylene di- or tri-block copolymers. The rubber based thermoplastic block polymers available from Shell Chemical Company under the trade name Kraton™ are the most preferred.

In general, the oil droplet should be at least 5 times as great as the size of the suspended particles, which can be either inorganic or organic particles with a particle size of 0.1 to 150 microns, preferably 0.2 to 100 microns. Typically the structured oil comprises 70% to 95% of the particle-in-oil dispersion and the solid particle comprises 5% to 30% of the dispersion. The final composition may also contain any of the usual cosmetic additives to aid stability or to improve its aesthetic qualities.

The following Liquid Cleansing Base exemplifies the basic composition

Lauric Acid	2.88%
Triethanolamine	2.0%
Sodium Lauroamphoacetate	5.8%
Sodium Lauryl Sulfosuccinate	5.8%
Xanthan Gum	1.2%
Glycerin	10.0%
DMDM Hydantoin	0.20%
Perfume	0.5%

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Water To 100%

To this base may be added the required quantity of particles suspended in oil, for example 10% Spectratek 100 microns Geometric Silver with 90% petrolatum/polybutene or 10% Spectratek 50 microns Geometric Silver in 90% petrolatum/polybutene. These are added to comprise about 8% of the final composition.

**Title: Nail enamel composition containing light reflecting material**

**Publication No. USP 6,352,687**

**Application No. 361050**

**Date of filing 26/07/1999**

**Assignee: Kirker Enterprises, USA**

Typically, clear nail enamel compositions include a film forming polymer, a film forming resin, a plasticiser and one or more solvents. Colour nail enamels also include a thixotropic compound, a suspending agent and one or more pigments. In addition, a number of optional and proprietary components are often included such as UV light absorbers, moisturisers, stabilisers, fragrances etc. A variety of pigments can provide an opaque coloured film and organic colorants are used to create semi-translucent films. Glitters may be added to provide dramatic effect. Glitters are commercially available in a variety of materials, for example, polyester film with metallised coatings, aluminium foil with thermosetting coatings, polybutylene terephthalate with acrylates copolymer and acrylates copolymer polybutylene terephthalate ethylene/vinyl acetate copolymer.

The aesthetic properties of glitter nail enamel compositions initially depend upon their wet state clarity at the time of purchase and dry state clarity after application. A problem associated with conventional glitter nail enamel compositions is its dull appearance in the wet state, resulting from the use of conventional suspending agents such as bentonite or montmorillonite clays and stearalkonium hectorite.

The applicants claim nail enamel compositions based upon the use of fumed silica as a suspending agent for the glitter and the use of nail enamel components which produce a base that is transparent in both wet and dry state. Described is a transparent nail enamel composition having an optical density less than 0.1 comprising a film forming polymer, a film forming resin, a solvent having a refractive index greater than about 1.40, a plasticiser, light reflecting material and fumed silica as the suspending agent.

The film forming polymer, usually nitrocellulose, comprises about 5 to 40% of the composition: the film forming resin, typically tosylamide formaldehyde, about 5 to 25%; a solvent, either toluene or xylene and mixtures thereof, present in an amount greater than about 20%; a plasticiser, typically dibutyl phthalate; glitter, and fumed silica as a suspending agent, present in the range of about 2 to 6%, all % are by weight.

Example formulation:

Toluene	26.60%
Nitrocellulose 1/4 Sec.	15.2%
Polyester Resin	8.90%
Dibutyl Phthalate	6.25%
Butyl Acetate	20.47%
Isopropyl Alcohol	8.08%

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Aerosil 200 (Fumed Silica) 3.50%

Glitter 11.00%

**Title: Pseudoceramides, and dermatologic external preparations containing the same**

**Publication No. USP 6,221,371**

**Application No. 308031**

**Date of filing 10/05/1999**

**Assignee: Aekyung Industrial Co, Korea**

Although the patent is primarily intended to protect a process of synthesising pseudoceramides its description of the nature and possible uses make this of more general interest to the cosmetic formulator.

Ceramides are the most prominent lipids found in stratum corneum, the outermost layer of epidermis, and have an important function in formation and retention of stratum corneum. Skin damage caused by detergents which remove the lipids essential for the barrier function will result in an increased transepidermal water loss (TEWL), and deteriorated barrier function has negative consequences for the total condition of the skin. Moreover, a damaged skin barrier leads to increased skin sensitivity and potential irritation such as atopic dermatitis or psoriasis. It has been found that topical applications of ceramide- or pseudoceramide-containing compositions are effective in relieving atopic eczema. They also have been found to exhibit therapeutic properties such as wound and ulcer healing through the promotion of cell restoration and growth.

**Title: Rinsable skin conditioning compositions**

**Publication No. USP 6,699,488**

**Application No. 298891**

**Date of filing 18<sup>th</sup> November, 2002**

**Assignee: Procter & Gamble Co.**

Described is a skin conditioning composition comprising an oil-in-water emulsion that is readily rinsed from the skin but which deposits a measurable amount of oil onto the skin. It was the objective of the applicants to provide compositions that effectively deposit moisturisers and other skin benefit agents onto the skin when used in the shower or bath and thereby assist the stratum corneum in maintaining its barrier and water-retention functions at optimum performance in spite of deleterious interactions which the skin may encounter in washing, work, and recreation.

The applicants claim to meet their objective with a rinsable skin conditioning composition comprising from about 20% to about 90% by weight of oil; from about 0.1% to about 10% by weight of a stabiliser; from about 9.5% to about 79.5% by weight of water and from about 0% to about 2% by weight of a perfume. The applicants definition of rinsable formulations is that the product is applied topically to the skin and then subsequently rinsed away with water, or otherwise wiped off using a substrate or other suitable removal means or the compositions may be used as leave-on lotions.

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The oil phase may include hydrocarbon oils and waxes, silicones, fatty acid derivatives, cholesterol, cholesterol derivatives, diglycerides, triglycerides, vegetable oils, vegetable oil derivatives, acetoglyceride esters, alkyl esters, alkenyl esters, lanolin and its derivatives, wax esters, beeswax derivatives, sterols and phospholipids, and combinations thereof and they preferably constitute about 30% to 40% by weight of the final composition.

<b>Ingredient</b>	<b>% w/w</b>
Water	To 100%
Petrolatum	40.00
Dimethicone/Dimethiconol	5.00
Stearyl alcohol	0.43
Cetyl alcohol	0.24
Cetylhydroxy cellulose	1.31
Perfume	1.00
Preservatives, colour, additives	As required

Approximately 3% of the composition is an emulsion stabiliser, which may be a polymeric stabiliser such as a carbomer, an acrylates polymer, a cellulose derivative or cyclodextrins such as alpha cyclodextron, beta cyclodextron, hydroxypropyl alpha cyclodextrin and hydroxypropyl beta cyclodextrin. Stability may be further improved by the addition of a fatty alcohol such

cetyl alcohol, stearyl alcohol, behenyl alcohol, and mixtures thereof. An important aspect of the patent is that it is virtually surfactant-free.

The composition should ideally have a viscosity in the range of from about 2,000 to about 7,000 cP. and a yield stress from about 50 to about 90 Pa. The compositions may further comprise other optional ingredients that may modify the physical, chemical, cosmetic or aesthetic characteristics of the compositions or serve as additional "active" components when deposited on the skin.

An illustrative formula is shown.

**Title: Two-phase cosmetic composition**

**Publication No. USP 6,548,073**

**Application No. 437399**

**Date of filing November 10, 1999**

**Assignee: Industria e Comercio de Cosméticos Natura Ltda.**

Claimed is a two-phase cosmetic composition comprising an aqueous phase and an oily phase, wherein the aqueous phase contains an emulsifying system including at least one cationic surfactant and at least one non-ionic surfactant, and wherein a total concentration of all surfactants is lower than 0.1% in weight, based on a total weight of the composition. The surfactant is benzalkonium chloride and the non-ionic emulsifier system is copolyol dimethicone with poloxamer and the low level is to reduce the possibility of irritation caused by surfactants.

The two-phase composition is to be used to remove make-up; the lower phase is to remove non-waterproof makeup and the upper phase removes waterproof makeup. At rest the composition separates into two phases. It is stirred before use so that it becomes temporarily emulsified and the emulsion removes the two types of makeup satisfactorily.

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The product must remain emulsified for sufficient time for the user to remove all her make-up, on the other hand it should not cause any irritation since it is a product that may be applied to sensitive areas of the skin such as around the eyes and the face. The system works well with a mixture of isohexadecane and cyclomethicone at about 40% as the oil phase and about 5% glycerine in the aqueous phase.

**Title: Cool and dry soft solid antiperspirant**

**Publication No. USP 6,793,915**

**Application No. 806982**

**Date of filing March 23, 2004**

**Assignee: Colgate-Palmolive Company**

Claimed is surfactant-free, soft solid antiperspirant product which leaves little or no white residue when applied and which exhibits improved efficacy and stability when compared to other formulations. The particularly preferred proportions by weight of the composition comprise 46-53% of cyclopentasiloxane; 1.0-10% of a non-emulsifying elastomer; 0.1-10% of a superabsorbent powder; 0.01-0.5 % of a cooling agent; 1-10 % of an emollient or a mixture of two or more emollients; 10-25% of an antiperspirant active and 2-8% of polyethylene beads, plus a suitable fragrance.

The elastomer is a non-emulsifying polysiloxane such as a cross-linked or partially cross-linked cyclomethicone and dimethicone crosspolymer or a dimethicone/vinyldimethicone crosspolymer. The superabsorbant material in powder form acts to minimize the perception of wetness and acts as a water reservoir for the activation of the cooling agent. Since the selected cooling agents are activated by the presence of water, it is important to control the ratios of cooling agent and superabsorbent powder to achieve the desired effect. The preferred superabsorbant powder is starch/acrylates/acrylamide copolymer and the preferred cooling agents are L-menthol and menthyl lactate.

Emollients of special interest include C12-15 alkyl benzoate, isopropyl myristate and neopentyl glycol diheptanoate. The polyethylene beads have a particle size in the range of 5-40 microns and it is believed that the polyethylene component contributes to the reduction in syneresis and is also responsible for giving the products a powdery feel as determined by trained sensory panels.

The antiperspirant active material is desirably included as particulate matter suspended in the composition but can also be added as solutions or added directly to the mixture. Particular types of antiperspirant actives include aluminium zirconium trichlorohydrate and aluminium zirconium tetrachlorohydrate either with or without glycine. The final compositions are soft solids made as suspensions and thickened or gelled by the elastomer component.

The following formula illustrates the patent.

Ingredient	% w/w
Neopentylglycol diheptanoate	0.50
Cyclomethicone	0.80

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Phenyltrimethicone	0.50
Isopropyl myristate	0.50
C12-15 Alkyl benzoate	7.00
Antiperspirant Active	25.00
Polyethylene	6.00
Superabsorbent Powder	5.00
Elastomer	52.50
Fragrance	1.20
L-Menthol	0.40
Menthyl lactate	0.60

**Title: Warming composition**

**Publication No. USP 6,673,844**

**Application No. 006119**

**Date of filing December 10, 2001**

**Assignee: Takasago International Co**

Claimed is a warming composition which produces a long lasting effect with little or no skin irritation, a fragrance composition containing it, and cosmetics, toiletries, bath additives, and pharmaceuticals containing the warming or the fragrance composition.

Known warming agents often cause strong skin irritation or exhibit insufficient effect for too short a time. The inventors claim to have found that a combination of a cooling agent with a warming agent produces an unexpected warming effect that lasts for three hours or more.

The cooling agent can be any of those already known such as menthol, spearmint oil, peppermint oil, menthone, menthone glycerol ketal, menthyl lactate and various menthoxy compounds, particularly menthoxypropanediol. A second ingredient of the composition is vanillin. The third material is a warming agent and vanillyl ethyl ether, vanillyl propyl ether, vanillyl butyl ether, vanillyl pentyl ether, vanillyl hexyl ether, gingeron, capsicum tincture, and ginger extract are suggested with vanillyl butyl ether being the most preferred.

A preferred combination of components is menthoxypropanediol with 0.01 to 10 parts by weight vanillin and 0.5 to 5 parts by weight of vanillyl butyl ether. This may be incorporated into a fragrance or added directly to a cosmetic product, generally at 0.1% to 1% by weight of the total composition.

The patent includes many possible applications with illustrative formulations, test protocols and test results and it concludes that the warming composition makes it possible to produce a warming effect of long duration with no skin irritation.

**Title: Composition of menthol and menthyl lactate, its preparation and its applications as a cooling agent**

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**Publication No. USP 6,897,195**

**Application No. 202543**

**Date of filing July 24, 2002**

**Assignee: Nanjing Zhongshi Chemical Co**

Described is a composition containing menthol and menthyl lactate and its applications as a cooling and flavouring agent. Menthol is a physiological cooling agent well known for its analgesic, freshening and flavouring effects on the skin and the mucous membranes of the mouth. Being a major constituent of peppermint oil, menthol has been used extensively in foods, beverages, dentifrices, mouthwashes, toiletries, lotions, confectionary, tobacco and pharmaceutical products. The disadvantages of using menthol, however, are its strong mint-like odour and the characteristic harsh notes it imparts to compositions in which it is found. In order to overcome these disadvantages, various menthyl esters have been prepared but with the exception of menthyl lactate, most of these esters have disagreeable odours, making them unsuitable for use in a topical product.

Compared to menthol, menthyl lactate has the advantages of low irritation, long-lasting cooling effect and low volatility but it does not produce as strong an initial cooling effect as menthol, and therefore, its use has been limited to some extent, especially for oral care and skin care products, where the user desires a strong initial cooling effect as soon as the product is applied.

Menthol and methyl lactate are both solid at ambient temperature: the object of the invention is to provide a composition containing menthol and menthyl lactate that delivers both an excellent initial cooling sensation and long-lasting cooling effects. It should also be liquid at room temperature without any solvent or solubiliser, be non-irritating, of little odour and low volatility. This is achieved by mixing menthol and menthyl lactate in a ratio that provides a mixture with a crystallisation point below room temperature. The menthol portion of the composition provides a strong initial cooling sensation and the menthyl lactate provides the long-lasting cooling effects. A 1:1 ratio of menthol to menthyl lactate has a crystallisation point not higher than 8.5° C and satisfies the objectives of the patent claims.

**Title: Post hair removal skin care lotion**

**Publication No. USP 6,767,534**

**Application No. 251076**

**Date of filing Sept.20, 2002**

**Applicants: Ortiz & Fernandez, NY.**

Claimed is a post hair removal skin lotion composition for use in reducing inflammation and irritation of skin immediately following hair removal by shaving, waxing, tweezing, electrolysis, or use of depilatory products, and for repairing skin damage resulting from these methods.

Physical methods of hair removal often result in damaged areas of skin; the skin becomes irritated and often inflamed. Symptoms may include pain, redness, burning, itching, and dryness and these symptoms may be exacerbated in individuals with sensitive skin.

Another result may be pseudofolliculitis, which occurs when hairs emerge from the skin surface then curl back and re-enter the skin. Additionally, skin damage may be caused by

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other hair removal procedures, including waxing or the use of depilatory creams. Regardless of how it is caused, pseudofolliculitis can result in permanent unwanted dark areas on the skin and may detract from the appearance of a clear and healthy complexion. The applicants claim to provide a product that relieves the skin irritation caused by the removal of unwanted hair, and which augments the body's physiological repair of damaged skin. The composition contains hydrocortisone acetate\*, to provide relief of irritated skin, in association with vitamin E, vitamin C, soybean oil, and alpha-lipoic acid, a natural molecule found in every living cell of the human body. It is claimed to enhance the functions and effects of the vitamins C and E and together they prevent free radical-induced damage and have anti-inflammatory properties.

The composition is provided as an emulsion in the form of a thick cream to facilitate ease of handling and contains aloe barbdensis leaf juice to enhance the uptake of hydrocortisone acetate. The emulsifiers are stearic acid with glyceryl monostearate; viscosity control is via carbomer with hydroxypropyl methylcellulose and the remaining ingredients are propylene glycol as a humectant and solvent and lauramide DEA to improve application plus preservatives and water.

The levels claimed for the actives are tocopherol at a weight percent of 0.405-0.495%; hydrocortisone acetate at 0.180 to 0.500%; alpha lipoic acid at 0.180-1.25% and ascorbic acid at 0.198-0.242%.

[Note: hydrocortisone acetate is not permitted in cosmetic products under European legislation]

**Title: Natural insect repellent formula and method of making same**

**Publication No. USP 5,885,600**

**Application No. 831420**

**Date of filing: 01/04/1997**

**Assignees: Burlington Bio-Medical & Scientific Corp**

The patent state that many natural substances are known to repel insects, but these are normally only effective for a short period of time. Described is a composition that has insect repellent properties made from cold processed neem, citronella and cedar wood oils, that is said to be stable and effective. The majority of essential oils are obtained through solvent extraction or steam distillation and are sold in the refined state, free of residue and sediment. However it is claimed that essential bioactive ingredients are frequently left behind or destroyed in the process whereas by using cold processing and centrifugation these are retained.

Some of the essential ingredients found in *Azadirachta indica* (Neem) oil are various fractions of limonoids, terpenes and terpenoids present in the tree and its leaves, bark and seeds. It also contains phytosterols like beta sitosterol and kaemferol, and flavonoids such as quercetin and myricetin. Cold-process extraction returns higher levels of these materials than steam distillation and solvent extraction methods. Further, azadirachtin has numerous homologues remaining in the crude pressed oil that do not carry over as well when solvent extracted or heated and the resultant oil has superior insect repelling properties.

Its effectiveness can be further improved by combination with other cold pressed oils, in particular, citronella and cedar wood oil. Citronella contains citral, citronellal, limonene, geraniol, linalool, dipentene and pentinoids, and when processed by solvent extraction,

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usually with hexane, some of these are lost. Cedar wood oil acts as a repellent due to the various cedar terpenes, cedral and camphor present in it and cold processing retains these ingredients.

Neem oil is present in a range of from about 10-50%, Citronella oil is present in a range of from about 5-30%, and Cedar wood oil is present in a range of from about 5-30% by total weight in a ratio of from 2/1/1 to 5/3/3 Neem/Citronella/Cedar wood. For application the mixture may be incorporated in a light vegetable oil but it can also be added to lotions, creams or sprays. It is important to keep the oils in an inert atmosphere after extraction and to incorporate an antioxidant in the final composition. Other ingredients may be added to increase the efficacy of the essential oil composition, including oil of thyme, peppermint oil, menthol, camphor, garlic oil, wintergreen oil, oil of pennyroyal, oleoresin capsicum, and other similar substances.

**Title:       Stabilisation of vitamin C**

**Publication No.   USP 6,235,721**

**Application No.   503899**

**Date of filing:    15/02/2000**

**Assignees:        Natreon Inc**

While ascorbic acid possesses many indispensable biological properties, it has several disadvantages. It is susceptible to air oxidation, is sensitive to heat and is unstable in aqueous solution, even at neutral pH and at room temperature. Many attempts have been made to solve these problems including complexing it with cyclodextrin or incorporating it in zeolites or liposomes. Derivatives such as L-ascorbic acid 2-phosphate and alkyl esters have also been proposed but biological activity is reduced.

The applicants claim that the anti-oxidative fraction of *Emblica officinalis*, has better anti-oxidative properties against reactive oxygen and is much more stable than L-ascorbic acid and can stabilise and prolong its anti-oxidative properties. It has enhanced stability in an aqueous environment and can be formulated to provide significant protection against UV-induced erythema.

The anti-oxidant product is isolated in stable form from the fruit of *Emblica officinalis* using a very dilute aqueous or alcoholic water salt solution, which prevents degradation of the anti-oxidant compounds therein by enzymes present in the fruit. It is combined with ascorbic acid to counteract erythema in sun protection products and has many other uses in skin care and pharmaceuticals. An example formula is given as follows:

#### **Sunscreen spray; approximate SPF 25**

Ingredients% (W/W)

Phase A

Propylene Glycol Isoceteth-3 Acetate    5.00

Octyl methoxycinnamate   7.50

Benzophenone-3   3.00

Homomenthyl Salicylate   7.00

Steareth-2   0.40

Steareth-10 0.80

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Acrylates/C <sub>10-30</sub> Alkyl Acrylate Crosspolymer	0.18
Synthetic Wax	0.80
Dimethicone	1.00
Antioxidant Composition	0.25
Phase B	
Demineralised water	69.82
Phenylbenzimidazole sulfonic acid	1.00
Propylene glycol	2.00
Triethanolamine	0.90
Preservatives, perfume etc.	qs

**Title:** Cosmetic cleansing and skin care preparation containing plant and algae extracts

**Publication No.** USP 6,221,372

**Application No.** 319090

**Date of filing:** 28/05/1999

**Assignees:** Lancaster Group GmbH

The patent describes a cosmetic cleansing and skin care preparation that is suitable for oily and inflamed skin, especially skin during puberty, which often has inflamed spots or areas. It contains 0.25 to 5% of a combination of *Laminaria saccharina alga*, a root extract of *Lilium candidum* and a root extract of *Glycyrriza glabra* in a suitable cosmetic base.

Research demonstrated that an extract of *Laminaria saccharina* inhibits the lipase enzyme, which specifically cleaves triglycerides into glycerine and fatty acids, thereby preventing the formation of free fatty acids and prostaglandins that cause skin inflammation. The root extract of *Lilium candidum* has a tonic and astringent effect, and it also contributes toward an increase in the sebostatic effect of the composition. Root extract of *Glycyrriza glabra* yields glycyrrhetic acid, which is known to promote wound healing and is effective against itchy skin. It has also been used for allergic reactions and to treat rough or chapped skin in face lotions and creams. In the composition described it also contributes toward increasing the sebostatic effect and the three extracts in combination are claimed to exert a synergistic effect against the lipase enzyme.

The preparation may also advantageously contain 0.1% to 6.0% kaolin modified with spherical titanium dioxide particles, which has a very soft, feel on skin while also having an anti-inflammatory effect. It may also contain as another active ingredient a *Matricaria recutita* floral extract at 0.1 to 1.0 %, based on the total weight of the preparation. Due to its bisabolol content this plant extract has an anti-inflammatory effect on the skin and is present in many cosmetic and dermatological preparations. It is claimed that in use secretion of oil is greatly reduced and inflammations are eliminated within a short period of time.

**Title:** Stable gelled aqueous composition with high electrolyte content

**Publication No.** USP 6,277,388

**Application No.** 405232

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**John Woodruff**

**Date of filing**      **24/04/1999**

**Assignee:**            **L'Oreal, Paris**

Gelling agents are frequently used in cosmetic products intended for topical application to improve product consistency but frequently prove incompatible with electrolytes and primary alcohols. It is claimed that gel compositions that overcome these disadvantages may be accomplished with a preparation containing at least one associative polyurethane, at least one oxyalkylenated polymer and water. The associative polyurethanes are non-ionic sequential copolymers containing both hydrophilic and hydrophobic sequences. They generally contain a urethane bond between the hydrophilic sequences and include polymers, the hydrophilic sequences of which are bonded via other chemical bonds to the lipophilic sequences. The polymers may be in water or in an aqueous/alcoholic solutions or dispersions, and PEG-150/Stearyl Alcohol/SMDI Copolymer as a 15% dispersion is specifically cited and it may be used at up to 20% active content in the final composition.

The oxyalkylenated polymer may comprise 1% to 5% by weight of the total composition and examples include polyethylene glycols and polypropylene glycols of fatty acids and fatty acid ethers such as PEG-30 glyceryl stearate and PPG-15 stearyl ether. The primary alcohol, ethanol or isopropanol, is generally present at levels from 1% to 20%, dependant on the active ingredients to be incorporated.

The electrolyte included in the gel may be any organic or inorganic electrolyte but for the purposes of this patent Dead Sea Salts and salts from mineral springs are preferred and are present to a maximum of 40% by weight.

An example oil-in-water emulsion formulation is as follows:

Oil Phase	
Cetyl alcohol	5.00%
Glyceryl stearate	2.00%
PPG-15 stearate ether	2.00%
Groundnut oil	6.20%
Isopropyl myristate	3.00%
Aqueous phase:	
Ethanol	7.00%
Dead Sea salts	5.00%
PEG-150/Stearyl Alcohol/SMDI Copolymer (15% active)	6.70%
Demineralised water	q.s. for 100%

**Title:**            **Body care compositions, method of using same, and method of generating a relatively stable aqueous suspension of colloidal silica for use therein**

**Publication No.**    **USP 5,607,667**

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**Application No.** 076349  
**Date of filing** 11/06/1993  
**Assignee:** NovaTech, Inc.

Claimed is a moisturising body care composition comprising one or more body care components; and an aqueous suspension of colloidal silica particles generated by lowering the pH of an alkaline silica solution during circulation through a magnetic field to form charged colloidal silica particles. In the preamble the applicant suggests that many skin and hair care products claim to rejuvenate skin and hair but although most skin care products have an oil or cream base, the problem to be overcome is not one of loss of skin oil but the chronic loss of moisture, which is one of the aging factors. There is a need for a product that will enable water to penetrate the dehydrated epidermal structures, i.e., skin, hair, and nails.

It is claimed that an aqueous composition containing from about 1 part per million (ppm) to about 50 ppm of an inorganic colloidal greatly enhances the penetration of water, oils, and collagen into the epidermis of aging dehydrated skin and into hair shafts. The charge on the colloidal particles is stabilised by the mixing process and by the addition of molar amounts of citrate or citrate salts. The aqueous solution of colloidal silica is prepared by dissolving silicon dioxide in sodium hydroxide solution, which is then titrated with hydrochloric acid, very slowly and with constant stirring over a period of several hours. The final concentration is a solution of about 500ppm colloidal silica of between about 10 to 100 angstroms in size. The silica particles are believed to be a semi-conductor material and an electrical charge is generated on the particles as they cut through the lines of flux while being circulated in a magnetic field. The particles act as both a conductor and a capacitor, i.e., they generate a charge and store the charge.

Examples are given that purport to show that adding the colloidal silica to existing body care and hair care compositions their ability to penetrate and moisturise the stratum corneum and hair shafts is greatly enhanced.

**Title:** Self-foaming cream  
**Publication No.** USP 6,210,656  
**Application No.** 292372  
**Date of filing** 15/04/1999  
**Assignee:** L'Oreal, Paris

The major types of skin cleansing products are foaming detergent aqueous gels and lotions and rinse-off cleansing anhydrous gels and oils, cleansing milks and foaming creams, which are usually soap-based. Foaming detergent gels and lotions are cosmetically pleasant and efficient because they foam and they are easily removed. However, since they contain no cosmetic oil, they destroy the skin's hydrolipid film and leave the skin clean but rough. Rinse-off anhydrous gels and oils dissolve greasy residues and disperse make-up pigments but are heavy, do not foam and do not impart a sensation of freshness when applied. Cleansing milks and creams contain detergent surfactants, emulsifiers and oils in sufficiently low amounts so as not to destabilise the emulsion but are non-foaming and are not readily rinsed from the skin.

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Claimed is a self-foaming oil-in-water emulsion comprising at least 5% by weight of an oil phase and a gelling system of at least one emulsifying polymer. The total composition contains less than 2% surfactant in order to minimise skin drying and is packed in a pressurised aerosol container. It is dispensed as a cream that then foams on application to the skin. The nature of the oil phase is said not to be critical and may represent up to 50% of the total composition without adversely affecting foam generation.

Suitable emulsifying polymers may be anionic, such as acrylates/C10-30 alkyl acrylate crosspolymer or cationic like polyquaternium-37, although the anionic ones are preferred. Additional polymers are added to stabilise the system and suitable examples include carbomers and natural hydrocolloids. Although not essential, the presence of 1.5% surfactant is said to be beneficial to the product. The aqueous phase consists essentially of water plus humectants and active ingredients and the final composition may include any of the usual cosmetic additives to improve aesthetic properties and product stability and the product is packed in an aerosol container, pressurised by a suitable hydrocarbon propellant.

A simple example of self-foaming cleansing cream for sensitive skins is as follows:

Ethylhexyl palmitate	10.00%
Propylene glycol	5.00%
Sodium laureth sulfate	1.50%
Carbomer	0.30%
Acrylate/C <sub>10</sub> -C <sub>30</sub> alkylacrylate crosspolymer	0.20%
Xanthan gum	0.20%
Sodium hydroxide	0.30%
Fragrance	0.18%
Preserving agents	qs
Water	To 100%

**Title: Soufflé facial and body scrub**

**Publication No. USP 6,776,995**

**Application No. 183587**

**Date of filing: June 26, 2002**

**Applicant: Revivo; Rina**

Claimed is an improved exfoliating facial and body scrub which is effective for cleaning and exfoliating skin and is not so abrasive as to create any damage to sensitive skin areas. The preferred embodiment is a combination of sodium laureth sulfate, cocamidopropyl betaine; sodium chloride (salt), fragrance and a mixture of sodium polyacrylate, ethylhexyl stearate and trideceth-6 which is available as Rheocare ATH.

The proportions of each ingredient are as follows:

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Item	Min % w/w	Max % w/w	Preferred %
Sodium laureth sulfate	20.00	50.00	37.56
Cocamidopropyl betaine	5.00	15.00	10.99
Sodium chloride	30.00	60.00	45.80
Fragrance	0.50	3.00	1.83
Rheocare ATH	0.50	5.00	3.82

The surfactants are combined in a slow speed mixing vessel and sodium chloride added. It may be fine or coarse or a combination to give the desired feel and level of abrasion required. After the salt is evenly dispersed the fragrance is added followed by the Rheocare ATH, which will further thicken the mix.

**Title: After shave treatment preparation**

**Publication No. USP 6,277,362**

**Application No. 427244**

**Date of filing: October 26, 1999**

**Assignee: ISW, Inc.**

Described are non-steroidal anti-inflammatory after shave preparations to aid in the prevention and treatment of Pseudofolliculitis Barba. This is a bacterial disorder, usually caused by staphylococcus aureus, the characteristic lesions being erythematous papules, and sometimes pustules containing buried hairs. Shaving often induces the condition when hairs which are sharpened by shaving curve back and penetrate the skin, causing the characteristic papules or "razor bumps." The natural curvature of the facial hair of black males makes them particularly susceptible to Pseudofolliculitis Barbae (PFB). The bikini area in women is also often affected following shaving.

The compositions described have as essential components an anti-irritant selected from the group consisting of panthenol, pantothenic acid, pantetheine, and pantethine and a non-steroidal anti-inflammatory ingredient; which may be a propionic acid derivative or a naturally occurring herbal compound. Preferred propionic acid derivatives include naproxen and ibuprofen. More suitable for the European cosmetic market are the preferred herbal compounds, which include willow bark, turmeric root, liquorice root and ginger root.

Two formulations illustrate separate approaches to providing the desired compositions and are as follows:-

Composition 1.

Item	Min % w/w	Max % w/w
Salicylic acid	0.25	17.00
Propylene glycol	0.15	15.00
Glycerine	0.15	15.00

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Panthehtine	0.15	18.00
Fragrance	0.01	8.00
Ibuprofen or herbal anti-inflammatory compound.	1.00	35.00
Ethanol	To 100%	To 100%

The limits shown are extraordinarily wide. It is made by combining ethanol, glycerine and propylene glycol in a suitable vessel equipped with a high-speed mixer. Following vigorous mixing at ambient temperature the pantethine, salicylic acid, fragrance and ibuprofen are slowly with vigorous stirring. The applicants suggest that the ethanol acts as a carrier for the fragrance and a solvent for the anti-inflammatory agent. The combination of propylene glycol and glycerine not only provides lubricity or slip, but acts as a moisture barrier and humectant between the skin and environment. The salicylic acid and pantethine combination forms an anti-bacterial and skin replenishing component, while the ibuprofen, or herbal anti-inflammatory if used, acts as an anti-inflammatory agent to reduce or eliminate "razor bumps" thus allowing shaved hair to grow out of the hair follicle without obstruction.

**Composition 2**

Item	Min % w/w	Max % w/w
Water	2.00	30.00
Hydrolyzed oat flour	0.50	10.00
Sorbitol	1.00	5.00
Petrolatum	1.00	6.00
Lanolin	1.00	6.00
Cetyl alcohol	1.00	5.00
Sunflower seed oil	1.00	30.00
Stearic acid	0.10	5.00
Triethanolamine	0.10	5.00
Allantoin	0.10	5.00
Naproxen or herbal anti-inflammatory compound.	1.00	5.00
Preservatives, colour, fragrance etc.	Qs	qs

The limits shown are extraordinarily wide. The composition is made as an o/w emulsion. The applicant suggests that hydrolyzed oat flour provides natural moisture to the skin and, since it has natural therapeutic/healing properties, it also soothes and heals the affected area. Sorbitol acts as a humectant and moisture barrier that allows the therapeutic ingredients to remain on the skin. Petrolatum, lanolin, cetyl alcohol, sunflower seed oil and stearic acid act as emollients and emulsifiers. The anti-inflammatory naproxen or herbal anti-inflammatory additive acts as the "razor bump" eliminator or reducer.

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**Title:** After shave composition containing aluminium chlorohydrate

**Publication No.** USP 6,231,845

**Application No.** 317525

**Date of filing:** May 24, 1999

**Assignee:** The Gillette Co

Claimed is an after shave composition in the form of a lotion or microemulsion which, upon application to the skin, is said to provide reduced stinging and burning, reduce redness and irritation, and impart a soothing effect without tackiness or other undesirable aesthetic attributes.

Essential to the claim is the use of approximately 1% aluminium chlorhydrate, which is said to increase astringency. A surfactant is included to solubilise the fragrance. Typically a polyethoxylated and/or polypropoxylated surfactant such as, for example, PPG-26-Buteth-26 and PEG-40 Hydrogenated Castor Oil is used at a preferred level of 1% to 4%. Ethanol is incorporated at a level of about 10% to 22% and other ingredients may include emollients, cooling agents, preservatives, viscosity modifiers, colouring agents, moisturising agents, skin conditioning agents etc.

The preferred minimum and maximum levels of ingredients are shown in the following table.

Item	Min % w/w	Max % w/w
Ethanol	10.00	22.00
Surfactant	1.00	4.00
Aluminium chlorohydrate	0.80	1.030
Preservatives, colour, fragrance etc.	qs	qs
Water	To 100%	100%

**Title:** Therapeutic after-shave care lotion

**Publication No.** USP 6,352,691

**Application No.** 569250

**Date of filing:** May 11, 2000

**Applicant:** Ortiz; Robert

Claimed is a therapeutic after-shave care lotion composition for use in reducing inflammation and irritation of skin immediately following shaving, and for repairing skin damage resulting from shaving. The composition comprises Aloe barbadensis, vitamin C, vitamin E, and hydrocortisone acetate. According to the applicant each of these ingredients serves a different function relating to reducing inflammation and irritation, or nourishing and restoring the skin.

Aloe Vera pure gel (Aloe barbadensis leaf juice) is employed for its moisturising properties and for its role in the process of skin healing and regeneration. Aloe also has bactericidal properties which help protect the damaged skin from bacterial infection. Topical application of Vitamin C greatly facilitates the production of collagen and thus the regeneration of skin damaged by shaving. Vitamin E is a powerful biological antioxidant,

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which protects cellular membranes from oxidative destruction by reducing free radical membrane damage. It is an effective moisturizing agent and because it aids in cell division, it greatly assists the regenerative process. Vitamin E also has anti-inflammatory properties.

Hydrocortisone Acetate [Author's Note: This is not permitted in cosmetic products for sale in the EU] is employed in the composition to act as the main anti-inflammatory agent for reducing the effects of pseudofolliculitis. Hydrocortisone Acetate is a corticosteroid which provides temporary relief of itching, minor irritations and rashes when applied topically. When applied after shaving, the composition as described is effective in reducing the inflammation and irritation commonly associated with pseudofolliculitis, and in initiating repair of skin damaged by shaving.

**Title: Compositions and delivery methods for the treatment of wrinkles, fine lines and hyperhidrosis**

**Publication No. USP 6,866,856**

**Application No. 334887**

**Date of filing December 31, 2002**

**Assignee: Avon Products, Inc**

Claimed are compositions and methods for treating, preventing ameliorating, reducing and eliminating fine lines and wrinkles in human skin, wherein the compositions include limonoid constituents which inhibit acetylcholine release at neuromuscular junctions of skeletal muscle so as to relax the muscles involved with facial movement and expression. Botulinum toxin inhibits neurotransmission in nerve cells, thereby causing contracted muscles to relax, however there may be unwanted side effects and the effect also tends to lessen with time. Therefore it was the applicants wish to find new ingredients for use as effective, active agents in compositions and formulations for topical application to the skin that could be used to improve facial skin and it was discovered that limonoid constituents of the Maliaecae and Rutaceae families could be used for this purpose. Non-limiting examples of limonoids include the plant alkaloids toosendanin from *Melia Toosendan*, commonly known as the Chinaberry tree, and azadirachtin from *Melia Azadirachta*, commonly known as the Neem tree.

The ability of the limonoid constituents to inhibit acetylcholine release by muscle cells results in a modulation of motor contraction so as to relax the muscle fibres in cutaneous or subcutaneous muscle and nerve tissue, thereby attenuating wrinkles and fine lines. The limonoid plant alkaloids can be chemically synthesised at industrial scale or extracted as natural raw materials from plants. The limonoid constituents, which preferably comprise from 0.01 to 1% of the formulation, are incorporated in topically applied compositions that also include anti-oxidants, anti-inflammatory ingredients, sunscreens, preservatives and other materials to improve the delivery vehicle, the aesthetics and the stability of the final preparations.

**Title: Pharmaceutical and cosmetic carrier or composition for topical application**

**Publication No. USP 6,911,211**

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**Application No. 169897**

**Date of filing January 10, 2001**

**Assignee: Foamix Ltd.**

Described is a composition for topical application characterised by rheological properties which render it semi-solid at rest and a liquid upon application of shear forces. This is based on the discovery claimed by the applicants that the addition of fatty alcohols to hydrophobic liquids, such as saturated, mono-unsaturated or poly-unsaturated oils, as well as mineral and silicone oils, may alter the physicochemical properties of the material, including the solidification thereof. This appears to be particularly relevant when the fatty alcohol has a molecular weight greater than 200 Da and at least one hydroxyl group in its chemical structure. The addition of a fatty alcohol to liquid oil also gives rise to thixotropic properties

The most common skin diseases or disorders include eczema, psoriasis and dermatitis, including contact dermatitis, atopic dermatitis and seborrheic dermatitis, which are commonly caused by inflammatory agents, such as, bacteria, fungal infections and allergens. Such problems are usually treated by creams, gels or ointments but in many instances such compositions are difficult to spread or result in a greasy and sticky appearance and are not appealing for use. The applicants claim that there is thus a widely recognised need for a new pharmaceutical or cosmetic composition which is semi-solid at rest and which liquefies upon application of shear forces, resulting in faster absorption and less greasiness and stickiness.

The compositions described comprise from 1 – 25% of a solidifying agent and 75-99% of a hydrophobic solvent which is typically liquid at ambient temperature. Preferably the amount of the solidifying agent is about 4% to about 12% and the hydrophobic solvent is about 88% to 96% of the total weight of the composition. Preferred solidifying agents include fatty alcohols and fatty acids having 15 or more carbons in their carbon chain. In a preferred class of solidifying agents, the carbon chain of the fatty acid is substituted with a hydroxyl group, e.g., 12-hydroxy stearic acid.

An important aspect of the fatty alcohols and fatty acids used is their therapeutic properties, which have been reported to include antiviral and anti-inflammatory effects and they are also claimed to exhibit metabolism modifying properties and tissue energising properties. Thus, the compositions provide extra benefits in comparison with currently used vehicles, such as petroleum, which is inert and non-active.

The hydrophobic solvent includes at least one marine animal-derived oil, at least one mineral oil, at least one silicone oil and at least one plant-derived oil. Examples include herring oil, cod-liver oil, salmon oil, corn oil, flaxseed oil, wheat germ oil, rape seed oil, evening primrose oil, rosehip oil, tea tree oil, melaleuca oil and jojoba oil. A particularly preferred embodiment includes poly-unsaturated oils and the composition contains at least 6% omega-3 oil and omega-6 oil.

The pH is preferably maintained in the range of about pH 5.5-7.0 and a variety of additional ingredients can be incorporated into the composition to provide the properties desired.

**Title: Delivery of reactive agents via multiple emulsions for use in shelf stable products**

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**Publication No.** USP 6,936,264

**Application No.** 799185

**Date of filing** March 5, 2001

**Assignee:** The Procter & Gamble Company

Described are multiple emulsion treatment compositions composed of droplets of one liquid dispersed in larger droplets of a second liquid which are in turn dispersed in a final continuous phase.

The emulsion treatment compositions include an aqueous continuous phase; and a discontinuous phase in the form of an oil-in-oil emulsion which comprises a reactive component solubilised in the internal oil and a middle oil in which the internal oil is dispersed. The middle oil is immiscible with the internal oil, it does not solubilise the reactive agent, it is immiscible with the aqueous continuous phase, and it includes a hydrophobic particulate thickener.

This type of emulsion protects the reactive agent from oxidation and other reactions that might occur if it came into contact with water or air. Suitable functional groups are antimicrobial compounds, UV-absorbing compounds, skin conditioning agents, hair conditioning agents, hair repair agents, hair styling agents, hair dyes and many other materials too numerous to list.

The two oils must be immiscible: Suitable non-polar oils for the internal phase include propylene carbonate, volatile and non-volatile silicone compounds, volatile or non-volatile hydrocarbon compounds, and mixtures thereof. The volatile silicone compounds can be a linear or cyclic polydimethylsiloxane, such as hexamethylsiloxane or a cyclomethicone and the preferred hydrocarbon compounds have 12 to 24 carbon atoms, and a boiling point of about 90° C. to about 250° C. The middle oil may be a natural triglyceride, an ester, various waxes and polyol esters and mixtures of two or more of these materials.

The middle oil also contains a particulate thickener that is immiscible in the aqueous continuous phase and may be tri-12-hydroxystearin, quaternium-18 hectorite or a wax, hydrophobic silica, hydrophobic clay or mixtures thereof. The composition may optionally include an emulsifier and other cosmetic ingredients to improve the aesthetics, efficacy and shelf life of the product and it can take any form commonly used for cosmetic application.

**Title:** Cream composition for skin care

**Publication No.** USP 6,372,236

**Application No.** 691446

**Date of filing** Oct 18, 2002

**Assignee:** Doosan Corporation, Korea

Claimed is a composition for skin care, which is identical in lipid composition and structural properties to intercellular lipid lamella of stratum corneum. The stratum corneum is primarily responsible for protecting the skin from external physical and chemical damage and also functions as a barrier to prevent the loss of internal water.

Ceramides play a particularly important role in preventing the loss of the water through the stratum corneum and in restoring any damage to the skin lipid barrier. Phytosphingosine, a

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ceramide precursor, is formed as a result of the degradation of the ceramides of the stratum corneum and functions as a barrier to inhibit the growth of microorganisms. A reduction of the ceramide content in the stratum corneum brings about a decrease of phytosphingosine content, leading to skin troubles such as acne and atopic dermatitis.

Ceramides and phytosphingosines are poor in stability in cosmetic formulations, however the applicants claimed to have developed a stable composition for skin care, which is similar in composition and structural properties to that of human skin and has excellent skin compatibility.

The ceramides used comprise derivatives of sphingosine, sphinganine and phytosphingosine, and mixtures thereof and of polar derivatives of phytosphingosine. Hydrogenated or hydroxylated phospholipids are incorporated for skin penetration enhancement and emulsification and C10 – C25 fatty acids are also included. The optimum ratio for skin care was found to 10:5:4 ceramides:cholesterol:fatty acids, by weight. The ceramides used are amide derivatives in which fatty acids are attached to the amine groups of sphingosine, phytosphingosine, and sphinganine.

The presence of cholesterol is helpful in the liquid lamellar crystallisation of ceramides, stabilising the liquid crystals formed. Cholesterol is preferably used at an amount of 2-8% based on the weight of the composition and most preferably at an amount of 40-50% based on the weight of the ceramides used. Phospholipids that are hydrogenated or hydroxylated with an iodine value of around 20 are preferred because of oxidative stability.

An illustrative formulation follows:-

Lipid Phase % <sup>w/w</sup>		Aqueous Phase % <sup>w/w</sup>	
Stearic Acid	1.00	Water	79.50%
Cholesterol	2.50	Phytosphingosine HCL	1.00
Tricaproid	5.00	Phytosphingosine	1.00
Ceramide	5.00	Lactic Acid	1.00
Lecithin	2.00	The aqueous phase is slowly added in the lipid phase with stirring at 80C. for 60 min and then, slowly cooled to room temperature to afford a creamy composition.	
Oleic Acid	1.50		
Linoleic Acid	0.50		

**Title: Fast-acting antimicrobial lotion with enhanced efficacy**

**Publication No. USP 6,383,505**

**Application No. 710804**

**Date of filing Nov 9, 2000**

**Assignee: Steris Inc, USA**

According to the applicants chemical control of bacteria and viruses is assuming increasing importance in the hospital and medical fields. A wide variety of topical compositions for treatment of the skin are available, including moisturisers, anti-acne compositions, sunscreens and the like, often in lotion form. The most common lotions use

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anionic emulsifiers to stabilise the composition. These lotions have no antimicrobial activity and are used for moisturising only.

Lotions are also available which leave an antimicrobial residue on the skin after washing but these are not themselves moisturising and would be harsh to the skin if utilised repeatedly in leave-on applications. The applicants claim that although lotions are available that claim to have both moisturising and antimicrobial properties they are either relatively ineffective at reducing the antimicrobial population on the skin or do not have sufficient moisturising properties. In turn they claim an oil-in-water emulsion incorporating 0.25-8.0% non-ionic emulsifier, 0.1-2.0% anionic emulsifier, 0.25-5% cationic antimicrobial agent, a carrier oil, thickener, humectant and water, fulfils the need for a fast acting antimicrobial lotion with moisturising properties.

Of the many non-ionic emulsifiers cited a combination of two or more steareth-n compounds is particularly preferred, to provide a hydrophobic lipophilic balance (HLB) of about 12.5. The anionic emulsifier should be low foaming and particularly preferred is sodium lauroyl lactylate. Chlorhexidene digluconate is the preferred antimicrobial agent, present from about 0.5 to about 4% by weight of the composition. Preferred humectants are propylene glycol and glycerin, which have a positive effect on both the moisturizing function and the antimicrobial activity of the composition. Emollient oils and a skin-conditioning agent such as Polyquaternium-7 are also incorporated and viscosity is increased by the presence of cetaryl alcohol.

The preferred composition is summarised as follows:

Component	Active ingredient	Range % <sup>w</sup> / <sub>w</sub>
Non-ionic emulsifier	Two or more steareth compounds	1.00 - 5.00
Anionic emulsifier	Sodium lauroyl lactylate	0.10 - 0.75
Thickener	Fatty alcohol	0.50 - 6.00
Humectant	Polyhydric alcohol	2.00 - 10.00
Skin conditioner	Polyquaternium - 7	0.02 - 2.00
Carrier	Cyclomethicone	5.00 - 12.00
Antimicrobial agent	Chlorhexidine digluconate	0.50 - 4.00

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**Title: Restructuring complex for cosmetic compositions**

**Publication No. USP 6,572,868**

**Application No. 620543**

**Date of filing July 25, 2000**

**Inventor: Cope; Sandra E, USA**

Described is a restructuring cosmetic composition comprising a combination of borage seed oil, squalane, ceramide 3, ceramide 6, red algae extract, dipalmitoyl hydroxyproline, oleuropein, sodium hyaluronate and a mixture of two or more types of carrageenans. The composition comprises only plant-derived ingredients and effective cell renewal is achieved with substantially no skin irritation during use.

An illustrative formula is as follows:

INGREDIENT	Preferred % <sup>w</sup> / <sub>w</sub>
Carrageenans	40 - 45
Borago Officinalis (Borage) Seed Oil	1 - 2
Squalane	1 - 3
Ceramide III	0.1 - 0.2
Ceramide VI	0.1 - 0.2
Red Algae Extract	1.9 - 2.25
Dipalmitoyl Hydroxyproline	0.05 - 1.00
Oleuropein	0.01 - 0.50
Triticum Vulgare (Wheat Germ) Extract, Saccharomyces Cerevisiae Extract, Sodium Hyaluronate mixture	0.01 - 0.50
Persea Gratissima (Avocado) Oil	0.1 - 0.50
Demineralised Water	qs

The Carrageenan component consists of a mixture of two or more types with the iota carrageenan in a higher proportion than lambda carrageenan. The Borage seed oil contains at least 20% of gamma-linolenic acid, either in a free acid form or as its salt, or as a mixture thereof. Triticum vulgare (wheat germ) extract, saccharomyces cerevisiae extract and sodium hyaluronate is added as a proprietary mixture containing proteinase inhibitors; it is trade-named Eashave from Pentapharm and has anti-irritant properties. The red algae extract is an aqueous mixture of butylene glycol and red algae extract obtained from Ahnfeltia concinna. Squalane is a non-occlusive moisturiser and is obtained from olive oil. Oleuropein is a bitter glucoside found in olives and the roots, leaves and bark of the olive tree, Olea europaea and has been found to protect low-density lipoproteins from oxidation. The pH of the composition is ideally 4.0 - 4.5. Other ingredients may be added to improve the efficacy, aesthetics and stability of the product.

**Title: Stable emulsions useful for skin care wipes**

**Publication No. USP 6,696,070**

**Application No. 947877**

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**Date of filing**      **September 6, 2001**

**Assignee:**          **Johnson & Johnson Consumer Co.**

Claimed are stable emulsions comprising salicylic acid and acrylates/C<sub>10</sub>–C<sub>30</sub> alkyl acrylate cross polymers which are used in combination with a non-ionic surfactant system on a substrate to form a mild wipe product that effectively delivers salicylic acid to the skin.

Salicylic acid is incorporated for its keratolytic action, for the prevention and treatment of comedones and for its slight antibacterial properties. Suitable amounts of salicylic acid range for example, from about 0.05 to about 0.5% by weight, preferably from about 0.05 to about 0.5% by weight.

The particularly preferred nonionic surfactant system is Poloxamer 124 with Polysorbate 20. The emulsions further comprise a lipophilic component to contribute to the aesthetics of the product. Suitable emollients are about 0.2% by weight of cyclomethicone, about 0.2% dimethicone, and about 1.00% by weight of C<sub>12</sub>–C<sub>15</sub> alkyl benzoate. The wipe product may also include a water-soluble polyol to function as a skin moisturizer, humectant, or emollient and as a solvent for one or more components of the composition. Most preferably the polyol is present from about 0.5 to about 2% by weight and free from ethanol. It may also contain a suitable anti-irritant such as allantoin, which is generally present from about 0.05 to about 0.5% by weight. The composition is preserved and the pH adjusted to 4.0 – 5.5 and it should have a viscosity of less than 1000 cps, which allows for impregnation into wet-wipe fabric.

**Title:**            **Exothermic cosmetic composition**

**Publication No.**    **USP 6,752,998**

**Application No.**    **901688**

**Date of filing**      **July 11, 2001**

**Assignee:**          **L'Oreal (Paris, FR)**

Described is an exothermic composition, which includes at least one zeolite; at least one surfactant; at least one magnesium or calcium halide; and a physiologically acceptable anhydrous medium. Another embodiment provides a composition, which includes a means for making the composition exothermic and processes for removing make-up from or cleansing the skin or mucous membrane that include the composition.

According to the applicants zeolites are particularly effective as exothermic compounds however, in order for the compositions containing them to have good cleansing properties, it is necessary to add surfactants foaming surfactants but the addition of surfactants leads to instability and the zeolites have a tendency to migrate to the bottom, which makes the composition unacceptable for use.

The zeolites are dispersed in a physiologically acceptable anhydrous medium such as glycerine, butylene glycol or polyethylene glycol or a mixture of these. The composition is generally in the form of a translucent to opaque gel, but it may also be in the form of a cream, a paste or a powder and it may be used, whatever its form, on a wipe.

Zeolites are silicoaluminates, which give the compositions containing them a high basic pH which is incompatible with topical use on the skin. The pH is reduced by the inclusion of a metal halide such as calcium chloride to the range 5 to 9 and preferably to pH 6 to 8.

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A mixture of nonionic surfactants or a mixture of nonionic and anionic surfactants is included to enhance cleansing and the composition may also include oils, fragrances, preserving agents, antioxidants, sequestering agents, fillers, colorants, cosmetic or dermatological active agents, or mixtures thereof.

### Typical formula for an exothermic cleansing composition

Material	% w/w
Butylene glycol	18.00
PEG-8	18.00
Glycerol	14.00
Polyglyceryl-3 hydroxylauryl ether	6.00
PEG-120 methyl glucose dioleate	1.00
Zeolite (activated potassium aluminosilicate)	40.00
Calcium chloride	3.00

The calcium chloride is dissolved in the PEG-8 and the butylene glycol. The molten surfactants are then added to the glycerol at 65° C. The 2 phases are homogenised, the mixture is cooled to room temperature and the zeolite is then added while homogenising. The product obtained is said to be a stable white gel, which is easy to apply and to remove, and which has a soft feel and good cleansing power.

**Title: Foaming cosmetic compositions used for cleansing or make-up removal**

**Publication No. USP 6,812,192**

**Application No. 400580**

**Date of filing March 28, 2003**

**Assignee: L'Oreal S.A. (Paris, FR)**

Claimed is a foaming composition for topical application for cleansing and make-up-removal, including at least one surfactant system comprising at least one fatty acid chosen from partially and completely neutralised fatty acids, at least one non-betaine amphoteric co-surfactant and at least one anionic co-surfactant of the sulphosuccinate type.

The fatty acid may be chosen from lauric acid, myristic acid, palmitic acid and stearic acid or it may be a mixture of two or more of these. The fatty acid component may be between 10 to 50% of the composition and approximately 55 to 75% should be saponified by sodium hydroxide, potassium hydroxide, triethanolamine or other suitable alkali.

A sulphosuccinate-type anionic surfactant such as disodium oleamido PEG-2 sulfosuccinate may be present from about 1 to about 15% by weight, relative to the total weight of the composition. The non-betaine amphoteric surfactant may be an amphopropionate or an amphotoacetate such as sodium cocoamphoacetate and represent up to 20% by weight of the composition. Further anionic and amphoteric surfactants may also be included.

The composition may also contain between 5% and 20% of a polyol such as glycerine; a glycol such as butylene glycol, isoprene glycol, propylene glycol, a polyethylene glycol

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such as PEG-8; sorbitol or sugars such as glucose, fructose, maltose, lactose, and sucrose. A polyquaternium-type cationic polymer or a cationic guar, which may impart softness and unctuousness to the foaming cream, may be included.

At least one thickener such as a polysaccharide biopolymer like xanthan gum, guar gum, alginates, and modified celluloses, or a synthetic polymer like the carbomers or an acrylate/acrylonitrile copolymer may be included. Other possible thickeners are smectites, modified hectorites and non-modified hectorites.

Finally the composition may incorporate those ingredients commonly found in cosmetic compositions that enhance the aesthetic properties or the stability of the product. These include oils, active agents, perfumes, preservatives, sequestrants, pigments, pearlescent agents, inorganic and organic fillers such as talc, kaolin, silica and polyethylene powders, and soluble colorants.

### Example Formulation

Ingredient	%w/w
Palmitic acid	10.64
Myristic acid	7.68
Lauric acid	5.00
Stearic acid	3.18
Potassium hydroxide	3.96
Disodium Oleoamido PEG-2 Sulphosuccinate	2.00
Sodium Cocoamphoacetate	2.00
PEG-7 Glyceryl Cocoate	2.00
Glycerine	1.00
Cetareth-60 myristyl glycol	0.50
Plus electrolyte, preservatives, sequestrant, antioxidant and perfume plus water to 100% by weight.	

**Title: Compositions for darkening the skin and/or hair**

**Publication No. USP 6,926,886**

**Application No. 285108**

**Date of filing October 31, 2002**

**Assignee: Johnson & Johnson, Inc**

The ability to generate a tanned appearance without incurring photo-damage is important to many individuals. According to the applicants, products supplied to provide a synthetic tan include materials such as dihydroxyacetone (DHA), beta-carotene, cantaxanthin and lycopene but these often result in unnatural and uneven distributed skin colour by saturating and staining the fat layers just below the skin.

Rhubarb is one of the oldest and well-known Chinese herbal medicines. Rhubarb root has traditionally been used both internally for stomach problems and externally for the

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treatment of atopic dermatitis and for cosmetic applications such as melanin formation and for improving skin roughness. This patent claims the use of a rhubarb extract for darkening the skin and hair.

A rhubarb extract is a blend of compounds isolated from a plant from the genus *Rheum*, which includes, but is not limited to, the plant *R. rhubarbarum*. Such compounds may be isolated from the seed, root, rhizome, fruit and leaf of the plant. The extract typically will be present in the composition in an amount from 0.01% to about 5% by weight.

The composition may also include a pigment capable of darkening skin and melanin and melanin derivatives or pigments from plants from the *Hedychium* or Bearberry genus or yellow, orange and red pigments from plants containing carotenoids or canthaxanthins are suggested. It may also include synthetic chemicals such as copper salts and synthetic carotenoids or canthaxantins. They will typically be present in the composition in an amount from about 0.005% to about 5% by weight. Dihydroxyacetone or lawsone may also be present in an amount from about 1% to about 7% by weight.

The active ingredients are supplied in typical cosmetic form for cosmetic applications and the patent lists the test protocols and results for in-vitro and in-vivo testing of various compositions to show that they produce a natural-looking darkening of the skin and hair.

**Title:       Transparent concentrated hair conditioning composition**

**Publication No.   USP 6,927,196**

**Application No.   387885**

**Date of filing     March 13, 2003**

**Assignee:         The Procter & Gamble Co**

According to the applicants shampooing cleans the hair by removing excess soil and sebum. However, shampooing can leave the hair in a wet, tangled, and generally unmanageable state and when it dries it is often left in a dry, rough, or frizzy condition. A variety of approaches have been developed to alleviate these after-shampoo problems including post-shampoo application of hair conditioners and hair conditioning shampoos, which attempt to both clean and condition the hair from a single product.

The applicants identified a need to provide concentrated hair conditioning compositions which have a transparent appearance and disperse easily upon contact with water, yet provide hair conditioning benefits such as smooth feel when the hair is wet, combing ease when the hair is wet or dry, and softness when the hair is dry.

The composition is designed to "purify" water by chelating heavy metal ions and calcium and magnesium salts and it also contains from about 1% to 20% of conditioning agents preferably selected from the group consisting of long-chain ammonium compounds, hydrophilically substituted cationic surfactants, cationic polymers, hydrophilically substituted silicone compounds, polyalkylene glycols, and mixtures thereof. A preferred mixture is stearylalkonium chloride with polyquaternium-4 or 11 or 16, although many other mixtures are described.

A polyethylene glycol such as PEG-12 or PEG-20 is added as part of the carrier system because of its good water solubility and transparency and the composition may also include from about 0.01% to about 20% of a hydrophilically substituted silicone compound. Those having substitute alkoxy groups, amino groups, quaternary groups, and

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mixtures thereof are preferred, particularly those materials previously known as dimethicone copolyols.

Finally the compositions may include perfume, preservatives, pH adjusting agents and other ingredients to improve the aesthetics, efficacy and stability of the product.

**Title: Clear hair treatment composition**

**Publication No. USP 6,528,046**

**Application No. 691761**

**Date of filing March 4, 2003**

**Assignee: Wella AG**

Claimed is a leave-in hair-care agent or a hair rinse, preferably in the form of an optically clear product containing hydrophilic silicones and certain associative thickeners and cationic hair-care substances.

Suitable hydrophilic silicones are polydimethylsiloxanes with aminoalkyl groups known collectively as amodimethicones and dimethylsiloxanes with two terminal amine groups such as quaternium-80. Suitable silicones with alkylene oxide groups are polydimethylsiloxanes with polyoxyalkylated substituents, particularly silicones modified with polypropylene oxide, polyethylene oxide or a mixture thereof. In this case, the alkylene oxide groups can be lateral or terminal and the polymers can be polydimethylsiloxane/polyalkylene oxide block copolymers. The alkylene oxide-modified siloxanes are also known as dimethylsiloxane glycol copolymers or dimethicone copolyols. Suitable silicones with hydroxyl groups are the dimethiconols. These are polydimethylsiloxanes with hydroxyl end groups. Suitable silicones with thiosulphate groups are known under the INCI name dimethicone/sodium PG-propyldimethicone thiosulfate copolymer.

The nonionic amphiphilic associative thickener is a polymer containing both hydrophilic and hydrophobic groups. Associative thickeners are water-soluble polymers containing surfactant-like hydrophobic moieties which, in aqueous medium, are capable of associating with themselves as well as with other hydrophobic substances and the resulting network causes the medium to thicken or to gel. Particularly preferred associative thickeners are hydrophobically modified aminoplast polyether copolymers with the INCI names polyether 1, PEG 180/octoxynol 40/TMMG copolymer and PEG 180/laureth 50/TMMG copolymer.

Suitable cationic surfactants contain amino groups or quaternised hydrophilic ammonium groups, which in solution, bear a positive charge: a preferred example is cetyltrimethylammonium chloride. The composition may also include a cationic polymer such as polyquaternium 10, 11 or 16. Other polymers that also be employed are chitosan, chitosan salts and chitosan derivatives and chitosonium pyrrolidonecarboxylate is particularly preferred.

To maintain a clear and transparent composition it may be supplied in an aqueous-alcohol base with a water content from about 60 to 90 wt % and the alcohol content is then preferably from about 5 to 20 wt %. The alcohol may be either ethanol or isopropanol, however the alcohol content is not always necessary. A non-ionic surfactant may be included at about 1 - 5% and the composition may also include glycerol, ethylene glycol or propylene glycol, used in an amount from about 0.5 to 5 wt %.

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The composition may be supplied as a lotion or gel and may contain other actives and additives to further improve its aesthetics, efficacy and stability.

**Title:** Saponin or sapogenol compositions for increasing collagen IV synthesis

**Publication No.** USP 6,641,848

**Application No.** 700654

**Date of filing** November 17, 2000

**Assignee:** Parfums Christian Dior (Paris, FR)

Claimed is the use of saponins or sapogenols for treating the skin in order to increase the amount of collagen IV in the dermo-epidermal junction. It is applicable for cosmetic anti-wrinkle treatment and in the treatment of diseases associated with a deficiency of the dermo-epidermal junction resulting from an insufficient amount of collagen IV.

Collagen IV is a major constituent of the dermo-epidermal junction, which is involved in maintaining a functional interface between the dermis and the epidermis. For its optimum functioning it need sufficient collagen IV and to maintain or restore the physiological state of the dermo-epidermal junction, it is desirable to have a means of increasing the amount of collagen IV therein.

The applicants claim that triterpenic saponins and sapogenols are particularly appropriate as agents for increasing the amount of collagen IV in the dermo-epidermal junction and claim the use of at least one cosmetically acceptable saponin or sapogenol of triterpenic character as a cosmetic agent for increasing the amount of collagen IV in the dermo-epidermal junction.

Many plants are named as possible sources of the triterpenic saponin or sapogel but *Glycine soja* (soya) and plants of the medicago type such as *Medicago alfalfa* and *Medicago sativa* are particularly preferred. The active extracts comprise between 0.01% and 2.00% by weight of the final composition. Their efficacy can be increased if they are used in association with ecdysteroids, and particularly ecdysterone, which are natural substances found in insects and in certain plants such as *Polypodium vulgare* and *Cyanotis arachnoidea*. Their use in conjunction with other actives is also claimed, particularly in association with vitamins A, B and E and with 5- $\alpha$ -reductase inhibitors such as that found in an extract of *Serona repens*.

An example formulation for combating wrinkles and preventing photo-ageing is given as follows:

Retinol	2000 IU
Retinol palmitate	0.01 g
Ascorbyl palmitate	0.10 g
Wheat proteins	3.00 g
Soya saponins	0.05 g
Madecassoside	0.05 g
Parsol MCX	7.00 g
Benzophenone	3.10 g
Shea butter	1.00 g

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Perfumed cream excipient	qs 100 g
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**Title: Wrinkle-reducing system**

**Publication No. USP 6,684,107**

**Application No. 920550**

**Date of filing August 1, 2001**

**Assignee: Voyager Medical Corporation**

Described is a system for reducing wrinkles on human skin utilising an electrode to conduct a micro-current through the surface of the wrinkle into the underlying dermal layer. The electrode is moved in multiple passes along the length of the wrinkle while generating a periodically repeating micro-current having a peak amplitude in the range of 10-40 micro-amps, a peak current density in the range of 10-50 microamps/cm<sup>2</sup>, and a frequency in the range of 5-15 Hz. The electrode is attached to a case containing the battery for generating the current and a hand-engaging second electrode on the surface of the case completes a conductive path through the user's body.

The applicants claim that the application of electrical currents to various parts of the human body to achieve various therapeutic results is well known although how a particular therapeutic result is achieved is not always well understood. They are used to help reduce pain and itching, to relieve sinus and nasal congestion, to promote the healing of skin ulcers and of soft-tissue wounds in human skin and to electronically stimulate the skin and provide "facial toning" in beauty salons and similar establishments.

It is claimed that the present invention provides a system that enables an individual to safely self-administer a short course of treatment to reduce wrinkles on his or her skin. The design of the device is inherently safe because the voltage and micro-current generated, and the resultant current density, are very low. Such low micro-current levels are sufficient to stimulate blood flow and cellular oxygenation, prevent cellular dehydration, and restore healthy cell regeneration in the dermal layer so as to reduce wrinkles effectively. Only dermal cells, and not underlying muscle tissue, need be affected to achieve the desired result.

**Title: Cosmetic treatment method for fighting against skin ageing effects**

**Publication No. USP 6,471,972**

**Application No. 701341**

**Date of filing October 29, 2002**

**Assignee: LVMH Recherche (Paris, FR)**

It is claimed that it is possible to slow down or treat skin ageing, and in particular to reduce the depth of wrinkles, to slow down their appearance, and to restore the tonicity and elasticity of human skin by improving the adhesion of the keratinocytes of the epidermal basal layer to the collagen IV at the dermo-epidermal junction. Levels of collagen IV may be increased by stimulating its synthesis or by inhibiting the enzymes which degrade its constituent proteins.

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Described are cosmetic compositions with anti-wrinkle activity comprising at least one agent for promoting the adhesion of the keratinocytes of the epidermal basal layer to the dermo-epidermal junction in association with a divalent metal salt or complex.

The divalent metal salt or complex is preferably a divalent metal chloride or a divalent metal salt or complex with a cosmetically acceptable organic acid such as an amino acid or an alpha-hydroxy acid, particularly citric acid, glycolic acid or gluconic acid, Preferred are magnesium aspartate or magnesium chloride.

Any stimulant of collagen IV synthesis can be used but preferred are soya saponins and soya sapogenols, and extracts of *Medicago sativa*. Named alternatives are extracts of *Potentilla erecta* and *Bertholletia excelsa*.

Many possible additional extracts and active substances are also named and it is also suggested that UV-A filters and UV-B filters, particularly titanium oxides and zinc oxides, oxybenzone and Parsol MCX improve the efficacy of the compositions. They may also contain substances such as ascorbic acid and its derivatives for limiting the damage caused to DNA by limiting the formation of thymine dimers and inhibiting melanin and tyrosinase synthesis.

An example w/o Anti-wrinkle cream is given as follows:

Magnesium aspartate	0.30 g
Dry extract of <i>Potentilla erecta</i>	1.00 g
Glycerol	5.00 g
Propylene glycol	2.00 g
Ceramide III	0.04 g
UV filters	9.00 g
Methylsilanol mannuronate	0.05 g
Dry extract of <i>Perilla frutescens</i>	1.00 g
Dry extract of <i>Centella asiatica</i>	0.50 g
Soya peptide	1.00 g
Retinol palmitate	0.20 g
W/O emulsion excipient	qs 100 g

**Title: Compositions and methods for treatment of rosacea**

**Publication No. USP 6,927,206**

**Application No. 457045**

**Date of filing: June 6, 2003**

**Assignee: ProCyte Corp.**

Rosacea is a chronic inflammatory skin disorder characterised by four distinct stages predominantly affecting the central aspect of the face. The first evidence of rosacea is frequent and intense vasodilation or flushing. This is followed by a vascular stage characterised by an erythema that can persist for hours or days after a triggering event. It

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may then progress to an inflammatory stage characterised by a symmetrical array of papules and pustules in addition to the persistent erythema and this stage can often become a chronic condition.

Claimed is a method for treating rosacea of the skin by the topical application of a composition containing at least one peptide-copper complex and various active cosmetic substances that render the compositions particularly effective. The stability of the copper peptide is enhanced if it is in liposome form or deposited within a micro-sponge or polymer matrix or otherwise encapsulated. The final composition may be an emulsion, microemulsion or gel. Copper salts alone are ineffective and the copper must be delivered in a biologically acceptable form as, for example, copper complexed with a biologically acceptable carrier molecule such as a peptide.

The compositions may be enhanced by the addition of a skin lightening agent, a sunscreen agent, a skin conditioning agent, an emollient, a humectant, or a mixture thereof.

Additionally they may contain sulphur, azelaic acid or other active cosmetic substance selected from the group consisting of allantoin, tocopherol, niacinamide, phytosterols, isoflavones, panthenol, bisabolol or farnesol.

A representative formulation is shown as follows:

<b>Ingredients</b>	<b>% w/w</b>
Water	73.80%
Glycerin	1.00%
Xanthan gum	0.50%
Diisopropyl adipate	4.00%
Isocetyl stearate	6.00%
Octyl palmitate	10.00%
Glyceryl stearate	1.00%
Cetyl alcohol	1.00%
Stearyl alcohol	0.80%
Behenyl alcohol	0.50%
Palmitic acid	0.25%
Stearic acid	0.25%
Glycyl-L-histidyl-L-lysine:copper (II)	0.30%
Propylene glycol	0.55%
Diazolidinyl urea	0.03%
Iodopropynyl butylcarbonate	0.02%
Total	100.00%

**Title:** Method of skin care

**Publication No.** USP 6,919,306

**Application No.** 076686

**Date of filing:** February 14, 2002

**Assignee:** Yaizu Suisankagaku Ind.

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Described is a method for promoting amelioration of rough skin and wrinkles by the oral administration of a skin care agent to improve moisture and tension of the skin. The skin care agents are a collagen peptide with an average molecular weight of 1,000 to 10,000 obtained from fish skin or fish bone by enzymolysis. This is followed by reverse osmosis to purify the material so that the maximum level of free amino acids is 1% and from 0.5 to 5.0g per day may be taken. The second active ingredient is N-acetylglucosamine obtained by acid or enzyme hydrolysis of chitin and the preferred daily intake is 0.5 to- 1.50g.

The two materials are administered in an ingestible carrier and it is claimed that the N-acetylglucosamine is rapidly absorbed from the intestine and reaches the cutaneous layer where it promotes biosynthesis of mucopolysaccharides such as hyaluronic acid, and thus improves the condition of skin. Similarly, the collagen peptide is digested and absorbed easily and has the effect of accelerating skin metabolism, improving skin tension and moisture retention.

The composition may contain other components recognised to have a skin care effect, for example, collagen, chondroitin sulfate, hyaluronic acid, vitamin C, vitamin B group, trehalose and ceramide and it is preferred to contain at least one selected from collagen, chondroitin sulfate and vitamin C.

Various tests to prove the efficacy of the compositions are described and oral administration of them on a regular basis appears to improve skin condition.

**Title: Compositions and methods for softening, thinning and removing hyperkeratotic tissue**

**Publication No. USP 6,858,215**

**Application No. 171602**

**Date of filing: June 14, 2002**

**Assignee: Buck; Carol J.**

Dry skin is a normal consequence of aging and is aggravated by cold, dry or windy climatic conditions. Treatment unusually involves the use of moisturisers after bathing, including petrolatum, lanolin, urea, alpha hydroxy acids, lactic acid or ammonium lactate to reduce scaling and help the skin hold water.

Normally epidermal cells are gradually pushed to the surface by underlying dermis cells where they exfoliate. When these cells do not exfoliate naturally they accumulate on the surface to form hyperkeratotic tissue causing discomfort. Hyperkeratotic tissue in mammals includes calluses and fissures, corns and dry skin scales and flakes. Common methods for managing hyperkeratinised tissue are the application of acids in lotion or cream carriers, moisturising creams or lotions or mechanical scraping.

The patent describes compositions and methods for treatment of hyperkeratotic tissue employing proteolytic enzymes originally developed for the hydrolysis of food-related proteins and currently commonly used as food grade meat tenderisers and flavour enhancers. With regular application these enzymes safely soften, thin and exfoliate hyperkeratotic formations on the skin when placed in a suitable carrier for dermatological use. The enzymes lysing only the 10-end peptide bonds of keratin protein, the dominant protein component of hyperkeratotic skin. They have minimal effect on normal skin

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because healthy epidermis lacks keratin, other than a fine layer of dead skin cells associated with normal sloughing.

An example of an appropriate proteinase enzyme is a fungal protease/peptidase complex produced by submerged fermentation of a selected strain of *Aspergillus oryzae*. Its optimum pH is 5.0 – 7.0 and its optimum working temperature is 50°C. Another example is Subtilisin Carlsberg, an endopeptidase produced by submerged fermentation of a selected strain of *Bacillus licheniformis*. The main enzyme component, Subtilisin A, is an endoproteinase and its optimum activity is at a pH of 6.5 to 8.5 and, although its optimum working temperature is 60°C, it shows good activity (about 40%) at normal human body temperature.

The compositions described are pharmaceutical or cosmetic preparations for topical application such as solutions, creams, ointments, ointment sticks, gels, powders or adhesive plasters. The compositions have a neutral or alkaline pH, as the enzymes become inactive in an unduly basic or acid environment. The compositions may contain additives such as fungicides and fragrance and those excipients commonly used in cosmetic and dermatology products.

Tests conducted under bilateral, placebo-controlled, double blind conditions evidenced no irritation to adjacent normal skin and a 50% reduction in hardness and density within 14 days of nightly application to foot callus.

**Title: Sunscreen compositions**

**Publication No. USP 6,540,986**

**Application No. 755918**

**Date of filing January 5, 2001**

**Assignee: Johnson & Johnson Consumer Products, Inc.**

Claimed are new and useful ultraviolet radiation sunscreen agents and compositions displaying enhanced protection and methods of protecting human skin against the potentially harmful effects of sunlight.

The effectiveness of a sunscreen product is indicated by its sun protection factor (SPF). The sun protection factor is the ratio of the amount of exposure required to produce a minimal erythema reaction in protected skin to the amount required to produce the same reaction in unprotected skin. Recent public awareness of the problems of exposure to sunlight has led to a demand for sunscreen products with SPF values at or above SPF 8.

According to the applicants a desirable sunscreen product should impart protection in both the UV-A and UV-B ultraviolet radiation ranges; be waterproof and perspiration proof; be non-staining and non-greasy; and not cause irritation to the user. Consumer research studies indicate that a sunscreen formulation should rub in easily, leave the skin non-sticky and, above all, should be invisible on the skin after application. It is claimed that this patent meets these criteria. Sunscreen compositions containing organic sunscreen agents have been found, in some cases, to be irritating to the skin, therefore use has been made of inorganic sunscreen agents, such as titanium dioxide and zinc oxide.

The compositions claimed are oil-in-water emulsions containing an inorganic sunscreen, such as titanium dioxide or zinc oxide or a mixture thereof; an anionic emulsifier and a carrier oil to provide sunscreen formulations having an SPF of at least 10. They are easily made by simple mixing and provide an excellent dispersion of the inorganic sunscreen

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agent throughout the composition, thus ensuring even skin coverage and they are substantially invisible upon application to the skin.

Suitable anionic emulsifiers include sodium laurate, sodium lauryl sulfate, DEA cetyl phosphate and dioctyl sulfosuccinate but the most preferred emulsifier is sodium stearate present at a level between 0.5% and 5%. The applicants claim that straight-chain fatty acid salts, having melting points of about 70°C or higher are preferred due to their structure. Extra emulsion stability may be provided by including non-ionic surfactants in the composition.

The carrier oil should be present should be present in the amount of between about 2% and 3% and most preferred is isopropyl PPG-2-iIsodeceth-7 carboxylate. An emollient oil such as mineral oil, vegetable oil, dimethicone or a fatty acid ester should be present in the formulation in a ratio to the carrier oil concentration of about 2:1.

The preferred sunscreen is microfine titanium dioxide, present at from 3% to 10% and the ratio of titanium dioxide to oil phase should be about 0.5:2.3. The pH should be above 5.5 and the composition may also include additional ingredients to improve shelf life and aesthetic appeal.

The following formula had an SPF of 16.9 and was given as a basic example and used to illustrate the effects of varying the composition.

Ingredient	% w/w
Aqua (Water)	74.50
Carbopol 940	0.25
Disodium EDTA	0.10
Propylene glycol	3.00
BHT	0.05
Isopropyl PPG-2-isodeceth-7 carboxylate	2.50
Stearic acid	5.00
Cetyl alcohol	1.00
Caprylic/capric triglyceride	3.75
Microfine titanium dioxide	4.50
Sodium hydroxide 10% solution (to pH 8.25)	5.00
Quaternium 15	0.10
Parfum (Fragrance)	0.25

**Title: Sun protection product with water-insoluble linear polyglucan microparticles**

**Publication No. USP 6,746,665**

**Application No. 869394**

**Date of filing February 25, 2002**

**Assignee: Celanese Ventures GmbH**

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Described is a sun protection product which comprises spherical microparticles composed of at least one water-insoluble linear polyglucan

Individual polysaccharides such as poly-.beta.-1,3-glucans, are known to filter solar radiation. Such polyglucans can be obtained from yeasts; they are water-insoluble and have a linear structure with a small proportion of beta.-1,6 branching. They may be incorporated in emulsions at up to 70% of the composition but the preferred level is 10% or less. They require no special dispersing aids or techniques and they impart a soft velvety feel to the composition.

Linear polyglucans may be obtained naturally or by biotechnology methods, which includes biocatalytic, biotransformation, or fermentation processes. This latter method uses naturally occurring organisms, such as fungi, algae, bacilli, bacteria or protists or genetically modified versions of these, and the polysaccharide may be of any origin although starch and starch analogues are preferred. For isolation and purification the linear polyglucans are dissolved in DMSO and then precipitated using water or dichloromethane or a mixture of the two.

By using suitable additives, it is possible to influence the properties of the microparticles, such as size, surface structure and porosity. The additives are added to the precipitating agent and when used, water-soluble cellulose provides particularly smooth microparticles with little deviation in size and shape are obtained.

5% by weight of microparticles of a linear polyglucan were added to a standard emulsion and found to impart an SPF of 6.15.

**Title: Photostabilisation of dibenzoylmethane derivatives**

**Publication No. USP 6,803,063**

**Application No. 275870**

**Date of filing November 8, 2002**

**Assignee: Ciba Specialty Chemicals Co.**

Claimed is the use of triazine derivatives for improving the photostability of dibenzoylmethane derivatives and cosmetic compositions containing such for protection against UV radiation.

A UV filter should, ideally, convert absorbed UV radiation quickly and efficiently into harmless thermal energy without the UV filter and its protective action being degraded or the function and reliability of the sun protection preparation being impaired. Although there is a large selection of suitable UVB filters, good UVA absorbers are rare because they are mostly of low activity or of inadequate photostability. In particular, dibenzoylmethane derivatives such as butyl methoxydibenzoylmethane, the most commonly used UVA filter, are degraded relatively quickly under the action of sunlight and, as a result, lose their protective action. If used in combination with ethylhexyl methoxycinnamate or other cinnamic acid esters, they are also degraded.

The applicants claim that bis-ethylhexyloxyphenol methoxyphenyl triazine effectively stabilises combinations of ethylhexyl methoxycinnamate and butyl methoxydibenzoylmethane against photo-degradation. The compositions may be emulsions or other suitable compositions for solar protection and may incorporate additional organic sun filters or micronised metallic oxides. Basic formulations containing

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UVA/UVB filters are given and the effects of adding that bis-ethylhexyloxyphenol methoxyphenyl triazine to improve photostability shown.

**Title: Creamy, stable homogeneous antiperspirant/deodorant composition**

**Publication No. USP 6,719,966**

**Application No. 127876**

**Date of filing: April 23, 2002**

**Assignee: Andrew Jergens Co**

Claimed is an antiperspirant/deodorant composition which includes a homogeneous wax-liquid matrix, that minimises syneresis, which provides smooth skin emolliency and skin conditioning, that minimises white residue left on the skin, and promotes easier shaving with less irritation.

In addition to their efficacy as a deodorant or antiperspirant such products should not leave a white residue on the skin or clothing and should also provide good skin feel and remain stable without exhibiting syneresis.

The compositions described preferably include between 15% and- 26% antiperspirant, from 40 – 60% volatile fluid such as hydrogenated polydecene, isododecane, cyclopentasiloxane or mixtures thereof, up to 25% wax structurant such as behenyl alcohol, and a water-based botanical such as Zingiber officinale (ginger) root extract and the preferred forms are a semi-solid composition or a solid stick composition.

The antiperspirant actives listed are aluminium and zirconium salts, such as aluminium halides, aluminium chlorhydrate, aluminium hydroxyhalides, zirconyl oxyhalides, zirconyl hydroxyhalides, and mixtures thereof, with Aluminium zirconium tetrachlorohydrax-Gly being particularly preferred. Deodorant compositions include any known or otherwise safe and effective deodorant active or perfume suitable for topical application to human skin and are included at about 0.1% to 0.5%. Preferred deodorant actives are triclosan, triclocarban and combinations thereof, wherein the total concentration of triclosan and triclocarban when used together in a composition ranges from about 0.2% to about 0.6%, by weight of the composition.

Other materials to improve the efficacy, aesthetics and stability of the compositions may be included.

Illustrative formulations are shown in the table.

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Ingredient Name	% w/w	% w/w	% w/w
Cyclopentasiloxane	46.5	46.1	51.9
Hydrogenated polydecene	-	17.0	6.9
Isododecane	7.0	-	-
Behenyl alcohol	5.0	5.1	5.5
C24-28 alkyl methicone	2.0	2.3	2.0
Dimethicone crosspolymer	-	-	1.2
Isostearyl benzoate	1.0	-	-
Trimethylpentanediol/adipic acid/ Isononanoic acid copolymer	-	1.0	-
Colloidal silicone dioxide	2.5	2.5	2.5
Corn starch modified	4.0	-	1.0
Aluminium zirconium tetrachlorohydrate-Gly	24.0	24.0	24.0
Aqueous Ginger Root Extract	7.0	3.0	5.0
Fragrance	qs	qs	qs

**Title: Absorbent articles with non-aqueous compositions containing botanicals**

**Publication No. USP 6,749,860**

**Application No. 747382**

**Date of filing: December 22, 2000**

**Assignee: Kimberly-Clark Worldwide, Inc**

Diaper liners and other body-facing materials may be treated with emollients, such as petrolatum, that can be transferred to the skin through normal diapering practices. Once transferred to the skin, diaper liner formulations may provide an artificial barrier against faeces and urine. In order to process and apply the formulations they need to be in a semi-solid or fluid state. However, in order to have stability on the body-facing material after manufacture, the formulations need to be semi-solid or solid across a wide range of shipping and storage temperatures.

Described are absorbent articles including non-aqueous compositions for protecting the barrier function of the skin. The compositions can be applied to the body-facing surfaces of absorbent articles so that the compositions come into contact with the skin to provide

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several benefits including prevention and alleviation of skin irritations associated with the use of absorbent articles. The compositions can include emollients, viscosity enhancers and extracted botanical actives

The emollient is selected from petrolatum, vegetable based oils, mineral oils, dimethicone, lanolin, glycerol esters, alkoxyated carboxylic acids, alkoxyated alcohols, fatty alcohols and mixtures thereof. The botanical active is selected from echinacea, yucca, willow herb, green tea, black tea, oolong tea, Chinese tea and mixtures thereof. It also contains a viscosity modifier and a wax to increase the melting point plus optional ingredients to improve the aesthetics, efficacy and stability of the composition.

The use of more than one rheology modifier, such as organically modified clay in combination with silica, can provide a benefit to the rheology of the compositions by increasing the viscosity of the compositions at process temperatures. In use a small amount of shear causes the composition to become soft and to spread easily resulting in an improvement in the transfer of the composition from the body-facing liner of the article to the skin.

The patent has more than 50 claims and much of it is devoted to descriptions of the absorbent materials but there are extensive test protocols described and the process of selecting the optimum ratios of emollients, viscosity modifiers and active botanical ingredients is of interest to any one in this field.

**Title: Plant extracts with anti-radical type action**

**Publication No. USP 6,861,078**

**Application No. 307977**

**Date of filing: December 3, 2002**

**Assignee: Cognis France**

Described is the use of plant extracts, especially plant extracts with an anti-radical-type action, and a cosmetic or dermo-pharmaceutical composition containing extracts of this type. The extracts are prepared from certain medicinal herbs used by the Creole and Palikur peoples of French Guyana in their traditional medicine. The plants are of the botanical genus belonging to the group formed by Clidemia, Inga, Sabicea, Astrocaryum, Siparuna, Eperua, Byrsonima, Priva, Coutoubea or Goupia.

The applicants discovered that extracts of these plants have various biological and biochemical actions linked with very high cutaneous tolerance, which enables them to be used directly in compositions for cosmetic use and particularly in dermo-cosmetics. The extracts have a strong anti-radical-type action and also an inhibiting action on tyrosinase. They also have anti-UVA and anti-UVB activity and protect catalase from UVA, and an anti-elastase, anti-collagenase, anti-glycation and lypolytic action making them of interest in anti-ageing and slimming products for topical application.

The parts of the plants used to prepare and obtain the extracts are roots, cortices, leaves and foliated stalks, fruit, grains and blossoms and the extracts are used alone or combined together or with other active compounds in products designed mainly to control ageing skin, hyper-pigmentation of the skin, patches of pigment, loss of skin elasticity, wrinkles, irritation and inflammation, irritation caused by environmental pollution or sunshine and for slimming formulae.

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Tests used to evaluate anti-free radical activity, UVA protection of human fibroblasts and their effects on enzyme activity are described. The inhibition of melanogenesis by inhibiting the action of tyrosinase is also covered and in all cases the difference in efficacy in extracts from the various plants and the methods of extraction are compared.

The patent contains some illustrative formulations, one of which describes a skin bleaching composition as follows:-

Fraction A:	%w/w
Glycerin stearate (and) Cetearth-20	15.0 0
Paraffin oil	3.0 0
Ascorbyl palmitate	3.0 0
Dimethicone	3.0 0
Cetyl alcohol	0.5 0
PEG 30 glycerol isostearate	2.0 0
Fraction B:	
Aqua (Water)	72.2 0
Methylparaben	0.2 0
Imidazolidinyl urea	0.3 0
Ethanol extract of Inga bourgoni	0.5 0
Fraction C	
Perfume	0.3 0

**Title:** Therapeutic bath salts and method of use

**Publication No.** USP 5,958,462

**Application No.** 62683

**Date of filing:** May 23, 1997

**Applicants:** McLean; Linsey

Claimed are therapeutic bath salts comprising a magnesium salt, such as magnesium sulfate trihydrate; a lithium salt, such as lithium chloride; a copper salt, such as copper gluconate; a carbonate, preferably sodium or potassium bicarbonate or sodium sesquicarbonate; and essential oils. The preferred oils include rosewood oil, eucalyptus oil, sandalwood oil, ylang ylang oil, lavender oil and patchouli oil, either alone or in various combinations.

Exercise causes glucose molecules to be changed to pyruvic acid, which is then changed to lactic acid, which collects in the muscles. Because of the acid's effect on the peptide bonds of amino acids excess lactic acid causes deformation of protein chains leading to muscle fatigue and muscle ache.

After exercise the bath salts are added to warm bath water and by resting in the bath, the user accrues the combined benefits of external therapy and internal therapy. It is claimed that doing so counteracts the effects of lactic acid at the cellular level. By providing a

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warming environment, the therapeutic bath helps to relax contractions and enhance absorption of the base minerals through tissue and cellular pores. Chemical reactions leading to the normalisation of the protein chains are normally driven by enzymes and bases. However, at times of anaerobic cellular respiration during exercise, enzymatic activity is slowed because of the lowering of both intra- and extra-cellular pH. The heating nature of the bath therapy speeds up chemical reactions in the same manner as enzymatic reactions.

The bath salts preferably include copper, which is known to activate and drive several anti-inflammatory enzyme systems and biochemical pathways. The user experiences relaxed muscles, elimination or reduction of muscle spasms, arthritic pain and swelling, and an overall enhanced feeling of well-being by alleviating depression and related moods.

**Title:       Cleansing compositions with milk protein and aromatherapy**

**Publication No.   USP 6,780,825**

**Application No.   097057**

**Date of filing:    March 13, 2002**

**Assignee:         Playtex Products, Inc.**

Described are cleansing compositions for infant and toddler use that have a moisturiser system containing a milk protein and an aromatherapy system. The stated objectives of the applicants are to provide cleansing compositions that are tear-free., non-drying to the skin, that moisturise and condition the skin and which promote a calming effect and overall enhancement of the mood of the bather.

Preferred anionic surfactants include sodium laureth sulfate and sodium lauroyl ethylenediaminetriacetate at about 1 – 8% by weight of the total composition. Preferred nonionic surfactants include PEG-30 glyceryl cocoate, PEG-80 glyceryl cocoate, decyl glucoside, or any combinations thereof and present at about 5 – 10% by weight.

Cocamidopropyl betaine is also present at about 1 – 4% to act as foam booster and the total surfactant content is preferably less than 15% by weight of the total composition.

The composition has a moisturiser system based on sunflower seed amidopropyl dimethylamine lactate with glycerine and hydrolysed milk protein. The total moisturiser system is present at about 3 – 4% and the hydrolysed milk protein content is about 0.5% of the total composition.

Although many essential oils are listed those preferred are lavender and chamomile. Both are used for promoting relaxation and a calming effect to the bather. The total composition may include other ingredients to improve the efficacy, aesthetics and stability of the product.

**Title:       Pesticidal compositions containing plant essential oils against human body louse**

**Publication No.   USP 6,974,584**

**Application No.   269870**

**Date of filing:    October 15, 2002**

**Assignee:         Ecosmart Technologies, Inc**

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Each year over 10 million Americans get head lice (pediculosis) alone. Head lice are spread through direct contact or the sharing of certain household items and clothing. Many health professionals and parents are very concerned about the toxicity of pesticide shampoos, especially those containing Lindane. Furthermore, recent research indicates that head lice are becoming resistant to permethrin or pyrethrin shampoos, two current treatments for the problem.

Botanical pesticides are of great interest because they are natural pesticides derived from plants that are safe to humans and the environment. The applicants claim the use of essential oils and ingredients that may be isolated from them. While similar products often use the pure oil this patent predominantly uses active materials isolated from the oil. Of particular interest are materials with a monocyclic, carboxylic ring structure having six-members and substituted by at least one oxygenated or hydroxyl functional moiety, which includes compounds such as pyrethrins, neem oil, d-limonene, and citronella oil. Among many others named are eucalyptol, eugenol, iso-eugenol, galaxolide, geraniol, guaiacol, ionone, menthol, methyl anthranilate, methyl ionone, methyl salicylate, vanillin and ethyl vanillin.

It is believed that certain plant essential oils antagonize a pest's nerve receptors or may act as drug metabolising enzyme inhibitors. They may also act as agonists or antagonists against the octopamine receptors that are distinct to invertebrates. It is claimed that use of the compositions generally results in 100% mortality on contact, along with good repellence and residual control. They are advantageously employed as pesticidal agents in uses such as shampoos, hair gels, body lotions, and other applications for the treatment of head lice, body lice, and pubic lice. They may also be used in combination with other pesticidally active compounds, to increase efficacy and reduce toxicity, generally making conventional pesticides more acceptable.

A mixture of 40% thymol, 25% trans-anethole, 15%  $\alpha$ -terpineol, 10% eugenol, and 10% citronellal in a suitable carrier was shown to compare favourably with pyrethrum extract in benzyl alcohol in both repellency and residual control.

**Title: Lice removing composition**

**Publication No. USP 6,350,724**

**Application No. 373951**

**Date of filing August 13, 1999**

**Assignee Effcon Laboratories, Inc**

The patent describes a composition for removing a pest and its ova from an individual consisting essentially of an acid selected from the group consisting of an acetic acid or a hydrochloric acid in a concentration of between about 0.01 and 10% w/w; an alcohol selected from the group consisting of isopropanol, propanol and ethanol in a concentration of between about 10 and 30% w/w; an aqueous detergent in a concentration of between about 7 and 21% w/w; and water.

The preferred acid is acetic acid at about 5-6% by weight, the preferred alcohol is isopropanol at about 20% and the preferred surfactant is sodium laureth sulfate at about 15% active in the total composition.

It is suggested that the composition is effective because of the synergistic effects of the composition's ingredients, which affects pests, such as lice, sufficiently such that they may

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be washed and removed from the infested region. It also aids in the removal of the pests' ova by loosening or breaking down the substances some pests use to attach their ova to their hosts.

**Title:** Method of using optically-activated particles in cosmetic preparations

**Publication No.** USP 6,808,722

**Application No.** 383363

**Date of filing** March 7, 2003

**Assignee:** Lipo Chemicals, Inc

Claimed is the use of optically-activated particles comprising optical brighteners bonded to various substrate particles for diffusing light to reduce the visual perception of skin imperfections when topically applied. The particles are encapsulated with a UV transparent coating and are able to both scatter and absorb light.

Natural-looking skin is influenced by a number of physiological and genetic factors. Standard definitions of beautiful skin include skin having a transparent quality with uniform undertones of colour and it should also be smooth and even, with no apparent surface flaws. Only a few individuals can ever hope to meet such a standard without some outside assistance. Thus, a wide variety of cosmetics exist to help out where nature has failed.

Currently, the trend for cosmetic preparations is for natural-looking make-ups. However, it is difficult to accomplish the goal of achieving coverage of flaws and unevenness of skin tone, while still maintaining the vibrant look of clean bare skin. This is primarily because those components which provide the desired colour and coverage, such as titanium or iron oxide pigments, are largely opaque, and therefore obscure that sought-after vibrant transparency. Although in recent years, transparent pigments have become available, the coverage needed to mask flaws in the surface of the skin is frequently lacking. The applicants claim it is possible to convey the perception that the user's skin has less imperfections by obscuring discolorations to the skin and reducing skin blotchiness through the use of optically-activated and bonded particles.

The substrate made of materials selected from the group consisting of nylons, acrylics, polyesters or other plastic polymers, natural materials, regenerated cellulose, metals, minerals or other suitable materials, and have an index of refraction greater than 1 in order that the image of the skin imperfection is bent away from the viewer's visual axis.

The optical brightener is selected from the group consisting of, but not limited to, Tinopal 5BM, Stilbene 3, Stilbene 4 and Leucophor BSB Liquid, or equivalents. This is permanently adhered and bonded to the substrate by Van Der Waal's forces or ionic bonding or covalent bonding which makes the optical brightener compound at least one molecule thick bonded to the pre-treated substrate.

The particle with an optical brightener adhered to its surface is encapsulated in polyoxymethylene urea, wherein each capsule acts as a diffusion lens, which increases the diffusion of emitted and reflected light. The particle size is below 30 $\mu$ m (microns) and preferably in the range of 5 $\mu$ m to 8 $\mu$ m in diameter, and is colourless, translucent, and non-visible to the human eye.

The encapsulated optically-activated particles are used in the making of cosmetic preparations such as skin lotions, creams, body and skin rinses, foundation liquids and

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compressed or loose powders. When applied to the skin surface they are claimed to reduce the visual perception of skin imperfections, including shadows, cellulite, wrinkles, and skin discolorations. Additionally they may be used in hair shampoos, conditioners and colouring products to obtain interesting optical effects.

**Title:       Cosmetic skin care compositions containing gum mastic**

**Publication No.   USP   6,623,728**

**Application No.   872925**

**Date of filing     June 1, 2001**

**Assignee:         Unilever Home & Personal Care US**

Described are compositions that provide control of sebum secretion from sebocytes, resulting in improved oil control and skin feel. They are claimed to prevent shine and stickiness, while also providing anti-aging benefits, which results in reduced appearance of wrinkles and aged skin. Further they improve skin colour, skin radiance and clarity and finish, and provide an overall healthy and youthful appearance of the skin.

Sebum is oil produced by sebocyte cells of the sebaceous glands and is then secreted to the skin surface. A frequent, undesirable skin condition is oily skin, which results from an excessive amount of sebum and is associated with a shiny, undesirable appearance and a disagreeable tactile sensation.. Inhibition of sebocyte lipogenesis reduces excretion of sebum, thereby reducing and controlling oily skin. Enhancing collagen production aids in preventing skin wrinkles and laxity. It is claimed that solubilised gum mastic inhibits sebocyte lipogenesis as well as providing anti-aging benefits through enhanced collagen production.

Gum mastic is the resin from the species *Pistacia lentiscus* L., an evergreen shrub of the Anacardiaceae family, found on the island of Chios, Greece. The patent describes the use of from about 0.001 wt. % to about 10 wt. % of solubilised gum mastic in an oil-in-water (o/w) cosmetic skin care emulsion that also contains about 20% ethanol and volatile and non-volatile silicone fluids and fatty acid esters.

By solubilising gum mastic in a water miscible solvent such as ethanol, it is present in the continuous aqueous phase of the emulsion for immediate contact with the skin upon application. The solvent evaporates leaving the gum mastic supersaturated in the water phase of the emulsion. Supersaturation allows the gum mastic to remain in contact with the skin despite evaporation of the water phase, thus increasing the chances of it penetrating the skin.

The patent describes many different ways of incorporating the gum mastic and the test protocols used to justify its claims for efficacy.

**Title:       Skin Cream**

**Publication No.   USP 6,861,062**

**Application No.   16735**

**Date of filing     June 12, 2002**

**Inventors:        Silva; Victor *et al.***

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Claimed is A composition, consisting of between 4% to 72% by weight of water; between 7% to 50% by weight of a xanthine based and between 14% to 60% by weight of glycerine. It is claimed that xanthine based compounds, when combined in particular proportions and using particular steps of heating, cooling, mixing and precipitating, can produce a new and unique skin cream which not only reduces wrinkles, but also protects and moisturises the skin.

The xanthine-based compound is selected from the group consisting of theophylline, theobromine, aminophylline, dyphylline, oxtriphylline, caffeine citrate, and caffeine mateine. The xanthine-based compounds are often found in natural plant extracts, which may be used as the source of the active compound. Extracts of green or black tea produce theophylline and caffeine, extracts of coffee or gurana yield caffeine and extracts of yerbamate provide mateine.

The xanthine based compound and water are mixed together first and heated to facilitate thorough mixing. Glycerin is heated in another vessel and is slowly added to solution. The entire composition is then cooled. Any precipitate coming out of the solution during cooling is mixed back into solution. The active ingredient thus produced may then be combined with a suitable cosmetic or pharmaceutical vehicle to create the topical cream applied to the skin to reduce wrinkles and to protect and moisturise the skin.

**Title:       Composition for permanent waving of human hair**

**Publication No.   USP 6,017,519**

**Application No.   195374**

**Date of filing     Feb. 14, 2004**

**Assignee:         Goldwell AG**

Claimed is a two-part composition that presents outstanding stability and after combining together it provides optimal waving performance with gentle treatment of the hair.

Part A is an aqueous composition comprising thioglycollic acid or a salt thereof, at least one amino acid hydrochloride, and at least one compound chosen from the group consisting of polyol, and a methyl or ethyl ether thereof. It has a pH-value of about 4.5 to 6.5 but most preferred is 5.4 – 5.6

Part B comprises at least one compound chosen from the group consisting of ammonium carbonate, ammonium bicarbonate and ammonium carbamate. It has a pH-value of about between 8 and 9.5 but preferred is 8.5 – 9.2.

When the two compositions are combined the mixture is ready for use as a permanent waving lotion for human hair. It has a pH of between 7.0 and 8.0 but preferred is 7.4 – 7.6.

In Part A the preferred salt of thioglycollic acid is ammonium thioglycollate, present at 12% to 18% so that the thioglycollic acid content is between 6% and 9%. The preferred amino acid salt is cysteine hydrochloride, although others may also be used. The preferred polyol is 1,2 propanediol or glycerol, present at about 2.5%.

In Part B either ammonium bicarbonate or ammonium carbamate is preferred at between 2% and 5%. An amphoteric surfactant is included in the examples and perfume, defoaming agents, opacifiers and other materials may be added to improve the stability and aesthetic properties of the composition and final mixture.

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**Title:** Hair perming method

**Publication No.** USP 6,557,562

**Application No.** 802339

**Date of filing:** March 9, 2001

**Inventor:** Rathnam; Jayaseelan

Claimed is an innovative new perming system with ultra gentle formulations and very short processing times. It is focused on dramatically reducing the perming chemicals, processing time, and the malodour associated with perming and to minimising hair damage.

The inventor claims that the practice of shampooing hair prior to perming saturates the hair with water, raising typical moisture content from 10% to 30% or higher. When the perming lotion is applied this water content acts as a barrier to penetration of the cortex. This not only prolongs processing time but also means that the outer areas of hair are in extended contact with the lotion while the inner areas have reduced contact with a lotion that is becoming progressively diluted by the water content of the hair.

It is suggested that instead of shampooing the hair it is treated with a perm enhancing solution containing wetting, moisturising, setting, conditioning, protecting, chelating and cleansing ingredients. This provides easy combing and wrapping, uniform setting, quick wetting and good penetration to achieve even and optimum curl results. The major portion of the enhancer is applied onto the whole head to free tangles and to spread product evenly from root to end by combing, followed by additional misting of enhancer as needed for wrapping hair onto each perm-rod.

Optionally, a pre-conditioner formulated with selected wetting, conditioning and moisturising ingredients, botanical extracts and amino acids may also be used. The pre-conditioner is sparingly and evenly misted onto all the wrapped hair about 5 times to cover all the wrapped hair.

Detailed descriptions of the use of the perm enhancing lotion and the savings in chemicals and processing times that could be achieved are given. The patent concludes that the amount of waving lotion needed to obtain desirable curl generally should be about equal to the weight amount of hair, depending on hair texture. The right amount of waving lotion and the perm enhancing lotion will provide desirable even and long lasting curls, control spillage, and provide utmost safety for clients.

**Title:** Method for colouring hair with removable hair colour

**Publication No.** USP 6,599,330

**Application No.** 245160

**Date of filing:** November 4, 2002

**Assignee:** Revlon Consumer Products Co

Claimed is a method for colouring hair and removing it when desired. An aqueous hair colour composition comprising a reducing agent capable of reducing the --S--S-- bonds on hair fibre surface to form reactive --SH groups; and a dye molecule containing chemical groups reactive with the --SH groups on the hair fibre is applied to the hair at ambient conditions. The colour is removed from the hair with an aqueous based reducing agent

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capable of disrupting the --S--S-- bonds between the dye molecule and the hair fibre surface.

*Permanent hair colours are usually oxidative dyes, which provide hair colour that lasts about four to six weeks. They are supplied as a two part composition; an aqueous alkaline part that contains oxidative dyes and a developer that contains an oxidising agent, usually hydrogen peroxide. The two components are mixed immediately prior to use and applied to hair. The peroxide in the composition causes the hair shaft to swell, permitting the dye precursors in the lotion to penetrate the hair shaft. The oxidizing agent then oxidizes the dye precursors, which then combine to form large colour molecules within the hair shaft. Oxidative hair colour can be removed from the hair by applying an aqueous composition containing an oxidizing agent but colour removal is inconsistent, and the oxidizing agents are prone to causing damage to hair.*

The inventors claim that the process described in the patent provides a method for colouring hair to the same degree as permanent hair colour, but which can be removed from the hair when desired. It does not utilise oxidizing agents and the process is very gentle on the hair.

The hair colour composition comprises a dye molecule that contains a chromophore, and at least one free reactive group which, upon contact with hair, reacts with the --SH groups on the hair fibre surface which may be formed by the reducing agent. An --S--S-- bond between the dye molecule and the hair fibre surface is formed. The dye molecule is thus bonded to the hair but may be removed by applying a reducing agent composition that disrupts the --S--S-- bonds formed between the dye molecule and the hair.

The dye molecule contains a chromophore and at least one free reactive group that upon contact with hair, reacts with the --SH groups formed by the reducing agent. Any chromophore is suitable for use in dye molecule provided it is capable of imparting colour to the hair. The dye molecules may be present in the form of complex molecules or polymers, or may simply be a chromophore compound which is substituted with the requisite --SH group or protected --SH groups as found in Bunte or isothiuronium salts. Suitable compounds include acid dyes, basic dyes, disperse dyes, and HC dyes, as well as dyes typically used for oxidative dyeing of the hair such as aminophenols, nitrophenols, which are derivatised by substituting on the compound one or more --SH groups

The preferred reducing agent is glyceryl thioglycollate or thioglycollic acid, present at 1.5 – 2.5% by weight in the total composition. The remainder is water plus other ingredients that may improve the aesthetics of the formula, or provide other effects, including humectants, pH adjusters, hair conditioning agents and biological products.

**Title: Hair care compositions which reduce colour loss in hair and methods of using the compositions**

**Publication No. USP 6,805,856**

**Application No. 123208**

**Date of filing 17<sup>th</sup> April, 2002**

**Assignee: L'Oreal**

Claimed are compositions that reduce the loss of colour in the hair, methods of using the compositions to reduce the effects of oxidation on the hair, and methods of using the compositions to add volume to the hair.

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Essential to the compositions are one or more polydialkylsiloxanes; described as non-cyclic, linear methicones having a molecular weight of less than 1000 and volatile at room temperature with hexylmethicone and caprylmethicone being particularly preferred. The siloxane compounds comprise at least 10% of the total composition. They are said to protect the hair against colour loss and to provide volume to the hair. It is claimed that loss of colour and of hair strength through oxidation due to solar radiation is also reduced by the presence of polydialkylsiloxanes but the patented compositions do also include UV-absorbers.

Products incorporated in the patent include shampoos, conditioners, hair treatment creams, styling gels, hair mousse, hair sprays, setting and blow styling lotions, hair colour lotions, hair relaxing compositions, permanent waves and permanent colour. The compositions comprise one or more ingredients selected from the group consisting of a surfactant, a dye, an organic solvent, organic diluents, a foam booster, a pH adjusting agent, a conditioning agent, a humectant, a lipid, a fragrance, a preservative, a protein, a skin active agent, a suspending agent, a sunscreen, a thickener, a vitamin, a ceramide, a botanical, an anti-oxidant, a retinoid, an anti-dandruff agent, an anti hair-loss agent, and viscosity adjusting agents.

The methods claimed in the patent are those that would normally be employed to use the types of product described.

**Title: Method for colouring hair with removable hair colour**

**Publication No. USP 6,599,330**

**Application No. 245160**

**Date of filing 4<sup>th</sup> November, 2002**

**Assignee: Revlon Consumer Products**

It is the stated objective of the inventors to provide a method for colouring hair with a hair colour composition that provides the same degree of gentleness as found in semi-permanent hair colour, yet provides the relative permanence found with oxidative hair colour, which colour can be removed from the hair when desired in a simple one-step process.

Described is method for colouring hair with an aqueous composition containing a reducing agent capable of reducing the --S--S-- bonds on the hair fibre surface to form reactive --SH groups. Also included is a dye molecule containing at least one chromophore and at least one free reactive group selected from the group consisting of --SH, thiouronium salts, bunte salts, and mixtures thereof. When the hair colour composition is applied at ambient conditions the dye molecule reacts with the --SH groups on the hair surface thus providing colour to the hair that will last at least six weeks. However the colour may be readily removed by the application of a reducing agent that breaks the bond between the hair and the dye.

Any chromophore which provides colour to the hair is suitable for use provided it contains at least one free --SH group. Suitable compounds include acid dyes, basic dyes, disperse dyes, and HC dyes, as well as dyes typically used for oxidative dyeing of the hair such as aminophenols and, nitrophenols. Although a large variety of reducing agents are named those preferred are glyceryl thioglycollate and thioglycolic acid. The compositions are aqueous-based and may contain other ingredients to improve the aesthetics and effectiveness of the formula and include humectants, pH adjusters, hair conditioning agents and biological products.

The colour removing composition contains a different reducing agent to that in the dye composition and may be in the form of a shampoo, conditioner, or hair treatment product. The preferred reducing agent is sodium sulphite and the composition may also contain ancillary ingredients that improve the aesthetics and performance of the composition.

An example formulation for the dye composition follows:

<b>Ingredients</b>	<b>%w/w</b>
Glyceryl-thioglycollate	4.00
Urea	10.00
Polymeric dye compound	8.40
Ethanol	8.43
Acetic acid	QS to pH 7.00
Water	QS to 100

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An example formulation for the colour removing shampoo follows:

<b>Ingredients</b>	<b>%w/w</b>
Sodium lauryl sulfate (30% active)	1.5
Sodium laureth sulfate (28% active)	0.7
Lauramide DEA	0.15
Sodium sulphite	10.00
Fragrance	0.10
Guar hydroxypropyl trimonium	0.10
Urea	10.00
Glycol stearate	0.01
Myristic acid	0.01
Citric acid	0.01
Hydrolyzed silk	0.01
Cocamidopropyl betaine (35%	0.35
Dimethicone copolyol	0.03
Glycerin	0.01
Trisodium HEDTA	0.01
Preservatives	QS
Water	QS 100

**Title: Method of using optically-activated particles in cosmetic preparations**

**Publication No. USP 6,808,722**

**Application No. 383363**

**Date of filing 7<sup>th</sup> March, 2003**

**Assignee: Lipo Chemicals, Inc**

Claimed are optically-activated particles for use in cosmetic preparations comprising insoluble solid substrate particles and a fluorescent compound fixed to them to form integral units. They increase the diffusion of light to reduce the visual perception of imperfections including cellulite, wrinkles, discoloration by veins and arteries, shadows, pores, and follicles. Additionally they disguise mild discolorations such as minor scars and blotchiness of the skin in the face area, and can be used in an encapsulated or non-encapsulated form in various cosmetic preparations including skin lotions, creams, shampoos, body rinses, bath gels, soaps, hair conditioners, colour conditioners and rinses, foundation liquids and powders, toothpastes and oral rinses and colour cosmetics and skin treatment products.

The optically-activated particles are able to absorb ultraviolet radiation and emit visible light and are also able to both scatter and emit light in a diffuse manner. The preferred size of the bonded particles is in the range of 5. $\mu$ .to 8. $\mu$ . in diameter, and they are colourless, translucent, and non-visible to the human eye. The particle substrate is selected from the group consisting of nylons, acrylics, polyesters or other plastic polymers and materials that have an index of refraction greater than 1 in order that the image of the skin imperfection is bent away from the viewer's visual axis.

The preferred optical brighteners are Leucophor BSB and Tinopal 5BM or equivalents and methods are described for bonding these to the substrate. Approximately 0.3 – 0.5% brightener is adsorbed onto the substrate surface and this may then be encapsulated in a UV transparent coating, such as polyoxymethylene urea (PMU), wherein each capsule acts as a diffusion lens which increases the diffusion of emitted and reflected light.

**Title: Infant skin care composition**

**Publication No. USP 6,589,537**

**Application No. 753895**

**Date of filing: 03/01/2001**

**Inventor: Harbeck; Marie, USA**

Claimed is an oil-based composition for the alleviation and treatment of infant skin conditions, including, dry, sensitive, chapped, cracked, itching, reddened, and flaking skin, as well as infant skin infirmities associated with eczema, dermatitis and diaper rash. It has as its main constituents, safflower oil, flaxseed oil, vitamin A, tocopheryl linoleate, sweet almond oil, apricot kernel oil, essential oil of lavender, and tincture of benzoin, in an organic beeswax emulsifying base.

The composition is alcohol-free and it is said to provide an essential plant oil, preferably lavender, as an organic antiseptic adjuvant to treat bacterial, and fungal conditions of the skin. It is also claimed that the high level of organic cold-pressed vegetable oils and organic beeswax present in the composition improve trans-epidermal delivery, make it water-resistant and it provides up to twelve hours protection to infant skin.

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Following is an illustrative composition.

Ingredient	Typical %
Cetearyl alcohol (&) Polysorbate 60	15.00
Organic white beeswax	7.60
Cold-pressed safflower oil	15.00
Sweet almond oil	15.00
Cold-pressed flaxseed oil	7.60
Apricot kernel oil	7.60
Joboba oil	2.53
Cocoa butter or lanolin	3.80
Tocopheryl linoleate	0.63
Borax	0.13
Essential oil (lavender)	0.63
Vitamin A	0.32
Tincture of benzoin	0.13
DMDM hydantoin	0.15
Water to 100%	

**Title: Conditioner that provides skin like an angel**

**Publication No. USP 6,544,534**

**Application No. 753895**

**Date of filing: 21/08/2001**

**Inventor: Malmgren; Janice, USA**

Claimed is a skin conditioner made of all natural ingredients that eliminates body dandruff and provides the user with skin "like an angel".

In order to maintain the elasticity of their skin many people regularly apply conditioners to it. Maintaining the proper functioning of the skin is important in preventing pre-mature aging and regulating body temperature. One way to help skin properly function is to aid in the removal of dead skin cells, which not only prevents blockage of sweat and sebaceous glands but also promotes the production of healthy new skin cells. It is claimed that the composition uses only natural ingredients to promote the growth of healthy new skin cells and maintain the proper functioning of the skin.

The composition consists primarily of a mixture of cold-pressed vegetable oils in a base of Castile soap. Soaps are made from animal and vegetable fats, oils, and greases.

Chemically, the sodium or potassium salt of a fatty acid, is formed by the interaction of fats and oils with alkali. Hard soaps are made from oils and fats that contain a high percentage of saturated acids, which are saponified with sodium hydroxide. Soft soaps are

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made from linseed oil, cottonseed oil, and fish oils, which are saponified with potassium hydroxide. A fine toilet soap made of high-grade olive oil is known as castile soap. Oils expressed without heating contains the least amount of impurities and are known as cold-pressed, cold drawn or virgin oils. After removing shells or hulls; the kernels are ground into coarse meal and the oil removed by hydraulic or screw presses.

The claimed composition consists of sea salt, Epsom salt and aloe vera gel, mixed with cold-pressed oils of almond, apricot kernel, avocado and jojoba oil and of castor oil, vitamin E, vegetable glycerin and Castile soap. The units of measurement are as follows: the amount of sea salt is 2 cups, the amounts of Epsom salt and aloe vera gel are 1 cup, the approximately equal amounts of each of the first group of ingredients is approximately 1 cup, and the amounts of each of the second group of ingredients is equal to or less than 1 tablespoon. Optionally, one or more essential oils can be added to provide a pleasant fragrance to the conditioner. The composition is essentially non-aqueous so the sea salt and Epsom salt are present in their crystalline form.

It is claimed that the composition may be applied to the hair and scalp to remove dandruff or to the body to remove dead skin cells. After the composition is massaged into the scalp or onto the body it is removed by rinsing with water, the result being that the conditioner exfoliates, cleanses and conditions the skin and scalp.

**Title: Skin care compositions**

**Publication No. USP 6,551,604**

**Application No. 807151**

**Date of filing: 08/11/2001**

**Assignee: The Procter & Gamble Company**

According to the applicants a variety of compounds have been described as being useful for regulating fine lines, wrinkles and other forms of undesirable skin surface texture. In addition, Vitamin B<sub>3</sub> compounds, particularly Niacinamide, have been found to provide measurable benefits in regulating skin condition associated with aged or photo-damaged skin. However, many materials require multiple applications over an extended period to provide noticeable benefits. Claimed is a composition that provides a more immediate improvement in appearance and also effects an immediate improvement in the feel of the skin.

The composition comprises a particulate material dispersed in a topical carrier that includes a an active effective for chronically regulating skin condition, selected from the group consisting of Vitamin B<sub>3</sub> compounds, retinoids, and mixtures thereof. The particulate matter has a refractive index of from about 1.35 to about 1.6 and preferably a median particle size of from about 3 to about 7.5 microns. A second particulate material is also incorporated. This should have a similar refractive index to the first but a larger mean particle size, preferably from 10 to 20 microns.

The particulate materials can be inorganic or organic, preferably they are free-flowing organ silicone polymers such as polymethylsilsequioxane, or polyamide, polythene, polyacrylonitrile, polyacrylic acid, polymethacrylic acid, polystyrene, polytetrafluoroethylene (PTFE) and poly(vinylidene chloride). Copolymers derived from monomers of these materials can also be used. Inorganic materials include silica and boron

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nitride. The smaller sized material is present at about 2% to 12% and the second particulate from about 1% to 3%.

Highly preferred carriers are liquid or semi-solid, such as creams, lotions and gels with sufficient thickness or yield point to prevent sedimentation of the particles. The carrier can be inert or it can possess dermatological benefits of its own. The carrier should also be physically and, chemically compatible with the particulate matter and with the active ingredients.

The active ingredients are preferably Vitamin B3 derivatives, particularly Niacinamide, and retinol esters such as retinyl palmitate, retinyl acetate, and retinyl propionate. Most preferred are retinyl propionate and retinyl palmitate.

The following formulae illustrate the patent

Example	1	2	3
Ingredient	% w/w	% w/w	% w/w
Niacinamide	2.50	4.00	3.00
Retinyl propionate			0.2
Polymethylsilsesquioxane (1)	6.00	9.00	3.00
Ethylene/acrylic acid copolymer (2)	1.50		1.00
Polyacrylamide & isoparaffin & laureth-7	2.00	2.00	1.00
Xanthan gum		0.60	0.30
Titanium dioxide		0.50	0.30
Glycerine	7.00	5.00	3.00
Urea		2.00	
Panthenol	1.00		
Salicylic acid		1.50	
Allantoin	0.20	0.10	
Aloe vera gel			0.05
Tocopheryl acetate			0.05
Cetyl alcohol	2.00	1.00	1.25
Stearyl alcohol	2.00	1.00	1.25
Cyclomethicone & dimethiconol	0.75	0.50	0.50
Steareth-21	0.60	0.40	0.300
Steareth-2	0.10	0.08	0.03
Sorbitan stearate & sucrose cocoate		1.50	
PPG-15 stearyl ether	3.00	5.00	4.00
Sucrose polycottonseedate	2.00	3.00	
Dimethicone 350 cs	0.50		0.50

**Patent Abstracts**  
**John Woodruff**

Disodium EDTA	0.02	0.01	0.02
Deionised water	to100%	to 100%	to 100%

(1) Polymethylsilsesquioxane, median particle size about 4.5 microns, supplied by Toshiba Silicone Co. Ltd.

(2) Ethylene/acrylic acid copolymer, median particle size about 10 microns, supplied by Kobo.

**Title: Infant skin care composition**

**Publication No. USP 6,589,537**

**Application No. 753895**

**Date of filing: 03/01/2001**

**Inventor: Harbeck; Marie, USA**

Claimed is an oil-based composition for the alleviation and treatment of infant skin conditions, including, dry, sensitive, chapped, cracked, itching, reddened, and flaking skin, as well as infant skin infirmities associated with eczema, dermatitis and diaper rash. It has as its main constituents, safflower oil, flaxseed oil, vitamin A, tocopheryl linoleate, sweet almond oil, apricot kernel oil, essential oil of lavender, and tincture of benzoin, in an organic beeswax emulsifying base.

The composition is alcohol-free and it is said to provide an essential plant oil, preferably lavender, as an organic antiseptic adjuvant to treat bacterial, and fungal conditions of the skin. It is also claimed that the high level of organic cold-pressed vegetable oils and organic beeswax present in the composition improve trans-epidermal delivery, make it water-resistant and it provides up to twelve hours protection to infant skin.

Following is an illustrative composition.

Ingredient	Typical %
Cetaryl alcohol (&) Polysorbate 60	15.00
Organic white beeswax	7.60
Cold-pressed safflower oil	15.00
Sweet almond oil	15.00
Cold-pressed flaxseed oil	7.60
Apricot kernel oil	7.60
Jjoba oil	2.53
Cocoa butter or lanolin	3.80
Tocopheryl linoleate	0.63
Borax	0.13
Essential oil (lavender)	0.63
Vitamin A	0.32
Tincture of benzoin	0.13

**Patent Abstracts**  
**John Woodruff**

DMDM hydantoin	0.15
Water to 100%	

**Title:** Conditioner that provides skin like an angel

**Publication No.** USP 6,544,534

**Application No.** 753895

**Date of filing:** 21/08/2001

**Inventor:** Malmgren; Janice, USA

Claimed is a skin conditioner made of all natural ingredients that eliminates body dandruff and provides the user with skin "like an angel".

In order to maintain the elasticity of their skin many people regularly apply conditioners to it. Maintaining the proper functioning of the skin is important in preventing pre-mature aging and regulating body temperature. One way to help skin properly function is to aid in the removal of dead skin cells, which not only prevents blockage of sweat and sebaceous glands but also promotes the production of healthy new skin cells. It is claimed that the composition uses only natural ingredients to promote the growth of healthy new skin cells and maintain the proper functioning of the skin.

The composition consists primarily of a mixture of cold-pressed vegetable oils in a base of Castile soap. Soaps are made from animal and vegetable fats, oils, and greases.

Chemically, the sodium or potassium salt of a fatty acid, is formed by the interaction of fats and oils with alkali. Hard soaps are made from oils and fats that contain a high percentage of saturated acids, which are saponified with sodium hydroxide. Soft soaps are made from linseed oil, cottonseed oil, and fish oils, which are saponified with potassium hydroxide. A fine toilet soap made of high-grade olive oil is known as castile soap. Oils expressed without heating contains the least amount of impurities and are known as cold-pressed, cold drawn or virgin oils. After removing shells or hulls; the kernels are ground into coarse meal and the oil removed by hydraulic or screw presses.

The claimed composition consists of sea salt, Epsom salt and aloe vera gel, mixed with cold-pressed oils of almond, apricot kernel, avocado and jojoba oil and of castor oil, vitamin E, vegetable glycerin and Castile soap. The units of measurement are as follows: the amount of sea salt is 2 cups, the amounts of Epsom salt and aloe vera gel are 1 cup, the approximately equal amounts of each of the first group of ingredients is approximately 1 cup, and the amounts of each of the second group of ingredients is equal to or less than 1 tablespoon. Optionally, one or more essential oils can be added to provide a pleasant fragrance to the conditioner. The composition is essentially non-aqueous so the sea salt and Epsom salt are present in their crystalline form.

It is claimed that the composition may be applied to the hair and scalp to remove dandruff or to the body to remove dead skin cells. After the composition is massaged into the scalp or onto the body it is removed by rinsing with water, the result being that the conditioner exfoliates, cleanses and conditions the skin and scalp.

**Title:** Skin care compositions

**Patent Abstracts**  
**John Woodruff**

**Publication No. USP 6,551,604**

**Application No. 807151**

**Date of filing: 08/11/2001**

**Assignee: The Procter & Gamble Company**

According to the applicants a variety of compounds have been described as being useful for regulating fine lines, wrinkles and other forms of undesirable skin surface texture. In addition, Vitamin B<sub>3</sub> compounds, particularly Niacinamide, have been found to provide measurable benefits in regulating skin condition associated with aged or photo-damaged skin. However, many materials require multiple applications over an extended period to provide noticeable benefits. Claimed is a composition that provides a more immediate improvement in appearance and also effects an immediate improvement in the feel of the skin.

The composition comprises a particulate material dispersed in a topical carrier that includes a an active effective for chronically regulating skin condition, selected from the group consisting of Vitamin B<sub>3</sub> compounds, retinoids, and mixtures thereof. The particulate matter has a refractive index of from about 1.35 to about 1.6 and preferably a median particle size of from about 3 to about 7.5 microns. A second particulate material is also incorporated. This should have a similar refractive index to the first but a larger mean particle size, preferably from 10 to 20 microns.

The particulate materials can be inorganic or organic, preferably they are free-flowing organ silicone polymers such as polymethylsilsesquioxane, or polyamide, polythene, polyacrylonitrile, polyacrylic acid, polymethacrylic acid, polystyrene, polytetrafluoroethylene (PTFE) and poly(vinylidene chloride). Copolymers derived from monomers of these materials can also be used. Inorganic materials include silica and boron nitride. The smaller sized material is present at about 2% to 12% and the second particulate from about 1% to 3%.

Highly preferred carriers are liquid or semi-solid, such as creams, lotions and gels with sufficient thickness or yield point to prevent sedimentation of the particles. The carrier can be inert or it can possess dermatological benefits of its own. The carrier should also be physically and, chemically compatible with the particulate matter and with the active ingredients.

The active ingredients are preferably Vitamin B<sub>3</sub> derivatives, particularly Niacinamide, and retinol esters such as retinyl palmitate, retinyl acetate, and retinyl propionate. Most preferred are retinyl propionate and retinyl palmitate.

The following formulae illustrate the patent

Example	1	2	3
Ingredient	% w/w	% w/w	% w/w
Niacinamide	2.50	4.00	3.00
Retinyl propionate			0.2
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Ethylene/acrylic acid copolymer (2)	1.50		1.00
Polyacrylamide & isoparaffin & laureth-7	2.00	2.00	1.00

**Patent Abstracts**  
**John Woodruff**

Xanthan gum		0.60	0.30
Titanium dioxide		0.50	0.30
Glycerine	7.00	5.00	3.00
Urea		2.00	
Panthenol	1.00		
Salicylic acid		1.50	
Allantoin	0.20	0.10	
Aloe vera gel			0.05
Tocopheryl acetate			0.05
Cetyl alcohol	2.00	1.00	1.25
Stearyl alcohol	2.00	1.00	1.25
Cyclomethicone & dimethiconol	0.75	0.50	0.50
Steareth-21	0.60	0.40	0.300
Steareth-2	0.10	0.08	0.03
Sorbitan stearate & sucrose cocoate		1.50	
PPG-15 stearyl ether	3.00	5.00	4.00
Sucrose polycottonseedate	2.00	3.00	
Dimethicone 350 cs	0.50		0.50
Disodium EDTA	0.02	0.01	0.02
Deionised water	to100%	to 100%	to 100%

(1) Polymethylsilsesquioxane, median particle size about 4.5 microns, supplied by Toshiba Silicone Co. Ltd.

(2) Ethylene/acrylic acid copolymer, median particle size about 10 microns, supplied by Kobo.

**Title: Method and composition for treating minor skin irritations**

**Publication No. USP 5,620,695**

**Application No. 647723**

**Date of issue 15/03/97**

**Applicants: Jennifer Elliott, Florida**

Claimed is a method and composition for the treatment of minor skin irritations based upon the use of a carrier oil with the essential oils of eucalyptus, lavender and tea tree added to provide a unique composition capable of reducing irritation, promoting healing and resisting insects.

The preamble suggests that skin irritation problems are numerous and common. They can develop from weather conditions, fungal infections and as a response to insect bites. Based on the science of aromatherapy, the applicant claims that the mixture provides antiseptic

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and antibiotic properties to inhibit infection, has soothing and calming qualities to decrease irritation, it repels insects which decreases infection and it speeds healing. It is said to be natural with no known side effects. The composition is also recommended for use on domesticated animals.

The essential oils are added to a carrier oil, preferably canola, that serves as a diluting base and which aids application and absorption of the oils. Lavender (*Lavendula angustifolia*) oil is claimed to be the most useful and most versatile therapeutically of all the essential oils and is effective on almost all skin conditions. It is considered antiseptic, antibiotic, analgesic and anti-inflammatory. It is said to encourage skin cell regeneration and has the additional emotional effects of calming emotions and nervous tension. *Eucalyptus globulus* oil cools the skin, its odour repels insects, it is anti-inflammatory and is highly effective against fungal infections. Tea (*Melaleuca alternifolia*) tree oil is said to be antifungal, antiviral and antibacterial.

The composition comprises 96% carrier oil, 2% lavender, 1% eucalyptus and 1% tea tree oil. It may also contain PABA as a sunscreen. The skin is cleansed then the lotion applied and massaged into the skin. For a horse it should be applied sparingly to the ears and face and liberally to the coat, mane and tail.

**Title: Transfer resistant cosmetic compositions**

**Publication No. USP 6,074,654**

**Application No. 277485**

**Date of issue 13/06/2000**

**Applicants: The Procter & Gamble Company**

Claimed is a cosmetic composition that is applied to the lips comprising an organosiloxane resin, a fluid diorganopolysiloxane polymer, and a volatile carrier. The composition is applied to the lips with an appropriate applicator wherein the carrier volatilises leaving a thin, but, durable film, resistant to transfer upon contact with objects such as clothing, table wear and foods, especially oily or greasy foods.

The novelty of the invention is said to be in the characteristics of the films formed by the composition, which exhibit a degree of transfer resistance directly proportional to the hardness and solvent-resistance of the film. This hardness can be expressed as a function of the dry blot and rub test. The solvent-resistance, or resistance to being solvated by fluids, can be expressed as a function of an oil blot and rub test. The optimum test conditions to reliably correlate these tests to the physical characteristics of the composition require that the film be dry, meaning that at least 90% of the volatile carrier of the claimed cosmetic composition has evaporated.

The tests used to prove the efficacy of the product are described in detail and will be of interest to others working in the field of cosmetic makeup. The dry blot and rub test predicts the ability of a cosmetic film to resist colour transfer to dry objects. The oil blot and rub test predicts the ability of a cosmetic film to resist colour transfer to oily objects such as foods. A flexibility test predicts the ability of the colour film to resist flaking or peeling types of failure after application by movement of the skin during normal activities.

The organosiloxane resin must be solid at 25°C and soluble inorganic solvents including isoparaffins and cyclosiloxanes. The fluid diorganopolysiloxane must be compatible with the solid organosiloxane and the volatile carrier, which may be a volatile hydrocarbon like

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isododecane or a volatile silicone like cyclomethicone, or a mixture of these. The pigment may be any considered suitable for use in compositions for the lips. The final product may contain the usual oils, fats and waxes, flavourings and other materials commonly found in lip compositions. Polyoxyethylene glycols and sucrose polyesters are cited as particularly preferred and the latter may be used in an overcoat composition to further enhance the aesthetic appeal of the transfer-resistant product. Overcoat compositions form part of the patent and many example formulae illustrate both product types.

**Title:** Aqueous dispersion comprising a UV screening agent of organosiloxane type containing a benzalmonate function and a water-insoluble cationic surfactant

**Publication No.** USP 6,120,757

**Application No.** 204554

**Date of issue** 19/09/2000

**Applicants:** L'Oreal, France

The introduction describes the damage that can be caused to hair when exposed to ultra violet light. It becomes, dull, coarse and brittle and turns lighter in colour. Attempts have been made to protect the hair from damage using conventional sunscreens. They may be ionic water-soluble compounds or non-ionic liposoluble ones. However anionic compounds are generally incompatible with cationic conditioning aids and cationic materials compete for anionic binding sites on the keratin fibres. Both may be readily removed by rinsing, to the detriment of product efficacy. Liposoluble screening agents are difficult to solubilise in suitable vehicles and tend to be poorly distributed on the hair.

It is the claim of this patent that the use of a water-insoluble cationic surfactant and a liposoluble organosiloxane type UV-screening agent containing a benzalmonate function makes it possible to obtain stable, homogeneous aqueous dispersions of the screening agents. The formulations thus obtained can be used in many types of hair compositions and make it possible to deposit sufficient screening agent to confer good protection of the hair against attack by UV rays. The formulations provide excellent detangling, softness and sheen and good protection of the colour of natural hair or artificially dyed hair. In particular the compositions may be of the rinse-out type without significant loss of the screening agent.

The preferred UV screening agent is an organosiloxane compound selected from those fully described in WO 92/20690, filed by Givaudan-Roure. The material is claimed to be four times more effective than ethylhexyl methoxycinnamate when applied to the hair. The cationic surfactant may be drawn from a wide list but distearyldimonium chloride, behenyl dimethylbenzylammonium chloride and stearylalkonium chloride are preferred at a level below 6% by weight. The composition is preferably an oil-in-water emulsion with a pH in the range 4 – 6 but almost any product form may be used. Illustrative formulations and comparative studies are included in the patent.