

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
17 November 2005 (17.11.2005)

PCT

(10) International Publication Number  
**WO 2005/107695 A1**

(51) International Patent Classification<sup>7</sup>: **A61K 7/48**

(21) International Application Number:  
PCT/EP2005/004267

(22) International Filing Date: 19 April 2005 (19.04.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/569,778 10 May 2004 (10.05.2004) US

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: COSMETIC COMPOSITONS WITH TAPIOCA STARCH

(57) Abstract: A cosmetic composition is provided which includes tapioca starch, polyacrylic beads, an emulsifier and a cosmetically acceptable carrier. Optionally the composition may include a polysiloxane material to provide an initial silky feel upon skin contact, a fatty acid, a preservative and a polyhydric alcohol.

WO 2005/107695 A1

## COSMETIC COMPOSITIONS WITH TAPIOCA STARCH

The invention concerns cosmetic compositions with aesthetics providing a silky rub-in transforming into a powdery, drier afterfeel.

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Proper aesthetics are essential to any successful skin cream or lotion. Without the proper feel, consumers would not buy or use even those products with the most proven dermatological benefits.

10 Silkiness is known to be imparted by a variety of silicone materials. Yet the silicones do not transform compositions into a powdery afterfeel. Typical disclosures of silicone materials for cosmetics is found in US Patent 5,972,359 (Sine et al.) and US Patent 6,524,598 B2 (Sunkel et al.)

15 Powders have been formulated into cosmetics. For instance, talc in a fluid media tends to pill or ball-up. US Patent 6,495,123 B1 (Faryniarz et al.) describes how porous particles such as Ganzpearl® GMP 0820 removes the tackiness normally associated with organic sunscreen agents in low pH systems.

20 Starches have been employed to enhance viscosity of liquid formulations. For instance, US Patent 5,824,323 (Fishman) reports skin lotion compositions with non-greasy skinfeel. These formulas can contain a variety of starches including tapioca to provide body and thickness to the lotions.

Although solutions have been suggested to solve the problem of delivering silky feel to the skin, there still remains the challenge of formulating a cosmetic that upon continued rub-in converts to a powdery dry, almost satin or velvet afterfeel.

## SUMMARY OF THE INVENTION

25 A cosmetic composition is provided which includes:

- 2 -

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- (i) from 0.1 to 10% by weight of tapioca starch;
  - (ii) from 0.001 to 5% by weight of polyacrylic beads of number average particle size ranging from 1 to 50 microns;
  - (iii) from 0.01 to 10% by weight of an emulsifier;
  - 10 (iv) optionally, an effective amount to provide an initial silky feel upon skin contact of a polysiloxane material;
  - (v) optionally, from 0.1 to 20% by weight of a C<sub>12</sub>-C<sub>22</sub> fatty acid;
  - (vi) optionally, from 0.1 to 40% by weight of polyhydric alcohol;
  - (vii) optionally, an effective amount to preserve of a preservative; and
  - 15 (viii) a cosmetically acceptable carrier.

## DETAILED DESCRIPTION OF THE INVENTION

Now there is provided a cosmetic composition of exceptionally pleasant aesthetics. The composition initially delivers a silky feel transitioning after rub-in to a powdery, dry satin or  
15 velvety afterfeel. The afterfeel aesthetics are achieved with a combination of tapioca starch and polyacrylate in bead form having number average particle size ranging from 1 to 50 microns.

Tapioca starch is a first component of the present invention. Tapioca, also known as Cassava or Manioc, is a root or tuber extract. The plant is a perennial that grows eight to  
20 twelve feet high and the roots can be as much as three feet long and five to ten inches in diameter. Cells of the tuber carry the tapioca starch. This starch is recovered by wet grinding the washed roots and continuous re-washing, resulting in a pure carbohydrate. Particularly preferred is a powder source with a median particle size ranging from about 1 to 100 microns, preferably from 5 to 15 microns, optimally from 10 to 30 microns.

25 The starch is commercially available under the tradename TAPIOCA PURE (28-1810) from the National Starch & Chemical Company, Division of ICI. An alternative source is TIStar Tapioca Starch sold by the Multi-Kem Corporation.

- 3 -

Another component which may be utilized in compositions of the present invention is that of polyacrylic beads. Especially useful are polymethyl methacrylate, polyethyl methacrylate, polyethyl acrylate and polymethyl acrylate polymers. Most preferred are polymethyl methacrylate beads. The beads can range in number average particle size  
5 from 1 to 50 microns, preferably from 3 to 30 microns, optimally from 5 to 10 microns. These beads may be crosslinked or non-crosslinked, but crosslinking is preferred. The beads may have an Oil Absorbance ranging from 60 to 300 ml/100g, preferably from 70 to 180 ml/100g, as defined by ASTM-D281-31. Beads of polymethyl methacrylate are sold under the trademark Ganzpearl, available from Presperse Inc., Piscataway, New  
10 Jersey 08854. Most preferred is Ganzpearl® GMP-0820 with number average particle size of about 8 micron and an Oil Absorbance of about 170 ml/100g.

Amounts of the polyacrylate beads may range from 0.001 to 5%, preferably from 0.01 to 1%, optimally from 0.1 to 0.5% by weight of the composition.

Emulsifiers may also be present in cosmetic compositions of the present invention. Total  
15 concentration of the emulsifier when present may range from 0.01 to about 10%, preferably from 0.1 to 5%, optimally from 1 to 3% by weight of the composition. The emulsifier may be selected from the group consisting of anionic, nonionic, cationic and amphoteric actives. Particularly preferred nonionic emulsifiers are those with a C<sub>10</sub>-C<sub>20</sub> fatty alcohol or acid hydrophobe condensed with from 2 to 100 moles of ethylene oxide or  
20 propylene oxide per mole of hydrophobe; C<sub>2</sub>-C<sub>10</sub> alkyl phenols condensed with from 2 to 20 moles of alkylene oxide; mono- and di-fatty acid esters of ethylene glycol; fatty acid monoglyceride; sorbitan, mono- and di- C<sub>8</sub>-C<sub>20</sub> fatty acids; and polyoxyethylene sorbitan as well as combinations thereof. Alkyl polyglycosides and saccharide fatty amides (e.g. methyl gluconamides) are also suitable nonionic emulsifiers.

25 Polyhydric alcohols may be employed in certain compositions of the present invention. Typical polyhydric alcohols include glycerin (also known as glycerol), polyalkylene glycols and more preferably alkylene polyols and their derivatives, including propylene glycol, dipropylene glycol, polypropylene glycol, polyethylene glycol and derivatives thereof, sorbitol, hydroxypropyl sorbitol, hexylene glycol, 1,3-butylene glycol, isoprene glycol,

- 4 -

1,2,6-hexanetriol, ethoxylated glycerol, propoxylated glycerol and mixtures thereof. The amount of polyhydric alcohol when present may range from 0.1 to 40%, preferably from 0.5 to 20%, optimally from 1 to 10% by weight of the composition.

Preservatives can desirably be incorporated into the cosmetic compositions of this invention to protect against the growth of potentially harmful microorganisms. Suitable traditional preservatives for compositions of this invention are alkyl esters of para-hydroxybenzoic acid. Other preservatives which have more recently come into use include hydantoin derivatives, propionate salts, and a variety of quaternary ammonium compounds. Particularly preferred preservatives are phenoxyethanol, methyl paraben, propyl paraben, DMDM Hydantoin, iodopropynyl butylcarbamate, 5-chloro-2-methyl-4-isothiazolin-3-one, 2-methyl-4-isothiazolin-3-one and benzyl alcohol. The preservatives should be selected having regard for the use of the composition and possible incompatibilities between the preservatives and other ingredients in the emulsion. Preservatives are preferably employed in amounts ranging from 0.00001% to 2% by weight of the composition.

Preferred anionic surfactants include soap, C<sub>8</sub>-C<sub>20</sub> alkyl ether sulfates and sulfonates, C<sub>8</sub>-C<sub>20</sub> alkyl sulfates and sulfonates, C<sub>8</sub>-C<sub>20</sub> alkylbenzene sulfonates, C<sub>8</sub>-C<sub>20</sub> alkyl and dialkyl sulfosuccinates, C<sub>8</sub>-C<sub>20</sub> acyl isethionate, C<sub>8</sub>-C<sub>20</sub> alkyl ether phosphates, C<sub>8</sub>-C<sub>20</sub> sarcosinates, C<sub>8</sub>-C<sub>20</sub> acyl lactylates and combinations thereof.

Polysiloxane materials may be present in compositions of this invention. The organopolysiloxane may be volatile, nonvolatile, or a mixture of volatile and non-volatile silicones. The term "nonvolatile" refers to those silicones that are liquid or solid under ambient conditions and have a flash point (under one atmosphere pressure) of at least about 100°C. The term "volatile" refers to all other silicone oils. Suitable organopolysiloxanes include polyalkylsiloxanes, cyclic polyalkylsiloxanes, and polyalkylarylsiloxanes.

Polyalkylsiloxanes can be represented by the general chemical formula  $R_3SiO[R_2SiO]_xSiR_3$  wherein R is an alkyl group having from one to 30 carbon atoms

- 5 -

(preferably R is methyl or ethyl) and x is an integer from 0 to 10,000, chosen to achieve the desired molecular weight which can range to over 10,000,000. Commercially available polyalkylsiloxanes include the polydimethylsiloxanes, which are also known as dimethicones. These include the Vicasil® series sold by General Electric Company and the Dow Corning® 200 series sold by Dow Corning Corporation. Dimethicones include those represented by the chemical formula  $(\text{CH}_3)_3\text{SiO}[(\text{CH}_3)_2\text{SiO}]_x[\text{CH}_3\text{RSiO}]_y\text{Si}(\text{CH}_3)_3$  wherein R is a straight or a branched chain alkyl having from 2 to 30 carbon atoms and x and y are each integers of 1 or greater selected to achieve the desired molecular weight which can range to over 10,000,000. Examples of these alkylsubstituted dimethicones include cetyl dimethicone and lauryl dimethicone.

Cyclic polyalkylsiloxanes suitable for use in the composition include those represented by the chemical formula  $[\text{SiR}_2\text{-O}]_n$  wherein R is an alkyl group (preferably R is methyl or ethyl) and n is an integer from 3 to 8, more preferably from 4 to 6. Where R is methyl, these materials are typically referred to as cyclomethicones. Commercially available cyclomethicones include Dow Corning® 244 fluid which primarily contains the cyclomethicone tetramer (i.e. n=4), Dow Corning® 344 fluid which primarily contains the cyclomethicone pentamer (i.e. n=5), Dow Corning® 245 which primarily contains a mixture of the cyclomethicone tetramer and pentamer (i.e. n=4 and 5), and Dow Corning® 345 which primarily contains a mixture of the cyclomethicone tetramer, pentamer, and hexamer (i.e. n=4, 5 and 6).

Also useful are materials such as trimethylsiloxysilicate, which is a polymeric material corresponding to the general chemical formula  $[(\text{CH}_3)_3\text{SiO}_{1/2}]_x[\text{SiO}_2]_y$ , wherein x is an integer from 1 to 500 and y is an integer from 1 to 500. A commercially available trimethylsiloxysilicate is sold as a mixture with dimethicone as Dow Corning® 593 fluid.

Dimethiconols are also suitable for use in the composition. These compounds can be represented by the chemical formulas  $\text{R}_3\text{SiO}[\text{R}_2\text{SiO}]_x\text{SiR}_2\text{OH}$  and  $\text{HOR}_2\text{SiO}[\text{R}_2\text{SiO}]_x\text{SiR}_2\text{OH}$  wherein R is an alkyl group (preferably R is methyl or ethyl) and x is an integer from 0 to 500, chosen to achieve the desired molecular weight. Commercially available dimethiconols are typically sold as mixtures with dimethicone or

- 6 -

cyclomethicone (e.g. Dow Corning® 1401, 1402, 1403 and 1501 fluids). Particularly preferred is a blend with INCI name of Cyclopentasiloxane and PEG/PPG-20/15 Dimethicone commercially available from GE Silicones as SF1528.

Crosslinked organopolysiloxane elastomers may also be useful as polysiloxane materials.

- 5 These may be of the emulsifying or non-emulsifying crosslinked elastomer variety. The term "non-emulsifying" defines a crosslinked organopolysiloxane elastomer from which polyoxyalkylene units are absent. The term "emulsifying" is used to mean crosslinked organopolysiloxane elastomer having at least one polyoxyalkylene unit.

- 10 Non-emulsifying silicone elastomers may be powders such as vinyl dimethicone/methicone silesquioxane crosspolymers available from Shin-Etsu as KSP-100, KSP-101, KSP-102, KSP-103, KSP-104, KSP-105, hybrid silicone powders that contain a fluoroalkyl group such as KSP-200, and hybrid silicone powders that contain a phenyl group such as KSP-300; and Dow Corning material DC 9506.

- 15 Preferred organopolysiloxane compositions are dimethicone/vinyl dimethicone crosspolymers. These are commercially available as Dow Corning (DC 9040 and DC 9045), General Electric (SFE 839), Shin Etsu (KSG-15, 16, 18 [dimethicone/phenyl vinyl dimethicone crosspolymer]), and Grant Industries (Gransil™ line of materials), and lauryl dimethicone/vinyl dimethicone crosspolymers supplied by Shin Etsu as KSG-31, KSG-32, KSG-41, KSG-42, KSG-43, and KSG-44.

- 20 Particularly useful emulsifying elastomers are polyoxyalkylene-modified elastomers formed from divinyl compounds, particularly siloxane polymers with at least two free vinyl groups, reacting with Si-H linkages on a polysiloxane backbone. Preferably, the elastomers are dimethyl polysiloxanes crosslinked by Si-H sites on a molecularly spherical MQ resin.

- 25 Combinations of emulsifying and non-emulsifying crosslinked siloxane elastomers may also be useful for the purposes of this invention.

- 7 -

Amounts of the polysiloxane materials may range from 0.1 to 80%, preferably from 1 to 60%, optimally from 5 to 40% by weight of the composition.

Fatty acids having from 10 to 30 carbon atoms may in certain formulations also be suitable for compositions of the present invention. Illustrative of this category are  
5 pelargonic, lauric, myristic, palmitic, stearic, isostearic, hydroxystearic, oleic, linoleic, ricinoleic, arachidic, behenic and erucic acids. Particularly preferred is stearic acid. Amounts of the fatty acid may range from 0.1 to 20%, preferably from 0.5 to 10%, optimally from 1 to 5% by weight of the composition.

Compositions of this invention will include a cosmetically acceptable carrier. Amounts of  
10 the carrier may range from 1 to 99.9%, preferably from 50 to 95%, optimally from 80 to 90%. Among the useful carriers are water, emollients, fatty alcohols, thickeners and combinations thereof. The carrier may be aqueous, anhydrous or an emulsion. Preferably the compositions are aqueous, especially water and oil emulsions of the W/O or O/W variety. Water when present may be in amounts ranging from 1 to 95%,  
15 preferably from 20 to 70%, optimally from 35 to 60% by weight.

Emollient materials may serve as cosmetically acceptable carriers. These may be in the form of natural or synthetic esters and hydrocarbons. Amounts of the emollients may range anywhere from 0.1 to 95%, preferably between 1 and 50% by weight.

Among the ester emollients are:

20 a) Alkenyl or alkyl esters of fatty acids having 10 to 20 carbon atoms. Examples thereof include isoarachidyl neopentanoate, isononyl isonanonoate, oleyl myristate, isopropyl myristate, oleyl stearate, and oleyl oleate.

b) Ether-esters such as fatty acid esters of ethoxylated fatty alcohols.

25 c) Polyhydric alcohol esters. Ethylene glycol mono and di-fatty acid esters, diethylene glycol mono- and di-fatty acid esters, polyethylene glycol (200-6000) mono- and di-fatty



- 8 -

acid esters, propylene glycol mono- and di-fatty acid esters, polypropylene glycol 2000 monooleate, polypropylene glycol 2000 monostearate, ethoxylated propylene glycol monostearate, glyceryl mono- and di-fatty acid esters, polyglycerol poly-fatty esters, ethoxylated glyceryl mono-stearate, 1,3-butylene glycol monostearate, 1,3-butylene glycol distearate, polyoxyethylene polyol fatty acid ester, sorbitan fatty acid esters, and polyoxyethylene sorbitan fatty acid esters are satisfactory polyhydric alcohol esters. Particularly useful are pentaerythritol, trimethylolpropane and neopentyl glycol esters of C<sub>1</sub>-C<sub>30</sub> alcohols.

- d) Wax esters such as beeswax, spermaceti wax and tribehenin wax.
- 10 e) Sterols esters, of which cholesterol fatty acid esters are examples thereof.
- f) Sugar esters of fatty acids such as sucrose polybehenate and sucrose polycottonseedate.
- g) Natural esters useful in this invention are sunflower seed oil, safflower oil, cottonseed oil, olive oil, jojoba and mixtures thereof.
- 15 Hydrocarbons which are suitable cosmetically acceptable carriers include petrolatum, mineral oil, C<sub>11</sub>-C<sub>13</sub> isoparaffins, polyalphaolefins, and especially isohexadecane, available commercially as Permethyl 101A from Presperse Inc.

Fatty alcohols having from 10 to 30 carbon atoms are another useful category of cosmetically acceptable carrier. Illustrative are stearyl alcohol, lauryl alcohol, myristyl alcohol and cetyl alcohol. Amounts may range from 0.05 to 20%, preferably from about 20 0.1 to about 2% by weight of the composition.

Thickeners can be utilized as part of the cosmetically acceptable carrier of compositions according to the present invention. Typical thickeners include polyacrylamides (e.g. Sepigel 305®), acryloyldimethyltaurate polymers and copolymers (e.g. Aristoflex AVC), 25 crosslinked acrylates (e.g. Carbopol 982®), hydrophobically-modified acrylates (e.g.

- 9 -

Carbopol 1382®), cellulosic derivatives and natural gums. Among useful cellulosic derivatives are sodium carboxymethylcellulose, hydroxypropyl methocellulose, hydroxypropyl cellulose, hydroxyethyl cellulose, ethyl cellulose and hydroxymethyl cellulose. Natural gums suitable for the present invention include guar, xanthan, sclerotium, carrageenum, pectin and combinations of these gums. Inorganics may also be utilized as thickeners, particularly clays such as bentonites and hectorites, fumed silicas, and silicates such as magnesium aluminum silicate (Veegum®). Amounts of the thickener may range from 0.0001 to 10%, usually from 0.001 to 1%, optimally from 0.01 to 0.5% by weight of the composition.

10 Cosmetic compositions of the present invention may be in any form. These forms may include lotions, creams, roll-on formulations, sticks, mousses, aerosol and non-aerosol sprays and pad-applied (e.g. wipe) formulations.

Sunscreen actives may also be included in compositions of the present invention. Particularly preferred are such materials as ethylhexyl p-methoxycinnamate, available as Parsol MCX®, Avobenzene, available as Parsol 1789® and benzophenone-3, also known as Oxybenzone. Inorganic sunscreen actives may be employed such as microfine titanium dioxide and zinc oxide. Amounts of the sunscreen agents when present may generally range from 0.1 to 30%, preferably from 2 to 20%, optimally from 4 to 10% by weight.

20 Compositions of the present invention may also contain vitamins. Illustrative water-soluble vitamins are Niacinamide, Vitamin B<sub>2</sub>, Vitamin B<sub>6</sub>, Vitamin C, Folic Acid and Biotin. Among the useful water-insoluble vitamins are Vitamin A (retinol), Vitamin A Palmitate, ascorbyl tetraisopalmitate, Vitamin E (tocopherol), Vitamin E Acetate and DL-panthenol. Total amount of vitamins when present in compositions according to the present invention may range from 0.0001 to 10%, preferably from 0.01% to 1%, optimally from 0.1 to 0.5% by weight of the composition.

25 Skin lightening agents may be included in the compositions of the invention. Illustrative substances are placental extract, lactic acid, niacinamide, arbutin, kojic acid, resorcinol

- 10 -

and derivatives including 4-substituted resorcinols and combinations thereof. Amounts of these agents may range from 0.1 to 10%, preferably from 0.5 to 2% by weight of the composition.

5 Desquamation agents are further optional components. Illustrative are the alpha-hydroxycarboxylic acids and beta-hydroxycarboxylic acids. Among the former are salts of glycolic acid, lactic acid and malic acid. Salicylic acid is representative of the beta-hydroxycarboxylic acids. Amounts of these materials when present may range from 0.01 to 15% by weight of the composition.

10 A variety of herbal extracts may optionally be included in compositions of this invention. Illustrative are green tea, chamomile, licorice, lavender, grape seed and extract combinations thereof. The extracts may either be water soluble or water-insoluble carried in a solvent which respectively is hydrophilic or hydrophobic. Water and ethanol are the preferred extract solvents.

15 Anti-microbial agents may also be included in the compositions of this invention. Illustrative are trichlosan, trichlocarban, Octopyrox® and zinc pyrithione. Amounts may range from 0.01 to 5%, preferably from 0.1 to 0.5% by weight of the composition.

Colorants, fragrances, opacifiers and abrasives may also be included in compositions of the present invention. Each of these substances may range from 0.05 to 5%, preferably between 0.1 and 3% by weight.

20 The term "comprising" is meant not to be limiting to any subsequently stated elements but rather to encompass non-specified elements of major or minor functional importance. In other words the listed steps, elements or options need not be exhaustive. Whenever the words "including" or "having" are used, these terms are meant to be equivalent to "comprising" as defined above.

The following examples will more fully illustrate the embodiments of this invention. All parts, percentages and proportions referred to herein and in the appended claims are by weight unless otherwise illustrated.

5

### **EXAMPLE 1 to 8**

Typical body lotions according to the present invention are illustrated in the Examples of Table I.

- 10 The formulations of Table I are formulated in the following manner. Above specified quantities of disodium EDTA, titanium dioxide and xanthan gum/glycerin slurry are charged to a batching vessel. These components are mixed for 5 minutes and then the Carbomer is added as an aqueous solution (2% w/w). Heat is applied and the mixed contents are held at 80°C for 15 minutes. The remaining glycerin is added.
- 15 The oil phase ingredients are then charged to a separate vessel. Light mixing is begun and heat applied to achieve 80°C. Slowly, the oil phase is added to the water phase under moderate mixing while maintaining temperature. All remaining water is charged to the vessel. Then the contents are homogenized at 80°C for 1 minutes. Contents are then cooled to 38-40°C accompanied by large sweep (75
- 20 rpm) mixing. Glydant Plus is added at 55°C. Cooling is continued accompanied by slow addition of DC 1501, fragrance and the various minor ingredients.



## EXAMPLE 9

Illustrated herein is a skin cream according to the present invention.

TABLE II

5

INGREDIENT	WEIGHT %
Glycerin	6.95
Niacinamide	5.00
Tapioca Starch	5.00
Permethyl 101A <sup>1</sup>	3.00
Sepigel 305 <sup>2</sup>	2.50
DC-1403 <sup>3</sup>	2.00
Isopropyl Isostearate	1.50
Arlatone 2121 <sup>4</sup>	1.00
Cetyl Alcohol	0.75
SEFA Cottonate <sup>5</sup>	0.70
Tocopherol Acetate	0.50
Panthenol	0.50
Stearyl Alcohol	0.50
Titanium Dioxide	0.40
Ganzpearl® GMP 0820	0.35
Disodium EDTA	0.10
Glydant Plus <sup>6</sup>	0.10
PEG-100 Stearate	0.10
Stearic Acid	0.10
Purified Water	Balance

<sup>1</sup> Isohexadecane (Presperse Inc., South Plainfield, NJ)

<sup>2</sup> Polyacrylamide(and)C13-14 Isoparaffin(and) Laureth-7 (Seppic Corporation, Fairfield, NJ)

<sup>3</sup> dimethicone(and)dimethiconol (Dow Corning Corp. Midland, MI)

<sup>4</sup> Sorbitan Monostearate and Sucrococoate (ICI Americas Inc., Wilmington, DE)

<sup>5</sup> Sucrose ester of fatty acid

<sup>6</sup> DMDM hydantoin (and) iodopropynyl butylcarbamate (Lonza Inc., Fairlawn, NJ)

10

## EXAMPLE 10

15 Another oil-in-water emulsion according to the present invention is described under Table III.

TABLE III

INGREDIENT	WEIGHT %
Phase A	
Distilled Water	balance
Phase B	
Glycerin	5.00
Titanium dioxide	0.75
Phase C	
Glycerin	1.00
Disodium EDTA	0.10
Carbopol® 954	0.68
Carbopol® 1382	0.10
Tapioca starch	2.50
Phase D	
Cetyl alcohol	0.70
Stearyl alcohol	0.50
Stearic acid	0.10
PEG-100 stearate	0.10
Glycerol monostearate	1.00
Dimethicone	2.00
Cyclomethicone	0.65
Tocopherol acetate	0.10
Niacinamide	2.00
Phase E	
Distilled water	2.00
NaOH	To neutralize
Phase F	
Urea	2.00
D-Panthenol	0.10
Distilled water	5.00
Phase G	
Glydant Plus	0.10
Glycerin	1.00
Distilled water	1.00
Phase H	
Methyl isostearate	1.50
Ganzpearl® GMP 0820	0.50
Retinol	0.50
Butylated hydroxy toluene	0.05
Tween® 20	1.00

## EXAMPLE 11

A study was performed to evaluate various performance aspects of the present invention. For this purpose, a panel of 10 members was assembled to measure sensory properties of a series of lotions. The base formula employed for the study is reported as Example 1, except that the Tapioca Pure, Ganzpearl® GMP 0820, and the silicones were varied according to Table IV.

TABLE IV

Sample No.	Tapioca Pure	Ganzpearl ® GMP 0820 (wt.%)	Silicones (wt.%)
A	0	0.25	0
B	1.75	0	0
C	0	0	0
D	1.75	0.25	0
E	1.75	0.25	7.25
F	0	0	7.25
G	1.75	0	7.25
H	0	0.25	7.25

Each of the panelists was given the eight Samples A-H. A portion of each was spread on the panelist's hands with a request to rate each on a scale from 1 to 5. A rating of 1 corresponded to the least silky/powdery feel while a rating of 5 represented the best combination of most silky/powdery feel. Results are provided in Table V below.

Weighed rankings were obtained by multiplying the rating (1 to 5) by the number of panellists who thought that the sample fell within that rating, then adding up the five values so obtained (one for each rating) and dividing the total by five (the total number of ratings).



TABLE V

Sample No.	Weighted Ranking
A	5.0
B	5.4
C	5.2
D	7.2
E	6.8
F	4.6
G	6.0
H	5.4

The lotion which scored best was sample D formulated with a combination of Tapioca Pure and Ganzpearl® GMP 0820. The addition of silicones as in sample E was almost as silky/powdery. It was clear from samples A and B that lacking either Tapioca Pure or Ganzpearl® GMP 0820 lotions resulted with an inferior feel performance.

## EXAMPLE 12

A series of experiments were conducted to evaluate skinfeel performance through instrumentation. The same samples C, E and F as in example 11 were evaluated for stick/slip friction. Each product was applied to a 15 cm by 15 cm glass plate and spread uniformly using a #12 Meier Wire Rod. The spread lotion was then dried for 18 hours at 21°C and 50% relative humidity. A 7.6 cm by 2.5 cm aluminum sled covered with a 100% rayon nonwoven fabric (carded white nonwoven fabric made from a 100% rayon staple fibre and a binder with basis weight of 34.0 g/yd<sup>2</sup> supplied by American Nonwovens Inc (Columbus, MS, USA)) was pulled across the surface of the sled by an Instron-type apparatus in 15 second increments, stopping at the end of each increment. The sled was pulled a distance of 2.5 cm during each 15 second increment. The sequence was: pull for 15-seconds, stop, pull for 15-seconds, stop and so on until the edge of the glass plate was reached. A new piece of nonwoven fabric was placed on the sled and the sequence was repeated on a new section of the glass plate. The sled was run without and with a 100 gram

weight. Sixteen runs were performed for each condition. The data is reported in Table VI.

TABLE VI

Sled with or without 100 g	Sample C	Sample E	Sample F
With weight	78.7 +/- 6.8	73.1 +/- 5.1	88.7 +/- 6.5
Without weight	14.3 +/- 1.1	12.2 +/- 1.2	16.4 +/- 2.0

- 5 The values in the table represent the mean peak load in grams as measured by the Instron-type apparatus force transducer with standard deviation specified. The data shows that the addition of silicones increases the peak load ("stick") 15% and 13% for the un-weighted and weighted sled. Compare sample C to sample F. The effect of all the additives is a decrease of 15% and 7%. Compare sample C to sample E.
- 10 Note that the addition of Tapioca Pure and Ganzpearl® GMP 0820 to the product containing silicone reduces the peak load by 26% and 18%. Compare sample E to sample F. These tests confirm the enhanced aesthetics achievable by the Tapioca Pure and Ganzpearl® GMP 0820 combination.

## CLAIMS

1. A cosmetic composition comprising:
  - (i) from 0.1 to 10% by weight of tapioca starch;
  - (ii) from 0.001 to 5% by weight of polyacrylic beads of number average particle  
5 size ranging from 1 to 50 microns;
  - (iii) from 0.01 to 10% by weight of an emulsifier;
  - (iv) optionally, an effective amount to provide an initial silky feel upon skin  
contact of a polysiloxane material;
  - (v) optionally, from 0.1 to 20% by weight of a C<sub>12</sub>-C<sub>22</sub> fatty acid;
  - 10 (vi) optionally, from 0.001 to 40% by weight of polyhydric alcohol;
  - (vii) optionally, an effective amount to preserve of a preservative; and
  - (viii) a cosmetically acceptable carrier.
  
2. The cosmetic composition according to claim 1 wherein the polyacrylic beads are  
15 crosslinked polymethyl methacrylate beads.
  
3. The cosmetic composition according to claim 1 or claim 2 wherein the beads  
have a number average particle size ranging from 3 to 15 microns.
  
- 20 4. The cosmetic composition according to any one of the preceding claims wherein  
the polysiloxane material is a dimethiconol.
  
5. The composition according to any one of the preceding claims wherein the  
tapioca starch is present in an amount from 0.5 to 5% by weight of the  
25 composition.
  
6. The composition according to any one of the preceding claims wherein the  
polyhydric alcohol is glycerin.
  
- 30 7. The composition according to any one of the preceding claims wherein the  
polysiloxane material is present from 0.1 to 80% by weight of the composition.

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/EP2005/004267

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 A61K7/48

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, CHEM ABS Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 03/022234 A (UNILEVER PLC; UNILEVER NV; HINDUSTAN LEVER LIMITED) 20 March 2003 (2003-03-20) page 1, lines 4-6; examples 1-8 page 2, line 23 - page 4, line 2	1-7
Y	WO 01/66078 A (BLOCK DRUG COMPANY, INC; WHALLEY, KEVIN) 13 September 2001 (2001-09-13) claims 10-15; example 1	1-7
A	WO 02/074264 A (BEIERSDORF AG; BLECKMANN, ANDREAS; KROEPKE, RAINER; RIEDEL, HEIDI) 26 September 2002 (2002-09-26) example 4	1-7

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

° Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
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- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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- \*&\* document member of the same patent family

Date of the actual completion of the international search

13 July 2005

Date of mailing of the international search report

16/08/2005

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## INTERNATIONAL SEARCH REPORT

International Application No  
PCT/EP2005/004267

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