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(72) Inventeurs/Inventors:
KASAT, RADHAKRISHNA B., US;
DE LA ROSA, CONSUELO P., US;
LINN, ELIZABETH, US;
BARR, MORTON L., US

(73) Propriétaire/Owner:
COLGATE-PALMOLIVE COMPANY, US

(74) Agent: SMART & BIGGAR

(54) Titre : COMPOSITION DE BATON ANTISUDORAL A FAIBLES RESIDUS
(54) Title: LOW RESIDUE ANTIPERSPIRANT STICK COMPOSITION

(57) **Abrégé/Abstract:**

Disclosed are antiperspirant stick compositions that exhibit substantially no visible residue (whitening) upon application to the skin or after drying. The compositions include both emollients that are silicone materials and emollients that are not silicone materials, these materials having a refractive index of at least 1.4460, in addition to including a vehicle (for example, cyclomethicone), a gelling agent (for example, stearyl alcohol and hydrogenated castor oil) and the active antiperspirant material (for example, particulate antiperspirant metal salts). These compositions reduce the necessity of using expensive silicone materials, while still achieving antiperspirant compositions with substantially no visible residue.



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(21) International Application Number: PCT/US97/04220 (22) International Filing Date: 18 March 1997 (18.03.97) (30) Priority Data: <table border="0"> <tr> <td>60/013,727</td> <td>20 March 1996 (20.03.96)</td> <td>US</td> </tr> <tr> <td>08/818,486</td> <td>14 March 1997 (14.03.97)</td> <td>US</td> </tr> </table> (71) Applicant: COLGATE-PALMOLIVE COMPANY [US/US]; 300 Park Avenue, New York, NY 10022 (US). (72) Inventors: KASAT, Radhakrishna, B.; 65 Oxford Place, Belle Mead, NJ 08502 (US). DE LA ROSA, Consuelo, P.; 12 Kenzel Avenue, Nutley, NJ 07110 (US). LINN, Elizabeth; 621 Fifth Avenue, Lyndhurst, NJ 07071 (US). (74) Agent: MIANO, Rosemary; Colgate-Palmolive Company, 909 River Road, Piscataway, NJ 08855-1343 (US).		60/013,727	20 March 1996 (20.03.96)	US	08/818,486	14 March 1997 (14.03.97)	US	(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
60/013,727	20 March 1996 (20.03.96)	US						
08/818,486	14 March 1997 (14.03.97)	US						
(54) Title: LOW RESIDUE ANTIPERSPIRANT STICK COMPOSITION (57) Abstract Disclosed are antiperspirant stick compositions that exhibit substantially no visible residue (whitening) upon application to the skin or after drying. The compositions include both emollients that are silicone materials and emollients that are not silicone materials, these materials having a refractive index of at least 1.4460, in addition to including a vehicle (for example, cyclomethicone), a gelling agent (for example, stearyl alcohol and hydrogenated castor oil) and the active antiperspirant material (for example, particulate antiperspirant metal salts). These compositions reduce the necessity of using expensive silicone materials, while still achieving antiperspirant compositions with substantially no visible residue.								

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LOW RESIDUE ANTIPERSPIRANT STICK COMPOSITION

10 BACKGROUND OF THE INVENTION

15 The present invention is directed to an antiperspirant stick composition. In particular, the present invention is directed to an antiperspirant stick composition (for example, a solid stick composition) which reduces or eliminates the residue left on the skin after application. Preferably the compositions of this invention leave substantially no visible (for example, white) residue on skin after application or after drying, and have superior cosmetic properties.

20 Wax-based stick compositions, which contain a wax-type solidifying agent, are known. It is also known to incorporate an antiperspirant active material, such as aluminum-zirconium-glycine complexes, in such wax-based stick compositions, to provide an antiperspirant stick. However, application of such
25 wax-based antiperspirant stick to the skin frequently results in objectionable aesthetic characteristics (such as unsatisfactory glide on the skin); moreover, such products leave undesirable visible residue (white residue) on the skin after application and after drying.

30 U.S. Patent No. 4,919,934 to Deckner, et al. discloses wax-based cosmetic stick compositions containing specific amounts of a wax-type solidifying agent and a polyalphaolefin, and preferably an active component such as a sunscreen agent, analgesic, antiperspirant or deodorant active. This patent

discloses that the stick composition preferably also includes at least one emollient, selected from volatile and non-volatile silicone oils and non-polar fatty acid and fatty alcohol esters; these compositions which contain an antiperspirant active and/or deodorant active also preferably include at least one emulsifier.

There have been attempts to provide low-residue antiperspirant solid sticks. See, for example, U.S. Patent No. 4,822,603 to Farris, et al.; U.S. Patent No. 5,254,332 to Greczyn, et al.; and U.S. Patent No. 5,302,381 to Greczyn, et al. Each of U.S. Patent No. 4,985,238 to Tanner and U.S. Patent No. 5,169,626 to Tanner discloses low residue antiperspirant sticks containing specific amounts of a volatile silicone material; a particulate antiperspirant active; a low melting point wax; and a non-volatile paraffinic hydrocarbon fluid selected from mineral oils, branched-chain hydrocarbons containing an average of from about 16 to about 68 carbon atoms, and mixtures thereof. Non-essential components which can also be incorporated in the sticks include, for example, emollients, colorants, perfumes and emulsifiers.

U.S. Patent No. 5,225,188 to Abrutyn, et al. discloses underarm formulations which contain volatile and/or non-volatile alkylmethysiloxanes having a specific structure, which formulations may contain other components such as astringent antiperspirant compounds, suspending agents, conventional waxes, emollients, perfumes, coloring agents and other ingredients normally used in making underarm products. Incorporation of the alkylmethysiloxanes in underarm formulations provide characteristics such as modified hardness, reduced

whitening, improved feel, compatibility of ingredients, and control of vapor pressure.

It has also been proposed to incorporate phenyltrimethicone in antiperspirant formulations containing
5 cyclomethicone as a vehicle, stearyl alcohol and hydrogenated castor oil as gelling agents, PEG-8 distearate, and aluminum-zirconium-tetrachlorohydrate-Gly, the phenyltrimethicone acting as a masking ingredient for the antiperspirant active ingredient to avoid a visible residue
10 of the antiperspirant active on the skin.

U.S. Patent No. 5,449,511 to Coe discloses a non-aqueous antiperspirant product that includes a non-aqueous carrier vehicle; an antiperspirant active salt suspended in particle form in the carrier vehicle; and a non-volatile,
15 water-soluble, liquid (at 25°C) masking agent that interacts with the antiperspirant active to essentially eliminate discernible whitening without substantially inhibiting the antiperspirant activity of the salt when the product is applied to the skin. The masking agent can be

WO 97/34577

PCT/US97/04220

5 selected from non-volatile aliphatic compounds (such as
alcohols, ethers, silanols, silyl ethers, siloxanes and
silicones) which contains disubstituted oxygen
functionalities. This patent discloses that the masking agent
preferably is a water-soluble, liquid, non-volatile emollient
10 material, which reduces whitening by interacting with the
particulates to produce an optical effect that tends to reduce
light scattering and apparent whiteness. Illustrative masking
agents disclosed in U.S. Patent No. 5,449,511 include PPG-10
butanediol and dimethicone copolyols. This patent discloses
15 that, in addition, for solid products, gelling agents may be
included, examples of suitable gelling agents including
hydrogenated castor oil, and fatty alcohols such as stearyl
alcohol, among others, as well as blends and combinations.

Thus, it is an object of the invention to provide an
20 antiperspirant stick composition that exhibits reduced and
preferably no whitening (residue) upon application to the skin
or after drying thereon, which has desired cosmetic properties
and antiperspirant efficacy, and which can be formed at
reduced cost.

25 It is also an object of the invention to provide
antiperspirant stick compositions with reduced visible residue
on the skin after application and after drying, which have
good cosmetic characteristics.

It is a further object of the invention to provide an
30 antiperspirant stick composition having reduced or

5 substantially no visible (white) residue on the skin after application and after drying, which includes a method of making and of using such antiperspirant stick composition.

It is another object of the present invention to provide an antiperspirant stick composition which exhibits
10 substantially little or no visible residue on the skin after application and after drying, and which has good cosmetic properties (including good glide on the skin and good emolliency).

15 SUMMARY OF THE INVENTION

The foregoing objects are achieved by an antiperspirant stick composition comprising:

- (1) an antiperspirant active material;
 - (2) a gelling agent, in an amount so as to form a stick
20 (especially a solid stick) product;
 - (3) a vehicle for the gelling agent, in an amount such that the gelling agent can dissolve therein and can gel therefrom; and
 - (4) an emollient, including both at least one non-
25 volatile silicone material and at least one non-volatile emollient material that is not a silicone material, wherein
 - (a) both the at least one non-volatile silicone material and the at least one emollient material that is not a silicone material have a refractive index of at least 1.4460;
- 30 and

(b) these emollient materials, as a whole, are included in an amount so as to reduce or eliminate the whitening effect of an antiperspirant active ingredient on the skin.

5 The invention also relates to a method for controlling perspiration wetness by applying the antiperspirant stick composition of the invention to auxillary regions of the human.

 The invention also relates to a method of reducing
10 visible residue resulting from application of an antiperspirant stick composition to human skin, comprising incorporating an emollient in a composition also containing an antiperspirant active ingredient, a gelling agent and a vehicle for the gelling agent, wherein the emollient
15 includes both at least one non-volatile silicone material and at least one non-volatile emollient material that is not a silicone material, the at least one non-volatile silicone material and the at least one non-volatile emollient material having refractive indices of at least 1.4460,
20 wherein the emollient is incorporated in an amount so as to reduce a whitening effect of the antiperspirant active ingredient on the skin.

 The invention also relates to an antiperspirant stick composition made by combining: (a) an antiperspirant
25 active ingredient, in an amount sufficient to provide an antiperspirant active effect when applied to the human skin; (b) a gelling agent, in an amount sufficient to provide the composition as a stick composition; (c) a vehicle for the gelling agent, in an amount such that the gelling agent can
30 dissolve therein and can gel therefrom; and (d) an

emollient, the emollient comprising both at least one non-volatile silicone material and at least one non-volatile emollient material that is not a silicone material, wherein (i) both the at least one non-volatile silicone material and the at least one non-volatile emollient material have refractive indices of at least 1.4460, and (ii) the emollient is included in an amount so as to reduce or eliminate a whitening effect of the antiperspirant active ingredient on the skin.

10 DETAILED DESCRIPTION OF THE INVENTION

The present invention contemplates an antiperspirant stick composition that leaves substantially little or no visible residue (whitening) either upon application to the skin or after drying on the skin. The nonaqueous composition includes, in addition to an antiperspirant active material (for example, a particulate antiperspirant metal salt), a gelling agent, a vehicle for the gelling agent (the vehicle being a material in which the gelling agent can dissolve and from which the gelling agent can form a gel (for example, upon cooling)), and an emollient, the emollient including at least one non-volatile silicone material and at least one non-volatile emollient material that is not a silicone material, the various emollient materials having a refractive index of at least 1.4460, with the emollient materials being included in an amount so as to mask a whitening effect of the antiperspirant active ingredient (and any other whitening powder ingredient, such as talc) on the skin.

By incorporating the emollient material that is not a silicone material, such emollient material having the specified refractive index, especially in combination with the

5 non-volatile silicone material, a relatively low-cost component can be included to mask any whitening effect, while also providing improved cosmetic properties due to its emolliency effects.

The antiperspirant active materials used in this
10 invention can be any conventional antiperspirant material, including (but not limited to) antiperspirant active metal salts. These antiperspirant active metal salts generally have a refractive index of at least 1.500, and include, but are not limited to, aluminum-zirconium tri-, tetra- and penta-
15 chlorohydrate glycine complexes, which are coordination complexes of aluminum-zirconium tri-, tetra- or penta-chlorohydrate and glycine in which some of the water molecules normally coordinated to the metal have been displaced by the glycine. Illustrative antiperspirant active metal salts
20 include aluminum-zirconium tetrachlorohydrex gly (for example, Reach AZP-908 and Reach 908-0, each manufactured by Reheis Inc., Berkeley Heights, New Jersey, which are coordination complexes of aluminum-zirconium tetrachlorohydrate and glycine in which some of the water molecules normally coordinated to
25 the metal have been displaced by the glycine. The present invention is not limited to use of aluminum-zirconium tetrachlorohydrex gly, and other antiperspirant active metal salts (such as aluminum chlorohydrate), and/or other antiperspirant active materials, can be utilized in the stick
30 composition of the present invention.

Illustratively, antiperspirant solid stick compositions according to the present invention contain the antiperspirant active material in an amount of 10-30% by weight, of the total weight of the composition. Moreover, 5 the preferred antiperspirant material particulate (for example, antiperspirant metal salt particulate) has a median particle size of less than 100 microns, a bulk density of 20-40 pounds/cubic foot and a spherical particle shape. Most preferred is a median particulate size of 10 5-40 microns, preferably 5-10 microns.

The gelling agent used in the composition of the present invention are those commonly known in the art. Examples include various waxes, including (but not limited to) hydrogenated castor oil, fatty alcohols such as stearyl 15 alcohol, polyethylene, etc. For various gelling agents, attention is directed to the solidifying agents described in U.S. Patent No. 4,919,934 to Deckner, et al. Various combinations, blends and mixtures of different materials can be utilized as the gelling agent according to the present 20 invention. Illustratively, the gelling agent is included in an amount of 17%-40% by weight, of the total weight of the composition.

A preferred gelling agent for the present invention is a mixture of high melting point wax and low 25 melting point wax, such as hydrogenated castor oil and stearyl alcohol, which

5 respectively have refractive indices in the ranges of 1.570-
1.585 and of 1.50-1.52. Any whitening effect due to the
gelling agent can be avoided according to the present
invention, utilizing emollient material having refractive
indices of at least 1.4460.

10 Illustratively (and not limiting of the present
invention), where the gelling agent includes both high and low
melting point waxes, the low melting point wax is included in
the composition in an amount of 10%-25% by weight, and the
high melting point wax is included in the composition in an
15 amount of 2%-17% by weight, each of the total weight of the
composition.

Of course, the gelling agent must be soluble in the
vehicle, and must be able to be gelled therefrom, for example,
upon cooling of the composition after the composition has been
20 heated in order to dissolve the gelling agent in the vehicle.

The gelling agents suitable for use with this invention
include microcrystalline waxes, stearyl alcohol, hydrogenated
castor oil, cetyl stearate, stearyl stearate, cetyl myristate,
cetyl palmitate, and stearoxydimethionine.

25 Compositions according to the present invention include a
non-aqueous carrier vehicle; in preferred embodiments, a
volatile silicone such as cyclomethicone is utilized as the
vehicle. An illustratively cyclomethicone which can be used
as the vehicle is DC-345 silicone fluid, from Dow Corning
30 Corp. However, the vehicle is not limited to cyclomethicone,

5 and other known vehicles, such as aliphatic hydrocarbons, can also be utilized as the vehicle. Illustratively, and not limiting of the present invention, the vehicle is included in the composition in an amount of 30%-50% by weight, of the total weight of the composition.

10 Suitable vehicles include cyclomethicone, hydrogenated polyisobutene, isodecane, isohexane, and isoeicosane.

Emollients are a known class of materials in this art, imparting a soothing effect to the skin. According to the present invention, the emollient (for example, non-volatile
15 emollient) incorporated in the composition both reduces or eliminates visible residue and imparts emollient effects to the skin. Suitable non-volatile emollients include silicone and non-silicone materials. Such silicone materials include silicone compounds such as phenyltrimethicone and dimethicone
20 copolyol.

The non-volatile emollient materials (both the non-volatile silicone materials and the non-volatile emollient material that is not a silicone material) each can include a mixture. The emollient materials cannot all be silicone
25 materials. It is preferred that each of the emollient materials of the mixture has a refractive index of at least 1.4460. Preferably, the emollient materials have a high refractive index, close to the refractive index of the antiperspirant active material.

5 By incorporating the emollient materials (including the
emollient material that is not a silicone material) having a
refractive index of at least 1.4460, in the composition, both
improved cosmetic properties and reduced whitening effects are
achieved. That is, by utilizing the emollient materials
10 having the refractive index of at least 1.4460, whitening
effects of the active salt complex (and any other whitening
powder ingredient in the composition for example, talc) can be
avoided. Moreover, the compositions, containing the at least
one non-volatile emollient material that is not a silicone
15 material, can include relatively inexpensive emollients.

Accordingly, through use of the present invention,
incorporating at least the non-silicone, non-volatile
emollient material having a refractive index of at least
1.4460 in the composition, in combination with the non-
20 volatile silicone, an antiperspirant stick composition is
achieved which exhibits no residue (whitening) upon
application to the skin or after drying, which composition
includes relatively low-cost materials, and which composition
has good cosmetic properties.

25 The composition according to the present invention
desirably includes, in addition to the foregoing components,
inert fillers and/or other materials such as, for example,
fragrances, bacteriostats and/or bactericides, colorants,
etc., known in the art as components of antiperspirant stick
30 compositions.

5 As mentioned previously, various known components of
antiperspirant solid sticks can also be incorporated in the
solid stick compositions according to the present invention,
such known components including fragrances, bacteriostats,
etc. Known bacteriostats include bacteriostatic quaternary
10 ammonium compounds such as 2-amino-2-methyl-1-propanol (AMP),
cetyl-trimethylammonium bromide, cetyl pyridinium chloride, 2,
4, 4N-trichloro-2N-hydroxydiphenylether (Triclosan), etc., and
various zinc salts. The bacteriostat can, illustratively, be
included in the composition in an amount of 0.2-1.0% by
15 weight, of the total weight of the composition.

Various fragrances known in the art can also be
incorporated in the antiperspirant solid stick composition of
the present invention. These fragrances can be incorporated
in amounts known in the art, e.g., 0.5-3.0% by weight, of the
20 total weight of the composition.

Inert fillers can be incorporated in the antiperspirant
stick compositions of the present invention. Illustratively,
the inert filler can be corn starch, talc, fumed silica and/or
inorganic clays, polyethylene, or mixtures of these inert
25 particulate materials. Preferably, the inert filler, in
particulate form, should have physical properties (for
example, size, shape, etc.) that are similar to those of the
antiperspirant active material (for example, particulate
antiperspirant active metal salt).

5 Where the inert filler contributes to the whitening
 (visible residue) effect of the stick composition, the
 whitening effect can be reduced through use of the emollient
 having the refractive index in the present invention.

 While the invention will be described in connection with
10 specific and preferred embodiments, it will be understood that
 it is not intended to limit the invention to those
 embodiments. To the contrary, it is intended to cover all
 alterations, modifications and equivalents as may be included
 within the spirit and scope of the invention as defined by the
15 appended claims.

 Throughout the present disclosure, where compositions are
 described as including or comprising specific components, or
 where processes are described as including or comprising
 specific processing steps, it is contemplated that
20 compositions of the present invention also consist essentially
 of, or consist of, the recited components, and that the
 processes of the present invention also consist essentially
 of, or consist of, the recited processing steps.

 In the following Table are set forth various illustrative
25 non-volatile, non-silicone emollient materials that can be
 utilized, in combination with the non-volatile silicone
 emollient material, as part of the present invention, both to
 reduce the whitening effect of the antiperspirant active
 ingredient and to provide emollient properties to the
30 antiperspirant stick compositions. Listed in the following

WO 97/34577

PCT/US97/04220

- 5 Table are the CTFA name (as set forth in the CTFA International Cosmetic Ingredient Dictionary (4th Ed. 1991)), a trade name for the material (where appropriate), and the refractive index of such material.

TABLE

CTFA Name	Tradename	Refractive Index
Isostearyl isostearate	SCHERCEMOL 1818	1.4612
Glycereth-7-benzoate	PELEMOL G7B	1.4953
C12-C15 alkyl benzoate	FINSOLV TN	1.4820
Octyldodecyl benzoate	FINSOLV BOD	1.4833
Isostearyl lactate	PELEMOL ISL	1.4519
Isostearyl palmitate	DERMOL ISP	1.4546
Benzyl laurate	MAZON EE-1	1.4811
Laureth 4	MACOL LA 4	1.4514
Laureth 7	MACOL LA 790	1.4547
Oleth 2	BRIJ 93	1.4612
PEG 4	CARBOWAX 200	1.4594
PEG 12	CARBOWAX 600	1.4664
PPG 2 ceteareth 9	EUMULGIN L	1.4611
PPG 2 isodeceth 12	SANDOXYLATE SX 424	1.4591
PPG 5 buteth 7	UCON 50 HB 170	1.4526
PPG 14 butyl ether	FLUID AP	1.4474
PPG 15 butyl ether	UCON LB 285	1.4479
PPG 53 butyl ether	UCON LB 3000	1.4512
Octyldodecanol	EUTANOL G	1.4530

Polydecene	ETHYLFLO 364	1.4535
Polydecene	ETHYLFLO 366	1.4569

5

Of course, combinations (for example, mixtures) of at least two of the above-listed emollient materials can be incorporated in compositions of the present invention.

10 Illustratively, the non-volatile emollient material that is not a silicone can be incorporated in the composition in an amount of 10%-27% by weight, of the total weight of the composition. This range is not limiting of the present invention.

15 Furthermore, compositions according to the present invention include non-volatile silicone emollient materials, for example, those having relatively high refractive indices (such as phenyltrimethicone, having a refractive index of 1.4600). Phenyltrimethicone is an illustrative non-volatile emollient silicone material, and is not limiting of the
20 present invention. Illustratively (and not limiting), the non-volatile emollient silicone material is included in the composition in an amount of 5%-20% by weight, of the total weight of the composition. Combinations (such as mixtures) of at least two non-volatile emollient silicone materials can be
25 incorporated in compositions of the present invention; thus, combinations both of non-volatile emollient materials and of non-volatile silicone emollient materials can be included in compositions of the present invention. Other emollient

5 materials which can be incorporated in the compositions of the present invention include, illustratively (but not limiting), dimethicone copolyol (DC 190), having a refractive index of 1.4480; and dimethicone copolyol (DC 193), having a refractive index of 1.4540. Where relatively large amounts of the
10 relatively expensive phenyltrimethicone, and where relatively large amounts of the dimethicone copolyols, are utilized, advantages of using the non-silicone material (for example, low-cost component) are somewhat limited.

The antiperspirant sticks of the present invention may be
15 manufactured using methods known in the art. Typically, the ingredients are combined and heated to melt components (for example, other than the antiperspirant material particulate and particulate inert filler), and the melted and particulate components are mixed. Desirably, volatile materials, such as
20 the fragrance material, are incorporated in the composition in the latter stages of the mixing cycle, in order to avoid volatilization thereof. After mixing, the molded composition can be poured into stick-form molds (for example dispensing containers), as conventional in the art, after which the
25 compositions harden into a solid.

The compositions according to the present invention can be utilized by the consumer, to reduce perspiration, as conventional antiperspirant solid stick compositions are used. An end of the molded compositions, hardened in the dispensing
30 container, can be elevated out of the dispensing container, so

5 as to protrude out of the dispensing container, and rubbed
 against the skin in the axillary region, for example, so as to
 deposit antiperspirant active material in the axillary region,
 which prevents (or at least reduces) perspiration from the
 axillary region. Thus, by rubbing the composition of the
 10 present invention against the skin in regions of the body
 particularly prone to perspiration (for example, the axillary
 region), perspiration wetness in such regions can be
 controlled.

The following sets forth an example of the present
 15 invention. This example is illustrative, and not limiting, of
 the present invention. In this Example A, the amounts are in
 percent by weight, of the total weight of the composition.
 Where appropriate, the refractive indices of the various
 materials are set forth.

20

EXAMPLE A

	<u>Ingredients</u>	<u>%w/w</u>	<u>Refractive Index</u>
	Cyclomethicone	37.0	1.3980
	PPG 14 Butyl Ether	13.1	1.4474
25	Phenyltrimethicone	5.0	1.4600
	Aluminum Zirconium		
	Tetrachlorohydrex Gly Complex	20.0	1.5360
	PEG 8 Distearate	2.0	
	Fragrance/Starch	1.9	
30	Hydrogenated Castor Oil	4.0	1.570-1.585
	Stearyl alcohol	<u>17.0</u>	1.50-1.52
		100.0%	

In the foregoing Example A, PPG-14 butyl ether and
 35 phenyltrimethicone are used as emollient materials reducing
 the whitening effect of the whitening powder ingredients (for
 example, the antiperspirant active material) on the skin. It

WO 97/34577

PCT/US97/04220

5 is preferred that emollients having relatively high refractive indices close to that of, for example, the antiperspirant active ingredient, be utilized, in order to avoid visible residue (whitening) on the skin.

EXAMPLE B

10	<u>Ingredients</u>	<u>%w/w</u>	<u>Refractive Index</u>
	Cyclomethicone	35.1	1.3980
	Phenyltrimethicone	10.0	1.4600
	Aluminum Zirconium		
15	Tetrachlorohydrex Gly Complex	20.0	1.5360
	PEG 8 Distearate	2.0	
	Fragrance/Starch	1.9	
	Hydrogenated Castor Oil	4.0	1.570-1.585
	Stearyl alcohol	17.0	1.50-1.52
20	Isostearyl isostearate	<u>10.0</u>	1.4612
		100.0%	

Accordingly, by the present invention, an antiperspirant
 25 solid stick composition having substantially no visible (white) residue on the skin after application and after drying, and which has good cosmetic properties, yet which is relatively inexpensive in cost of the materials utilized to form the composition, is achieved.

30 Studies were done to illustrate the performance of compositions made in accordance with this invention. In the first study, a composition was made according to Example A and evaluated for visual white residue when applied to the underarm. Four commercial, white, opaque antiperspirant
 35 sticks and one antiperspirant gel product were also evaluated for comparison. There were five cells (each commercial product versus the Example A product; 14 female panelists

WO 97/34577

PCT/US97/04220

5 participated in each cell. The evaluator applied 0.3 grams $\pm$
 10 percent of product in a circular motion into the armpit of
 the panelist. The panelist held her arms up for 30 minutes.
 Then the evaluator standing 1.83 meters (6 feet) away from the
 panelist, ranked the intensity of whiteness seen in the
 10 underarm area on a scale of 0 - 8 (0 being no whiteness and 8
 being extreme whiteness). The evaluators were given
 photographs as standards for the scale. The results are
 listed below. In these tables, axillary vault area means a
 10.16 cm X 15.24 cm (4 X 6 inch) underarm area; n means the
 15 number of evaluations (for all the following tests n=14);
 p-value means the probability of observing a test statistic
 value which can be considered as extreme as, or more extreme
 than, the observed value. The term "p-value" is recognized by
 those dealing with statistics. Usually p-value is interpreted
 20 as a measure (on a scale from 0-1) of how well the data
 support or discredit the null hypothesis; the smaller the p-
 value, the greater the evidence against the null-hypothesis.
 The "*" mark indicates a statistically significant difference
 favoring the product made by Example A.

Example A versus Commercial Sample B

Test Article	Mean	Difference (A vs. B)	p-value (A vs. B)
Example A	0.43	0.86	0.001
Sample B	1.29		

WO 97/34577

PCT/US97/04220

5

Example A versus Commercial Sample C

Test Article	Mean	Difference (A vs. C)	p-value (A vs. C)
Example A	0.29	0.39	0.010
Sample C	0.68		

Example A versus Commercial Sample D

Test Article	Mean	Difference (A vs. D)	p-value (A vs. D)
Example A	0.39	2.54	< 0.001
Sample D	2.93		

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Example A versus Commercial Sample E

Test Article	Mean	Difference (A vs. E)	p-value (A vs. E)
Example A	0.43	0.54	0.029
Sample E	0.96		

Example A versus Commercial Sample F

Test Article	Mean	Difference (A vs. F)	p-value (A vs. F)
Example A	0.29	2.29	< 0.001
Sample F	2.57		

15 In a second study, only the product of Example A was evaluated and similarly applied under both arms of 30 female panelists. This time the panelists held their arms at their sides for 30 minutes. Using the previously described 0 - 8

5 scale, the evaluator ranked the appearance of the underarm
area. The average result was a value of 0.13, indicating very
little visible white residue.

Although we have shown and described several embodiments
in accordance with the present invention, it is understood
10 that the same is not limited thereto, but is susceptible to
numerous changes and modifications as known to one having
ordinary skill in the art, and we therefore do not wish to be
limited to the details shown and described herein, but intend
to cover all such modifications as are encompassed by the
15 scope of the appended claims.

62301-2045

CLAIMS:

1. Antiperspirant stick composition exhibiting reduced or no visible residue after application to human skin, comprising:

5 (a) an antiperspirant active ingredient, in an amount sufficient to provide an antiperspirant active effect when applied to the human skin;

(b) a gelling agent, in an amount sufficient to provide the composition as a stick composition;

10 (c) a vehicle for the gelling agent, in an amount such that the gelling agent can dissolve therein and can gel therefrom; and

(d) an emollient, the emollient comprising both at least one non-volatile silicone material and at least one
15 non-volatile emollient material that is not a silicone material, wherein (i) both the at least one non-volatile silicone material and the at least one non-volatile emollient material have refractive indices of at least 1.4460, (ii) the emollient is included in an amount so as to
20 reduce or eliminate a whitening effect of the antiperspirant active ingredient on the skin, (iii) the non-volatile silicone material is included in an amount of 5-20% by weight of the total weight of the composition, and (iv) the non-volatile emollient material that is not a silicone
25 material is included in an amount of 10-27% by weight of the total weight of the composition.

2. The antiperspirant stick composition according to claim 1, wherein the at least one non-volatile emollient material is selected from the group consisting of isostearyl
30 isostearate; glycereth-7-benzoate; C₁₂-C₁₅ alkyl benzoate;

octyldodecyl benzoate; isostearyl lactate; isostearyl palmitate; benzyl laurate; laureth-4; laureth-7; oleth-2; PEG 4; PEG-12; PPG-2 Ceteareth-9; PPG-2 Isodeceth-12; PPG-5 buteth-7; PPG 14 butyl ether; PPG-15 butyl ether; PPG-53 butyl ether; octyldodecanol; and polydecene.

3. The antiperspirant stick composition according to claim 2, wherein the antiperspirant active ingredient is an antiperspirant metal salt, in particulate form.

4. The antiperspirant stick composition according to claim 3, wherein the antiperspirant active ingredient has a refractive index of at least 1.500.

5. The antiperspirant stick composition according to claim 4, wherein the antiperspirant active ingredient is aluminum-zirconium tetrachlorohydrex gly complex, having a refractive index of 1.5360.

6. The antiperspirant stick composition according to claim 4, wherein the non-volatile silicone material includes phenyltrimethicone.

7. The antiperspirant stick composition according to claim 6, wherein the composition also includes an additional whitening powder ingredient, the silicone material and the

emollient material being included in an amount sufficient to reduce a whitening effect of the additional whitening powder ingredient and of the antiperspirant active ingredient on the skin.

8. The antiperspirant stick composition according to claim 6, wherein the gelling agent includes both stearyl alcohol and hydrogenated castor oil.

9. The antiperspirant stick composition according to claim 8, wherein the vehicle for the gelling agent includes cyclomethicone.

10. The antiperspirant stick composition according to claim 9, wherein the composition includes, in percent by weight of the total weight of the composition, 30%-50% of the vehicle, 2%-17% hydrogenated castor oil, 10%-25% stearyl alcohol, 10%-30% antiperspirant metal salt, 5%-20% non-volatile silicone material, and 10%-27% non-volatile emollient material.

11. The antiperspirant stick composition according to claim 1, wherein the antiperspirant active ingredient is an antiperspirant metal salt, in particulate form.

62301-2045

12. The antiperspirant stick composition according to claim 11, wherein the non-volatile silicone material includes phenyltrimethicone.

13. The antiperspirant stick composition according to claim 11, wherein the non-volatile silicone material includes dimethicone copolyol.

14. The antiperspirant stick composition according to claim 1 or 2, wherein the vehicle is included in an amount of 30%-50% by weight, the gelling agent is included in an amount of 17%-40% by weight, and the antiperspirant active ingredient is included in an amount of 10%-30% by weight, each of the total weight of the composition.

15. The antiperspirant stick composition according to claim 14, wherein the non-volatile silicone material includes phenyltrimethicone or dimethicone copolyol.

16. The antiperspirant stick composition according to claim 14 or 15, wherein the antiperspirant active ingredient is an antiperspirant metal salt, in particulate form.

17. A method for controlling perspiration wetness, comprising applying the antiperspirant stick composition of claim 16 to axillary regions of a human.

18. A method for controlling perspiration wetness, comprising applying the antiperspirant stick composition of claim 11 to axillary regions of a human.

19. A method for controlling perspiration wetness, comprising applying the antiperspirant stick composition of claim 10 to axillary regions of a human.

20. A method for controlling perspiration wetness, comprising applying the antiperspirant stick composition of claim 3 to axillary regions of a human.

21. A method for controlling perspiration wetness, comprising applying the antiperspirant stick composition of claim 1 to axillary regions of a human.

22. A method of reducing visible residue resulting from application of an antiperspirant stick composition to human skin, comprising incorporating an emollient in a composition also containing an antiperspirant active ingredient, a gelling agent and a vehicle for the gelling agent, wherein the emollient includes both at least one non-volatile silicone

62301-2045

material and at least one non-volatile emollient material that is not a silicone material, wherein (i) the at least one non-volatile silicone material and the at least one non-volatile emollient material have refractive indices of at least 1.4460, (ii) the emollient is incorporated in an amount so as to reduce a whitening effect of the antiperspirant active ingredient on the skin, (iii) the non-volatile silicone material is included in an amount of 5-20% by weight of the total weight of the composition, and (iv) the non-volatile emollient material that is not a silicone material is included in an amount of 10-27% by weight of the total weight of the composition.

23. An antiperspirant stick composition made by combining:

(a) an antiperspirant active ingredient, in an amount sufficient to provide an antiperspirant active effect when applied to the human skin;

(b) a gelling agent, in an amount sufficient to provide the composition as a stick composition;

(c) a vehicle for the gelling agent, in an amount such that the gelling agent can dissolve therein and can gel therefrom; and

(d) an emollient, the emollient comprising both at least one non-volatile silicone material and at least one non-volatile emollient material that is not a silicone material, wherein (i) both the at least one non-volatile silicone material and the at least one non-volatile emollient material have refractive indices of at least 1.4460, (ii) the emollient is included in an amount so as to reduce or eliminate a whitening effect of the antiperspirant

62301-2045

active ingredient on the skin, (iii) the non-volatile silicone material is included in an amount of 5-20% by weight of the total weight of the composition, and (iv) the non-volatile emollient material that is not a silicone material is included in an amount of 10-27% by weight of the total weight of the composition.

24. The antiperspirant stick composition according to claim 1 further comprising a bacteriostat.
25. The antiperspirant stick composition according to claim 24 wherein the bacteriostat is added in an amount of 0.2 - 1.0% by weight of the total weight of the composition.
26. The antiperspirant stick composition according to claim 24 wherein the bacteriostat is selected from the group consisting of quaternary ammonium compounds and zinc salts.
27. The antiperspirant stick composition according to claim 26 wherein the bacteriostat is selected from the group consisting of 2-amino-2-methyl-1-propanol; cetyl-trimethylammonium bromide; cetyl pyridinium chloride; 2,4,4-N-trichloro-2N-hydroxydiphenylether.
28. The antiperspirant stick composition according to claim 1 further comprising a fragrance.
29. The antiperspirant stick composition according to claim 28 wherein the fragrance is added in an amount of 0.5 - 3.0% by weight of the total weight of the composition.
30. The antiperspirant stick composition according to claim 1 further comprising an inert filler.
31. The antiperspirant stick composition according to claim 30 wherein the inert filler is selected from the group consisting of corn starch, talc, fumed silica, inorganic clays, polyethylene and mixtures of the foregoing.
32. The antiperspirant stick composition according to claim 30 comprising cyclomethicone, PPG-14 butyl ether; phenyltrimethicone; aluminum zirconium tetrachlorohydrate glycine complex; PEG-8 distearate; fragrance; starch; hydrogenated castor oil; and stearyl alcohol.

