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(54) Title: COMPOSITION IN THE POWDER FORM COMPRISING AT LEAST ONE ESSENTIAL OIL AND ONE MODIFIED TAPIOCA STARCH

(57) Abstract: The present patent application relates to a composition in the powder form comprising, in a cosmetically acceptable particulate phase: a) at least one essential oil or a mixture of essential oils; b) at least one modified tapioca starch exhibiting an absorption capacity for a fatty substance of greater than 1ml/g; c) at least one filler other than the said starch. The present invention thus relates to a method for the cosmetic treatment of body odours, in particular axillary odours, which consists in applying, to the skin, in particular the axillae, a composition as defined above.



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COMPOSITION IN THE POWDER FORM COMPRISING AT LEAST ONE ESSENTIAL OIL AND ONE MODIFIED TAPIOCA STARCH

- 5 The present patent application relates to a composition in the powder form comprising, in a cosmetically acceptable particulate phase:
- a) at least one essential oil or a mixture of essential oils;
 - b) at least one modified tapioca starch exhibiting an absorption capacity for a fatty substance of greater than 1 ml/g;
 - c) at least one filler other than the said starch.
- 10 The present invention thus relates to a method for the cosmetic treatment of body odours, in particular axillary odours, which consists in applying, to the skin, in particular the axillae, a composition as defined above.
- 15 The commonest deodorant compositions on the cosmetics market are provided in the roll-on form, the stick form or in the form pressurized in a device of the aerosol type with propellant or vaporizer (spray). However, each of these types of presentation forms exhibits disadvantages and discomforts for the user. Roll-ons exhibit the inconvenience of producing a wet feeling and of having a long drying
- 20 time. Aerosols and sprays have the disadvantage of producing a sternutatory effect on the consumer. For their part, sticks have a tendency to leave marks or a greasy deposit layer which is not always pleasant. These types of presentations have a tendency, for a variable period of time, to form a wet film on the armpits.
- 25 For the treatment of body odours, presentation in the powder form makes it possible to avoid all these disadvantages. The use of polysaccharides and in particular of starches and of their derivatives is known in these applications. Starches are polymers composed of individual units which are anhydroglucose units. The number of these units and the assembling thereof make it possible to
- 30 distinguish amylose (linear polymer) and amylopectin (branched polymer). The relative proportions of amylose and amylopectin and their degree of polymerization vary according to the botanical source of the starches. The amylose/amylopectin ratio by weight can vary from 30/70 (maize) to 16/84 (rice).
- 35 These starting materials are often combined with other compounds in order to form more or less occlusive films on the skin. There may be numerous disadvantages exhibited by this, such as the drying time, the feeling of discomfort or the fluffing of the film.
- 40 The need remains to produce cosmetic or dermatological compositions in the powder form based on polysaccharides having a good deodorant effectiveness without the disadvantages indicated above, such as an excessively long drying time, the feeling of discomfort or a phenomenon of fluffing.
- 45 The Applicant Company has discovered, surprisingly, that this objective can be achieved by using an essential oil or a mixture of essential oils in a powder in combination with (a) at least one modified tapioca starch exhibiting an absorption capacity for a fatty substance of greater than 1 ml/g. The Applicant Company has also found, unexpectedly, that such a powder makes it possible not only to obtain
- 50 a good deodorant effectiveness but also an antiperspirant activity.

This discovery is at the basis of the present invention.

5 The present invention thus relates to a composition in the powder form comprising, in a cosmetically acceptable particulate phase:

- a) at least one essential oil or a mixture of essential oils;
- b) at least one modified tapioca starch exhibiting an absorption capacity for a fatty substance of greater than 1 ml/g;
- c) at least one filler other than the said starch.

10

The term "cosmetically acceptable" is understood here to mean any support compatible with the skin and/or its superficial body growths which exhibits a pleasant colour, a pleasant odour and a pleasant feel and which does not cause unacceptable discomfort (smartness, tightness, redness) liable to dissuade the consumer from using this composition.

15

The term "modified starch" is understood to mean any starch which has been subjected to a transformation by the chemical, physical or enzymatic route.

20 The fatty substances are composed of oils and waxes.

The term "oil" is understood to mean a compound which is liquid at ambient temperature.

25 The term "wax" is understood to mean a compound which is solid or substantially solid at ambient temperature and which has a melting point generally of greater than 35°C.

30 The Applicant Company has discovered in particular that the compositions in accordance with the invention exhibit a good bactericidal effectiveness with regard to the microorganisms involved in the formation of unpleasant axillary odours, predominantly *Corynebacterium xerosis*, and can thus be used as deodorant product.

35 The present invention thus relates to a method for the cosmetic treatment of body odours, in particular axillary odours, which consists in applying, to the skin, in particular the axillae, a composition as defined above.

ESSENTIAL OILS

40

According to the definition given in International Standard ISO 9235 and adopted by the European Pharmacopoeia Commission, an essential oil is an odorous product generally of complex composition which is obtained from a botanically defined plant starting material, either by steam distillation or by dry distillation or by an appropriate mechanical process devoid of heating (cold expression). The essential oil is generally separated from the aqueous phase by a physical process not resulting in a significant change in the composition.

45

Methods for obtaining essential oils

50

The choice of technique depends mainly on the starting material: its original state and its characteristics, its nature proper. The "essential oil/plant starting material" yield can be highly variable depending on the plants: 15 ppm to more than 20%. This choice conditions the characteristics of the essential oil, in particular
5 viscosity, colour, solubility, volatility, enrichment or depletion in some constituents.

Steam distillation

Steam distillation corresponds to the vaporization, in the presence of steam, of a
10 substance which is not very miscible with water. The starting material is brought together with water brought to boiling point or with steam in a still. The steam entrains the essential oil vapour, which is condensed in the condenser in order to be recovered as liquid phase in a Florentine flask (or essence jar), where the essential oil is separated from the water by settling. The term "aromatic water" or
15 "hydrolat" or "distilled floral water" is used to describe the aqueous distillate which remains after the steam distillation, once the essential oil has been separated.

Dry distillation

20 The essential oil is obtained by distillation of the wood, bark or roots, without addition of water or steam, in a closed chamber designed in order for the liquid to be recovered in its bottom part. Cade oil is the most well known example of this method of production.

25 Cold expression

This method of production is applied only to citrus fruit (*Citrus* spp.) by mechanical processes at ambient temperature. The principle of the method is as follows: the peel is shredded and the contents of the secretory cavities which have been
30 ruptured are recovered by a physical process. The conventional process consists in exerting an abrasive action over the entire surface of the fruit under a stream of water. After removing the solid waste, the essential oil is separated from the aqueous phase by centrifuging. The majority of industrial plants in fact allow the simultaneous or sequential recovery of the fruit juices and of the essential oil.

35 Physicochemical features

Essential oils are generally volatile and liquid at ambient temperature, which
40 differentiates them from "fixed oils". They are more or less coloured and their density is generally lower than that of water. They have a high refractive index and the majority deviate polarized light. They are soluble in fats and in standard organic solvents, can be steam distilled and exhibit a very low solubility in water.

They are composed of molecules comprising a carbon-based backbone, the
45 number of carbon atoms generally being between 5 and 22.

The main chemical categories of compounds present in essential oils are:

- terpene and sesquiterpene carbon-based compounds, such as, for example:
50 turpentine essential oil: α -pinene, camphene,

juniper essential oil: α -pinene, camphene, cadinene
lemon essential oil: limonene.

- alcohols, such as, for example:
5 coriander essential oil: linalool
rosewood essential oil: linalool
rose essential oil: geraniol.

- mixtures of esters and of alcohols, such as, for example:
10 lavender essential oil: linalool and linalyl acetate
mint essential oil: menthol and menthyl acetate.

- aldehydes, such as, for example:
cinnamon essential oil: cinnamaldehyde
15 citronella essential oil: citral and citronellal
Eucalyptus citriodora essential oil: citronellal.

- ketones, such as, for example:
caraway essential oil: carvone
20 sage essential oil: thujone
thuja essential oil: thujone

- phenols
thyme essential oil: thymol
25 savory essential oil: carvacrol
oregano essential oil: thymol and carvacrol
clove essential oil: eugenol.

- ethers, such as, for example:
30 aniseed essential oil or star anise essential oil: anethole
fennel essential oil: anethole
Eucalyptus globulus essential oil: eucalyptol
cajuput essential oil: eucalyptol
niaouli essential oil: eucalyptol

35 - peroxides, such as, for example:
Chenopodium essential oil: ascaridol
garlic essential oil: allicin.

40 The great majority of essential oils are composed of a complex mixture of compounds belonging to these different chemical families.

Plant starting materials

45 The plant starting materials used to produce the essential oils are generally plants or plant parts which are in various states of dryness (dry, withered or fresh form).

Mention may be made, among the essential oils that can be used according to the invention, of those obtained from plants belonging to the following botanical
50 families:

- Abietaceae or Pinaceae: conifers
- Amaryllidaceae
- Anacardaceae
- 5 Anonaceae: ylang ylang
- Apiaceae (for example umbellifers): dill, angelica, coriander, sea fennel, carrot, parsley
- Araceae
- Aristolochiaceae
- 10 Asteraceae: *Achillea*, *Artemisia*, camomile, *Helichrysum*
- Betulaceae
- Brassicaceae
- Burseraceae: frankincense
- Carophyllaceae
- 15 Canellaceae
- Cesalpiniaceae: *Copaifera* (copaiba)
- Chenopodaceae
- Cistaceae: *Cistus*
- Cyperaceae
- 20 Dipterocarpaceae
- Ericaceae: gaultheria (wintergreen)
- Euphorbiaceae
- Fabaceae
- Geraniaceae: geranium
- 25 Guttiferae
- Hamamelidaceae
- Hernandiaceae
- Hypericaceae: St. John's wort
- Iridaceae
- 30 Juglandaceae
- Lamiaceae: thyme, oregano, *Monarda*, savory, basil, marjorams, mints, patchouli, lavenders, sages, catnip, rosemary, hyssop, balm
- Lauraceae: *Ravensara*, bay, rosewood, cinnamon, *Litsea*
- Liliaceae: garlic
- 35 Magnoliaceae: magnolia
- Malvaceae
- Meliaceae
- Monimiaceae
- Moraceae: hemp, hop
- 40 Myricaceae
- Myristicaceae: nutmeg
- Myrtaceae: eucalyptus, tea tree, *Melaleuca quinquenervia*, cajuput, *Backhousia*, clove, myrtle
- Oleaceae
- 45 Piperaceae: pepper
- Pittosporaceae
- Poaceae: citronella grass, lemon grass, vetiver
- Polygonaceae
- Ranunculaceae
- 50 Rosaceae: roses

- Rubiaceae
 Rutaceae: the whole citrus family
 Salicaceae
 Santalaceae: sandalwood
 5 Saxifragaceae
 Schisandraceae
 Styracaceae: benzoin
 Thymelaceae: agarwood
 Tilliaceae
 10 Valerianaceae: valerian, nard
 Verbenaceae: lantana, verbena
 Violaceae
 Zingiberaceae: galangal, turmeric, cardamom, ginger
 Zygophyllaceae.
 15

Use will more preferably be made, among the essential oils which can be used according to the invention, of

- 20 tropical basil
 cajuput
 cinnamon
 lemon catnip
 citronella
 25 clove
 coriander
Eucalyptus radiata
Eucalyptus citriodora
Eucalyptus globulus
 30 geranium
 geranium bourbon
 laserwort
 bay laurel
 lemon grass
 35 green mandarin
 marjoram Spanish
 lemon balm
 niaouli
 Spanish oregano
 40 Greek oregano
 cineol rosemary
 rose
 winter savory
 tea tree (*Melaleuca alternifolia*)
 45 thyme linalool
 thymol thyme (*Thymus vulgaris*)
 thymol thyme (*Thymus zygis*)
 verbena
 vetiver
 50

The essential oil or oils used according to the invention will be present in concentrations preferably ranging from 0.001% to 10% by weight, with respect to the total weight of the composition, and more preferably from 0.1% to 6% by weight, with respect to the total weight of the composition.

5

PARTICULATE PHASE

The particulate phase in accordance with the invention comprises at least one filler other than the modified tapioca starch exhibiting an absorption capacity for a fatty substance of greater than 1 ml/g.

10

The term "filler" should be understood as meaning colourless or white and inorganic or synthetic particles of any shape which are insoluble in the medium of the composition, whatever the temperature at which the composition is manufactured.

15

The filler or fillers are present in concentrations preferably ranging from 50 to 99% by weight and more preferably from 75 to 99% by weight and more preferably still from 80 to 99% by weight, with respect to the total weight of the composition.

20

The filler can be composed of spherical particles, of lamellar particles or of a mixture of spherical particles and of lamellar particles.

The term "spherical particles" is understood to mean, in the present patent application, particles having the shape or substantially the shape of a sphere which are insoluble in the medium of the composition according to the invention, even at the melting point of the medium (approximately 100°C).

25

In addition, the term "lamellar particles" is understood here to mean particles of parallelepipedal shape (rectangular or square surface), discoidal shape (circular surface) or ellipsoidal shape (oval surface) characterized by three dimensions: a length, a width and a height, which particles are insoluble in the medium of the composition according to the invention, even at the melting point of the medium (approximately 100°C).

30

Spherical particles

The spherical particles used according to the invention have the shape or substantially the shape of a sphere and can be hollow or solid. Advantageously, the particles of the invention have a particle size (number-average diameter) ranging from 0.1 µm to 250 µm, better still from 1 µm to 150 µm and better still from 10 µm to 100 µm.

40

The spherical particles can be organic or inorganic microspheres. Mention may be made, as spherical particles which can be used in the composition of the invention, for example, of silica powder; polyamide particles and in particular particles of Nylon 12, such as that sold under the name Orgasol by Atochem; polyethylene powders; microspheres based on acrylic copolymers, such as those made of ethylene glycol dimethacrylate/lauryl methacrylate copolymer sold by Dow Corning under the Polytrap name; expanded powders, such as hollow

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microspheres and in particular the polyvinylidene chloride/acrylonitrile microspheres sold under the name Expancel by Kemanord Plast or under the name Micropearl F 80 ED by Matsumoto; natural organic powders, such as bamboo powders, for example sold by Draco Natural Products; native starch
5 powders or modified starch powders other than that of tapioca of the invention; silicone resin microbeads, especially silsesquioxane powders, in particular described in Patent EP 293 795, such as those sold under the name Tospearl by Toshiba Silicone; and their mixtures.

10 These spherical particles can be present in amounts preferably ranging from 20 to 100% by weight, more preferably from 20 to 50% by weight and more particularly from 25 to 35% by weight, with respect to the total weight of the particulate phase.

15 The starches used, other than that of modified tapioca as described above, may be unmodified (native) or modified by the chemical or physical route.

The term "unmodified or native starch" is understood to mean any starch which has not been subjected to chemical, physical or enzymatic transformation.

20 These additional starches can have, as botanical origin, cereals or tubers. Thus, the natural starches can be chosen from maize, rice, tapioca, cassava, barley, potato, wheat, sorghum, palm or pea starches.

25 Use will more particularly be made of unmodified rice starches, such as the commercial product sold under the trade name Remi DR I by Beneo-Remy, or maize starches (INCI name: Zea Mays Starch) such as the product sold under the trade name C Gel 04201 by Cargill or such as the products sold under the Farmal CS trade names, in particular the commercial product Farmal CS 3650, by Corn Products International.

30 The additional modified starches of the invention can be modified by crosslinking with functional agents capable of reacting with the hydroxyl groups of the starch molecules, which will thus be bonded to one another (for example with octenylsuccinate anhydride, glyceryl and/or phosphate groups).

35 It is possible in particular to obtain, by crosslinking with phosphorus-comprising compounds, monostarch phosphates (of the St-O-PO-(OX)₂ type), distarch phosphates (of the St-O-PO-(OX)-O-St type) or even tristarch phosphates (of the St-O-PO-(O-St)₂ type) or their mixtures.

40 X denotes in particular alkali metals (for example sodium or potassium), alkaline earth metals (for example calcium or magnesium), ammonium ion, amine, such as those of monoethanolamine, diethanolamine, triethanolamine or 3-amino-1,2-propanediol, or basic amino acids, such as lysine, arginine, sarcosine, ornithine or
45 citrulline.

The phosphorus-comprising compounds can be, for example, sodium tripolyphosphate, sodium orthophosphate, phosphorus oxychloride or sodium trimetaphosphate.

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Mention may be made, by way of example, of starches crosslinked by octenylsuccinate anhydride, sold under the name Dry-Flo by National Starch, distarch phosphates or compounds rich in distarch phosphate, in particular the hydroxypropyl ethers of distarch phosphate having the INCI name: Hydroxypropyl Starch Phosphate, such as the products sold under the trade names Farinex VA70 C or Farnal MS 689 by Avebe Stadex; the products sold under the trade names Structure BTC, Structure HVS, Structure XL or Structure Zea by National Starch (maize distarch phosphate).

10 Lamellar particles

As indicated above, the lamellar particles are particles of parallelepipedal shape (rectangular or square surface), discoidal shape (circular surface) or ellipsoidal shape (oval surface) characterized by three dimensions: a length, a width and a height. When the shape is circular, the length and the width are identical and correspond to the diameter of a disc, while the height corresponds to the thickness of the disc. When the surface is oval, the length and the width correspond respectively to the major axis and to the minor axis of an ellipse and the height corresponds to the thickness of the elliptical disc formed by the platelet. When a parallelepiped is involved, the length and the width can be of identical or different dimensions: when they are of the same dimension, the shape of the surface of the parallelepiped is square; in the contrary case, the shape is rectangular. With regard to the height, it corresponds to the thickness of the parallelepiped.

The length of the lamellar particles used according to the invention preferably ranges from 0.01 to 100 μm , better still from 0.1 to 50 μm and even better still from 1 to 50 μm . The width of these platelets preferably ranges from 0.01 to 100 μm , better still from 0.1 to 50 μm and even better still from 1 to 10 μm . The height (thickness) of these platelets preferably ranges from 0.1 nm to 1 μm (0.1 to 1000 nm), better still from 1 nm to 600 nm and even better still from 1 nm to 500 nm.

Lamellar silicates as lamellar particles can be used in the composition of the invention.

Mention may be made, as lamellar silicates, of clays, talcs, micas, pearlescent agents, perlites and their mixtures.

Clays are mixed silicates of natural or synthetic origin including several (two or more) types of cations chosen from alkali metals (for example Na, Li or K), alkaline earth metals (for example Be, Mg or Ca), transition metals and aluminium.

Mention may be made, as clays which can be used in the invention, for example, of sodium magnesium silicate (CTFA name), clays of the kaolin family, such as kaolin or kaolinite, dickite or nacrite; clays of the family of halloysite, donbassite, antigorite, berthierine or pyrophyllite; montmorillonites; beidellite; vermiculites; stevensite; hectorites; saponites; chlorites; sepiolite or smectite, and also these clays chemically modified, for example by acrylic acids, polysaccharides (for

example carboxymethylcellulose) or organic cations, and their mixtures.

5 Talcs are hydrated magnesium silicates generally comprising aluminium silicate. The crystalline structure of talc consists of repeated layers of a sandwich of brucite between silica layers.

10 Micas are aluminium silicates optionally comprising iron and/or alkali metals. They have the property of being able to split up into thin layers (approximately 1 μm). They generally have a dimension ranging from 5 to 150 μm , preferably from 10 to 100 μm and better still from 10 to 60 μm , for the greatest dimension (length), and a height (thickness) of 0.1 to 0.5 μm . Mention may be made, as micas, of phlogopite, muscovite, fluorophlogopite, vermiculite and their mixtures. Mention may also be made of micaceous clays, such as illite.

15 The term "pearlescent agents" should be understood as meaning iridescent particles, in particular produced by certain shellfish in their shells or else synthesized, which are used to modify the texture of the composition and the mattness/sheen effect. Pearlescent agents are generally micas surface-treated in order to obtain this iridescent effect. Mention may be made, among the
20 pearlescent agents which can be used in the invention, for example, of micas covered with titanium oxide, with iron oxide, with natural pigment and/or with bismuth oxychloride, such as coloured or colourless mica/titanium oxide (or titanium oxide-coated mica), and their mixtures.

25 Mention may also be made, among lamellar silicates, of perlites and preferably expanded perlites.

The perlites which can be used according to the invention are generally aluminosilicates of volcanic origin and have the composition:

30 70.0-75.0% by weight of silica SiO_2
12.0-15.0% by weight of aluminium oxide Al_2O_3
3.0-5.0% of sodium oxide Na_2O
3.0-5.0% of potassium oxide K_2O
0.5-2% of iron oxide Fe_2O_3
35 0.2-0.7% of magnesium oxide MgO
0.5-1.5% of calcium oxide CaO
0.05-0.15% of titanium oxide TiO_2

40 The perlite is milled, dried and then graded in a first stage. The product obtained, referred to as perlite ore, is grey in colour and has a size of the order of 100 μm .

45 The perlite ore is subsequently expanded (1000°C/2 seconds) to give more or less white particles. When the temperature reaches 850–900°C, the water trapped in the structure of the material is vaporized and brings about the expansion of the material with respect to its original volume. The expanded perlite particles in accordance with the invention can be obtained by the expansion process described in Patent US 5 002 698.

50 Preferably, the perlite particles used will be milled; they are in this case referred to as Expanded Milled Perlite (EMP). They preferably have a particle size defined by

a median diameter D_{50} ranging from 0.5 to 50 μm and preferably from 0.5 to 40 μm .

5 Preferably, the perlite particles used exhibit a loose bulk density at 25°C ranging from 10 to 400 kg/m^3 (Standard DIN 53468) and preferably from 10 to 300 kg/m^3 .

10 Preferably, the expanded perlite particles according to the invention have a water absorption capacity, measured at the wet point, ranging from 200 to 1500% and preferably from 250 to 800%.

15 The wet point corresponds to the amount of water which it is necessary to add to 1 g of particles in order to obtain a homogeneous paste. This method is derived directly from that of the oil uptake applied to solvents. The measurements are carried out in the same way via the wet point and the flow point, which respectively have the following definitions:

20 wet point: weight, expressed in grams per 100 g of product, corresponding to the achievement of a homogeneous paste during the addition of a solvent to a powder;

25 flow point: weight, expressed in grams per 100 g of product, starting from which the amount of solvent is greater than the capacity of the powder to retain it. This is reflected by the achievement of a more or less homogeneous mixture which flows over the glass plate.

30 According to a particularly preferred embodiment of the present invention, the lamellar particles will be chosen from an expanded perlite, sodium magnesium silicate, kaolin, kaolinite, a montmorillonite, a hectorite, a talc, a mica, a pearlescent agent and their mixtures.

More particularly, the lamellar particles will be chosen from expanded perlite, kaolin, a talc or their mixtures.

35 Advantageously, use is more particularly made, in the composition of the invention, as lamellar particles, of kaolin, such as the product sold under the name Coslin C-100 by Engelhard; talc, such as those sold under the names Rose Talc and Talc SG-2000 by Nippon Talc; mica, such as those sold under the names Mica M RP and Silk Mica by Merck; titanium oxide-coated micas, such as the mica/titanium oxide/brown iron oxide (CTFA: Mica/Iron oxides/Titanium dioxide)
40 sold under the name Cloisonné rouge flambe 440 X by Engelhard; a modified hectorite, such as, for example, a bentone; or expanded perlite (INCI name: Expanded Milled Perlite), such as sold under the name Optimat 1430 OR by World Minerals.

45 These lamellar particles can be present in amounts preferably ranging from 40 to 100% by weight, more preferably from 50 to 91% by weight and better still from 60% to 80% by weight, with respect to the total weight of the particulate phase.

Pigments

In addition to the fillers, the particulate phase of the composition according to the invention can comprise pigments.

5

The term "pigments" should be understood as meaning inorganic or organic particles which are insoluble in the liquid organic phase and which are intended to colour and/or opacify the composition.

10 The pigments can be inorganic or organic pigments. Use may be made, as pigments, of metal oxides, such as iron oxides (in particular those which are yellow, red, brown or black in colour), titanium dioxides, cerium oxide, zirconium oxide or chromium oxide; manganese violet, ultramarine blue, Prussian blue, ferric blue and their mixtures.

15

Use is preferably made of pigments formed of iron oxides or of titanium dioxide.

The pigments can be treated with a hydrophobic agent in order to render them compatible with the organic phase of the composition. The hydrophobic treatment agent can be chosen from silicones, such as methicones, dimethicones or perfluoroalkylsilanes; fatty acids, such as stearic acid; metal soaps, such as aluminium dimyristate or the aluminium salt of hydrogenated tallow glutamate; perfluoroalkyl phosphates, perfluoroalkylsilanes, perfluoroalkylsilazanes, poly(hexafluoropropylene oxide)s, polyorganosiloxanes comprising perfluoroalkyl perfluoropolyether groups, amino acids; N-acylated amino acids or their salts; lecithin, isopropyl triisostearyl titanate, and their mixtures. The N-acylated amino acids can comprise an acyl group having from 8 to 22 carbon atoms, such as, for example, a 2-ethylhexanoyl, caproyl, lauroyl, myristoyl, palmitoyl, stearyl or cocoyl group. The salts of these compounds can be aluminium, magnesium, calcium, zirconium, zinc, sodium or potassium salts. The amino acid can, for example, be lysine, glutamic acid or alanine.

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The term "alkyl" mentioned in the abovementioned compounds denotes in particular an alkyl group having from 1 to 30 carbon atoms, preferably having from 5 to 16 carbon atoms.

Hydrophobic treated pigments are described in particular in Application EP-A-1 086 683.

40 Dyes

In addition to the fillers and the pigments, the particulate phase of the invention can comprise dyes.

45 The composition according to the invention can also comprise water- or fat-soluble dyes.

50

The term "fat-soluble dyes" should be understood as meaning compounds, generally organic compounds, which are soluble in fatty substances, such as oils.

The fat-soluble dyes are, for example, Sudan red, D&C Red No. 17, D&C Green No. 6, β -carotene, soybean oil, Sudan brown, D&C Yellow No. 11, D&C Violet No. 2, D&C Orange No. 5, quinoline yellow, annatto or bromo acids.

- 5 According to a preferred specific form of the invention, the particulate phase comprises at least one unmodified starch as described above and more particularly an unmodified rice starch, such as the commercial product sold under the trade name Remi DR I by Beneo-Remy, or a maize starch (INCI name: Zea Mays Starch), such as the product sold under the trade name C Gel 04201 by
10 Cargill, or such as the products sold under the Farmal CS trade names, in particular the commercial product Farmal CS 3650 by Corn Products International.

- 15 According to the invention, the unmodified starch or starches can preferably represent from 10 to 95% by weight, preferably from 20 to 90% by weight, with respect to the total weight of the composition.

MODIFIED TAPIOCA STARCH

- 20 One of the essential ingredients of the composition in the powder form according to the invention is a modified tapioca starch exhibiting an absorption capacity for a fatty substance of greater than 1 ml/g.

25 Preferably, the absorption capacity for a fatty substance varies from 2 to 6 ml/g.

The fatty substance absorption capacity can be measured according to the method described below:

Equipment:

- 30 - 10 ml pipette made of glass category AS 10 ml/0.1 ml, corresponding to the following specific features:
length 36.4 cm
external diameter: 11 mm
35 internal diameter, body: 8 mm
internal diameter, tip: 1 mm
- Pipette filter of Gilson F161280 type
- Support and rack for glass pipette
- Small laboratory equipment (beaker, spatula, funnel, Erlenmeyer flask, and the
40 like)
- Precision balance of Mettler XP504 type

Setup:

- 45 - The glass pipette is split 10 cm from the top end under the reservoir bulb.
- The Gilson filter is cut up, the cylinder of diameter 8 mm/length 6 mm is extricated and it is introduced into the pipette as far as the tip.

Procedure (at ambient temperature)

5 If unknown, the density ($\rho = w/V$) of the solvent used is measured at the given temperature (where w is the weight of the homogeneous substance occupying a volume V).

The empty instruments (Erlenmeyer flask, weighing beaker, funnel) are weighed in order to be able to accurately determine the weights involved.

- 10 For example: $W_3 = W_{\text{solvent recovered}} = W_{\text{erlen+solvent}} - W_{\text{empty erlen}}$
 - 500 mg of starch starting material are accurately weighed out and are introduced into the pipette: i.e., W_1 , the weight weighed (in mg)
 - the powder is lightly packed.
 - 7.5 ml of solvent are added to the pipette, care being taken to measure the
 15 corresponding weight (W_2 in mg).
 - The solvent is allowed to fall by gravity through the powder for 72 h and is recovered in a 10 ml Erlenmeyer flask.
 - The residual solvent present in the pipette is driven out by injecting air under pressure.
 20 - The solvent recovered is weighed: i.e. W_3 , the weight obtained in mg.

$$W_{\text{absorbed (ml/100 g)}} = \frac{W_2 - W_3}{\rho} \times \frac{1}{M_1} \times 100$$

25 The modified tapioca starch will be present in the powder of the invention preferably at contents ranging from 0.1 to 10% by weight and more preferably from 0.5 to 5% by weight, with respect to the total weight of the composition.

30 Use will more particularly be made of the product sold under the trade name Natrasorb Bath by Akzo Nobel.

ADDITIVES

35 The compositions of the invention used for the treatment of body odours can additionally comprise at least one agent for the treatment of perspiration.

The term "agent for the treatment of perspiration" is understood to mean any substance which, by itself alone, has the effect of reducing the feeling of moisture on the skin related to human sweat or of masking human sweat.

40 The antiperspirant salts or complexes in accordance with the invention are generally chosen from aluminium and/or zirconium salts or complexes. They are preferably chosen from aluminium hydrohalides; aluminium zirconium hydrohalides, or complexes of zirconium hydroxychloride and of aluminium
 45 hydroxychloride, with or without an amino acid, such as those described in Patent US-3 792 068.

Mention may in particular be made, among the aluminium salts, of aluminium

chlorohydrate in the activated or nonactivated form, aluminium chlorohydrate, the aluminium chlorohydrate polyethylene glycol complex, the aluminium chlorohydrate propylene glycol complex, aluminium dichlorohydrate, the aluminium dichlorohydrate polyethylene glycol complex, the aluminium dichlorohydrate propylene glycol complex, aluminium sesquichlorohydrate, the aluminium sesquichlorohydrate polyethylene glycol complex, the aluminium sesquichlorohydrate propylene glycol complex or aluminium sulphate buffered with sodium aluminium lactate.

10 Mention may in particular be made, among aluminium zirconium salts, of aluminium zirconium octachlorohydrate, aluminium zirconium pentachlorohydrate, aluminium zirconium tetrachlorohydrate or aluminium zirconium trichlorohydrate.

15 The complexes of zirconium hydroxychloride and of aluminium hydroxychloride with an amino acid are generally known under the name ZAG (when the amino acid is glycine). Mention may be made, among these products, of the aluminium zirconium octachlorohydrate glycine, aluminium zirconium pentachlorohydrate glycine, aluminium zirconium tetrachlorohydrate glycine and aluminium zirconium trichlorohydrate glycine complexes.

20 The antiperspirant active principles can be present in the composition according to the invention in a proportion of approximately 0.5 to 25% by weight, with respect to the total weight of the composition.

25 The compositions according to the invention can also comprise, in addition, one or more additional deodorant active principles.

30 The term "deodorant active principle" is used to describe any substance capable of masking, absorbing, improving and/or reducing the unpleasant odour resulting from the decomposition of human sweat by bacteria.

The deodorant active principles can be bacteriostatic agents or bactericidal agents acting on the microorganisms of axillary odours, such as 2,4,4'-trichloro-2'-hydroxydiphenyl ether ([®]Triclosan), 2,4-dichloro-2'-hydroxydiphenyl ether, 3',4',5'-trichlorosalicylanilide, 1-(3',4'-dichlorophenyl)-3-(4'-chlorophenyl)urea ([®]Triclocarban) or 3,7,11-trimethyldodeca-2,5,10-trienol ([®]Farnesol); quaternary ammonium salts, such as cetyltrimethylammonium salts or cetylpyridinium salts, DPTA (1,3-diaminopropanetetraacetic acid), 1,2-decanediol (Symclariol from Symrise), biguanide derivatives, such as polyhexamethylene biguanide salts or chlorhexidine and its salts; or 4-phenyl-4,4-dimethyl-2-butanol (Symdeo MPP from Symrise).

Mention may also be made, among the additional deodorant active principles, of: zinc salts, such as zinc salicylate, zinc gluconate, zinc pidolate; zinc sulphate, zinc chloride, zinc lactate, zinc phenolsulphonate or zinc ricinoleate;

- sodium bicarbonate;
- salicylic acid and its derivatives, such as 5-n-octanoylsalicylic acid;
- silver zeolites or silver-free zeolites;
- alum.

50

The deodorant active principles can preferably be present in the compositions according to the invention in concentrations by weight ranging from 0.01 to 5% by weight, with respect to the total weight of the composition.

- 5 According to a specific form of the invention, in order to improve the deodorant effectiveness of the composition, it is possible to add a hydroxylated ester resulting from the esterification of polyol and of C₄-C₁₆ carboxylic acid(s).

10 **HYDROXYLATED ESTERS RESULTING FROM THE ESTERIFICATION OF POLYOL AND OF C₄ TO C₁₆ CARBOXYLIC ACID(S)**

15 The esters more particularly considered according to the present invention are hydroxylated esters resulting from the esterification of polyol and of C₄ to C₁₆, more particularly C₆ to C₁₂, in particular C₇ to C₁₀ and more particularly C₈ to C₉ carboxylic acid(s).

20 The esters used according to the invention are in a hydroxylated form, that is to say carry at least one hydroxyl functional group, preferably 2, indeed even 3 or more, the hydroxyl functional groups being present on the alcohol residue of the ester.

Advantageously, the esters are C₁₀ to C₂₀ esters and have at least one fatty chain.

25 Generally, they derive from the esterification of at least one hydroxyl functional group of a polyol by a C₄ to C₁₆ carboxylic acid.

30 According to a specific embodiment, the esters suitable for the present invention can derive from the esterification of a polyol by various carboxylic acids, with the proviso, of course, that the ester thus obtained has at least one and preferably two free hydroxyl functional groups. It can be a hydroxylated monoester, a hydroxylated diester or one of their mixtures.

Polyols

35 The term "polyol" is understood to mean, within the meaning of the invention, any organic molecule comprising, in its chemical structure, at least two hydroxyl (OH) groups.

40 The polyol can in particular be a saturated or unsaturated and linear, branched or cyclic hydrocarbon compound carrying at least two and in particular at least three OH functional groups.

45 The polyol can in particular be a hydrocarbon compound comprising at least 2 carbon atoms and preferably less than 15 carbon atoms and carrying at least two hydroxyl groups, preferably from 2 to 10 hydroxyl groups.

It is preferably a hydrocarbon compound having from 2 to 12 carbon atoms and more preferably still from 2 to 8 carbon atoms.

50 The polyol can be a compound having from 2 to 8 carbon atoms and from 2 to 6 hydroxyl functional groups, such as, for example, ethylene glycol, glycerol, 1,2,3-

trihydroxyhexane, butanediol, 1,2-propanediol, erythritol, arabitol, adonitol, dulcitol, pentanediols, in particular 1,2-pentanediol, sorbitol or their mixtures.

5 Glycerol derivatives are, for example, butyl diglycol, polyglyceryl-3 diisostearate and castor oil. The polyol can be chosen from glycerol polymers and copolymers, such as, for example, hexaglycerol and diglycerol.

10 Glycol examples are, for example, ethylene glycol, propylene glycol, hexylene glycol, isoprene glycol, butylene glycol and pentylene glycol and those defined above.

The polyol can also be chosen from sugars, such as glucose, fructose, xylose, trehalose, sucrose, maltose, lactose and their mixtures.

15 Use may also be made of a mixture of polyols.

The polyol used according to the invention can more particularly be chosen from glycerol, glycols and their derivatives.

20 The particularly preferred polyols are chosen from glycerol, 1,2-propylene glycol or a mixture of two or more of these polyols.

Carboxylic acid

25 The carboxylic acid can be saturated or unsaturated and linear or branched.

It is advantageously a linear monocarboxylic acid.

30 Mention may in particular be made, by way of illustration of examples of monocarboxylic acid suitable for the invention, of butanoic acid, pentanoic acid, hexanoic acid, heptanoic acid, octanoic acid, nonanoic acid, decanoic acid, undecanoic acid, dodecanoic acid, tridecanoic acid, tetradecanoic acid, heptadecanoic acid, hexadecanoic acid or pentadecanoic acid.

35 Mention may more particularly be made, by way of representation of the branched acids, of isobutanoic acid, isopentanoic acid, pivalic acid, isohexanoic acid, isoheptanoic acid, isooctanoic acid, dimethyloctanoic acid, isononanoic acid, isodecanoic acid, isoundecanoic acid, isododecanoic acid, isotridecanoic acid, isotetradecanoic acid, isopentadecanoic acid, isohexadecanoic acid, 2-ethyl-
40 hexanoic acid, 2-butyloctanoic acid or 2-hexyldecanoic acid.

Hydroxy acids are also suitable for the present invention, such as
45 2-hydroxybutanoic acid, 2-hydroxypentanoic acid, 2-hydroxyhexanoic acid, 2-hydroxyheptanoic acid, 2-hydroxyoctanoic acid, 2-hydroxynonanoic acid, 2-hydroxydecanoic acid, 2-hydroxyundecanoic acid, 2-hydroxydodecanoic acid, 2-hydroxytridecanoic acid, 2-hydroxytetradecanoic acid and 2-hydroxyhexadecanoic acid.

50 It is more particularly a nonhydroxylated C₇ to C₁₀ acid and more particularly heptanoic acid, caprylic acid and capric acid.

The esters chosen from mono- and/or diglyceryl caprylate, mono- and/or diglyceryl heptanoate, mono- and/or diglyceryl caprylate, propylene glycol caprylate, propylene glycol heptanoate and their mixtures are very particularly suitable for the invention.

It is more particularly monoglyceryl caprylate and its mixtures. Mention will in particular be made of the compounds sold under the name Apmul MCM or Akoline MCM (glyceryl caprylate/caprato) from Abitec, or Dermosoft GMCY (glycerol caprylate) from Straetmans, Capmul 708 G (glyceryl caprylate comprising 75% of monoesters) from Abitec and also Capmul 907P (propylene glycol heptanoate) from Abitec or also Capmul 908P (propylene glycol caprylate) from Abitec.

The ester or esters can be present in the composition of the invention at a content preferably varying from 0.1 to 5% by weight, more preferably from 0.5 to 3% by weight and more particularly from 1 to 2% by weight of the total weight of the composition.

20 **PACKAGINGS AND DEVICES**

According to a specific form of the invention, the compositions in accordance can be packaged in and dispensed from a device of "saltcellar" type provided with a container comprising the composition and surmounted by a dispensing opening, in particular a dispensing grid comprising a plurality of holes; this opening being able to be attached by a fastening ring which is connected to the container by any appropriate means, such as screwing, snapping or crimping, and generally comprising a cap which will reversibly close the said dispensing opening by any appropriate means, such as screwing or snapping.

The said dispensing opening can be covered with an intermediate protective cover.

The device and its various components will preferably be formed from polymer of the polyolefin type, such as polyethylene or polypropylene. The wall of the container can be flexible or rigid.

Another subject-matter of the invention consists of such a packaging and dispensing device comprising a composition according to the invention as defined above.

According to another specific form of the invention, the compositions in accordance can be packaged in the form of single-dose bags.

According to another specific form of the invention, the composition of the invention can be packaged in an applicator comprising a reservoir containing the said composition, a cap intended to close the reservoir and an applicator holder which supports a deformable component for application of the product, made of foam or of elastomer of low hardness, the deformable component carrying bumps at the surface and having a high shape memory. In this applicator, the reservoir is

5 bounded by a capillary end piece in the form of a thimble having a far end equipped with a seat pierced by at least one capillary orifice against which the deformable component is applied and deformed in the position of closure of the reservoir by the cap. Such a device is described in particular in Patent EP 0 612 488.

10 According to another specific form of the invention, the composition of the invention can be packaged in a device as described in Application EP 1 086 904. It is a packaging device comprising a container having an interior space in which the composition of the invention in the powder form is present, a housing for receiving the application component and a permeable wall positioned between the said housing and the interior space containing the composition, the application component and the housing being arranged so that the application component exhibits, when it is in the said housing, at least one surface portion situated without substantial axial compression, with regard to an opening in the permeable wall, the said interior space being variable in volume. In this device, compression means are provided in order to selectively change the said interior volume from a first volume, greater than the volume of the composition, to a second volume, lower than the first, this reduction in volume being accompanied by an excess pressure, which is capable of promoting the transfer of composition through the said permeable wall to the application component.

25 The following examples will make possible a better understanding of the invention, without, however, exhibiting a limiting nature. The amounts shown are in % by weight.

Example 1: Deodorant powder

Ingredients	Amounts
Mandarin essential oil	5 g
Modified tapioca starch (Natrasorb Bath from Akzo Nobel)	5 g
Unmodified rice starch (Remi DR I from Beneo-Remy)	q.s. for 100 g

Example 2: Deodorant powder

Ingredients	Amounts
Sodium bicarbonate as a fine powder	15
Eucalyptus essential oil	0.14
Thyme essential oil	0.055
Modified tapioca starch (Natrasorb Bath from Akzo Nobel)	0.5
Unmodified maize starch (C* Gel 04201 from Cargill)	30
Glycerol caprylate	1.5
Ultrafine bamboo powder	10
Kaolinite	20
Talc (particle size: 4.5 microns) (Imperial 400, Luzenac)	q.s. for 100 g

CLAIMS

- 5 **1.** Composition in the powder form comprising, in a cosmetically acceptable particulate phase:
- a) at least one essential oil or a mixture of essential oils;
 - b) at least one modified tapioca starch exhibiting an absorption capacity for a fatty substance of greater than 1 ml/g;
 - c) at least one filler other than the said starch.
- 10 **2.** Composition according to Claim 1, where the filler is composed of spherical particles, of lamellar particles or a mixture of spherical particles and of lamellar particles.
- 15 **3.** Composition according to Claim 1 or 2, where the organic or inorganic spherical particles are chosen from silica powder; polyamide particles; polyethylene powders; microspheres based on acrylic copolymers; expanded polymeric spherical powders; natural organic powders, such as bamboo powders; native or modified cellulose powders, unmodified or modified starch powders; silicone resin
- 20 microbeads and their mixtures.
- 4.** Composition according to either one of Claims 2 and 3, where the lamellar particles are lamellar silicates and are more particularly chosen from clays, talcs, micas, pearlescent agents, perlites and their mixtures.
- 25 **5.** Composition according to any one of Claims 1 to 4, where the modified tapioca starch exhibits an absorption capacity for a fatty substance varying from 2 to 6 ml/g.
- 30 **6.** Composition according to any one of Claims 1 to 5, where the modified tapioca starch is present at contents ranging from 0.1 to 10% by weight and more preferably from 0.5 to 5% by weight, with respect to the total weight of the composition.
- 35 **7.** Composition according to any one of Claims 1 to 6, where the particulate phase comprises at least one unmodified starch.
- 8.** Composition according to Claim 7, where the unmodified starch is chosen from cereals and tubers, in particular from maize, rice, tapioca, cassava, barley, potato,
- 40 wheat, sorghum, palm or pea starches and preferably from native maize starches or native rice starches.
- 9.** Composition according to Claim 7 or 8, where the unmodified starch is present at contents ranging from 10 to 95% by weight, preferably from 20 to 90% by
- 45 weight, with respect to the total weight of the composition.
- 10.** Composition according to any one of Claims 1 to 9, additionally comprising at least one hydroxylated ester resulting from the esterification of polyol and of
- 50 C₄-C₁₆ carboxylic acid(s).

11. Composition according to any one of Claims 1 to 10, characterized in that it is packaged in the form of a single-dose bag.

5 **12.** Method for the cosmetic treatment of body odours, in particular axillary odours, which consists in applying, to the skin, in particular the axillae, a composition as defined in any one of Claims 1 to 11.

10 **13.** Device of "saltcellar" type provided with a container comprising a composition according to any one of Claims 1 to 11 and surmounted by a dispensing opening, in particular a dispensing grid comprising a plurality of holes; this opening being able to be attached by a fastening ring which is connected to the container by any appropriate means, such as screwing, snapping or crimping, and generally comprising a cap which will reversibly close the said dispensing opening by any appropriate means, such as screwing or snapping.

15 **14.** Applicator comprising a reservoir containing a composition according to any one of Claims 1 to 11, a cap intended to close the reservoir and an applicator holder which supports a deformable component for application of the product, made of foam or of elastomer of low hardness, the deformable component carrying bumps at the surface and having a high shape memory, characterized in that the reservoir is bounded by a capillary end piece in the form of a thimble having a far end equipped with a seat pierced by at least one capillary orifice against which the deformable component is applied and deformed in the position of closure of the reservoir by the cap.

20 **15.** Packaging device comprising a container having an interior space in which a composition according to any one of Claims 1 to 11 is present, a housing for receiving the application component and a permeable wall positioned between the said housing and the interior space containing the composition, the application component and the housing being arranged so that the application component exhibits, when it is in the said housing, at least one surface portion situated without substantial axial compression, with regard to an opening in the permeable wall, the said interior space being variable in volume, characterized in that compression means are provided in order to selectively change the said interior volume from a first volume, greater than the volume of the composition, to a second volume, lower than the first, this reduction in volume being accompanied by an excess pressure, which is capable of promoting the transfer of composition through the said permeable wall to the application component.

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30
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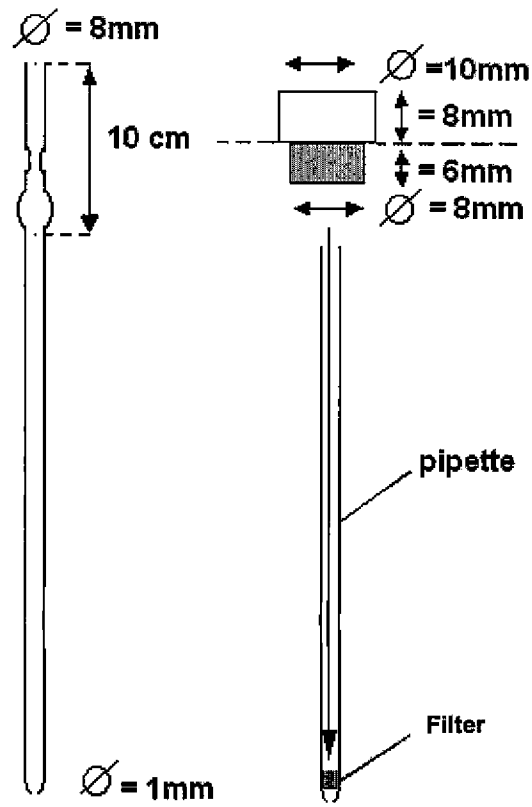


FIG 1

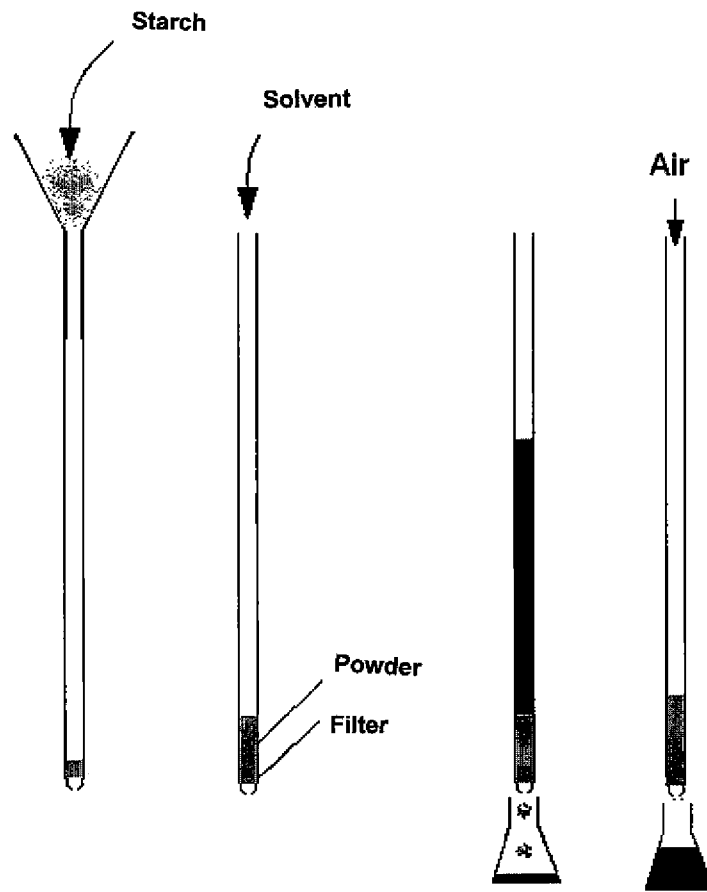


FIG2

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2011/068457

A. CLASSIFICATION OF SUBJECT MATTER
 INV. A61K8/73 A61K8/92 A61Q15/00 A61K8/97 A45D33/00
 ADD.
 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)
 A61K A61Q A45D
 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, BIOSIS, EMBASE

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"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</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p>
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Date of the actual completion of the international search 29 November 2011	Date of mailing of the international search report 07/12/2011
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Tardi, Christine
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INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2011/068457

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Information on patent family members

International application No
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