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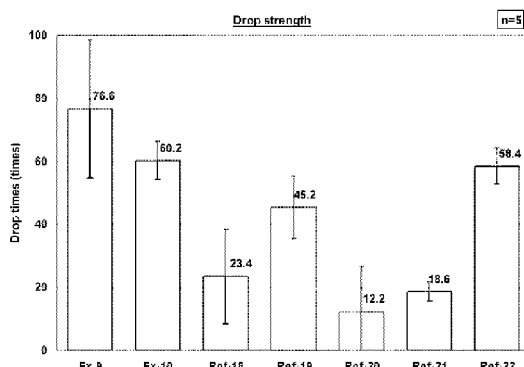
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(54) Title: POWDER COMPOSITION CONTAINING FUSIFORM PARTICLES FOR COSMETIC USE

[Fig. 6]



(57) Abstract: A powder composition for cosmetic use containing fusiform particles in addition to a filler and a pigment and other cosmetically acceptable ingredients, the fusiform particles being made of an organosilicone having a crosslinked polysiloxane structure, and having diameters along major axis  $L_1$  between approximately 0.05 micro meter and approximately 20 micro meter, diameters along minor axes  $L_2$  between approximately 0.03 micro meter and approximately 15 micro meter, and  $L_1/L_2$  between approximately 1.1 and approximately 3.3.

WO 2010/109545 A1

## Description

### POWDER COMPOSITION CONTAINING FUSIFORM PARTICLES FOR COSMETIC USE

#### Technical Field

[0001] The present invention relates to a powder composition, in particular a powder foundation, for cosmetic use which contains particles having a non (hemi)spherical shape such as a fusiform shape, also named a "rugby ball" shape according to the invention.

#### Background

[0002] It is desired to provide a powder composition, in particular a dry foundation with a smooth texture. However, other features such as a good press forming compatibility, less littering and strong drop strength, etc., in particular when the composition is in the form of a compact powder, are also searched for.

The preparation of compact powders raises numerous difficulties as the final composition has to be sufficiently homogeneous and compact to prevent fragmentation of the product brought about in particular by impacts. The compact powder must also be easy to remove in order to allow the user to remove the necessary amount of product in order to apply it subsequently to keratinous substances, in particular to the skin.

#### Disclosure of Invention

[0003] In view of the fact that the products now available still require improved smoothness yet having simultaneously a good press forming compatibility, less littering and strong drop strength, the inventors of the present invention have tested numerous particles to be included in a dry foundation and discovered that inclusion of fusiform particles can provide dry foundations with desired features and thereby completed the present invention.

[0004] According to an aspect of the present invention, the inventors propose a powder composition, in particular in a compact powder form, for cosmetic use containing fusiform particles in addition to a filler and optionally a pigment and other cosmetically acceptable ingredients, the fusiform particles being made of an organosilicone having a crosslinked polysiloxane structure, and having diameters along major axis  $L_1$  between approximately 0.05 micro meter and approximately 20 micro meter, diameters along minor axes  $L_2$  between approximately 0.03 micro meter and approximately 15 micro meter, and  $L_1/L_2$  between approximately 1.1 and approximately 3.3.

The fusiform particles as well as the methods for obtaining the fusiform particles are described, for example, in the Japanese Patent Application, Publication No. 2003-171465 filed by Takemoto Fat and Oil.

[0005] In the present specification, unless otherwise specified, the term "cosmetic use" includes uses for so-called cosmetic and dermatological purposes as well as aesthetic purposes. Another subject-matter of the invention is a cosmetic process for making up or caring for human keratinous substances, such as the skin, hair or nails, and more particularly the skin.

The composition according to the invention can be a composition for making up or caring for the skin and can be provided in the form of a blusher, an eyeshadow, a face powder, a foundation, a concealer, a product for making up the body, a product for caring for the face, a product for caring for the body or an antison product. More specifically, the invention relates to a foundation composition.

[0006] A fusiform or 'rugby ball' shape in this specification refers to such a shape that a sphere is extended in one direction so that there is a major axis along which the fusiform particle has the largest diameter  $L_1$  which is between approximately 0.05 micro meter and approximately 20 micro meter and two minor axes  $L_2$  perpendicular to the major axis and to each other along which the fusiform particle has the smallest diameter which is between approximately 0.03 micro meter and approximately 15 micro meter, and  $L_1/L_2$  between approximately 1.1 and approximately 3.3.

[0007] The organosilicone material having a crosslinked polysiloxane structure preferably comprises, indeed even is composed of, units of formula (I):  $\text{SiO}_2$ , and of formula (II):  $\text{R}^1\text{SiO}_{1.5}$ ,

in which  $\text{R}^1$  denotes an organic group having a carbon atom directly connected to the silicon atom. The organic group can be a reactive organic group or an unreactive organic group and preferably an unreactive organic group.

The organosilicone material having a crosslinked polysiloxane structure also preferably comprises first, second and third siloxane units which are formula (I):  $\text{SiO}_2$ , formula (II):  $\text{R}^1\text{SiO}_{1.5}$  and formula (III):  $\text{R}^2\text{R}^3\text{SiO}$ , respectively, wherein  $\text{R}^1$ ,  $\text{R}^2$  and  $\text{R}^3$  are any one of organic groups, same or different, having a carbon atom directly linked to a silicon atom.  $\text{R}^2$  and  $\text{R}^3$  may be either a non-reactive organic group or an organic group having no reactive group or a reactive organic group or an organic group having a reactive group, independently. However, it is preferred that at least either one of  $\text{R}^2$  and  $\text{R}^3$  a reactive organic group or an organic group having a reactive group.

[0008] The unreactive organic group can be a  $\text{C}_1$ - $\text{C}_4$  alkyl group, in particular a methyl, ethyl, propyl or butyl group, or a phenyl group and preferably a methyl group.

The reactive organic group can be an epoxy group, a (meth)acryloyloxy group, an alkenyl group, a mercaptoalkyl, aminoalkyl or haloalkyl group, a glyceroxy group, a ureido group or a cyano group. Preferably, the reactive organic group can be an epoxy group, a (meth)acryloyloxy group, an alkenyl group or a mercaptoalkyl or aminoalkyl group. The reactive organic group generally comprises from 2 to 6 carbon atoms, in

particular from 2 to 4 carbon atoms.

[0009] Mention may be made, as epoxy group, of a 2-glycidoxyethyl group, a 3-glycidoxypropyl group or a 2-(3,4-epoxycyclohexyl)propyl group.

Mention may be made, as (meth)acryloyloxy group, of a 3-methacryloyloxypropyl group or a 3-acryloyloxypropyl group.

Mention may be made, as alkenyl group, of a vinyl, allyl or isopropenyl group.

Mention may be made, as mercaptoalkyl group, of a mercaptopropyl or mercaptoethyl group.

[0010] Mention may be made, as aminoalkyl group, of a 3-[(2-aminoethyl)amino]propyl group, a 3-aminopropyl group or an N,N-dimethylaminopropyl group.

Mention may be made, as haloalkyl group, of a 3-chloropropyl group or a trifluoropropyl group.

Mention may be made, as glyceroxy group, of a 3-glyceroxypropyl group or a 2-glyceroxyethyl group.

Mention may be made, as ureido group, of a 2-ureidoethyl group.

Mention may be made, as cyano group, of a cyanopropyl or cyanoethyl group.

Preferably, in the unit of formula (II), R<sup>1</sup> denotes a methyl group.

Advantageously, the organosilicone material comprises the units (I) and (II) according to a unit (I)/unit (II) molar ratio ranging from 30/70 to 50/50, preferably ranging from 35/65 to 45/55.

Also advantageously, the organosilicone material comprises the units (I), (II) and (III) so that the molar ratio of the molar sum of the first siloxane unit (I) and the second unit (II) over the third siloxane unit (III) is between 99:1 to 50:50, more preferably between 90:10 to 60:40, approximately. The molar ratio of the first siloxane unit (I) with respect to the second siloxane unit (II) may preferably be between 23:77 and 40:60, approximately.

[0011] The organosilicone particles can in particular be capable of being obtained according to a process comprising:

(a) the introduction into an aqueous medium, in the presence of at least one hydrolysis catalyst and optionally of at least one surfactant, of a compound (IV) of formula SiX<sub>4</sub> and of a compound (V) of formula R<sup>4</sup>SiY<sub>3</sub>, where X and Y denote, independently of one another, a C<sub>1</sub>-C<sub>4</sub> alkoxy group, an alkoxyethoxy group including a C<sub>1</sub>-C<sub>4</sub> alkoxy group, a C<sub>2</sub>-C<sub>4</sub> acyloxy group, an N,N-dialkylamino group including a C<sub>1</sub>-C<sub>4</sub> alkyl group, a hydroxyl group, a halogen atom or a hydrogen atom and R denotes an organic group comprising a carbon atom connected directly to the silicon atom; and

(b) the operation in which the mixture resulting from stage (a) is brought into contact with an aqueous solution including at least one polymerization catalyst and optionally at least one surfactant, at a temperature of between 30 and 85 degrees Celsius, for at

least two hours.

[0012] Stage (a) corresponds to a hydrolysis reaction and stage (b) corresponds to a condensation reaction.

In stage (a), the molar ratio of the compound (IV) to the compound (V) generally ranges from 23/77 to 40/60, advantageously from 35/65 to 45/45, and is preferentially 40/60.

The organosilicone particles can also be capable of being obtained according to a process comprising:

(a) the introduction into an aqueous medium, in the presence of at least one hydrolysis catalyst, of a silanol group forming silicon compound (IV) of formula  $\text{SiX}_4$ , of a silanol group forming silicon compound (V) of formula  $\text{R}^4\text{SiY}_3$ , and of a silanol group forming silicon compound (VI) of formula  $\text{R}^5\text{R}^6\text{SiZ}_2$ , at the molar ratio for (the silanol group forming silicon compound (IV) and the silanol group forming silicon compound (V): the silanol group forming silicon compound (VI) to be 99:1 to 50:50, preferably 90:10 to 60:40 so that the the silanol group forming silicon compounds are hydrolyzed to generate a silanol compound (it is furthermore preferred that the silanol forming silicon compounds of formula IV and V are at the molar ratio of 23:77 to 40:60); and

(b) causing condensing reaction of the generated silanol compound in aqueous medium in the presence of at least one hydrolysis catalyst

The ratio by weight of the water to the total of the compounds (IV) and (V) preferably ranges from 10/90 to 70/30. The order of introduction of the compounds (IV) and (V) generally depends on their rate of hydrolysis. The temperature of the hydrolysis reaction generally ranges from 0 to 40 degrees Celsius and usually does not exceed 30 degrees Celsius in order to prevent premature condensation of the compounds.

[0013] For the X, Y and Z groups of the compounds (IV), (V) and (VI):

mention may be made, as  $\text{C}_1$ - $\text{C}_4$  alkoxy group, of the methoxy or ethoxy groups;

mention may be made, as alkoxyethoxy group including a  $\text{C}_1$ - $\text{C}_4$  alkoxy group, of the methoxyethoxy or butoxyethoxy groups;

mention may be made, as  $\text{C}_2$ - $\text{C}_4$  acyloxy group, of the acetoxy or propionyloxy groups;

mention may be made, as N,N-dialkylamino group including a  $\text{C}_1$ - $\text{C}_4$  alkyl group, of the dimethylamino or diethylamino groups;

mention may be made, as halogen atom, of the chlorine or bromine atoms.

[0014] Mention may be made, as compounds of formula (IV), of tetramethoxysilane, tetraethoxysilane, tetrabutoxysilane, trimethoxyethoxysilane, tributoxyethoxysilane, tetraacetoxysilane, tetrapropioxysilane, tetra(dimethylamino)silane,

tetra(diethylamino)silane, silanetetraol, chlorosilanetriol, dichlorodisilanol, tetrachlorosilane or chlorotrihydrosilane. Preferably, the compound of formula (IV) is chosen from tetramethoxysilane, tetraethoxysilane, tetrabutoxysilane and their mixtures.

[0015] The compound of formula (IV) results, after the polymerization reaction, in the formation of the units of formula (I).

The compound of formula (V) results, after the polymerization reaction, in the formation of the units of formula (II).

The R group in the compound of formula (V) has the meaning as described for the R<sup>1</sup> group for the compound of formula (II).

[0016] Mention may be made, as examples of compounds of formula (V) comprising an unreactive organic group R, of methyltrimethoxysilane, ethyltriethoxysilane, propyltributoxysilane, butyltributoxysilane, phenyltrimethoxyethoxysilane, methyltributoxyethoxysilane, methyltriacetoxysilane, methyltripropioxysilane, methyltri(dimethylamino)silane, methyltri(diethylamino)silane, methylsilanetriol, methylchlorodisilanol, methyltrichlorosilane or methyltrihydrosilane.

[0017] Mention may be made, as examples of compounds of formula (V) comprising a reactive organic group R, of:

silanes having an epoxy group, such as (3-glycidoxypropyl)trimethoxysilane, (3-glycidoxypropyl)triethoxysilane, [2-(3,4-epoxycyclohexyl)ethyl]trimethoxysilane, (3-glycidoxypropyl)methyldimethoxysilane, (2-glycidoxyethyl)methyldimethoxysilane, (3-glycidoxypropyl)di-methylmethoxysilane or (2-glycidoxyethyl)dimethylmethoxysilane;

silanes having a (meth)acryloyloxy group, such as (3-methacryloyloxypropyl)trimethoxysilane or (3-acryloyloxypropyl)trimethoxysilane;

silanes having an alkenyl group, such as vinyltrimethoxysilane, allyltrimethoxysilane or isopropenyltrimethoxysilane;

silanes having a mercapto group, such as mercapto-propyltrimethoxysilane or mercaptoethyltrimethoxysilane;

silanes having an aminoalkyl group, such as (3-aminopropyl)trimethoxysilane, (3-[(2-aminoethyl)amino]propyl)trimethoxysilane, (N,N-dimethylaminopropyl)trimethoxysilane or (N,N-dimethylaminoethyl)trimethoxysilane;

silanes having a haloalkyl group, such as (3-chloropropyl)trimethoxysilane or trifluoropropyltrimethoxysilane;

silanes having a glyceroxy group, such as (3-glyceroxypropyl)trimethoxysilane or di(3-glyceroxypropyl)dimethoxysilane;

silanes having a ureido group, such as (3-ureidopropyl)trimethoxysilane, (3-ureidopropyl)methyldimethoxysilane or (3-ureidopropyl)dimethylmethoxysilane; silanes having a cyano group, such as cyanopropyltrimethoxysilane, cyanopropyl-methyldimethoxysilane or cyanopropyldimethylmethoxysilane.

[0018] Preferably, the compound of formula (V) comprising a reactive organic group R is chosen from silanes having an epoxy group, silanes having a (meth)acryloyloxy group, silanes having an alkenyl group, silanes having a mercapto group or silanes having an aminoalkyl group.

[0019] Examples of compounds (IV) and (V) which are preferred for the implementation of this invention are respectively tetraethoxysilane and methyltrimethoxysilane.

Use may independently be made, as hydrolysis and polymerization catalysts, of basic catalysts, such as sodium hydroxide, potassium hydroxide, sodium carbonate, sodium hydrogencarbonate or amines (such as ammonia, trimethylamine, triethylamine or tetramethylammonium hydroxide), or acidic catalysts chosen from organic acids, such as citric acid, acetic acid, methanesulphonic acid, p-toluenesulphonic acid, dodecylbenzenesulphonic acid or dodecylsulphonic acid, or inorganic acids, such as hydrochloric acid, sulphuric acid or phosphoric acid. When it is present, the surfactant used is preferably a nonionic or anionic surfactant or a mixture of the two. Sodium dodecylbenzenesulphonate can be used as anionic surfactant. The end of the hydrolysis is marked by the disappearance of the products (IV) and (V), which are insoluble in water, and the production of a homogeneous liquid layer.

The silanol forming silicon compounds of formula (VI) forms siloxane unit (III) as a result. The group Z in formula (VI) may be selected from the group listed for group X in formula (IV). R<sup>5</sup> and R<sup>6</sup> in formula (VI) may be selected from the group described for R<sup>2</sup> and R<sup>3</sup> in formula (III).

[0020] The condensation stage (b) can use the same catalyst as the hydrolysis stage or another catalyst chosen from those mentioned above.

On conclusion of this process, a suspension in water of fine organosilicone particles is obtained, which particles can optionally be separated subsequently from their medium. The process described above can thus comprise an additional stage of filtration, for example on a membrane filter, of the product resulting from stage (b), optionally followed by a stage of centrifuging the filtrate, intended to separate the particles from the liquid medium, and then by a stage of drying the particles. Other separation methods can, of course, be employed.

In a particular embodiment, the fusiform particles have slits along their major axes.

Also, the fusiform particles are generally less than 40 wt% by weight, preferably between approximately 1 wt% and approximately 40 wt% , preferably between approximately 5 wt% and approximately 20 wt%, more preferably between ap-

proximately 10 wt% and approximately 15 wt% of the powder composition.

In a particular embodiment, the crosslinked polysiloxane comprises first, second and third siloxane units which are  $\text{SiO}_2$ ,  $\text{R}^1\text{SiO}_{1.5}$  and  $\text{R}^2\text{R}^3\text{SiO}$ , respectively, wherein  $\text{R}^1$ ,  $\text{R}^2$  and  $\text{R}^3$  are any one of organic groups, same or different, having a carbon atom directly linked to a silicon atom. The molar ratio of the third siloxane unit with respect to the molar sum of the first, second and third siloxane units is between 1 to 50 percent, approximately.

The molar ratio of the first siloxane unit with respect to the second siloxane unit is between 23:77 and 40:60, approximately. In the powder composition according to the present invention,  $\text{R}^1$  and at least one of  $\text{R}^2$  and  $\text{R}^3$  may preferably selected from the group consisting of epoxy group, (meta) acryloxy group, mercaptoalkyl group, aminoalkyl group and organic groups having any one of preceding groups.

[0021] Fillers

The filler(s) present in the composition may be in a spherical shape or non-spherical shape. In a particular embodiment, the composition contains at least fillers in a non-spherical shape.

In particular, the filler(s) in the composition include at least one filler in a plate or lamellar form and optionally other spherical fillers, said fillers being chosen from talc, mica, silica, kaolin, powders formed of polyamide, of poly-beta-alanine and of polyethylene, powders formed of tetrafluoroethylene polymers (PTFE), lauroyllysine, starch, boron nitride, polymeric hollow microspheres of poly(vinylidene chloride)/acrylonitrile or of acrylic acid copolymers, silicone resin microbeads, particles formed of polyorganosiloxane elastomers, precipitated calcium carbonate, magnesium carbonate, basic magnesium carbonate, hydroxyapatite, barium sulphate, aluminium oxides, polyurethane powders, composite fillers, hollow silica microspheres, glass or ceramic microcapsules, or metal soaps derived from organic carboxylic acids having from 8 to 22 carbon atoms, preferably from 12 to 18 carbon atoms, for example zinc stearate, magnesium stearate, lithium stearate, zinc laurate or magnesium myristate.

In a preferred embodiment, the composition according to the invention comprises at least one filler in a non spherical shape and having a flake or lamellar form.

As examples of such fillers, we can cite lauroyl lysine, mica, talc, boron nitride, kaolin, oxychloride bismuth, barium sulfate, perlite, PTFE, and their mixtures.

In a particular embodiment, the composition comprises at least one lamellar filler, in particular chosen from talc, mica, boron nitride and their mixtures.

Said fillers might be surface treated by silicone compounds and/or amino acids.

[0022] Examples of fillers in a flake or lamellar form which are convenient for the invention are shown by Table 1 below.

Name	Surface Treatment	Chemistry (composition)	Morphology		
			Shape	Mean Size ( $\mu\text{m}$ )	Size Span
Amihope LL	NT	Lauroyl Lysine	lamellar	11.7	1.4
Mica Concord 1000	NT	Mica	lamellar	8.3	2.7
SERICITE S-152-BC	NT	Mica	lamellar	7.8	2.3
Sericite SL	NT	Mica	lamellar	7.3	2.2
MEARI MICA CF	NT	Mica	lamellar	18.5	1.9
M/MCF	NT	Mica	lamellar	18.5	1.9
J 68 BC	NT	Talc	lamellar	10.4	3.1
Ceridust 9205F	NT	PTFE	flake	3.5	0.9
PUHP 3008	NT	Boron Nitride	flake	5.4	1.8
SOFTOUCH BN	NT	Boron Nitride	lamellar	9.0	1.7
POWDER CC6058	NT	Boron Nitride	lamellar	9.0	1.7
Coslin C100	NT	Kaolin	flake	1.6	1.7
TALC P3	NT	Talc	lamellar	4.4	1.7
Boron LF 2000	NT	Oxychloride Bismuth	flake	7.5	1.5
LL-5 BaSO4	LL-5%	Barium Sulfate	flake	4.3	1.6
Coverleaf AR80	NT	SiO <sub>2</sub> -TiO <sub>2</sub> -Al <sub>2</sub> O <sub>3</sub> on Talc	flake	4.3	1.0
Boron Nitride SHP 3	NT	Boron Nitride	flake	6.7	1.3
MICA POWDER Y-2300	NT	Mica	lamellar	11.4	1.9
Optimat 1430 OR	NT	Perlite	lamellar	16.4	1.9
Peal 2600UVS	NT	Oxychloride Bismuth	flake	6.5	1.9
Luzenac 00	NT	Talc	lamellar	14.2	2.4
Luzenac Pharma M	NT	Talc	lamellar	7.6	1.7
Flake shaped Barium Sulfate HP	NT	Barium sulfate	flake	5.1	2.2
Coverleaf AR100	NT	SiO <sub>2</sub> -Al <sub>2</sub> O <sub>3</sub> on Talc	flake	3.5	1.1
Shadeleaf A	NT	ZnO on Mica-Barium sulfate	flake	5.6	1.4
Biancsealer	NT	TiO <sub>2</sub> on Mica	flake	5.6	1.3
Boronege 120f	NT	Boron Nitride	lamellar	9.0	1.6
Boronege Superfine	NT	Boron Nitride	lamellar	2.7	2.2
Boronege 90f	NT	Boron Nitride	lamellar	7.2	1.9
TBN 02	NT	Boron Nitride	lamellar	2.5	1.5
Naturaleaf powder	NT	TiO <sub>2</sub> on Mica	flake	5.0	1.3
PDM 20L	NT	Barium sulfate	flake	4.1	1.9
PDM 5L	NT	Synthetic Mica	lamellar	22.7	1.6
Sericite FSE	NT	Synthetic Mica	lamellar	7.2	1.5
JA-48R	NT	Mica	lamellar	7.6	1.8
Flake shaped Barium Sulfate H	NT	Talc	lamellar	8.0	2.0
	NT	Barium sulfate	flake	4.1	1.9

NT= non-treated

LL-5%= treated with 5% Lauroyl lysine

In particular, the lamellar fillers can be chosen from:

- talc, which is a magnesium silicate hydrate, in particular the talcs sold under the names "Talc Luzenac 00" by Luzenac and "Talc P3" by Nippon Talc;
- kaolin, which is a hydrated aluminosilicate which is provided in the form of particles of anisotropic shape having dimensions generally of less than 30 micro meter . Use may be made, as kaolin, of that sold under the name "Kaolin Supreme 1" by English China Clays;
- mica or aluminosilicate chosen from muscovite, phlogopite, tiotite, sericite, lepidolite, paragonite, margarite, roscoelite, artificial or synthetic mica having a fluorine atom substituting for the hydroxyl group of natural mica, and the heated or calcined products of these micas. Micas are generally provided in the form of flakes having dimensions of 2 to 200 micro meter , preferably 5 to 70 micro meter , and a thickness of 0.1 to 5 micro meter , preferably of 0.2 to 3 micro meter . Use may be made, as mica, for example, of those sold under the names "Mica SFG70" by Aspanger

or "Mica Concord 1000" by Sciama;

- lamellar silica, such as in particular that sold under the names "SG Flake 3 M" by Maprecos or "Chemicelen" by Sumitomo;

- and their mixtures.

[0023] According to a preferred embodiment, the lamellar fillers are chosen from talc, mica, boron nitride and their mixture.

According to a specific embodiment, the talc, mica and/or boron nitride can be present in the composition according to the invention in a content ranging from 5 to 90% by weight, with respect to the total weight of the composition, preferably from 10 to 85% by weight, more preferably from 20 to 80% by weight, and more preferably from 50 to 80% by weight of the composition.

[0024] The total fillers in the composition of the invention can be present in a content ranging from 5 to 90% by weight, with respect to the total weight of the composition, preferably from 10 to 85% by weight, more preferably from 20 to 80% by weight, and more preferably from 50 to 80% by weight of the composition.

In particular, the fillers in the form of flake or lamellar represent from 50 to 100% of total amount of fillers in the composition of the invention.

The composition may also contain spherical fillers, in particular for improving the slipiness of the composition. Such spherical fillers may be chosen from powders formed of polyamide, of poly-beta-alanine and of polyethylene, silicone resin microbeads, particles formed of polyorganosiloxane elastomers, polyurethane powders, and mixtures thereof. The spherical fillers may be present in a content ranging from 0 to 20% by weight of the composition, in particular 1 to 10% by weight of the composition.

[0025] Pigments

The powder composition of the invention, in particular if it is a make-up product, may comprise at least one pigment.

The term pigments should be understood to mean particles of any shape, white or colored, inorganic or organic, which are insoluble in the physiological medium and which are intended to color the composition. The pigments can be white and/or colored and inorganic and/or organic.

[0026] According to a specific embodiment, the composition according to the invention can comprise at least one pigment chosen from inorganic pigments. These inorganic pigments can in particular be chosen from metal oxide pigments.

[0027] Mention may be made, among inorganic pigments, of titanium dioxide, optionally surface treated, zirconium or cerium oxides, and also zinc, iron (black, yellow or red) or chromium oxides, manganese violet, ultramarine blue, chromium hydrate and ferric blue, and metal powders, such as aluminium powder or copper powder, and their

mixtures.

[0028] According to a preferred embodiment, the inorganic pigments, in particular metal oxide pigments, present in the composition according to the invention are chosen from titanium dioxide, zinc oxide and/or iron oxide.

[0029] According to a specific embodiment, the composition may comprise at least two different pigments. According to an embodiment which is also preferred, the composition may comprise at least one first pigment chosen from iron oxides and at least one second titanium dioxide pigment.

[0030] In addition to inorganic pigments, the composition according to the invention can comprise organic pigments. Mention may be made, among organic pigments, of carbon black, pigments of D and C type and lakes based on cochineal carmine, barium, strontium, calcium or aluminium.

[0031] The pigment can also comprise goniochromatic pigments. These pigments exhibit a relatively large change in color with the angle of observation. The goniochromatic pigment can be chosen, for example, from pigments comprising a multilayer interference structure and liquid crystal pigments.

[0032] In the case of a multilayer structure, the latter can comprise, for example, at least two layers, each layer, independently or not of the other layer(s), being produced, for example, from at least one material chosen from the group consisting of the following materials: MgF<sub>2</sub>, CeF<sub>3</sub>, ZnS, ZnSe, Si, SiO<sub>2</sub>, Ge, Te, Fe<sub>2</sub>O<sub>3</sub>, Pt, Va, Al<sub>2</sub>O<sub>3</sub>, MgO, Y<sub>2</sub>O<sub>3</sub>, S<sub>2</sub>O<sub>3</sub>, SiO, HfO<sub>2</sub>, ZrO<sub>2</sub>, CeO<sub>2</sub>, Nb<sub>2</sub>O<sub>5</sub>, Ta<sub>2</sub>O<sub>5</sub>, TiO<sub>2</sub>, Ag, Al, Au, Cu, Rb, Ti, Ta, W, Zn, MoS<sub>2</sub>, cryolite, alloys, polymers and their combinations.

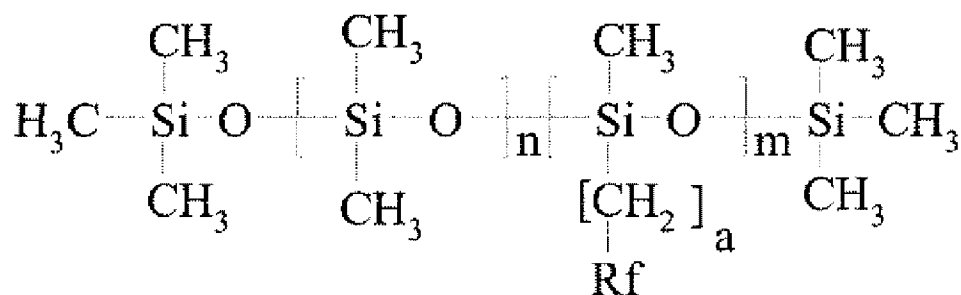
[0033] The goniochromatic agents comprising multilayer structures are in particular those described in the following documents: US-A-3,438,796, EP-A-227,423, US-A-5,135,812, EP-A-170,439, EP-A-341,002, US-A-4,930,866, US-A-5,641,719, EP-A-472,371, EP-A-395,410, EP-A-753,545, EP-A-768,343, EP-A-571,836, EP-A-708,154, EP-A-579,091, US-A-5,411,586, US-A-5,364,467, WO-A-97/39066, DE-A-4,225,031, WO-9517479 (BASF) and DE-A-196,14,637. They are provided in the form of flakes with a metallic color.

[0034] The multilayer structures which can be used in the invention are, for example, the following structures: Al/SiO<sub>2</sub>/Al/SiO<sub>2</sub>/Al; Cr/MgF<sub>2</sub>/Al/MgF<sub>2</sub>/Al; MoS<sub>2</sub>/SiO<sub>2</sub>/Al/SiO<sub>2</sub>/MoS<sub>2</sub>; Fe<sub>2</sub>O<sub>3</sub>/SiO<sub>2</sub>/Al/SiO<sub>2</sub>/Fe<sub>2</sub>O<sub>3</sub>; Fe<sub>2</sub>O<sub>3</sub>/SiO<sub>2</sub>/Fe<sub>2</sub>O<sub>3</sub>/SiO<sub>2</sub>/Fe<sub>2</sub>O<sub>3</sub>; MoS<sub>2</sub>/SiO<sub>2</sub>/mica oxide/SiO<sub>2</sub>/MoS<sub>2</sub>; Fe<sub>2</sub>O<sub>3</sub>/SiO<sub>2</sub>/mica oxide/SiO<sub>2</sub>/Fe<sub>2</sub>O<sub>3</sub>. Different colors are obtained depending on the thicknesses of the different layers. Thus, with the structure Fe<sub>2</sub>O<sub>3</sub>/SiO<sub>2</sub>/Al/SiO<sub>2</sub>/Fe<sub>2</sub>O<sub>3</sub>, the color changes from golden-green to grey-red for SiO<sub>2</sub> layers with a thickness of 320 to 350 nm; from red to golden for SiO<sub>2</sub> layers with a thickness of 380 to 400 nm; from purple to green for SiO<sub>2</sub> layers with a thickness of 410 to 420 nm; and from copper to red for SiO<sub>2</sub> layers with a thickness of 430 to 440 nm.

- [0035] Consequently, the multilayer structure can be essentially inorganic or organic. Different colors are obtained depending on the thickness of each of the different layers. The goniochromatic pigments comprising a multilayer interference structure according to the invention are in particular those described in the following documents: US-A-3,438,796, EP-A-227,423, US-A-5,135,812, EP-A-170,439, EP-A-341,002, US-A-4,930,866, US-A-5,641,719, EP-A-472,371, EP-A-395,410, EP-A-753,545, EP-A-768,343, EP-A-571,836, EP-A-708,154, EP-A-579,091, US-A-5,411,586, US-A-5,364,467, WO-A-97/39066, DE-A-4,225,031, WO-9517479 (BASF) and DE-A-196,14,637, and their combinations. They are provided in the form of flakes with a metallic color.
- [0036] The goniochromatic pigment comprising a multilayer interference structure can be chosen from the group consisting of the following commercial goniochromatic pigments: Infinite Colors from Shiseido, Sicopearl Fantastico from BASF, Colorstream, Xirallic and Xirona from Merck, Colorglitter from Flex, and their mixtures.
- [0037] Liquid crystal pigments are described in particular in Application EP-A-1,046,692. Use may in particular be made, as liquid crystal particles, of those known under the CTFA name Polyacrylate 4 and sold under the names "Helicone<sup>Trademark</sup> HC Sapphire", "Helicone<sup>Trademark</sup> HC Scarabeus", "Helicone<sup>Trademark</sup> HC Jade", "Helicone<sup>Trademark</sup> HC Maple", "Helicone<sup>Trademark</sup> HC XL Sapphire", "Helicone<sup>Trademark</sup> HC XL Scarabeus", "Helicone<sup>Trademark</sup> HC XL Jade" and "Helicone<sup>Trademark</sup> HC XL Maple" by Wacker.
- [0038] The pigments can be present in the composition according to the invention in a content ranging from 0 to 30% by weight, with respect to the total weight of the composition, in particular from 1 to 30% by weight, preferably from 5 to 20% by weight and more preferably from 5 to 15% by weight.
- [0039] Cosmetically acceptable other ingredients are, for example, waxes, preservatives, cosmetic active principles, moisturizing agents, UV screening agents, thickeners, water, surfactants, binders or fragrances. The cosmetically acceptable other ingredients may be one or more of pulverulent phases including spherical solid particles, boron nitride particles, lamellar particles, additional particles, fatty binders, waxes, pasty fatty substances, and other additives.
- [0040] Fatty binder  
The composition according to the invention may comprise at least one fatty binder. The term fatty binder is understood to mean, within the meaning of the present application, a fatty phase which generally comprises at least one oil. This type of fatty phase is used in particular as dispersing medium for the pulverulent phase. Advantageously, the fatty binder can comprise at least one oil.  
The fatty binder may also comprise waxes.
- [0041] The oil can be chosen from the oils conventionally used as binder in loose or

compact powders. These oils can in particular be chosen from:

- mink oil, turtle oil, soybean oil, grape seed oil, sesame oil, corn oil, rapeseed oil, sunflower oil, cottonseed oil, avocado oil, olive oil, castor oil, jojoba oil or peanut oil;
- hydrocarbon oils, such as liquid paraffins, squalane or liquid petrolatum;
- fatty esters, such as isopropyl myristate, isopropyl palmitate, butyl stearate, isodecyl stearate, isocetyl stearate, hexyl laurate, isononyl isononanoate, 2-ethylhexyl palmitate, 2-hexyldecyl laurate, 2-octyldecyl palmitate, 2-octyldodecyl myristate, 2-octyldodecyl lactate, di(2-ethylhexyl) succinate, diisostearyl malate, glyceryl triisostearate or diglyceryl triisostearate;
- silicone oils, such as polymethylsiloxanes, polymethylphenylsiloxanes, polysiloxanes modified by fatty acids, fatty alcohols or polyoxyalkylenes, fluorosilicones or perfluorinated oils;
- higher fatty acids, such as myristic acid, palmitic acid, stearic acid, behenic acid, oleic acid, linoleic acid, linolenic acid or isostearic acid;
- higher fatty alcohols, such as ketanol, stearyl alcohol or oleyl alcohol;
- poly(methylfluoroalkyl)(dimethyl)siloxanes of formula (I):



(I)

in which:

- n represents an integer varying from 5 to 90, in particular from 30 to 80 and especially from 50 to 80,
  - m represents an integer varying from 1 to 150, in particular from 1 to 80 and especially from 1 to 40,
  - a represents an integer varying from 0 to 5, and
  - Rf denotes a perfluoroalkyl radical comprising from 1 to 8 carbon atoms;
- and
- their mixtures.

[0042] According to a preferred embodiment, the oil is chosen from fatty esters, such as isopropyl myristate, isopropyl palmitate, butyl stearate, isodecyl stearate, isocetyl stearate, hexyl laurate, isononyl isononanoate, 2-ethylhexyl palmitate, 2-hexyldecyl

laurate, 2-octyldecyl palmitate, 2-octyldodecyl myristate, 2-octyldodecyl lactate, di(2-ethylhexyl) succinate, diisostearyl malate, glyceryl triisostearate or diglyceryl triisostearate.

[0043] The oil of the binder can represent from 10 to 100% by weight, with respect to the total weight of the binder. The binder can be present in the composition according to the invention in a content ranging from 0.5 to 15% by weight, with respect to the total weight of the composition, in particular from 1 to 10% by weight and more preferably from 1.5 to 5% by weight.

[0044] Additives

The composition according to the invention can comprise at least one other conventional cosmetic ingredient which can be chosen in particular from surfactants, antioxidants, fragrances, preservatives, neutralizing agents, sunscreens, vitamins, moisturizing agents, self-tanning compounds, antiwrinkle active agents, emollients, hydrophilic or lipophilic active principles, agents for combating pollution or free radicals, sequestering agents, dermo-decontracting active agents, soothing agents, agents which stimulate the synthesis of dermal or epidermal macromolecules and/or which prevent their decomposition, antiglycation agents, agents which combat irritation, desquamating agents, depigmenting, antipigmenting or propigmenting agents, NO-synthase inhibitors, agents which stimulate the proliferation of fibroblasts or keratinocytes and/or the differentiation of keratinocytes, agents which act on the microcirculation, agents which act on the energy metabolism of the cells, healing agents, and their mixtures.

In a particular embodiment, the surfactant includes zinc stearate, the binder includes a mineral oil or phenyl trimethicone, and the preservative includes phenoxyethanol.

[0045] According to a preferred embodiment, the composition according to the invention can be a cosmetic composition in the powder form comprising:

i) 20 to 85% by weight, preferably 50 to 85% by weight, with respect to the total weight of the composition, of at least one filler,

ii) 1 to 40% by weight, preferably 5 to 20% by weight, with respect to the total weight of the composition, of fusiform particles being made of an organosilicone having a crosslinked polysiloxane structure, and having diameters along major axis  $L_1$  between approximately 0.05 micro meter and approximately 20 micro meter, diameters along minor axes  $L_2$  between approximately 0.03 micro meter and approximately 15 micro meter, and  $L_1/L_2$  between approximately 1.1 and approximately 3.3,

iii) 0 to 30% by weight, preferably 1 to 30% by weight, with respect to the total weight of the composition, of at least one pigment,

iv) 2 to 15% by weight, preferably 5 to 10% by weight with respect to the total weight of the composition, of at least one fatty binder.

[0046] In particular, the filler is a non-spherical filler, having a flake or a lamellar form. The composition may also contain spherical filler in addition to non-spherical filler, and in particular the non-spherical filler represents 50 to 100% by weight of total fillers in the composition.

In a preferred embodiment, the pigment is an inorganic pigment. The composition advantageously contains titanium dioxide and iron oxides.

The fatty binder advantageously comprises a fatty phase with oil(s), in particular chosen from mineral oil, silicone oil, and mixtures.

[0047] According to a preferred embodiment, the composition according to the invention can be an anhydrous composition. The term "anhydrous composition" is understood to mean a composition comprising less than 2% by weight of water, indeed even less than 0.5% by weight of water, and which in particular is devoid of water, the water not being added during the preparation of the composition but corresponding to the residual water contributed by the mixed ingredients.

[0048] In a particular embodiment, the composition of the invention is in the form of a compact powder and can be prepared by mixing the ingredients of the pulverulent phase (organosilicone particles, fillers and optionally pigments) and by then adding the fatty phase with stirring, the mixture subsequently being milled, sieved, then poured into a dish and compacted.

[0049] The milled and sieved mixture of the pulverulent phase and of the fatty phase is compacted using a press, in particular by applying a pressure ranging from 0.5 MPa to 10 MPa and preferably ranging from 1 MPa to 5 MPa.

The composition thus obtained is provided in the form of a compact powder.

[0050] According to the present invention, the powder composition may be a make-up or caring for the skin and can be provided in the form of a blusher, an eyeshadow, a face powder, a foundation, a concealer, a product for making up the body, a product for caring for the face, a product for caring for the body or an antison product.

More specifically, the composition is a powder foundation, in particular in a compact powder form.

### **Brief Description of the Drawings**

[0051] [fig.1]Fig. 1 is a diagram schematically showing the shape of a fusiform particle

[fig.2]Fig. 2 is a diagram showing the formation of cracking during press forming of a compact foundation.

[fig.3]Fig. 3 is a diagram showing the amount of product obtained by sponge wiping and the amount of litters appearing at the same time (Formula I).

[fig.4]Fig. 4 shows the amount of littering at the 100th rubbing (Formula II).

[fig.5]Fig. 5 shows friction coefficients

[fig.6]Fig. 6 shows drop strength of compacted products

### Description of Embodiments

[0052] Embodiments of the present invention will be described herebelow. It should be noted that the embodiments and descriptions thereof are provided solely to assist in understanding the present invention and should not be construed as limiting the present invention in any way to the embodiments described below.

[0053] Fig. 1 schematically shows the shape of a fusiform particle. The particle has a rugby ball shape, that is, a major axis along which the diameter is larger than any other diameters, and two minor axis which are perpendicular to the major axis and which are perpendicular to each other. In fact the two minor axes may be defined in any direction as long as the axes are in the plane perpendicular to the major axes. The diameters along major axis  $L_1$  between approximately 0.05 micro meter and approximately 20 micro meter, diameters along minor axes  $L_2$  between approximately 0.03 micro meter and approximately 15 micro meter, and  $L_1/L_2$  between approximately 1.1 and approximately 3.3. As may be understood from Fig. 1, there is a groove on the surface along the major axis, in the particles used in the experiments described below. However, the groove is not necessary.

[0054] Table 2 below shows morphology of the particles according to the present invention (Example particle 1 and Example particle 2) which have fusiform shapes and different in size, and the comparative particles which have a bowl shape (Reference particle 1 or NLK506), spherical shapes (Reference particle 2 or Tospearl, Reference 3 or Silica Beads SB700, and Reference particle 4 or KSP300). Their mean sizes and frictions are also shown in Table 2.

	Name	Supplier	Chemical composition	Morphology		Friction	
				Shape	Mean Size ( $\mu$ m)	Size Span	Mean MIU
Example particle 1	NLK600	Takemoto Oil & Fat	Silicone resin	fusiform	5.3	0.8	0.56
Example particle 2	NLK602	Takemoto Oil & Fat	Silicone resin	fusiform	2.9	0.8	0.62
Reference particle 1	NLK506	Takemoto Oil & Fat	Silicone resin	bowl	2.3	0.9	0.61
Reference particle 2	Tospearl 145A	Momentive Performance Material	Silicone resin	sphere	4.6	0.7	0.36
Reference particle 3	Silica Beads SB700	Miyoshi Kasei	Silica	sphere	4.6	1.3	0.33
Reference particle 4	KSP300	Shin-Etsu Chemical	Silicone elastomer	sphere	6.0	1.3	0.34

[0055] Table 3 shows the ingredients of Formula I to which the above-described particles are to be added. Formula I includes the elements which are typical in a cosmetic composition.

INCI NAME	Role	Wt%
TALC (and) HYDROGENATED EGG OIL (and) METHICONE	Filler (plate)	39.5
MICA (and) DISODIUM STEAROYL GLUTAMATE (and) ALUMINUM HYDROXIDE	Filler (plate)	35.0
MICA (and) DISODIUM STEAROYL GLUTAMATE (and) ALUMINUM HYDROXIDE	Filler (plate)	5.0
ZINC STEARATE	Surfactant	1.0
METHYLPARABEN	Preservative	0.3
TITANIUM DIOXIDE (and) DISODIUM STEAROYL GLUTAMATE (and) ALUMINUM HYDROXIDE	Pigment / Binder	8.0
IRON OXIDES (CI: 77491 + 77492)	Pigment	0.5
IRON OXIDES (CI: 77492)	Pigment	1.5
IRON OXIDES (CI: 77499)	Pigment	0.2
MINERAL OIL	Binder	4.0
PHENYL TRIMETHICONE	Binder	5.0
<b>TOTAL</b>		<b>100.0</b>

[0056] Table 4 below shows the amount of particles included in the examples of the present invention (Examples 1 - 8) and comparative references (References 1 - 17) for the tests. The amount of particles have been varied in the range of 5, 10, 15 and 20 wt%.

	INCI NAME		METHYLSILANOL/SILICATE CROSSPOLYMER	METHYLSILANOL/SILICATE CROSSPOLYMER	METHYLSILANOL/SILICATE CROSSPOLYMER	POLYMETHYLSILSESQUIOXANE	SILICA	DIPHENYL DIMETHICONE/VINYL DIPHENYL DIMETHICONE/SILSESQUIOXANE CROSSPOLYMER	TOTAL
			Filler (rugby, silicon resin)	Filler (rugby, silicon resin)	Filler (chawan, silicon resin)	Filler (sphere, silicon resin)	Filler (sphere, silica)	Filler (sphere, silicon elastomer)	
Proportion (wt%)	Example 1	95	5						100
	Example 2	90	10						100
	Example 3	85	15						100
	Example 4	80	20						100
	Example 5	95		5					100
	Example 6	90		10					100
	Example 7	85		15					100
	Example 8	80		20					100
	Reference-1	95			5				100
	Reference-2	90			10				100
	Reference-3	85			15				100
	Reference-4	80			20				100
	Reference-5	95				5			100
	Reference-6	90				10			100
	Reference-7	85				15			100
	Reference-8	80				20			100
	Reference-9	95					5		100
Reference-10	90					10		100	
Reference-11	85					15		100	
Reference-12	80					20		100	
Reference-13	95						5	100	
Reference-14	90						10	100	
Reference-15	85						15	100	
Reference-16	80						20	100	
Reference-17	100							100	

[0057] Table 5 below shows another formula of cosmetic composition, Formula II. The same particles were included in Formula II also.

INCI NAME	Role	Example 9	Example 10	Reference 18	Reference 19	Reference 20	Reference 21	Reference 22
TALC (and) METHICONE	Filler (plate)	34.8	34.8	34.8	34.8	34.8	34.8	39.8
MICA (and) DISODIUM STEAROYL GLUTAMATE (and) ALUMINUM HYDROXIDE	Filler (plate)	35.0	35.0	35.0	35.0	35.0	35.0	35.0
MICA (and) DISODIUM STEAROYL GLUTAMATE (and) ALUMINUM HYDROXIDE	Filler (plate)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
ZINC STEARATE	Surfactant	1.0	1.0	1.0	1.0	1.0	1.0	1.0
METHYLSILANOL/SILICATE CROSSPOLYMER	Filler (rugby, silicon resin)	5.0						
METHYLSILANOL/SILICATE CROSSPOLYMER	Filler (rugby, silicon resin)		5.0					
METHYLSILANOL/SILICATE CROSSPOLYMER	Filler (chawan, silicon resin)			5.0				
POLYMETHYLSILSESQUIOXANE	Filler (sphere, silicon resin)				5.0			
SILICA	Filler (sphere, silica)					5.0		
DIPHENYL DIMETHICONE/VINYL DIPHENYL DIMETHICONE/SILSESQUIOXANE CROSSPOLYMER	Filler (sphere, silicon elastomer)						5.0	
TITANIUM DIOXIDE (and) LAUROYL LYSINE	Pigment / Binder	8.0	8.0	8.0	8.0	8.0	8.0	8.0
IRON OXIDES (CI: 77491)	Pigment	0.5	0.5	0.5	0.5	0.5	0.5	0.5
IRON OXIDES (CI: 77492)	Pigment	1.5	1.5	1.5	1.5	1.5	1.5	1.5
IRON OXIDES (CI: 77499)	Pigment	0.2	0.2	0.2	0.2	0.2	0.2	0.2
MINERAL OIL	Binder	4.0	4.0	4.0	4.0	4.0	4.0	4.0
PHENYL TRIMETHICONE	Binder	4.5	4.5	4.5	4.5	4.5	4.5	4.5
PHENOXYETHANOL	Preservative	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Total		100.0	100.0	100.0	100.0	100.0	100.0	100.0

[0058] Fig. 2 shows a result of press compaction one of the compositions according to Formula I after pressing with MIZUHO press machine. Cracks as shown by Fig. 2

appeared and therefore decided unsuitable as cosmetic compositions such as foundations, solid make-up, eye shadow, etc. for the compositions containing 15 wt% or more of Silica Beads SB700 or KSP300. In other words, Reference 11, 12, 16 were found to be unsuitable for products.

[0059] Fig. 3(A) through 3(F) show the results of pick-up and littering tests performed on Examples 1 - 8 and References 1 - 16. One of the reasons to decrease litters is that the appearance around the product is very messy by litters exists. The tests were performed by means of a test machine which repeats reciprocal movements so that a cake made of the test composition is rubbed with a sponge and the amount of the composition taken by the sponge (pick-up amount) and remaining on the cake surface (litters) were measured after predetermined number of rubbings. As may be clear from Fig. 3(A) and 3(B), litters are small throughout the tested range when the particles are fusiform, NLK600 and NLK602. When other kinds of particles are included, the litters tend to be large especially when the amount of particles is higher than 10 wt% and therefore undesirable except in the case of Tospearl. From the point of view of less litters which is desirable, the compositions according to the present invention and the compositions containing Tospearl are considered to be desirable and other particles are not.

[0060] Fig. 4 shows the results of similar tests performed on the compositions according to Formula II. The graph shows the amount of litters after 100 rubbings by a sponge. The results show that relatively large amount of litters appears even when Silica Beads SB700 or KSP300 are included. Other results are more or less the same and acceptable including the composition containing non spherical particles.

[0061] Fig. 5 shows the friction coefficient (MIU) of the composition. Friction coefficient was measured on a bulk powder of the composition to be tested. By means of a test machine, the force which was necessary to move a sponge along the bulk powder surface and the force exerted perpendicular to the bulk powder surface were measured, and the friction coefficient was determined to be the ratio thereof. A general tendency observed in the compositions containing fusiform particles is that the friction coefficient decreases as the amount of particles contained in the composition increases (Examples 1 - 8). More or less the same results are observed in the compositions containing a bowl shaped particles (Reference 1 - 4) and Silica Beads SB700. However, with regard to the compositions containing Tospearl, the friction coefficient is high regardless of the amount of particles contained in the composition meaning that the smoothness is not obtained by adding Tospearl.

[0062] Fig. 6 shows the drop strength of the composition after press compacted. Pressed powder was dropped on the tile from 20 cm of height until 5% of the initial weight is lost. Fig. 6 shows how many times the compositions were dropped. As may be clear from the figure, the compositions according to the present invention, Examples 9 and

10, depicts remarkably high resistance against dropping while the compositions containing other types of particles tend to be more fragile against dropping compared with blank specimen which contains no spherical particles.

[0063] These test results were numerically evaluated. Table 6 shows the definitions used in the evaluation.

	Basis of evaluation	◎ (very good)	○ (good)	△ (medium)	× (bad)	×× (very bad)
Press condition	Maximum amount that can be physically included (wt%)	Over 20	15 ~ 20	10 ~ 15	5 ~ 10	Less than 5
Litters	Increase in the amount of litters as for 5wt% and 10 wt% compared with non spherical (mg)	Less than 0.5	0.5 ~ 1	1 ~ 1.5	1.5 ~ 2	Over 2
Friction coefficient	Decrease of friction coefficient for the average of 5 wt% to 20 wt% as compared with non spherical	Over 0.12	0.12 ~ 0.09	0.09 ~ 0.06	0.06 ~ 0.03	Less than 0.03
Drop strength	Increase of drop times before appearance of cracks as compared with non spherical (times)	Over 15	0 ~ 15	-15 ~ -1	-15 ~ -30	-30 or more

[0064] Table 7 below shows the results of the evaluation performed according to the definitions described in Table 6. Table 7 clearly shows that the Examples according to the present invention which contain fusiform particles depict overall superiority to other compositions containing other types of particles. Each one of the other compositions has a weakness in at least one of the features described there.

	Examples 1 - 4	Examples 5 - 8	References 1 - 4	References 5 - 8	References 9 - 12	References 13 - 16
Press condition	◎	◎	◎	◎	△	○
Litters	○	◎	○	◎	××	××
Friction coefficient	△	○	×	×	◎	◎
Drop strength	◎	○	××	△	××	××

[0065] As may be clear now, it was discovered that a powder composition for cosmetic use containing fusiform particles in addition to a filler and a pigment and other cosmetically acceptable ingredients depicts superior features desired from cosmetic compositions such as good press forming compatibility, small amount of litters by rubbing, small friction coefficient to guarantee a smooth touch and a good drop strength.

[0066] Examples of formulations

#### Blush

A formulation of ablush (cheek) product is described as follows.

TYPE	INCI NAME	wt%
Pigment	IRON OXIDES (CI77499)	0.1
Pigment	ULTRAMARINES (CI77007)	13.1
Pigment	TITANIUM DIOXIDE (CI77891)	1.0
Pigment	IRON OXIDES (CI77492)	0.1
Preservative	METHYLPARABEN	0.1
Preservative	BUTYLPARABEN	0.1
Binder	MINERAL OIL	2.5
Filler (Flake)	MICA	35.0
Filler (Flake)	TALC	25.0
Filler (Flake)	KAOLIN	5.0
NLK602 / Filler (rugby)	METHYLSILANOL/SILICATE CROSSPOLYMER	10.0
Surfactant	ZINC STEARATE	8.0
TOTAL		100.0

[0067] Eye shadow

A formulation of an eye shadow product is described as follows.

TYPE	INCI NAME	wt%
Filler (Flake)	BORON NITRIDE	5.0
Filler (Flake)	TALC (and) METHICONE	8.0
Pearl	MICA (and) TITANIUM DIOXIDE	10.0
Pearl	MICA (and) TITANIUM DIOXIDE (and) IRON OXIDES (CI: 77491)	10.0
Pearl	MICA (and) DISODIUM STEAROYL GLUTAMATE (and) ALUMINUM HYDROXIDE	20.0
Pearl	MICA (and) TITANIUM DIOXIDE	15.0
NLK602 / Filler (rugby)	METHYLSILANOL/SILICATE CROSSPOLYMER	10.0
Pigment	RED 30	0.1
Pigment	IRON OXIDES (CI: 77492)	2.0
Pigment	IRON OXIDES (CI: 77499)	0.2
Pigment	IRON OXIDES (CI: 77491)	2.5
Surfactant	MAGNESIUM STEARATE	3.0
Binder	CAPRYLIC/CAPRIC TRIGLYCERIDE	6.5
Binder	DIISOSTEARYL MALATE	2.0
Binder	DIMETHICONE	4.9
Preservative	ETHYLPARABEN	0.4
Preservative	METHYLPARABEN	0.4
Vitamine	TOCOPHERYL ACETATE	0.1
TOTAL		100.0

[0068] Foundation (compact powder)

A formulation of foundation (compact powder) product is described as follows.

TYPE	INCI NAME	wt%
Filler (Flake)	SYNTHETIC FLUORPHLOGOPITE	18.5
Filler (Flake)	BORON NITRIDE	12.0
Filler (Flake)	TALC (and) LAUROYL LYSINE	28.0
Filler (Flake)	BARIUM SULFATE (and) LAUROYL LYSINE	6.4
NLK602 / Filler (rugby)	METHYLSILANOL/SILICATE CROSSPOLYMER	10.0
Pigment	TITANIUM DIOXIDE (and) LAUROYL LYSINE	8.0
Pigment	IRON OXIDES (CI: 77491) (and) DISODIUM STEAROYL GLUTAMATE (and) ALUMINUM HYDROXIDE	1.0
Pigment	IRON OXIDES (CI: 77499) (and) DISODIUM STEAROYL GLUTAMATE (and) ALUMINUM HYDROXIDE	0.4
Pigment	IRON OXIDES (CI: 77492) (and) DISODIUM STEAROYL GLUTAMATE (and) ALUMINUM HYDROXIDE	3.0
Preservative	PHENOXYETHANOL (and) METHYLPARABEN (and) ISOPROPYLPARABEN (and) ISOBUTYLPARABEN (and) BUTYLPARABEN	0.6
Binder	CAPRYLIC/CAPRIC TRIGLYCERIDE	2.0
Binder	POLYMETHYLSILSESQUIOXANE	4.0
UV filter	ETHYLHEXYL METHOXYCINNAMATE	3.0
Vitamine	TOCOPHERYL ACETATE	0.1
TOTAL		97.0

## Claims

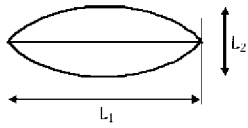
- [1] A powder composition, in particular in a compact powder form, for cosmetic use containing fusiform particles in addition to a filler and optionally a pigment and other cosmetically acceptable ingredients, the fusiform particles being made of an organosilicone having a crosslinked polysiloxane structure, and having diameters along major axis  $L_1$  between approximately 0.05 micro meter and approximately 20 micro meter, diameters along minor axes  $L_2$  between approximately 0.03 micro meter and approximately 15 micro meter, and  $L_1/L_2$  between approximately 1.1 and approximately 3.3.
- [2] The powder composition according to claim 1, wherein the fusiform particles have slits along their major axes.
- [3] The powder composition according to one of claims 1 and 2, wherein the fusiform particles are less than 40 wt% by weight, preferably between approximately 1 wt% and approximately 40 wt%, preferably between approximately 5 wt% and approximately 20 wt%, more preferably between approximately 10 wt% and approximately 15 wt% of the powder composition.
- [4] The powder composition according to one of claims 1 to 3 wherein the filler is a non-spherical filler having a plate or lamellar form, such as lauroyl lysine, mica, talc, boron nitride, kaolin, oxychloride bismuth, barium sulfate, perlite, PTFE, and their mixtures.
- [5] The powder composition according to one of claims 1 to 3 wherein the filler represents between 5 and 90 % of the total composition.
- [6] The powder composition according to one of claims 1 to 3 wherein:  
the filler includes at least one filler in a plate or lamellar form and optionally other spherical fillers, said fillers being chosen from talc, mica, silica, kaolin, powders formed of polyamide, of poly-beta-alanine and of polyethylene, powders formed of tetrafluoroethylene polymers, lauryllysine, starch, boron nitride, polymeric hollow microspheres of poly(vinylidene chloride)/acrylonitrile or of acrylic acid copolymers, silicone resin microbeads, particles formed of polyorganosiloxane elastomers, precipitated calcium carbonate, magnesium carbonate, basic magnesium carbonate, hydroxyapatite, barium sulphate, aluminium oxides, polyurethane powders, composite fillers, hollow silica microspheres, glass or ceramic microcapsules, or metal soaps derived from organic carboxylic acids having from 8 to 22 carbon atoms, preferably from 12 to 18 carbon atoms, for example zinc stearate, magnesium stearate, lithium stearate, zinc laurate or magnesium myristate;  
the pigment includes one or more of titanium dioxide, optionally surface treated,

zirconium or cerium oxides, and also zinc, iron (black, yellow or red) or chromium oxides, manganese violet, ultramarine blue, chromium hydrate and ferric blue, and metal powders, such as aluminium powder or copper powder, and their mixtures; and

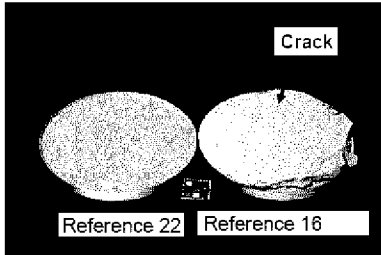
the other cosmetically acceptable ingredients include one or more of waxes, preservatives, cosmetic active principles, moisturizing agents, UV screening agents, thickeners, water, surfactants, binders or fragrances.

- [7] The powder composition according to claim 4, wherein the surfactant includes zinc stearate, the binder includes a mineral oil or phenyl trimethicone, and the preservative includes phenoxyethanol.
- [8] The powder composition according to one of claims 1 and 5, wherein the crosslinked polysiloxane comprises first, second and third siloxane units which are  $\text{SiO}_2$ ,  $\text{R}^1\text{SiO}_{1.5}$  and  $\text{R}^2\text{R}^3\text{SiO}$ , respectively, wherein  $\text{R}^1$ ,  $\text{R}^2$  and  $\text{R}^3$  are any one of organic groups, same or different, having a carbon atom directly linked to a silicon atom.
- [9] The powder composition according to any one of claims 1 to 6, wherein molar ratio of the molar sum of the first siloxane unit and the second unit over the third siloxane unit is between 99:1 to 50:50, more preferably between 90:10 to 60:40, approximately.
- [10] The powder composition according to claim 7, wherein molar ratio of the first siloxane unit with respect to the second siloxane unit is between 23:77 and 40:60, approximately.
- [11] The powder composition according to any one of claims 6 to 8, wherein  $\text{R}^1$  and at least one of  $\text{R}^2$  and  $\text{R}^3$  are selected from the group consisting of epoxy group, (meta) acryloxy group, mercaptoalkyl group, aminoalkyl group and organic groups having any one of preceding groups.
- [12] The powder composition according to any one of claims 1 to 9 wherein the powder composition is a make-up or caring product for the skin in the form of a blusher, an eyeshadow, a face powder, a foundation, a concealer, a product for making up the body, a product for caring for the face, a product for caring for the body or an antison product.

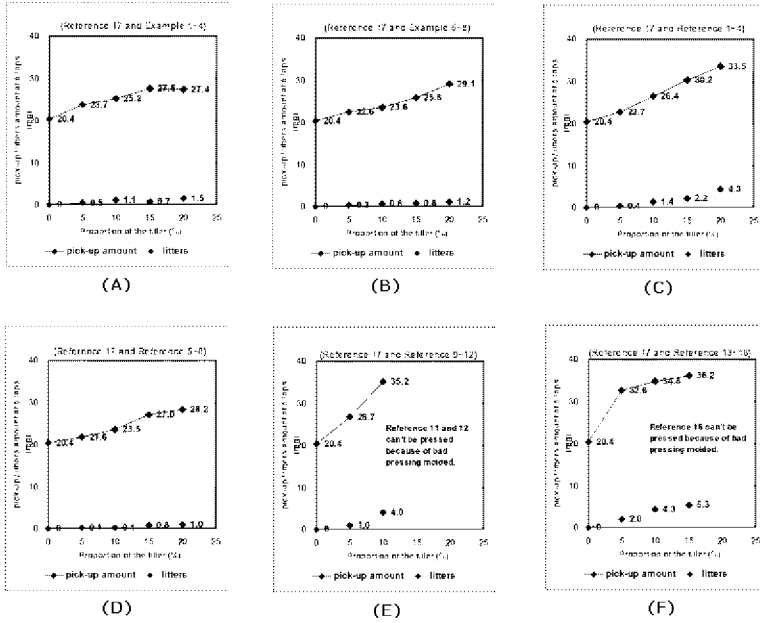
[Fig. 1]



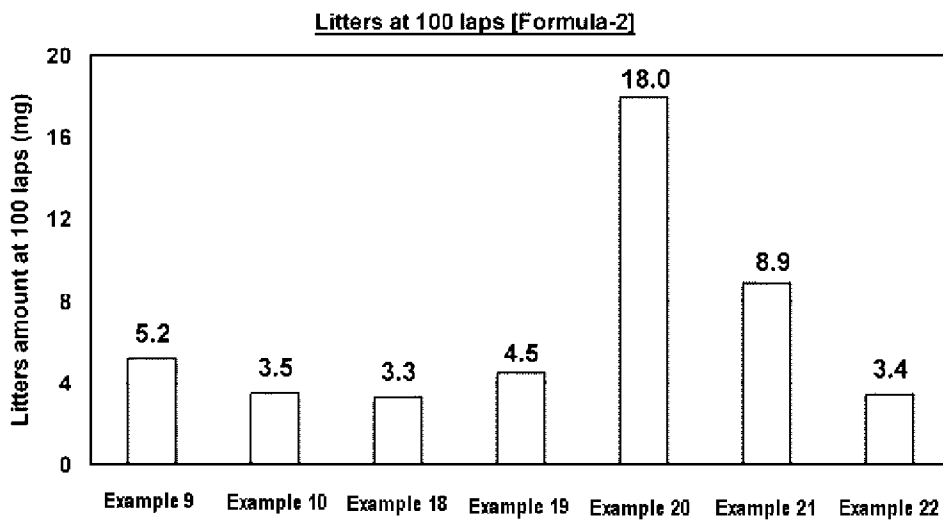
[Fig. 2]



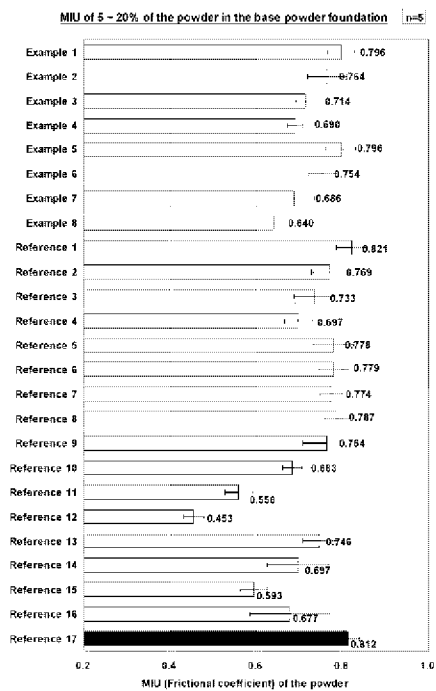
[Fig. 3]



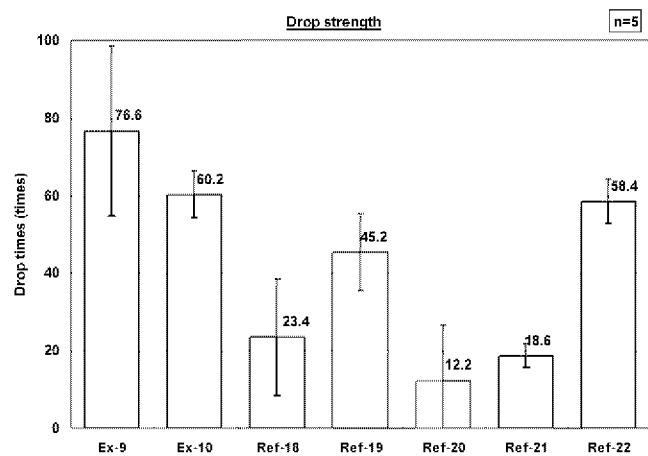
[Fig. 4]



[Fig. 5]



[Fig. 6]



**INTERNATIONAL SEARCH REPORT**

International application No  
PCT/JP2009/001420

**A. CLASSIFICATION OF SUBJECT MATTER**  
 INV. A61K8/04 A61K8/89 A61Q1/12 A61Q1/10  
 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

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

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2006/089478 A1 (NODA IPPEI [JP]) 27 April 2006 (2006-04-27) paragraph [0082]; claims; tables 3-6	1-12
X	US 6 123 927 A (OGAWA KATSUKI [JP] ET AL) 26 September 2000 (2000-09-26) column 1, lines 44-48; example 1	1-12
A	JP 2003 171465 A (TAKEMOTO OIL & FAT CO LTD) 20 June 2003 (2003-06-20) cited in the application paragraph [0001]; claims	1-12
X	US 2004/266926 A1 (SASAKI YUKI [JP] ET AL) 30 December 2004 (2004-12-30) paragraphs [0007] - [0012]; claims; figures	1-12

Further documents are listed in the continuation of Box C.  See patent family annex.

\* Special categories of cited documents :

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*E* earlier document but published on or after the international filing date	*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
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*O* document referring to an oral disclosure, use, exhibition or other means	
*P* document published prior to the international filing date but later than the priority date claimed	*G* document member of the same patent family

Date of the actual completion of the international search  25 January 2010	Date of mailing of the international search report  02/02/2010
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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  Miller, Bernhard
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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/JP2009/001420
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2006089478 A1	27-04-2006	JP 2006117867 A KR 20060036362 A	11-05-2006 28-04-2006
US 6123927 A	26-09-2000	AU 724012 B2 AU 7589996 A DE 69629357 D1 DE 69629357 T2 EP 0801941 A1 WO 9718793 A1 TW 487579 B	07-09-2000 11-06-1997 11-09-2003 01-07-2004 22-10-1997 29-05-1997 21-05-2002
JP 2003171465 A	20-06-2003	JP 3701017 B2	28-09-2005
US 2004266926 A1	30-12-2004	JP 3646721 B2 JP 2005015437 A	11-05-2005 20-01-2005