Packaging and application device (1) comprising: - a container (20) containing a cosmetic makeup composition, especially foundation, having a viscosity of less than 0.8 Pa.s at 25°C, - an applicator (10), comprising: - a stem (12) having a distal portion, - an application member (13), the application member (13) being borne by the distal portion (12c) of the stem (12) and protruding with respect thereo.
WO 2015/075626 A 1

SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, KM, ML, MR, NE, SN, TD, TG). Published:

— with international search report (Art. 21(3))
Applicator for cosmetic use

The present invention relates to packaging and application devices for applying a cosmetic fluid makeup composition, for example to human keratin materials, in particular the skin, especially a liquid foundation.

The invention relates more particularly, but not exclusively, to devices in which the applicator comprises a product application member, borne by a stem and introduced into a container in order to be loaded with product.

Certain low-viscosity liquid foundations have been proposed, which are withdrawn using a pipette. The product is difficult to apply using a pipette, and the user must use their finger or an additional applicator.

The expression "cosmetic fluid makeup composition" is understood to mean a composition that flows under its own weight at room temperature, as opposed to a "solid" composition. Interest is taken in particular, within the context of this invention, in cosmetic makeup compositions of low viscosity, in particular of less than 0.8 Pa.s at 25°C, preferably of less than 0.6 Pa.s, more preferably of less than 0.4 Pa.s, especially of less than 0.2 Pa.s, and more preferably of less than 0.1 Pa.s, the viscosity being measured as indicated below.

According to one particular embodiment, the cosmetic makeup composition according to the invention has a viscosity from 0.04 to 0.08 Pa.s at 25°C.

The expression "cosmetic makeup composition" is understood to mean a cosmetic composition comprising at least colorants, intended to provide a colour and an aesthetic effect to the keratin materials on which it is applied. In particular, it will be a cosmetic composition for making up the skin of the face, such as a foundation, a complexion corrector or perfector, or a "BB" or "CC" type cream.

These makeup products, which may be more or less fluid, generally contain oils, pigments, fillers and optionally cosmetic or dermatological additives.

Consumers are increasingly seeking cosmetic makeup products that spread easily and rapidly in particular on the skin in the form of a deposit which should not be thick but on the contrary should blend in as much as possible with the support for coverage without marking or mask effect. They therefore seek makeup products with lighter, fluid formulations, which are easy to apply, and with superior comfort and wear properties
(wear property of the mattness, wear property of the colour, uniformity of the deposit, non-greasy, non-tacky appearance).

However, the distribution of a very fluid composition may prove difficult, uneven and uncontrolled.

The following are known: sprayers, tubes with flocked, woven, metallic end caps, or tubes with reducers, etc.

US 2010/0266327 describes an applicator for cosmetic use comprising an application member that is not particularly suitable for the application of a foundation.

WO 96/29905 describes a device for applying mascara, comprising spherical application elements positioned along the axis of the stem of the applicator.

FR 2901458 discloses a liquid product applicator device, comprising a stem that ends in a loop-shaped applicator head, having a smooth surface, and in particular an applicator head made of a flexible and substantially toric-shaped material.

FR 2951920 discloses a packaging and application device for applying a product to the lips, comprising an application member that defines two main application faces in order to apply the product to both lips simultaneously.

EP 1 440 629 describes an applicator for cosmetic use comprising a two-sided application element that makes it possible to apply a composition owing to an opening of elongated shape.

It is furthermore known to withdraw a liquid foundation with a pipette then to spread it on the skin with a separate applicator.

Such a device must be specifically adapted in particular to makeup formulations that are fluid or even very fluid (≤0.2 Pa.s at 25°C) for even and controlled distribution and an acceptable makeup result, in order to use one and the same applicator for both removing the product from a container that contains it and spreading it with comfort and precision over the skin.

There is a need to find a device suitable for very fluid compositions, and in particular makeup compositions that comprise colorant compounds, for which a poorly controlled distribution may have a very negative effect on the use of the product, giving the impression of a careless application. The invention seeks to further perfect the devices for packaging and applying a cosmetic liquid makeup composition, especially in order to enable the user to use the same applicator both for removing and applying the product.
The invention is aimed at meeting all or some of these requirements and one subject of the invention is, according to a first of its aspects, a packaging and application device comprising:

- a container containing a cosmetic makeup composition, especially foundation, having a viscosity of less than 0.8 Pa.s at 25°C, better still less than 0.2 Pa.s at 25°C, even better still less than 0.1 Pa.s at 25°C,
- an applicator, comprising:
  - a stem having a distal portion,
  - an application member, the application member being borne by the distal portion of the stem and protruding with respect thereto.

The application member according to the first aspect of the invention has, due to the protrusion of the application member with respect to the stem, when observed along at least one direction perpendicular to the longitudinal axis of the stem, one or more regions suitable for being loaded with cosmetic makeup composition and for releasing it.

The application surface makes it possible to apply the cosmetic makeup composition and to spread it. In particular, it is no longer necessary to resort, on the one hand, to a pipette for withdrawing the cosmetic fluid makeup composition, and, on the other hand, to an additional applicator for spreading it over the skin.

Preferably, the application member has proximal and distal ends and a larger transverse dimension greater than the largest transverse dimension of the distal portion of the stem level with its attachment to the application member, the application member being oriented along a first axis and having a rounded outer surface both along this first axis and along a second axis orthogonal to the first, at least at one location distant from the distal and proximal ends, especially where the transverse outer cross section of the application member is maximum.

The application member may be of ovoid shape. Preferably, when ovoid, it is then hollowed out, over a portion of its length, by longitudinal grooves parallel to the longitudinal axis of the application member, especially several groups of several close grooves, preferably three groups of three close grooves. The grooves preferably have a depth of between 0.2 and 3 mm and/or a width of between 1 and 4 mm and/or a length of between 7 and 14 mm. Such grooves make it possible to increase the amount of product...
that the application member can be loaded with, it being possible for the cosmetic makeup composition to be retained thereon by capillary action.

The application member may have a flattened general shape, in particular with an orifice, preferably of elongated shape along the longitudinal axis of the stem, more preferably with a hemispherical tip, the stem preferably being of elongated cross section along a flattening plane of the application member, the latter preferably having, in top view, a profile with two inflection points on either side of a peak, the largest width of the application member measured at the peak, being greater than the largest transverse dimension of the stem.

The application member may also be of substantially spherical shape, that is to say they have a rounded outer surface at any point along two perpendicular axes and the largest dimension of which does not exceed the smallest dimension by more than 15%.

The application member may comprise a body extended by an applicator appendage, an annular throat being formed between the two. The presence of the applicator appendage may increase the amount of product withdrawn and make it possible to outline contours more accurately on application, and/or to apply the product in crevices of the skin.

The appendage may have a surface area of substantially hemispherical shape, especially at the distal end thereof.

The stem and the application member are advantageously moulded from a single part, in particular from one and the same material. As a variant, the application member is added to the stem.

The applicator may or may not comprise a flock coating.

Another subject of the invention is, according to a second aspect, an applicator for applying a cosmetic product to human keratin materials, especially the skin, preferably a foundation, comprising:
- a stem, and
- an application member borne by the stem, the application member comprising a body that defines a cavity opening from one side onto an application surface, outwardly convex in a cutting plane containing a longitudinal axis of the application member, via at least one dispensing orifice, this dispensing orifice extending over less than three quarters of the length of the application member along said longitudinal axis, and
from the opposite side via a cavity-filling opening, this opening having a cross section at least two times greater than that of the dispensing orifice.

The cavity gives the applicator according to this second aspect of the invention good autonomy, while being able to be loaded rapidly and easily with product.

The back of the applicator, onto which the dispensing orifice opens, defines the application surface that makes it possible to apply the product under good conditions.

Preferably, the contour of the filling opening is closed and advantageously extends substantially in one plane, that is to say that the difference between the peaks and the troughs of the contour never exceeds more than 20% of the maximum thickness of the application member, measured parallel to a longitudinal median plane for the application member, which may also be a median plane of symmetry for the application member.

The cosmetic product easily penetrates the cavity of the application member via the filling opening, of enlarged cross section, and flows slowly, as and when it is applied, through the dispensing orifice, which limits the flow by surface tension.

Preferably, the application member has a general rounded spoon shape, which makes it possible to spread a foundation and to adapt to any reliefs of the skin to which it is applied. Such a shape may facilitate the retention of the product while favouring the flow thereof.

The invention makes it possible, according to the second aspect, thus both to apply a liquid foundation and to spread it with the same application member. In particular, it is not necessary to resort, on the one hand, to a pipette for applying the fluid foundation, and, on the other hand, to another device for spreading it over the skin.

The applicator according to the invention may facilitate the withdrawal of a dose of product suitable for a precise application, the product being able to adhere to the application member in the form of a thick layer.

The dispensing orifice preferably has a cross section of between 0.5 and 3 mm², possibly having a circular or lenticular cross section, *inter alia*, preferably being unique.

The filling opening preferably has a cross section of between 5 and 30 mm².

The dispensing orifice is preferably located at the bottom of the cavity or at the back of the latter, that is to say between the bottom of the cavity and the support stem of the application member.
The application member may comprise a tip that is rounded at the end. This tip may make it possible to load more product, but also to spread the product better and to recover possible excesses.

The tip may especially be of hemispherical shape. It is advantageous for the peak of this tip to be located at a distance of at least 2 mm from the dispensing orifice, as this makes it possible to produce the application member more easily with a shape that is tapered at the end. The peak of the tip may be located on the longitudinal axis of the stem.

The applicator may or may not comprise a flock coating.

The filling opening is, preferably, in top view, piriform, the contour of the opening being closed; in other words, the cavity does not open axially at the distal end of the application member.

Advantageously, the body of the application member is moulded as a single part with the stem, in particular from the same material.

Preferably, the outer surface of the body of the application member is connected to the stem by forming a non-right angle. This may facilitate crossing an optional wiping member present at the outlet of the container that contains the product. However, preferably, the container is devoid of a wiping member, which makes it possible to keep the product loaded on the stem.

A further subject of the invention is a packaging and application device comprising:
- a container containing a cosmetic fluid makeup composition, in particular a foundation, and
- an applicator according to the invention.

The product, in particular foundation, may have a viscosity of less than 0.8 Pa.s, better still of less than 0.2 Pa.s.

**Cosmetic makeup composition**

The cosmetic makeup composition according to the invention, whether it is the first or second aspect thereof, preferably comprises colorants in a content ranging from 2% to 25% by weight, in particular from 5% to 20% by weight, preferably from 8% to 15% by weight relative to the total weight of said composition.
The colorants are selected from organic or inorganic colorants, in particular such as pigments or nacres conventionally used in cosmetic compositions, liposoluble or water-soluble dyes, materials with a specific optical effect, and mixtures thereof.

The term "pigments" should be understood to mean white or coloured, mineral or organic particles which are insoluble in an aqueous solution and are intended for colouring and/or opacifying the resulting film.

As mineral pigments that may be used in the invention, mention may be made of titanium oxides, zirconium oxides or cerium oxides, and also zinc oxides, iron oxides or chromium oxides, ferric blue, manganese violet, ultramarine blue and chromium hydrate. Preferably, the composition of the invention comprises at least titanium oxides and iron oxides.

According to one particular embodiment, the colorants are mineral pigments selected from titanium oxides, iron oxides, and mixtures thereof.

The term "physiologically acceptable medium" is intended to denote a medium that is particularly suitable for the application of a composition of the invention to the skin or the lips, in particular the skin.

The physiologically acceptable medium is generally adapted to the nature of the support onto which the composition has to be applied, and also to the appearance under which the composition has to be packaged.

A composition of the invention may be a dispersion or an emulsion.

A dispersion may be made as an aqueous phase or as an oily phase.

The compositions of the invention may be in the form of an oily solution or dispersion, a gel, an emulsion or an anhydrous fluid, in particular an anhydrous fluid. An emulsion may have an oily or aqueous continuous phase. The emulsion may be, for example, an inverse (W/O) emulsion or a direct (O/W) emulsion, or alternatively a multiple emulsion (W/O/W or O/W/O). In the case of emulsions, inverse (W/O) emulsions are preferred.

**Aqueous phase**

A composition according to the invention, whether it is according to the first or second aspect thereof, may comprise an aqueous phase.
The aqueous phase comprises water. A water that is suitable for use in the invention may be a floral water such as cornflower water and/or a mineral water such as Vittel water, Lucas water or La Roche Posay water and/or a spring water.

The aqueous phase may also comprise organic solvents that are water-miscible (at room temperature: 25°C), for instance monoalcohols containing from 2 to 6 carbon atoms, such as ethanol or isopropanol; polyols especially containing from 2 to 20 carbon atoms, preferably containing from 2 to 10 carbon atoms and preferentially containing from 2 to 6 carbon atoms, such as glycerol, propylene glycol, butylene glycol, pentylene glycol, hexylene glycol, dipropylene glycol or diethylene glycol; glycol ethers (especially containing from 3 to 16 carbon atoms) such as mono-, di- or tripropylene glycol (Cl-C4)alkyl ethers, mono-, di- or triethylene glycol (Cl-C4)alkyl ethers, and mixtures thereof.

The aqueous phase may also comprise stabilizers, for example sodium chloride, magnesium dichloride and magnesium sulfate.

The aqueous phase may also comprise any water-soluble or water-dispersible compound that is compatible with an aqueous phase, such as gelling agents, film-forming polymers, thickeners, surfactants and mixtures thereof.

In particular, a composition of the invention may comprise an aqueous phase in a content ranging from 1% to 80% by weight, especially from 5% to 50% and more particularly from 10% to 45% by weight relative to the total weight of the composition.

According to one embodiment, the cosmetic makeup composition comprises less than 20% water, preferably less than 10% water, more preferably less than 5% water, or less than 2% water, or more preferably less than 1% water. According to one preferred embodiment, the composition is anhydrous.

**Monoalcohols**

The compositions of the invention may comprise at least one monoalcohol comprising from 2 to 8 carbon atoms, especially from 2 to 6 carbon atoms, and in particular from 2 to 4 carbon atoms.

The compositions of the invention may comprise one or more monoalcohol(s). This monoalcohol may be represented, for example, by the formula RₐOH, in which Rₐ represents a linear or branched alkyl group comprising from 2 to 8 carbon atoms. As monoalcohol, mention may be made of ethanol, isopropanol, propanol or butanol. According to one embodiment, the compositions of the invention comprise ethanol.
The amount of monoalcohol(s) may range from 5% to 40% by weight in the composition, preferably from 10% to 20% by weight and more preferentially still from 10% to 15% by weight relative to the total weight of said composition.

According to one particular embodiment, the cosmetic makeup product comprises one or more monoalcohol(s) comprising from 2 to 8 carbon atoms, in a content that may range from 5% to 20% by weight, especially from 10% to 15% by weight relative to the total weight of the composition.

**Fatty phase**

A cosmetic composition in accordance with the present invention, whether it is according to the first or second aspect thereof, may comprise at least one liquid and/or solid fatty phase.

In particular, a composition of the invention may comprise at least one liquid fatty phase, especially at least one oil as mentioned below.

The term "oil" means any fatty substance that is in liquid form at room temperature (20-25°C) and at atmospheric pressure. These oils may be of animal, plant, mineral or synthetic origin.

According to one embodiment, the fatty phase of the compositions of the invention comprises at least one volatile oil and/or at least one non-volatile oil.

According to one particular and preferred embodiment, the cosmetic makeup composition comprises at least one fatty phase comprising volatile or non-volatile, silicone or hydrocarbon oils, and preferably a mixture of volatile and non-volatile, silicone and hydrocarbon oils.

**Volatile oils**

According to one embodiment, the fatty phase of the compositions of the invention comprises at least one volatile oil. The fatty phase of the compositions of the invention may comprise a mixture of several volatile oils.

The term "volatile oil" means any non-aqueous medium that is capable of evaporating from the skin or the lips, in less than one hour, at room temperature and atmospheric pressure. The volatile oil is a cosmetic volatile oil, which is liquid at room temperature. More specifically, a volatile oil has an evaporation rate of between 0.01 and 200 mg/cm²/min, limits included.
To measure this evaporation rate, 15 g of oil or oil mixture to be tested are placed in a crystallizing dish 7 cm in diameter, placed on a balance that is in a large chamber of about 0.3 m³ which is temperature-regulated, at a temperature of 25°C, and hygrometry-regulated, at a relative humidity of 50%. The liquid is allowed to evaporate freely, without stirring it, while providing ventilation by means of a fan (Papst-Motoren, reference 8550 N, rotating at 2700 rpm) placed in a vertical position above the crystallizing dish containing said oil or said mixture, the blades being directed towards the crystallizing dish, 20 cm away from the bottom of the crystallizing dish. The mass of oil remaining in the crystallizing dish is measured at regular intervals. The evaporation rates are expressed in mg of oil evaporated per unit of area (cm²) and per unit of time (minutes).

The volatile oils may be hydrocarbon, silicone or fluoro oils.

For the purposes of the present invention, the term "silicone oil" is intended to mean an oil comprising at least one silicon atom, and in particular at least one Si-O group.

The term "fluoro oil" is intended to mean an oil comprising at least one fluorine atom.

The term "hydrocarbon oil" is intended to mean an oil containing mainly hydrogen and carbon atoms.

The oils may optionally comprise oxygen, nitrogen, sulfur and/or phosphorus atoms, for example in the form of hydroxyl or acid radicals.

The volatile oils may be chosen from hydrocarbon oils containing from 8 to 16 carbon atoms, and especially branched C₈-Ci₆ alkanes (also known as isoparaffins or isoalkanes), for instance isododecane (also known as 2,2,4,4,6-pentamethylheptane), isodecane, isohexadecane and, for example, the oils sold under the trade names Isopar® or Permethyl®.

As hydrocarbon volatile oil, mention may also be made of linear C₉-Ci₇ alkanes, such as dodecane (C₁₂) and tetradecke (C₁₄), sold respectively under the references PARAFOL® 12-97 and PARAFOL® 14-97 (Sasol) and such as the alkanes obtained according to the process described in international application WO 2007/068371 Al, such as the mixture of undecane (Cn) and tridecane (C₁₃).

Among the hydrocarbon volatile oils, isododecane is preferred.

Volatile oils that may also be used include volatile silicones, for instance volatile linear or cyclic silicone oils, especially those with a viscosity of less than or equal
to 8 centistokes (cSt) \( (8 \times 10^{-6} \text{ m}^2/\text{s}) \), and especially containing from 2 to 10 silicon atoms and in particular from 2 to 7 silicon atoms, these silicones optionally comprising alkyl or alkoxy groups containing from 1 to 10 carbon atoms. As volatile silicone oils that may be used in the invention, mention may be made in particular of dimethicones with viscosities of 5 and 6 cSt, octamethyldicyctetrasiloxane, decamethylcyclopentasiloxane, dodecamethylcyclohexasiloxane, heptamethylhexyltrisiloxane, heptamethyloctyltrisiloxane, hexamethyltrisiloxane, octamethyltrisiloxane, decamethyltetrasiloxane and dodecamethylpentasiloxane, and mixtures thereof.

More particularly, as volatile silicone oil, mention may be made of the linear or cyclic silicone oils containing from 2 to 7 silicon atoms, these silicones optionally comprising alkyl or alkoxy groups containing from 1 to 10 carbon atoms.

As preferred examples, mention may be made of decamethylcyclopentasiloxane, dodecamethylcyclohexasiloxane and dodecamethylpentasiloxane.

Among the silicone volatile oils, dodecamethylpentasiloxane is preferred.

According to one embodiment, the fatty phase of the compositions of the invention comprises from 40% to 100% by weight, preferably from 60% to 98% by weight and preferentially from 80% to 95% by weight of volatile oil(s) relative to the total weight of the fatty phase.

Non-volatile oils

According to one embodiment, the fatty phase of the compositions of the invention comprises at least one non-volatile oil. The fatty phase of the compositions of the invention may comprise a mixture of several non-volatile oils.

The term "non-volatile oil" means an oil that remains on the skin or the keratin fibre at room temperature and atmospheric pressure. More specifically, a non-volatile oil has an evaporation rate strictly less than 0.01 mg/cm²/min.

The non-volatile oils may be chosen especially from non-volatile hydrocarbon, fluoro and/or silicone oils.

Non-volatile hydrocarbon oils that may especially be mentioned include:

- hydrocarbon oils of plant origin, such as phytostearyl esters, such as phytostearyl oleate, phytostearyl isostearate and lauroyl/octyldodecyl/phytostearyl glutamate (AJINOMOTO, ELDEW PS203);
triglycerides formed from fatty acid esters of glycerol, in particular whose fatty acids may have chain lengths ranging from \( C_4 \) to \( C_{36} \) and especially from \( C_{18} \) to \( C_{36} \). These oils possibly being linear or branched, and saturated or unsaturated; these oils may especially be heptanoic or octanoic triglycerides, shea oil, alfalfa oil, poppyseed oil, pumpkin oil, millet oil, barley oil, quinoa oil, rye oil, candlenut oil, passionflower oil, shea butter, aloe oil, sweet almond oil, peach kernel oil, groundnut oil, argan oil, avocado oil, baobab oil, borage oil, broccoli oil, calendula oil, camelina oil, canola oil, carrot oil, safflower oil, hemp oil, rapeseed oil, cottonseed oil, coconut oil, marrow seed oil, wheatgerm oil, jojoba oil, lily oil, macadamia oil, corn oil, meadowfoam oil, St John's wort oil, monoi oil, hazelnut oil, apricot kernel oil, walnut oil, olive oil, evening primrose oil, palm oil, blackcurrant seed oil, kiwi seed oil, grape seed oil, pistachio oil, pumpkin oil, musk rose oil, sesame oil, soybean oil, sunflower oil, castor oil and watermelon seed oil, and mixtures thereof, or alternatively caprylic/capric acid triglycerides, such as those sold by the company Stearineries Dubois or those sold under the names Miglyol 810\textsuperscript{®}, 812\textsuperscript{®} and 818\textsuperscript{®} by the company Dynamit Nobel,

- synthetic esters, for instance the oils of formula \( R_1 \text{COOR}_2 \), in which \( R_1 \) represents a linear or branched fatty acid residue containing from 1 to 40 carbon atoms and \( R_2 \) represents a hydrocarbon chain, which is especially branched, containing from 1 to 40 carbon atoms, on condition that the sum of the number of carbon atoms of the \( R_1 \) and \( R_2 \) chains is greater than or equal to 10. The esters may be chosen especially from fatty acid esters of alcohols, for instance: cetostearyl octanoate, isopropyl alcohol esters, such as isopropyl myristate, isopropyl palmitate, ethyl palmitate, 2-ethylhexyl palmitate, isopropyl stearate, isopropyl isostearate, isostearyl isostearate, octyl stearate, hydroxylated esters, for instance isostearyl lactate, octyl hydroxystearate, diisopropyl adipate, heptanoates, and especially isostearyl heptanoate, alcohol or polyalcohol octanoates, decanoates or ricinoleates, for instance propylene glycol dioctanoate, cetyl octanoate, tridecyl octanoate, 2-ethylhexyl 4-diheptanoate, 2-ethylhexyl palmitate, alkyl benzoate, polyethylene glycol diheptanoate, propylene glycol 2-diethylhexanoate, and mixtures thereof, \( C_{12}-C_{15} \) alcohol
benzoates, hexyl laurate, neopentanoic acid esters, for instance isodecyl neopentanoate, isotridecyl neopentanoate, isostearyl neopentanoate, octyldodecyl neopentanoate, isononanoic acid esters, for instance isononyl isononanoate, isotridecyl isononanoate, octyl isononanoate, hydroxylated esters, for instance isostearyl lactate and diisostearyl malate;

- silicone oils, for instance linear or cyclic non-volatile polydimethylsiloxanes (PDMSs); polydimethylsiloxanes comprising alkyl, alkoxy or phenyl groups, which are pendant or at the end of a silicone chain, these groups containing from 2 to 24 carbon atoms; phenyl silicones, for instance phenyl trimethicones, phenyl dimethicones, phenyltrimethylsiloxanes, diphenyl dimethicones, diphenylmethyldiphenyltrisiloxanes and 2-phenylethyltrimethylsiloxysilicates, and mixtures thereof.

Among the linear or branched hydrocarbons of mineral or synthetic origin, use is preferably made of paraffin oils or liquid petroleum jelly.

Among the hydrocarbon oils of plant origin, mention may preferably be made of plant oils, such as sweet almond oil, jojoba oil or macadamia oil.

Among the synthetic oils such as synthetic esters, use is especially made of isodecyl neopentanoate or isononyl isononanoate, and among the synthetic ethers, use is preferably made of dicapryl ether.

Among the non-volatile silicone oils, use is preferably made of polydimethylsiloxanes, phenyl trimethicone or else alkyl dimethicones such as cetyl dimethicone.

According to one embodiment, the fatty phase of the compositions of the invention does not comprise non-volatile oil.

According to one embodiment, the fatty phase of the compositions of the invention comprises less than 60% by weight, preferably from 1% to 40% by weight and preferentially from 2% to 20% by weight of non-volatile oil(s) relative to the total weight of the fatty phase.

According to one embodiment, the fatty phase of the compositions of the invention comprises from 40% to 100%, preferably from 60% to 98%, and more particularly from 80% to 95% by weight of volatile oil(s) relative to the total weight of the
fatty phase, and less than 60%, preferably from 1% to 40% and more particularly from 2% to 20% by weight of non-volatile oil(s) relative to the total weight of the fatty phase.

According to one embodiment, the fatty phase of the compositions of the invention represents a percentage ranging from 25% to 85%, preferably ranging from 40% to 75% and more preferably still ranging from 50% to 70% relative to the total weight of the composition.

**Film-forming polymer**

The cosmetic makeup composition, according to the first or second aspect of the invention, advantageously comprises at least one film-forming polymer, in particular of vinyl polymer type having at least one carbosiloxane dendrimer-based unit.

The vinyl polymer has a backbone and at least one side chain, which comprises a carbosiloxane dendrimer-based unit having a carbosiloxane dendrimer structure.

The term "carbosiloxane dendrimer structure" in the context of the present invention represents a molecular structure with branched groups of high molecular weights, said structure having high regularity in the radial direction starting from the bond to the backbone. Such carbosiloxane dendrimer structures are described in the form of a highly branched siloxane-silylalkylene copolymer in the laid-open Japanese patent application Kokai 9-171 154.

Vinyl polymers grafted with at least one carbosiloxane dendrimer-based unit are described in application WO 2012/131083 which is incorporated by reference.

Vinyl polymers grafted with at least one carbosiloxane dendrimer-based unit that may be particularly suitable for use in the present invention are the polymers sold under the names TIB 4-100, TIB 4-101, TIB 4-120, TIB 4-130, TIB 4-200, FA 4002 ID (TIB 4-202), TIB 4-220 and FA 4001 CM (TIB 4-230) by the company Dow Corning.

According to one embodiment, the composition according to the present invention comprises the vinyl polymer having at least one carbosiloxane dendrimer-based unit in an active material content of from 0.5% to 20%, in particular from 1% to 15%, more particularly from 1.5% to 10% and preferably from 3% to 5% by weight, relative to the total weight of said composition.

**Other ingredients**

A composition according to the invention could also comprise additional ingredients selected from fillers, thickeners or gelling agents, surfactants, sequestrants,
fragrances, antioxidants, preservatives, UV-screening agents or sunscreens, cosmetic active agents, such as vitamins, moisturisers, emollients or mixtures thereof.

In particular, the cosmetic makeup composition also comprises at least one additional ingredient selected from fillers, thickeners or gelling agents, UV-screening agents, and mixtures thereof.

**Thickeners**

Depending on the fluidity of the composition that it is desired to obtain, it is possible to incorporate advantageously one or more thickeners or gelling agents into a composition of the invention.

A thickener or gelling agent suitable for the invention may be hydrophilic or lipophilic.

As lipophilic thickeners, mention may be made, for example, of modified clays such as modified magnesium silicate (Bentone gel VS38 from RHEOX), modified hectorites such as hectorite modified with a C_{10} to C_{22} fatty acid ammonium chloride, for instance hectorite modified with distearyldimethylammonium chloride such as, for example, that sold under the name Bentone 38V® by the company ELEMENTIS or that sold under the name "Bentone 38 CE" by the company RHEOX or that sold under the name Bentone Gel V 5 5V by the company ELEMENTIS.

According to one embodiment, a composition of the invention may comprise thickeners in an active material content from 0.01% to 40% by weight, especially from 0.1% to 20% by weight, in particular from 0.3% to 15% by weight relative to the total weight of the composition.

According to one preferred embodiment, the composition comprises at least one lipophilic thickener, in particular at least one modified hectorite such as a hectorite modified with a C_{10} to C_{22} fatty acid ammonium chloride, advantageously in a content ranging from 0.1% to 5% by weight, in particular from 0.5% to 2% by weight of active material relative to the total weight of said composition.

**Fillers**

A composition in accordance with the invention may also comprise at least one filler, of organic or mineral nature, that makes it possible, in particular, to give it complementary properties of mattness, coverage, wear property and/or improved stability.
The content of filler(s) may range from 2% to 20% by weight, especially from 4% to 12% by weight, relative to the total weight of said composition.

The term "filler" should be understood to mean colourless or white solid particles of any shape which are in a form that is insoluble and dispersed in the medium of the composition. These particles, of mineral or organic nature, can give body or rigidity to the composition and/or softness and uniformity to the makeup, according to the first or second aspect of the invention.

The fillers used in the compositions according to the present invention may be in lamellar, globular or spherical form, in the form of fibres or in any other intermediate form between these defined forms.

Needless to say, a person skilled in the art will take care to select the optional additional compounds and/or the amount thereof such that the advantageous properties intrinsically linked to the composition in accordance with the invention and its packaging and distribution with the device according to the invention are not, or are not substantially, adversely affected by the envisaged addition.

According to one particular embodiment, the cosmetic makeup composition comprises:

- a continuous oily phase representing from 40% to 80% by weight relative to the total weight of the composition;

- a water content of less than 20% or even of less than 1% by weight relative to the total weight of the composition;

- pigments preferably in a content ranging from 5% to 20% by weight relative to the total weight of the composition;

- advantageously at least one film-forming polymer; and

- advantageously monoalcohols comprising from 2 to 8 carbon atoms.

According to one particular embodiment, the cosmetic makeup composition is an anhydrous composition, preferably an anhydrous fluid foundation.

Unless otherwise mentioned, the values in the above examples are expressed as % by weight relative to the total weight of the composition.

Another subject of the invention is a makeup method, especially a method for making up human keratin materials, especially the skin or nails, in which an applicator according to the first or second aspect of the invention is used.
The invention may be better understood from reading the following detailed description of non-limiting implementation examples thereof and from examining the appended drawing, in which:

- Figure 1 represents, in elevation, with partial cutaway, an example of a packaging and application device according to a first aspect of the invention,
- Figure 2 is a partial side view of the applicator of the device from Figure 1,
- Figure 3 is a front view along III from Figure 2,
- Figure 4 is a top view along IV from Figure 3,
- Figure 5 is a bottom view along V from Figure 3,
- Figure 6 is a partial bottom view of the applicator,
- Figure 7 is a longitudinal cross section along VII-VII from Figure 6,
- Figure 8 is a cross section along VIII-VIII from Figure 6,
- Figure 9 represents the detail IX from Figure 6,
- Figure 10 schematically represents a variant of an applicator according to the invention, in longitudinal cross section,
- Figure 11 is a side view of the applicator from Figure 10,
- Figure 12 is a cross section of the stem along XII-XII from Figure 10,
- Figure 13 represents, in elevation, the applicator from Figure 10 with indication of the cutting plane corresponding to this figure,
- Figure 14 is a view similar to Figure 11 of an applicator embodiment variant,
- Figure 15 is a front view along XV from Figure 14,
- Figure 16 is an elevation view of the applicator from Figure 14,
- Figure 17 is a longitudinal cross section along XVII-XVII from Figure 16,
- Figure 18 is a view similar to Figure 11 of another embodiment variant,
- Figure 19 represents, in elevation, the applicator from Figure 18,
- Figure 20 is a longitudinal cross section along XX-XX from Figure 19,
- Figure 21 is a transverse cross section along X XI-X XI from Figure 19,
- Figure 22 is a front view of the applicator from Figure 18,
- Figure 23 is a top view of an applicator embodiment variant,
- Figure 24 is a cross section along XXIV of the applicator from Figure 23,
- Figure 25 is a cross section along XXV of the applicator from Figure 23,
- Figure 26 is a side view of the applicator from Figure 23, and
- Figures 27 and 28 illustrate another example of an applicator, Figure 27 being a cross section along XXVII from Figure 28.

The packaging and application device 1 according to the invention represented in Figure 1 comprises an applicator 10 and a container 20 to which the applicator 10 may be attached when not in use. The container 20 contains a product P to be applied to human keratin materials and more particularly a liquid foundation to be applied to the skin.

The applicator 10 comprises a stem 12 which is connected at one end to a gripping member 11 which also forms a cap for closing the container 20 and at the opposite end to an application member 13.

The container 20 may be provided with a threaded neck, not visible, onto which the gripping member 11 is screwed. This threaded neck may receive a member for wiping the stem 12 of the applicator 10, or, preferably, not comprise a wiping member so that the stem 12 of the applicator 10 retains product P so that it runs towards the application member 13.

In the example illustrated, the gripping member 11 is attached to the container 20 by screwing but it would not be outside the scope of the present invention when the applicator 10 is attached otherwise to the container 20, for example by snap-fastening, by a bayonet fitting, by friction or yet otherwise.

If reference is now made to Figures 2 to 9, it is seen that the application member 13 has a body 14 which defines a cavity 15 intended to be loaded with the product P to be applied.

The application member 13 defines an application surface 17 which is intended to come into contact with the skin during the use of the applicator, in order to apply the product contained in the cavity 15 thereto. The cavity 15 opens onto the application surface 17 via a dispensing orifice 30 which is made through the body 14.

The cavity 15 is open on the outside of the side opposite the application surface 17 via a filling opening 31, the cross section of which is greater than that of the dispensing orifice 30, especially at least two times greater.

In the example illustrated, the stem 12 extends along a rectilinear longitudinal axis X and the dispensing orifice 30 extends along an axis Y that is perpendicular to the axis X. It can be seen in Figure 7 in particular that the dispensing orifice 30 may be located...
slightly behind the bottom 33 of the cavity 15, the bottom 33 of the cavity 15 being defined
as the location of the latter where the depth of the cavity 15 is the greatest, the depth being
measured from the edge 34 that defines the contour of the filling opening 31.

The latter has, in top view, a substantially piriform contour, as can be seen in
particular in Figure 4, with a width \( w \) measured perpendicular to the longitudinal axis \( Z \) of
the application member 13, and which passes through a maximum at the level of the
dispensing orifice 30.

The contour 34 has opposite inflected portions 36 which are connected to a tip
40 located at the front end of the application member and the shape of which is
substantially hemispherical about the \( Z \) axis.

The hemispherical surface of the tip 40 is connected to the outer surface of the
body 14 without forming a recess, as can be seen in particular in Figure 5.

In the zone 50 where the dispensing orifice 30 emerges, the application surface
17 is outwardsly convex, both in a longitudinal cutting plane such as that from Figure 7 and
in a transverse cutting plane such as that from Figure 8, which enables the user to correctly
apply the product to the skin, if necessary by rotating the application surface 17 about an
axis of rotation that may be parallel to the longitudinal axis of the stem or perpendicular
thereto.

The zone 50 is located between the proximal end 13a and distal end 13b of the
application member, substantially where the cross section of the application member 13 is
maximum.

Preferably, as illustrated, the application surface 17 is inflected from the zone
50 onto which the dispensing orifice 30 emerges in the direction of the tip 40 when the
application member 13 is observed in a longitudinal median cutting plane as in Figure 7.

The axial dimension \( L \) of the appellation member, measured as illustrated in
Figure 5 between the end 13a for connection to the stem 12 and the peak of the tip 40
which defines the distal end 13b, may be between 5 and 20 mm, preferably being of the
order of 12 mm. The maximum width \( w_{\text{max}} \) of the application member 13 may be between
5 and 10 mm, for example being of the order of 7 mm. The radius of curvature \( r_p \) of the tip
40, when hemispherical, may be between 1 and 2 mm, for example being of the order of
1.3 mm.
In the zone 50 where the dispensing orifice 30 emerges, the radius of curvature \( r \) of the application surface 17, in a longitudinal median cutting plane such as that from Figure 7, may be between 2.5 and 20 mm; the radius of curvature \( r \) of the application surface 17 in a transverse cutting plane such as that from Figure 8 may be between 2.5 and 5 mm, for example being of the order of 3.2 mm.

The dispensing orifice 30 may have a constant cross section or, as illustrated in particular in Figure 8, a cross section that tends to increase slightly in the direction of the application surface 17, along for example a point angle \( \alpha \) of 3°.

The diameter \( d \) of the dispensing orifice 30, when it opens onto the application surface 17, maybe between 0.5 and 2 mm, for example being of the order of 1 mm, preferably being of circular cross section.

The edge 34 that defines the contour of the filling opening 31 is preferably substantially contained in one and the same plane.

Preferably, as illustrated, the dispensing orifice 30 is unique, extending over less than half of the length of the application member 13.

The application member 13 may be positioned relative to the stem 12 so that the filling opening 31 is located substantially level with a generatrix 12a of the stem when the applicator is observed, in side view, as in Figure 2.

Preferably, the application member 13 is moulded as a single part with the stem 12, from a thermoplastic material, which may or may not be an elastomer, for example being selected from POM (polyoxymethylene), PE (polyethylene) or else PP (polypropylene).

The plane in which the filling opening 31 substantially extends is preferably, as illustrated, oriented perpendicular to the axis Y of the dispensing orifice 30.

When seen from below, the application member 13 may be connected to the stem 12 with a slight slope \( \beta \) as illustrated in Figure 9, in a manner that is not perpendicular to the axis X of the stem 12.

The stem 12 may have a cylindrical body 12b which is connected to the application member 13 by a slightly conical distal portion 12c, that converges in the direction of the application member, the point angle \( \gamma \) of the conical portion 12c for example being between 1 and 5°.
In order to use the device 1, the user separates the applicator from the container and brings the application surface 17 into contact with the keratin materials to be treated, for example the skin of the face or body.

The product P is for example a foundation, the formulation of which is given in the table below.
<table>
<thead>
<tr>
<th></th>
<th>Isododecane</th>
<th>mass%</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Disteardimonium hectorite / propylene carbonate / isododecane (10/3/87) sold under the reference BENTONE GEL ISD V by the company Elementis</td>
<td>10.00</td>
</tr>
<tr>
<td></td>
<td>Phenyl trimethicone sold under the reference DC 556 by the company Dow Corning</td>
<td>2.00</td>
</tr>
<tr>
<td></td>
<td>Ethyl hexyl methoxycinnamate</td>
<td>3.00</td>
</tr>
<tr>
<td>A2</td>
<td>Butyl acrylate copolymer containing dendritic silicone side chains: Tris((trimethylsiloxy)siloxyethyl(dimethylsiloxy)silylpropyl methacrylate in isododecane (40/60) sold under the reference Dow Corning FA 4002 ID by Dow Corning.</td>
<td>5.00</td>
</tr>
<tr>
<td>A3</td>
<td>Dimethicone copolyol sold under the reference KF 6017 by the company Shin-Etsu</td>
<td>1.50</td>
</tr>
<tr>
<td></td>
<td>Iron oxides coated with aluminium stearoyl glutamate</td>
<td>4.20</td>
</tr>
<tr>
<td></td>
<td>Titanium dioxide coated with aluminium stearoyl glutamate</td>
<td>6.80</td>
</tr>
<tr>
<td>A4</td>
<td>Dodecamethylpentasiloxane</td>
<td>21.00</td>
</tr>
<tr>
<td></td>
<td>Cyclohexasiloxane</td>
<td>17.00</td>
</tr>
<tr>
<td></td>
<td>Vinyl dimethicone/methicone silsesquioxane crosspolymer sold under the reference KSP 100 by the company Shin-Etsu</td>
<td>8.00</td>
</tr>
<tr>
<td>B</td>
<td>96° denatured ethanol</td>
<td>11.50</td>
</tr>
<tr>
<td>C</td>
<td>Fragrance</td>
<td>qs</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>100%</td>
</tr>
</tbody>
</table>

In this example, the product $P$ is obtained as follows.

The constituents of phase A1 and A2 are weighed out in the main beaker and are stirred with a Rayneri mixer (200 to 300 rpm), while maintaining at room temperature, for 15 minutes until homogenized.

Phase A3 is prepared separately by milling the mixture of pigments, dimethicone copolyol and cyclohexasiloxane three times in a three-roll mill.
This phase A3 is then added while stirring with the Rayneri mixer (400 to 500 rpm) for 10 minutes at room temperature.

Phase A4 is prepared separately by dispersing the KSP 100 in the mixture of the two oils while stirring at room temperature with the Rayneri mixer (500 rpm) for 10 minutes until homogenized.

This phase A4 is then added slowly while stirring at room temperature with the Rayneri mixer (500 rpm) for 10 minutes.

Next, the stirring with the Rayneri mixer is reduced to 200-300 rpm and the phases B and C are added. After incorporation, the mixture is left stirring for a further 5 minutes at room temperature, and is then rapidly packaged.

Within the context of the present invention, the viscosity is measured at 25°C with a Rheomat 180 (Lamy) using a no. 2 spindle (MS-R2) at a rotational speed of 200 min⁻¹, the measurement being carried out after 10 minutes of rotation. 15-18 DU (deviation units) were obtained with said MS-R2 spindle, corresponding to 60-80 cP (centipoise), corresponding to 0.06-0.08 Pa.s. This foundation is very fluid.

When the applicator is withdrawn from the container, product is present in the cavity 15, being retained therein by capillary action and/or gravity. When the application surface 17 is moved in contact with the keratin materials, the product may flow through the dispensing orifice 30, and thus be deposited on the keratin materials. The application surface enables the product to be spread. The tip 40 may be used for finishing, for example by tracing the contour of the made-up area or for depositing the product within a crevice of the skin.

When the applicator is withdrawn from the container, product may also be present elsewhere other than in the cavity, especially on the application surface, and for example between the zone 50 thereof where the dispensing orifice 30 emerges and the hemispherical tip 40.

The invention is not limited to the example which has just been described. In particular, it is possible to introduce various modifications to the application member without departing from the scope of the present invention. In particular, the cavity 15 can be made to open onto the application surface via more than one orifice 30, for example several small orifices having axes parallel to one another. It is also possible to modify the
shape of the distal end of the application member and especially to give the tip 40 a more or less rounded shape with a larger or smaller radius of curvature. Where appropriate, the cavity 15 may be partitioned, for example due to the presence of ribs or pins inside the latter. The cavity 15 may be empty or as a variant receive a porous material capable of absorbing the product and of releasing it through the dispensing orifice 30.

The container 20 may be equipped with a wiping member, but preferably the applicator is used on being withdrawn from the container without passing through a wiping member.

The applicator 10 represented in Figures 10 to 13 comprises an application member 13 which has a spherical shape and which is produced by moulding of material in one piece with the stem 12.

The radius of curvature r of the application surface 17 is for example between 2.5 and 20 mm, preferably being of the order of 3.2 mm. As can be seen in particular in Figures 11 and 13, the largest transverse dimension W\text{max} of the application member 13 is greater than the largest transverse dimension D of the stem 12 level with the attachment thereof to the application member 13. The stem 12 is of circular cross section in the example considered, so that this larger transverse dimension D corresponds to its diameter, which may be between 3 and 8 mm, for example being of the order of 4 mm level with the connection with the application member 13. The ratio W\text{max}/D is preferably greater than or equal to 1.1, better still 1.5, even better still 1.8, or even 2.

The length L of the application member in this example where the application surface 17 has a spherical shape is for example between 3 and 20 mm, preferably being 6 mm.

The throat 60 formed level with the join between the application member 13 and the stem 12 makes it possible to retain the product P when the applicator is withdrawn from the container, which product P may then gradually flow onto the application surface 17 in order to be applied to the keratin materials to be treated. The angle δ formed between the tangent to the application surface 17 and a generatrix 12a of the stem level with the connection of the latter to the application member 13 is for example greater than or equal to 90°, for example being between 90° and 160°.

The embodiment variant from Figures 14 to 17 differs from that of Figures 10 to 13 by the shape of the application member 13, which has an appendage 70 at the end,
which defines the distal end of the application member 13. The appendage 70 has a shape that is rotationally symmetrical about the longitudinal axis Z of the application member 13, which may be, as illustrated, merged with the longitudinal axis X of the stem 12.

The transverse cross section of the appendage 70 may be circular in the area of connection thereof to the body of the application member 13. The appendage 70 may be terminated by a rounded surface 72, in particular that is substantially hemispherical about the axis Z.

The bulging portion of the body 14 of the application member may be substantially piriform, having both an outwardly convex contour in a longitudinal median cutting plane as illustrated in Figure 17 and in a transverse cutting plane, as seen in Figure 15.

The appendage 70 has an external transverse cross section which decreases then increases in the direction of the distal end 13b of the application member in order to reach a maximum $S_{Max}$ at a distance $t$ from the peak of the rounded surface 72. There is, for example, a ratio $S_{Max}/S_{Min}$ which is between 1 and 1.5, $S_{Min}$ being the narrowest external cross section of the appendage 70.

When the application member 13 is observed in cross section in a longitudinal median cutting plane as in Figure 17, it is thus seen that the profile of the application member undergoes two inflections, a first in a zone 80 which is located in front of the zone 81 where the transverse dimension of the application member is largest and a second inflection at the appendage 70 in a zone 82 located between the place where the cross section of the appendage 70 is smallest and that where it is largest. The presence of the appendage 70, and especially of the enlarged head of the appendage, makes it possible to define a throat 85 on the application member, which throat 85 may help to retain product on the application member 13.

The ratio of the maximum external transverse cross section of the body 14 of the application member to the maximum external transverse cross section of the appendage is preferably greater than 5.

Another embodiment variant of the applicator 10 will now be described with reference to Figures 18 to 21. In this variant, the application member 13 has an elongated shape along the axis Z with a plurality of grooves 90 that are oriented longitudinally and formed at its surface. These grooves, also referred to as striations, are for example
regrouped into groups of three as can be seen in Figure 21 and separated by sectors 92 of
the application surface 17. These sectors 92 extend, for example, angularly about the axis
Z each over an angular sector \( \alpha \) which is between 5° and 15° whereas the angular stretch \( \beta \)
about the axis Z which separates two striations within a group of striations is smaller. The
striations 90 extend over less of the total length L of the application member 13 and for
example over a fraction of between 50% and 80% of the total length L of the application
member 13. Each striation 90 may in particular, as illustrated, take the shape of a V-shaped
recess, having two sides 95 that meet at the bottom 96 of the striation. The depth \( p \) of the
striations measured between the bottom 96 and the envelope surface of the application
member 13 may be variable. In particular, as illustrated in Figure 20, the bottom 96 of each
striation may be parallel to the axis Z of the application member 13, and for example such
that the ratio \( \frac{p_{\text{max}}}{w_{\text{max}}} \) is less than or equal to 0.2, where \( p_{\text{max}} \) is the maximum depth.

In example considered, the distal end 13b of the application member 13 is
relatively tapered, the radius of curvature of the application surface \( R_n \) level with the
striations being, for example, of the order of 20 mm and the one \( \frac{3}{4} \) at the distal end being
of the order of 2 mm.

On the portion 97 of the application member which extends from the distal end
98 of the striations to the distal end 13b of the application member 13, the cross section of
the application member 13 decreases so as to substantially form an ogive of revolution.
The same is true between the proximal end 101 of the striations and the zone of attachment
of the application member 13 to the stem 12. In this example also, the application member
13 is produced by moulding as a single part with the stem 12.

In order to use one of the applicators that have just been described with
reference to Figures 10 to 21, the applicator is withdrawn from the container then the
application surface is applied to the keratin materials to be treated, especially the skin of
the face or body. The applicator may be moved in contact with the skin or making it slide
thereover optionally with a rotational movement of the application member upon itself
about an axis parallel to the longitudinal axis of the stem and/or perpendicular to this
longitudinal axis. The tip of the application member may be used for outlining a contour or
making the product penetrate into a crevice of the skin or removing excess product present
on the skin.
In the applicator 10 represented in Figures 23 to 26, the stem 12 has a body 12b of constant ellipsoidal transverse cross section, as illustrated in Figure 25, having a small axis e1 and a large axis e2. e1 is for example between 2 and 5 mm, preferably of the order of 3 mm and e2 is between 3 and 10 mm, preferably of the order of 4 mm. The ratio e1/e2 is preferably less than 0.9, better still less than 0.8, even better still of the order of 0.75. The body 12b is connected to the application member 13 by a distal portion 12c that converges with a linear profile towards the proximal end 13a of the application member 13.

The transverse cross section of the application member 13, in a plane perpendicular to the longitudinal axis X of the applicator 10, is of general flattened shape. The application member 13 may comprise a hemispherical tip 40.

The application member 13 has the same planes of symmetry as the stem 12, namely the median planes from Figures 23 and 24, perpendicular to one another and containing the axis X. Furthermore, the plane from Figure 23 is merged with the plane along which the application member is flattened. It can be seen in Figure 23 that the application member 13 protrudes relative to the stem 12 when seen perpendicular to the plane from Figure 23, the largest width of the application member wmax is greater than the large axis e2 of the cross section of the stem 12.

The application member 13 comprises a dispensing orifice 30 located substantially at its centre.

The dispensing orifice 30 has an elongated shape along the axis X, especially ellipsoidal shape, having a small axis o1 of between 0.1 and 2 mm and preferably of the order of 1 mm, and having a large axis o2 of between 2 and 8 mm and preferably of the order of 4 mm. The ratio o1/o2 is preferably less than 0.5, better still of the order of 0.25.

The application member 13 protrudes relative to the distal portion 12c of the stem along one plane only, corresponding to the plane from Figure 23. When travelling along the axis X of the applicator 10 from the proximal end 13a of the application member 13 towards its distal end 13b, the width w of the application member increases up to its maximum width wmax, for example of between 7 and 8 mm, the maximum being reached substantially at the mid-length of the dispensing orifice 30. The width w then decreases until the hemispherical tip 40, having a diameter h of between 2 and 3 mm, for example of the order of 2.6 mm, is reached. The application member has, in top view, a profile with an inflection point 13e on either side of the peak of largest width.
On travelling along the axis X of the applicator 10 from the proximal end 13a towards the distal end 13b, the thickness h of the application member 13 decreases linearly from a value \( h_a \) level with the proximal end 13a of the application member to the dispensing orifice 30 where it reaches a value \( h_0 \) corresponding to the depth of the dispensing orifice 30. Downstream of the dispensing orifice 30, the thickness gradually increases up to the hemispherical tip 40 of diameter \( h_p \), as can be seen in Figure 24.

There is, for example, \( W_{\text{max}}/h_0 \) which is greater than or equal to 3, better still greater than or equal to 4.

Represented in Figures 27 and 28 is an embodiment variant in which the dispensing orifice 30 has an elongated cross section along the longitudinal axis Z of the application member, having a length m along this axis.

The dispensing orifice 30 has, for example, in bottom view as in Figure 28, an elongated shape along the axis Z, especially a lenticular shape.

The maximum width \( n \) of the dispensing orifice 30 is for example between 0.3 and 0.5 times the maximum width \( W_{\text{max}} \) of the application member 13, \( n \) being for example between 2.5 and 2.8 mm and the maximum width \( W_{\text{max}} \) of the application member being between 6 and 7 mm.

The ratio \( m/L \) is for example between 0.4 and 0.5.

The radius of curvature of the hemispherical tip 40 is, in this example, between 0.6 and 0.8 mm, preferably being of the order of 0.7 mm.

The dispensing orifice 30 may extend, as illustrated, set back from the hemispherical tip 40, and especially at a distance \( q \) from the distal end of the application member of at least 3 mm. This makes it possible to produce the application member with a portion 13a that tapers from the dispensing orifice 30 to the tip 40.

It is also possible to make the cavity 15 open onto the application surface via more than one orifice 30, for example several small orifices having axes parallel to one another. It is also possible to modify the shape of the distal end of the application member and especially to give the tip 40 a more or less rounded shape with a larger or smaller radius of curvature. Where appropriate, the cavity 15 may be partitioned, for example due to the presence of ribs inside the latter. The cavity 15 may be empty or as a variant receive a porous material capable of absorbing the product and of releasing it through the dispensing orifice 30.
Needless to say, the invention is not limited to the examples that have just been described. Although it is very particularly advantageous to produce the application member by moulding as a single part with the stem, it is also possible to produce the application member 13 separately and to add it onto the stem 12. In this case, the application member may be produced with an endpiece that is, for example, received in a housing provided at the distal end of the stem. The application member may receive a flock coating, which may cover the entire outer surface of the application member or only a portion thereof, especially the portion intended to come into contact with the keratin materials to be treated. The application member may also be devoid of a flock coating.

The expression "comprising a" is synonymous with "comprising at least one".
1. Packaging and application device (1) comprising:
   - a container (20) containing a cosmetic makeup composition, especially foundation, having a viscosity of less than 0.8 Pa.s at 25°C,
   - an applicator (10), comprising:
     - a stem (12) having a distal portion,
     - an application member (13), the application member (13) being borne by the distal portion (12c) of the stem (12) and protruding with respect thereto.

2. Device according to Claim 1, the application member (13) having proximal (13a) and distal (13b) ends and a larger transverse dimension (W_max) greater than the largest transverse dimension of the distal portion of the stem level with its attachment to the application member (13), the application member (13) being oriented along a first axis and having a rounded outer surface both along this first axis and along a second axis orthogonal to the first, at least at one location (50) distant from the distal and proximal ends, especially where the transverse outer cross section of the application member (13) is maximum.

3. Device according to Claim 1 or 2, the application member (13) being of ovoid shape.

4. Device according to one of the preceding claims, the application member (13) being hollowed out, over a portion of its length, by longitudinal grooves (90) parallel to the axis of the application member (13), especially several groups of several close grooves.

5. Device according to Claim 4, the grooves (90) having a depth of between 0.2 and 3 mm.

6. Device according to either of Claims 4 and 5, the grooves (90) having a width of between 1 and 4 mm.

7. Device according to any one of Claims 4 to 6, the grooves (90) having a length of between 7 and 14 mm.

8. Device according to Claim 1 or 2, the application member (13) being of substantially spherical shape.
9. Device according to any one of Claims 1 to 8, the application member (13) comprising a body extended by an applicator appendage (70), separated from the body (14) of the application member (13) by an annular throat (85).

10. Device according to the preceding claim, the applicator appendage (70) having a surface area of substantially hemispherical shape.

11. Device according to either one of Claims 9 and 10, the stem (12), the application member (13) and the optional applicator appendage (70) being moulded as a single part, in particular in one and the same material.

12. Device according to Claim 1 or 2, the application member (13) having a flattened general shape, in particular with an orifice (30), preferably of elongated shape along the longitudinal axis (X) of the stem (12), more preferably with a hemispherical tip (40), the stem preferably being of elongated cross section along a flattening plane of the application member, the latter preferably having, in top view, a profile with two inflection points (13e) on either side of a peak, the largest width \( W_{\text{max}} \) of the application member measured at the peak, being greater than the largest transverse dimension (e2) of the stem (12).

13. Device according to any one of the preceding claims, the applicator comprising a flock coating.

14. Device according to any one of the preceding claims, the formulation of the cosmetic makeup composition comprising at least one film-forming polymer and one or more monoalcohol(s).

15. Applicator (10) for applying a cosmetic fluid makeup composition to human keratin materials, preferably a foundation, comprising:
   - a stem (12), and
   - an application member (13) borne by the stem (12), the application member (13) comprising a body (14) that defines a cavity (15) opening from one side onto an application surface (17), outwardly convex in a cutting plane containing a longitudinal axis (Z), via at least one dispensing orifice (30), this dispensing orifice (30) extending over less than three quarters of the length (L) of the application member (13) along said longitudinal axis (Z), and from the opposite side via a filling opening (31), having a cross section at least two times greater than that of the dispensing orifice (30).
16. Applicator according to Claim 15, the dispensing orifice (30) having a cross section of between 0.5 and 3 mm².

17. Applicator according to either of Claims 15 and 16, the filling orifice (31) having a cross section of between 5 and 30 mm².

18. Applicator according to any one of Claims 15 to 17, the dispensing orifice (30) being located at the bottom of the cavity (15) or at the back of this cavity.

19. Applicator according to any one of Claims 15 to 18, the application member (13) comprising a tip (40) that is rounded at the end.

20. Applicator according to the preceding claim, the tip (40) being of hemispherical shape.

21. Applicator according to any one of Claims 16 to 20, the filling opening (31) being piriform in top view.

22. Applicator according to any one of Claims 15 to 21, the body (14) of the applicator being moulded as a single part with the stem (12), in particular in one and the same material.

23. Applicator according to any one of Claims 15 to 22, the outer surface of the body (14) of the application member (13) connecting to the stem (12) by forming a non-right angle.

24. Applicator according to any one of Claims 15 to 23, the edge (34) of the filling opening of the cavity extending substantially in a plane.

25. Packaging and application device (1) comprising:
   - a container (20) containing a cosmetic fluid makeup composition, in particular a foundation,
   - an applicator (10) according to any one of Claims 15 to 25.

26. Device according to the preceding claim, the product, in particular foundation, having a viscosity of less than 0.8 Pa.s, better still of less than 0.2 Pa.s.

27. Makeup method, in which the cosmetic makeup composition is applied to the skin using a device according to any one of the preceding claims.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

INV.  A45D34/04
ADD.  A45D40/26

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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 practicable, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
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Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:
* A* document defining the general state of the art which is not considered to be of particular relevance
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* 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

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* "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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* "A" document member of the same patent family

Date of the actual completion of the international search

26 January 2015

Date of mailing of the international search report

02/02/2015

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

Zetzsche, Bri gi tta

Form PCT/ISA/210 (second sheet) (April 2005)
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