(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 953 504 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
**18.09.2019 Bulletin 2019/38**

(21) Application number: **14706427.3**

(22) Date of filing: **07.02.2014**

(51) Int Cl.:
***A45D 34/04*** *(2006.01)* ***A61Q 7/00*** *(2006.01)*
***A61Q 7/02*** *(2006.01)*

(86) International application number:
**PCT/US2014/015364**

(87) International publication number:
**WO 2014/124297 (14.08.2014 Gazette 2014/33)**

(54) **APPLICATOR**

APPLIKATOR

APPLICATEUR

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**

(30) Priority: **07.02.2013 US 201361761728 P**

(43) Date of publication of application:
**16.12.2015 Bulletin 2015/51**

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(56) References cited:
**EP-A1- 2 486 821**
**WO-A1-01/12137**
**WO-A1-98/52515**
**US-A1- 2007 189 841**



EP 2 953 504 B1

## Description

### BACKGROUND OF THE INVENTION

**[0001]** A known applicator is disclosed by document EP2486821. Typical applicators for topically applying facial skin care compositions (e.g., foundations) to skin and facial hair that are made of expanded foam do not provide a smooth and continuous deposition of the composition on a face for the purposes of concealing facial skin imperfections and fine facial hair (e.g., vellus hair). These existing applicators typically have a rough, and often porous and absorbent surface, which do not allow for an even and smooth deposition. There is a need to maximize the effectiveness of these skin compositions (e.g., concealing benefits) with even and smooth facial deposition.

**[0002]** Another shortcoming of these applicators is they do not offer the ability to manage a reservoir of skin care composition between the applicator surface and facial substrate and yet provide the desired even and smooth deposition. There is also a need for an applicator to be made from a material that resists absorption of the skin care composition during contact.

**[0003]** There is yet a further need for the applicator to be adaptable for use to the diverse contours of a human face (e.g., broad areas as cheeks as well as challenging areas around the nose and eyes) and also intuitive to the user in how to hold and use the applicator. There is a need for the applicator to be sanitary, i.e. allow the applicator to be washed after one or more uses. There is also a need for applicator to be able to hold a reservoir of dispensed skin care compositions in the dosing area and keep it from running before being applied to the face.

### SUMMARY OF THE INVENTION

**[0004]** The present invention is directed to solving one or more of these problems. Without wishing to be bound by theory, the present invention identifies the materials, geometry, and methodology to address one or more of the problems.

**[0005]** Firstly, the inventive applicator helps to addresses the need of managing and concealing fine facial hair of a human female. Depending on the individual and exactly where on the face this hair is located, the hair may be vellus hair with shaft diameters ranging from 1 to 30 micro meters to darker terminal hair with shaft diameters typically larger than 30 micrometer to about 120 micrometers. Without wishing to be bound by theory, concealing this hair is best achieved by using the applicator of the present invention to smoothly and evenly applying a skin care composition to skin and hair, and concurrently laying down (i.e., flatten) the hair against the skin. Furthermore, results are maximized by stroking the applicator along the grain of the hair. Results may also be maximized by including chemistry in the skin care composition to further minimize the appearance the fine facial hair through opacity and maintaining the adhesion of hair to the skin.

**[0006]** Accordingly, one aspect of the invention provides an applicator as defined by the features of claim 1.

**[0007]** A second aspect provides for a method as defined by the features of claim 8.

### BRIEF DESCRIPTION OF THE DRAWINGS

**[0008]**

Figure 1 is a perspective of an applicator of the present invention.
Figure 2 is a top view of the applicator of figure 1.
Figure 3 is a bottom view of the applicator of figure 1.
Figure 4 is cross sectional front view of the applicator of figure 1.
Figure 5 is a cross sectional right view of the applicator of figure 1.
Figure 6 is an exploded view of a cross sectional portion of figure 5.
Figure 7 is an example of kit that has the applicator of figure 1 and a secondary package that is capable of containing the applicator and a facial foundation composition.
Figure 8a is a user topically using the applicator of figure 1 on her nose.
Figure 8b is the user grabbing the applicator in a first position before using the applicator as shown in figure 8a.
Figure 9a is a user topically using the applicator of figure 1 on her nose.
Figure 9b is the user grabbing the applicator in a second position before using the applicator as shown in figure 9a.
Figure 10a is a user topically using the applicator of figure 1 on her cheek.
Figure 10b is the user grabbing the applicator in a third position before using the applicator as show in figure 10a.
Figure 11 a is a user topically using the applicator of figure 1 on her cheek.
Figure 11b is showing the user grabbing the applicator in a fourth position before using the applicator as shown in figure 11a.
Figure 12 is a deposition grading scale for even deposition of a formulation from an applicator.

DETAILED DESCRIPTION OF THE INVENTION

Composition of Applicator

**[0009]** One aspect of the invention provides for an applicator wherein a surface of the applicator comprises of a non-absorbing elastomeric material, wherein a first surface and an opposing second surface each comprise a non-absorbing elastomeric material. In one embodiment, the surface of the applicator configured to make contact with a facial substrate at least comprises the non-absorbing elastomeric material, wherein the surface is also a concave surface. Without wishing to be bound by theory, absorbing materials, such as sponges, exhibit many undesirable characteristics for hair lay-down applications. Based on unpublished consumer research, some consumers feel that a portion of the skin care composition is being lost by being absorbed into the sponge and therefore not being completely dosed on to the skin. Another challenge with absorbing materials is their use may lead to unsanitary conditions since sponges and other such materials are challenging to clean or wash and can harbor bacteria. Also, absorbing materials do not provide even applications of skin care composition on to the facial substrate given the rough or non-smooth topical surface that absorptive materials typically have.

**[0010]** In one embodiment, at least 10%, or 15%, 25%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 95%, or 98%, or more of an outer surface area of the applicator comprises a non-absorbing elastomeric surface. In another embodiment, less than 100%, or 98%, 95%, 90%, 80%, 70%, 60%, 50%, 40%, 30%, 25%, or 15%, or less; but greater than 10%, of the outer surface area of the applicator comprises a non-absorbing elastomeric material. In yet another embodiment, 40% to 100%, preferably from 50% to 100%, alternatively from 60% to 100%, alternatively combinations thereof, of the outer surface area of the application comprises the non-absorbing elastomeric material.

**[0011]** In one embodiment, from 5% to 100%, preferably from 10% to 100%, more preferably from 50% to 100%, alternatively from 25% to 75%, alternatively from 10% to 90%, alternatively from 80% to 100%, alternatively combinations thereof, by weight of the applicator comprises a non-absorbing elastomeric material. In yet another embodiment, the applicator comprises 2, 3, 4, 5, or more different types of materials. The different types of materials may or may not all be non-absorbing elastomeric materials.

**[0012]** An example of the applicator provides for at least a surface of the applicator configured to make contact with the skin or facial substrate to be comprised of a non-absorbing elastomeric material that is smooth for even application of skin care compositions to the facial substrate. Yet another example of the applicator provides for the material of the applicator, at least the outer surface, to be washable to allow the user to clean the applicator between one or more uses.

**[0013]** In one embodiment, the non-absorbing elastomeric material of the applicator is a combination of a hydrogenated styrene butadiene block copolymer and a silicone fluid, preferably wherein the silicone fluid is a dimethyl silicone fluid. The copolymer compound may be obtained from Kuraray Plastics Co., Ltd (Osaka, Japan); SEPTON COMPOUND JS20N. The dimethyl silicone fluid may be obtained from Momentive Performance Materials Japan LLC (Tokyo, Japan); TSF451 Series of products. In another embodiment, the applicator comprises from at least 95%, preferably at least 96%, or 97%, 98%, or at least 99% of the block copolymer by weight of the applicator. Alternatively the applicator comprises from 90% to 100%, alternatively from 99% to 99.9%, alternatively combinations thereof, of the block copolymer by weight of the applicator. In another embodiment, the applicator material further comprises a silicone fluid, preferably from 0.01% to 2 %, more preferable from 0.1% to 1.5%, alternatively from 0.5% to 1.2%, alternatively from 0.5% to 1%, alternatively combinations thereof, of the silicone fluid by weight of the applicator. In one non-limiting example, the material of the applicator comprises 99.3 % of the block copolymer and 0.7% of the silicone fluid, by weight of the applicator.

**[0014]** The material(s) comprising the applicator can be injected molded or caste molded to form the applicator. Alternatively these materials may be vulcanized, thermoformed, assembled and heat welded or welded with adhesives, injection molded, extruded, die cut, cast, or combinations thereof.

**[0015]** Non-limiting examples applicator materials that could be used on a surface of the applicator, or even throughout the applicator as a whole, include a polymer containing a heteroatom. Examples may include polyvinylchloride, polyurethanes, polyamides, polyesters, polyacrylates, and polycarbonates. These materials may be used with a plasticizer. In addition, a plurality of these materials may be formed as separate elements and then combined into a single unit (to ultimately make an applicator of the present invention). In one non-limiting example, a variety of materials may be die-cut from sheet stock and then assembled with heat, or adhesives to form a single composite applicator that yields the desired properties of *inter alia* surface profile, hardness, and flexibility.

**[0016]** In one embodiment, the applicator is made of several different types of materials. The applicator may be formed of a laminate of materials. In such an embodiment, one or more outer surfaces of the applicator may have a non-absorbing elastomeric material, whereas materials in the interior of the applicator may include other materials that may include absorbing or non-absorbing materials; or elastomeric or non-elastomeric materials; or combinations thereof. Such embodiments could provide the advantages of the present invention and yet allow for greater design and manufacturing flexibility. These laminates may be made through heat welding, adhesives, or multi sequential step casting or injection molding processes.

**[0017]** Other non-limiting examples of nonabsorbent materials that could be used throughout the applicator as a whole, in combination, and/or on a surface of the applicator include thermoplastic elastomers, urethanes, and rubber.

Applicator Dimensions

**[0018]** An example of the applicator provides the applicator to have an overall surface area from 25 $cm^2$ to 200 $cm^2$, preferably from 30 $cm^2$ to 100 $cm^2$, preferably from 35 $cm^2$ to 80 $cm^2$, alternatively from 40 $cm^2$ to 60 $cm^2$. In one embodiment, one surface of the applicator, preferably the surface configured to make contact with the skin or facial substrate, is concave. In such an embodiment, the concave surface preferably has a surface area from 5 $cm^2$ to 100 $cm^2$, preferably from 7 $cm^2$ to 50 $cm^2$, more preferably from 10 $cm^2$ to 30 $cm^2$. During use, not the entire one surface of the applicator (configured to make contact with the skin/facial substrate) will typically make contact with the skin or facial substrate. The percentage of the one surface of the applicator making contact with the skin/facial substrate will depend upon a number of variables including the user's preferences, contour of the face being treated, and amount of composition being applied (at any given time).

**[0019]** One surface of the applicator is concave, the concave surface is configured to contain a volume from 0,1 ml to 10 ml.

**[0020]** One suitable way to measure this volume is to place the concave surface of the applicator up and determine how much water the concave surface is capable of retaining. In addition, this volume may be customized to show the user how much product to dispense during one application cycle. By making visually or tactile evidence of steel mold markings or printed or decorated areas on the surface or changes in geometry or material thickness changes, the applicator design or a portion of the design is used to indicate to the user exactly how much skin care composition to dispense.

**[0021]** The size of the applicator can be important. Without wishing to be bound by theory, the applicator strikes a balance: in being small enough to provide a relatively compact design (for travel etc.) and suitable for use by the typical sized human female fingers but large enough to facilitate easy application for larger skin substrate areas (e.g., cheeks), and maintain a user gripable surface away from the skin/facial contact surface (avoiding unwanted contact and composition loss).

**[0022]** Turning to Figures 1-3, suitable lengths, widths, and thicknesses of the applicator (1) of the present invention are described. The length of the applicator (1) is its longest dimension when placed along a horizontal plane (35) (e.g., a level table top). A center vertical axis (37), orthogonal to the horizontal plane (35), passes through a geometric center (not shown) of the applicator (1).

**[0023]** The width of the applicator (1) is measured perpendicular to its length along the same horizontal plane (35). The thickest portion of the applicator (1), per the applicator (1) described by the figures herein, is at the center vertical axis (37). The length of the applicator is from 45 mm to 70 mm, preferably from 50 mm to 65 mm, alternatively from 55 mm to 60 mm, alternatively combinations thereof. The width of the applicator is from 30 mm to 60 mm, preferably from 35 mm to 55 mm, alternatively from 40 mm to 50 mm, alternatively combinations thereof. A thickness of the applicator is from 0.5 mm to 5 mm, alternatively from 1 mm to 4 mm. In one embodiment, the thickness, measured at the center vertical axis (37), is from 1 mm to 4 mm, alternatively from 2 mm to 3.5 mm, alternatively from 3 mm to 4 mm, alternatively combination thereof. In another embodiment, the thickest portion of the application is from 1 mm to 4 mm, alternatively from 2 mm to 3.5 mm, alternatively from 3 mm to 4 mm, alternatively combination thereof. The thickness of the applicator does not exceed 6 mm, preferably does not exceed 5 mm, alternatively does not exceed 4 mm.

**[0024]** Figure 1 is a perspective view of a non-limiting example of an applicator. Figure 2 is a top view of the applicator of figure 1, and figure 2 is a bottom view. As illustrated in these figures, the applicator (1) may have at least two zones (3, 6) defined by varying thicknesses. The outer zone (6) is defined being nearest the outside periphery of the applicator (1) and having a thickness less than inner zone (3). An inner zone (3) includes the center of the applicator (1). The circumferential edge (9) and is defined as the outer most peripheral edge of the applicator (9), generally defining an elliptical shape. In a preferred embodiment, as illustrated in the figures, the outer zone (6) has substantially the same thickness throughout. The inner zone (3) is thicker than the outer zone (6). As best illustrated in figures 1 and 2, an inter-zone border (13) demarcates the intersection between the outer zone (6) and the inner zone (3) on the first surface (31) of the applicator (1). The inter-zone border (13) forms an elliptical shape (or any other shape including a curvilinear one) that mimics the elliptical shape (or any other shape) defined by the circumferential edge (9)). The inner zone (3) has an ellipsoidal portion protruding from the first surface (31). The inner zone (3) increases in thickness from the inter-zone border (13) toward the center of the applicator (1). In one embodiment, the surface area of the first surface (31) of the inner zone (3) is from 1 $cm^2$ to 5 $cm^2$, preferably from 2 $cm^3$ to 4 $cm^2$. The length of the inner zone (3), along the major axis (not shown), may be from 15 to 25 mm, preferably from 18 to 22 mm, alternatively combinations thereof. The width of the inner zone (3), along the minor axis (not shown), is from 9 mm to 19 mm, alternatively from 11 mm to 17 mm, alternatively 12 mm to 15 mm, alternatively combinations thereof. In one non-limiting example, the length and the width of the inner zone (3) is 20 mm and 14 mm, respectively.

**[0025]** The applicator has a curvilinear shape as defined by a circumferential edge, said curvilinear shape being elliptical.

**[0026]** Preferably the outer zone (6) generally has uniform thickness throughout the outer zone from 0.5 mm to 3 mm, preferably 1 mm to 2.5 mm, more preferably from 1 mm to 2 mm. In yet an ever further preferred embodiments, the inner zone (3) has a thickness from 1.5 mm to 5 mm, preferably from 2.5 mm to 4.5 mm, more preferably from 3 mm to 4 mm.

**[0027]** The first surface (31) of the applicator (1) opposes the second surface (32). The second surface (32) is concave whereas the first surface is generally convex. It is the second surface that is configured to primarily make contact with the facial substrate. Referencing Figure 3, the second surface (32) of the applicator (1) has at least two relevant radii (when the applicator (1) is has an overall elliptical shape). $R_5$ (24), or the fifth radius, is the longest distance of an axis between: where the center vertical axis (37) intersects the second surface (32); and where circumferential edge (2) intersects the horizontal plane (35). $R_6$ (26), or the sixth radius, is the shortest distance of an axis between: where the center vertical axis (37) intersects the second surface (32); and where circumferential edge (2) intersects the horizontal plane (35).

**[0028]** $R_5$ (25) is along the plane of the major axis and $R_6$ (26) is along the plane of the minor axis. Accordingly $R_5$ (25) is longer than $R_6$ (26). In one embodiment, $R_5$ (25) is from 19 mm to 39 mm, preferably from 24 mm to 34 mm, alternatively from 26 mm to 32 mm, alternatively 25 to 30 mm, alternatively from 28 mm to 33 mm, alternatively combinations thereof. In another embodiment $R_6$ (26) is from 12 mm to 32 mm, preferably from 17 mm to 27 mm, alternatively from 19 mm to 25 mm, alternatively from 20 mm to 24 mm, alternatively combinations thereof. In yet another embodiment, the second surface (32) of the applicator is free or substantially free of any protrusions or texturing. In a non-limiting example, the $R_5$ (25) and $R_6$ (26) are 28.25 mm and 22 mm, respectively.

**[0029]** Figure 4 is cross sectional front view of the applicator of figure 1 along the minor axis. Figure 5 is a cross sectional right view along the major axis of the applicator of figure 1. The second surface (32) of the applicator (1) is generally concave. Accordingly, there is a gap between the second surface (32) and the horizontal plane (35) when the applicator (1) is placed on the horizontal plane (35) without any force being exerted onto the first surface (31). It is the second surface (32), along the circumferential edge (9), that makes contact with the horizontal plane (35). The maximum gap distance (not shown) is the maximum distance between the second surface (32) and the horizontal plane (35). Typically the maximum gap distance is measured along the center vertical axis (37). The maximum gap distance is from 1 mm to 5 mm, preferably from 2 mm to 4 mm. In one non-limiting example the maximum gap distance is 3 mm, and the thickest portion of the applicator (1) is at the center vertical axis (37) and is at 3.3 mm.

**[0030]** Figure 4 illustrates: $R_1$, or first radius (21); and $R_2$, or the second radius (22). These are not drawn to scale. The circumcenter of $R_1$ (21) and $R_2$ (22) are each located along the center vertical axis (37) and the plane of the minor axis of the applicator (1). $R_1$ (21) is the radius of the arc of the first surface (31) of the inner zone (3) of the applicator (1) along the minor axis. $R_2$ (22) is the radius of the arc of the first surface (31) of the outer zone (6) of the applicator (1) along the minor axis. In one embodiment, $R_1$ (21) is from 9 mm to 19 mm, preferably from 11 mm to 17 mm, more preferably from 12 mm to 16 mm, alternatively combinations thereof. In another embodiment, $R_2$ (22) is from 53 mm to 93 mm, preferably from 63 mm to 83 mm, alternatively from 67 mm to 79 mm, alternatively from 70 mm to 76 mm, alternatively combinations thereof.

**[0031]** Figure 5 illustrates: $R_3$, or third radius (23); and $R_4$, or the fourth radius (24). The respective circumcenter of $R_3$ (23) and $R_4$ (24) are each located along the center vertical axis (37) and the plane of the major axis (not shown) of the applicator (1). $R_3$ (23) is the radius of the arc of the first surface of the outerzone (6) of the applicator (1) along the major axis. $R_4$ (24) is the radius of the art of the first surface of the inner zone (3) of the applicator (1) along the major axis. In one embodiment, $R_3$ (23) is from 21 mm to 33 mm, preferably from 23 mm to 31 mm, alternatively from 25 mm to 29 mm, alternatively combinations thereof. In another embodiment, $R_4$ (24) is from 120 mm to 200 mm, preferably from 130 mm to 190 mm, preferably from 140 mm to 180 mm, alternatively from 150 mm to 166 mm, alternatively from 152 mm to 164 mm, alternatively combinations thereof.

**[0032]** Figure 6 is an exploded and cross sectional view of the applicator (1) nearest the circumferential edge (9). Figure 6 illustrates $R_7$, or the seventh radius (27). $R_7$ (27) is the radius of the arc of the circumferential edge (9) measured from the outer surface thereof. Preferably $R_7$ is the same circumferentially around the applicator (1). In one embodiment, $R_7$ (27) is 0.01 mm to 2 mm.

**[0033]** The mass of the applicator is from 1.0 g to 500 g.

**[0034]** Without wishing to be bound by theory, there are potential benefits of having the inner zone (3) thicker than the outer zone (6). The larger thickness may provide for improved mold processing. Furthermore, the ellipsoidal shaped protrusion (or any other shaped protrusion) of inner zone (3) from the first surface (31) of the applicator (1), may help novice users under the proper orientation of their fingers for use and perhaps avoiding having their fingers slip during use. The protrusion may help in the rigidity of the applicator at its center to help evenly distribute downward forces to the circumferential edge (9). The size of the protrusion may help visualize for the user how much of the skin care composition should be dosed. Lastly, processing may be improved with the protrusion by making applicator easier to separate should any co-adhesion happen during bulk packing.

Bending Force:

**[0035]** Exemplary examples in the art of applicators provide for the applicator to have the right balance in bending force. There needs to be enough bending force as to provide hair lay-down benefits but not too much so as to provide insufficient flexibility to accommodate the complex contours of the human face. Tables 1a and 1b summarizes dimensions of ten applicators (and standard deviation). Tables 2a and 2b summarize results from bending force testing from the applicators described in Tables 1 and 1b.

Table 1a: Dimensions (mm) Ellipse-Shaped Applicators of Figure 1

| Variable: | Length[1] | Width | Thickness[2] | Height[3] | $R_1$ (21)[4] |
|---|---|---|---|---|---|
| Average (N=10) | 57.390 | 44.165 | 1.599 | 6.076 | 13.824 |
| Standard Deviation | 0.052 | 0.140 | 0.111 | 0.266 | 0.249 |

[1] i.e., the longest dimension.
[2] Thickness of the outer zone (6), wherein the thickness of the outer zone (6) is substantially uniform throughout the outer zone (6)
[3] "Height" is the distance measured along the center vertical axis (35) from the horizontal plane (35) to the first surface (31) of the applicator (1). In other words, it is the maximum gap distance plus the thickness of the inner zone (3) along the center vertical axis (37). It should be appreciated, given the properties of the material, the mass of the applicator, and concave surface of the applicator facing down, and overall geometry of the application, are variables that may impact the "height" dimension herein.
[4] Radii $R_1$, $R_2$, $R_3$, $R_4$, $R_5$, and $R_6$ are as previously defined above.

Table 1b: Dimensions (mm) Ellipse-Shaped Applicators of Figure 1 continued

| Variable: | $R_2$ (22) | $R_3$ (23) | $R_4$ (24) | $R_5$ (25) | $R_6$ (26) |
|---|---|---|---|---|---|
| Average (N=10) | 72.942 | 27.158 | 158.151 | 17.178 | 37.130 |
| Standard Deviation | 6.410 | 1.575 | 35.259 | 0.371 | 1.168 |

**[0036]** Each of the ten applicators, with dimensions specified in the Tables 1a and 1b above, are assessed for bending force at various locations at the applicator. The average force values (Newton) and standard deviations are summarized in Table 2a and Table 2b below. An INSTRON branded model is a suitable instrument for assessing bending force. The instrument has a stainless steel probe with a circular and flat (1 cm diameter) contact zone, and is affixed to the load cell of the instrument. The probe depresses in a down direction (i.e., orthogonally down to a level bench top). The bending force is assessed at the circumferential edge (9), at the respective major and minor axis of the elliptical shaped applicator (1), and at the respective first surface (31) and the second surface (32). The contact zone of the probe is brought to bear on the circumferential edge (9) so that the center of the probe is in contact with the outermost edge of the circumferential edge (9) (at the respective surfaces (31, 32)). The applicator (1) is affixed in a C-clamp for the force measurement, wherein the C-clamp clamps the applicator at the geometric center of the applicator on the first surface (31) and the second surface (32). The C-clamp has a contact surface areas of 0.25 $cm^2$ for each clamp on the respective surfaces (31,32). The contact areas of each clamp are circular and flat.

**[0037]** Force measurements are taken at the major axis and minor axis of the applicator (1). In one set of measurements, the second surface (32) is face down, i.e., concave surface facing down, with the contact zone of the probe brought to bear on the first surface (31) at the major and minor axis. In another set measurements, the second surface (32) facing up, i.e., concave surface facing up, with the contact zone of the probe brought to bear on the second surface (32) of the applicator (1) at the major and minor axis. The percent difference in bending force of the respective surfaces (31, 32), at the respective axis, is compared. Table 2a is directed to the minor axis and Table 2b is directed to the major axis.

Table 2a- Difference in bending force (N) of the applicator at minor axis between second surface (32) facing down vs. second surface (32) facing up.

| Location: | Minor Axis; 2nd Surface Down[1] | Minor Axis; 2nd Surface Up[2] | Percent (%) Difference in Force |
|---|---|---|---|
| Average (n=10) | 0.0336 N | 0.11014 N | 328 % |

(continued)

| Location: | Minor Axis; 2nd Surface Down[1] | Minor Axis; 2nd Surface Up[2] | Percent (%) Difference in Force |
|---|---|---|---|
| Standard Deviation | 0.01713 N | 0.0307 N | 176 % |
| [1] Probe contacting the first surface (31) of the applicator.<br>[2] Probe contacting the second surface (32) of the applicator (i.e., concave surface against probe). | | | |

**[0038]** For the Minor Axis, the preferred range of downward resistance force against the skin at the outward edges of the applicator used to doctor the material inward and through the trailing edge of the applicator and distributed onto the skin should broadly range from 0.01804 Newton force to 0.20224 Newton force. The more preferred range of forces resistance for the sides, or minor axis, should be between the range of 0.04874 to 0.17154 Newton force. The most preferred lateral downward resistance should be between 0.07944 and 0.14084 Newton forces.

Table 2b- Difference in bending force (N) of the applicator at major axis between second surface (32) facing down vs. second surface (32) facing up.

| Location: | Major Axis; 2nd Surface Down[3] | Major Axis; 2nd Surface Up[4] | Percent (%) Difference in Force |
|---|---|---|---|
| Average (n=10) | 0.03754 N | 0.0931 N | 248 % |
| Standard Deviation | 0.00787 | 0.02051 N | 260 % |
| [3] Probe contacting the first surface (31) of the applicator.<br>[4] Probe contacting the second surface (32) of the applicator (i.e., concave surface against probe). | | | |

**[0039]** As contrasting to the previous Minor Axis ranges the Major Axis downward resistance on the skin needed to doctor a sufficient film of material through the trailing edge of the applicator is preferred to be from 0.03157 to 0.15463 Newton force. The more preferred range of resistance pressure is 0.05208 to 0.13412 Newton force. The most preferred range of resistance is 0.06153 to 0.11361 Newton force.

**[0040]** As illustrated by the Tables 2a and 2b, the bending force against the second surface (32) is greater than the bending force against the first surface (31). Without wishing to be bound by theory, the complex curvature in the Z axis (i.e., "cup shape") of the applicator forms an internal force distribution within the applicator. The shape, coupled with the use of the elastomeric materials described herein, enables even and smooth deposition of skin care compositions to the facial substrate. This internal force distribution enables the appropriate amount of downward pressure at the contact points of the applicator against the facial substrate for composition application, but also provides the appropriate amount of pressure to maintain a reservoir of the composition that precedes the contacting edge to offer an even flow of composition to the contacting edge (and thus facial substrate) during use. Furthermore, this bias of the bending force between the surfaces (31, 32) also enables less of the user's finger pressure during application and thus a more even distribution of downwards pressure against the facial substrate. This allows for a wider range of user back finger pressure variations and yet still achieving the desired even and smooth composition deposition.

**[0041]** One aspect of the invention provides for an applicator (1) wherein the first surface (31) has a first bending force measured at the circumferential edge (9), and the second surface (32) has a second bending force measured at the circumferential edge (9), wherein the second bending force is at least 1.1 times, preferably from 1.1 to 10, more preferably from 1.5 to 5, alternatively 2 to 5, alternatively combinations thereof, times greater than the first bending force.

Surface Friction

**[0042]** One aspect of the invention provides an applicator that has a smooth surface, preferably the surface that is configured to make contact with the target skin substrate. Such a smooth surface provides more effective application of skin care composition, particularly for providing hair lay-down benefits. One way of measuring the smooth surface of the applicator is by way of surface friction. One suitable way of analyzing friction is by using a "KES-SE" Friction Tester, manufactured by Kato Tech Co., Ltd., Kyoto, Japan. A non-limiting applicator of the present invention measures a coefficient of friction or "COF" of 0.65 (a control "roughness plate" measuring at 0.43 (typically measuring between 0.36 to 0.45). In one embodiment, the COF of a virgin applicator is from 0.5 to 0.9, alternatively from 0.55 to 0.75.

Surface Energy

**[0043]** Surface energy is another way of characterizing a smooth surface. One suitable way of measuring "Owens-Wendt Surface Energy" is using FTA1000 Drop Shape Instrumentation, manufactured by First Ten Angstroms, Inc., Portsmouth, Virginia, U.S.A. The Owens-Wendt Surface Energy is determined by adding: (i) the surface energy due to dispersive interactions (so called "dispersive component"); (ii) and the surface energy due to polar interactions (so called "polar component"). A glass microscope slide and a plastic microscope cover slip are used as controls. The results are summarized in the table below.

Table 3: Owens-Wendt Surface Energy of Applicator (of present invention) and Controls

| Sample: | Dispersive Component | Polar Component | Surface Energy |
|---|---|---|---|
| Applicator | 26.2 | 1.2 | 27.4 |
| Glass Slide (Control) | 33.2 | 34.6 | 67.8 |
| Plastic Cover Slip (Control) | 32.7 | 14.5 | 47.2 |

**[0044]** In one embodiment, an exterior surface of the applicator (1) (preferably the second surface (32)), comprises a surface energy from 17 dynes/cm to 37 dynes/cm, preferably from 32 dynes/cm to 42 dynes/cm, alternatively combinations thereof.

Hardness

**[0045]** The hardness value of a non-limiting example of an applicator is assessed at 39.8 on Durometer Scale A. In one embodiment, the applicator comprises a Hardness value measured on Durometer Scale A from 30 to 60, preferably from 35 to 50. The softness/pliability of the material should allow more force at the trailing edge. Applicator durometers were measured with a Shore Scale A (Asker Durometer model XP-A) durometer tester.

Skin care composition

**[0046]** The skin care composition suitable for topical application to skin by the applicator may be essentially any dermatologically safe composition. In a preferred embodiment, the composition contains one or more ingredients to soften hair (e.g., glycerol) to work in combination with the applicator to minimize the appearance of hair, preferably facial hair, preferably fine facial hair on a human female. In another preferred embodiment, the composition contains one or more ingredients to cover the fine facial hair such as foundation. More preferably, the skin care composition comprises both hair softening ingredients as well as hair or skin covering agents (e.g., pigments). While pigments may be used, an alternative preferred composition is essentially free of pigments. In other embodiments, the pigment level may be normal or a reduced level of pigment may be used. Other ingredients may also be included in the composition such as a sunscreen agent or skin whitening agent. Preferably the skin care composition: will not clog skin pores; is suitable for sensitive skin, and is dermatologically tested. In a preferred embodiment, the skin care composition is a film forming composition to provide, in part, hair lay-down benefits. Film-forming compositions (e.g., MQ resins) are known in the art. See e.g., WO 97/17057; WO 98/52515.

**[0047]** In another embodiment, the skin care composition generally has a higher viscosity. Without wishing to be bound by a theory, a more viscous composition can provide better coverage or application to a face since it will not run as compared to less viscous compositions, thereby allowing more time for the composition to be applied by the user via the applicator and more time for the composition to be absorbed by the facial skin and fine facial hair. The applicator of the present invention is particularly suitable for applying such higher viscosity composition. All stated viscosities in the present application are Brookfield viscosities, unless otherwise specified. Suitable Brookfield viscosity ranges for the skin care composition may include those from 100 centipoise (cps) to 200,000 cps, preferably from 15,000 cps to 90,000 cps, more preferably from 15,000 cps to 60,000 cps, alternatively for an applicator with 39.8 Shore A hardness the preferable ranges are from 15,000 cps to 40,000 cps, and alternatively combinations thereof. One suitable way of measuring viscosity includes using a Brookfield RVT, Spindle C, in Heliopath mode, at 5 rotations per minute (RPM) spindle speed (and under ambient conditions). Without wishing to be bound by theory, the second surface (32) of the applicator (1) having a concave surface may help to retain the skin care composition while the user dispenses the composition onto the second surface. The concave second surface of the applicator acts as a reservoir during the use of the applicator so the skin care composition is applied more from the center of the applicator. This is in sharp contrast to some other applicators that act as a rectilinear squeegee moving the skin care composition to the either side of the

applicator. This can lead to having more strokes of applicator by the user for application (increasing the time of application); and undesirably forcing the skin care composition to move in a direction inconsistent to the grain of the fine facial hair, thereby potentially leading to suboptimal hair lay-down results.

**[0048]** The viscosity of the skin care composition may have a significant impact on the effective coverage of the product on skin using the applicator of the present invention. Low viscosity compositions used with a high Shore A applicator may not dispense well from the applicator because the fluid may not develop sufficient fluid dynamic resistance to overcome the downward force of the applicator's trailing edge. Alternatively, high viscosity compositions, when used in combination with a low Shore A applicator, may result in uneven deposition due to the high level of fluid dynamic resistance and relatively low trailing edge force.

**[0049]** In one embodiment, the skin care compositions that are used in combination with the applicator of the present invention have a viscosity which correlates to the hardness of the applicator. For an applicator with a Shore A hardness of about 39 to 45, the skin care composition will have a viscosity of about 15,000 cps to 40,000 cps. Alternatively, for an applicator with a Shore A hardness of about 55 to 60, the skin care composition will have a viscosity of about 68,000 cps to 90,000 cps. Alternatively, for an applicator with a Shore A hardness of about 47, the skin care composition will have a viscosity of about 100 cps to 90,000 cps, more preferably, between about 15,000 cps to 90,000 cps.

**[0050]** The shear thinning behavior of the skin care formulation is also important for even deposition due to the fact application shear rates are $>100s^{-1}$. When used, the applicator is in motion, exerting a shear stress on the fluid. As a result, a velocity gradient is exerted and high shear rates are created due to the small gap thickness. A typical shear rate for "spreading" or "rubbing" is $>100\ s^{-1}$ and as a result, a shear thinning product will exert less resistance to spreading. Viscosities were defined as a Brookfield Viscosity which is a common industrial method to quantify the structure of the fluid. Additionally, steady state flow curves using a TA instrument AR-G2 rheometer was created by exerting the fluid to increasing shear stresses and measuring the resulting viscosity. As is common to those known in the field, the data was then fit to the constitutive Carreau Model to fit the data to a common shear rate (in this case 10 and $100\ s^{-1}$).

**[0051]** In addition, the Durometer measured hardness of the applicator material having the same geometry can be varied through composition to create a more ideal hardness of applicator for a particular product fluid viscosity. Specifically, with the oval geometry described herein, the applicator Durometer hardness may be ranged from Shore A 20 to Shore A 80, more preferably Shore A 30 to Shore A 65 and specifically Shore A 39 to Shore A 59. By comparing material deposited with a plurality of applicator hardness's, all with the same geometry, it is possible to determine the ideal range of applicator hardness's for specific ranges of product viscosities. In particular, a Shore A hardness of 39.8 has best product deposition performance for viscosities ranging from 100 cps to 19,900 cps. Similarly, an applicator with Shore A hardness of 47 created the most preferable deposition pattern with product viscosities between 20K cps and 69.9K cps. Moreover, an applicator with a Shore A hardness of 59 delivers a more preferred deposition pattern with viscosities from 70K to 200K cps.

## Examples

**[0052]** Cosmetic compositions were prepared by conventional methods from the following components.

| | Ex. 1 | Ex. 2 | Ex. 3 | Ex. 4 | Ex. 5 | Com 1 |
|---|---|---|---|---|---|---|
| KF-7312J *1 | 6.000 | 4.000 | | | | |
| Luviskol K17 *2 | | | 2.000 | | 0.500 | |
| Daitosol 5000 SJ *3 | | | | 5.000 | | |
| Glycerin USP | 10.000 | 5.000 | 10.000 | | 10.000 | 10.000 |
| Propylene glycol | | | | 30.000 | | |
| Pentylene glycol | | 2.500 | | 3.000 | | 2.500 |
| 1,2 HEXANEDIOL | | 0.500 | | 2.000 | | 0.500 |
| DI Water | 52.500 | 48.659 | 54.467 | 37.341 | 55.967 | 43.659 |
| SA TTC-30 *4 | | 4.500 | 2.000 | | 2.000 | 4.500 |
| TTC-30 *5 | | | | 5.000 | | |
| Cyclomethicone D5 | 15.0000 | 11.1010 | | | | 15.1010 |
| Tridecyl isononanoate (WHICKENOL 153) | 10.000 | 5.000 | 2.833 | | 2.833 | 5.000 |

(continued)

| | Ex. 1 | Ex. 2 | Ex. 3 | Ex. 4 | Ex. 5 | Com 1 |
|---|---|---|---|---|---|---|
| KF-6028 *6 | 2.000 | 1.500 | | | | 1.500 |
| Sorbitan isostearate (CRILL6) | 0.500 | 1.500 | | | | 1.500 |
| Brij 72 *7 | | | 0.100 | | 0.100 | |
| Brij S721 *8 | | | 0.900 | | 0.900 | |
| Polysorbate 20 | | | | 1.000 | | |
| Octyl methoxylcinnamate, USP (UVINUL MC80) | | 2.000 | 7.000 | | 7.000 | 2.000 |
| Tocopheryl acetate (DL) | | | 0.200 | | 0.200 | |
| Cetyl alcohol (APJ) | | | 0.200 | | 0.200 | |
| Stearyl alcohol (LEROL C18) | | | 0.600 | | 0.600 | |
| Behenyl alcohol (High stearyl) | | | 0.400 | | 0.400 | |
| BENTONE GEL VS-5PCV | | 1.500 | | | | 1.500 |
| RHEOPEARL KL2 *9 | 3.500 | 2.500 | | | | 2.500 |
| Ozokerite Wax | | | | | | |
| BHT | | 0.500 | | | | 0.500 |
| Ethyleparaben, NF | | | 0.200 | | 0.200 | |
| Propylparaben | | | 0.150 | | 0.150 | |
| SA/NAI-TR-10/D5 *10 | | 3.750 | | | | 3.750 |
| SA/NAI-Y-10/D5 *11 | | 0.637 | | | | 0.637 |
| SA/NAI-R-10/D5 *12 | | 0.327 | | | | 0.327 |
| SA/NAI-B-10/D5 *13 | | 0.196 | | | | 0.196 |
| SI-2 Yellow LL-100P *14 | | | 0.435 | | 0.435 | |
| SI-2 Red R-516P *15 | | | 0.240 | | 0.240 | |
| SI-2 Black BL-100P *16 | | | 0.096 | | 0.096 | |
| SA Titanium Dioxide CR-50 *17 | | | 5.544 | | 5.544 | |
| SI TALC *18 | | | 0.835 | | 0.835 | |
| SI SILDEX H-52 *19 | | 2.000 | | | | 2.000 |
| SI TALC CT-20 *20 | | 2.000 | | | | 2.000 |
| Silica Pearl P-4 *21 | | | 10.000 | 5.000 | 10.000 | |
| PGSS-22 TiO2 R250 *22 | | | | 8.330 | | |
| PGSS-22 Yellow No.602P *23 | | | | 0.620 | | |
| PGSS-22 Red No.211P Mix *24 | | | | 0.404 | | |
| PGSS-22 Black No.710P *25 | | | | 0.205 | | |
| SEPIGEL 305 *26 | | | 1.000 | 1.400 | 1.000 | |
| MAKIMOUSSE 12 *27 | | | | 0.250 | | |
| Hexamidine diisethionate | | 0.080 | | | | 0.080 |
| EDTA-2NA | 0.050 | | 0.050 | 0.050 | 0.050 | |
| Phenoxy Ethanol | 0.300 | 0.100 | | 0.400 | | 0.100 |

(continued)

| | Ex. 1 | Ex. 2 | Ex. 3 | Ex. 4 | Ex. 5 | Com 1 |
|---|---|---|---|---|---|---|
| Benzyl Alcohol | 0.150 | 0.150 | 0.500 | | 0.500 | 0.150 |
| Methylparaben | | | 0.250 | | 0.250 | |
| Total | 100.000 | 100.000 | 100.000 | 100.000 | 100.000 | 100.000 |

| | Ex. 6 | Ex. 7 |
|---|---|---|
| Cyclopentasiloxane | 0.036 | 13.000 |
| Cyclopentasiloxane/Di methicone Copolyol*28 | 23.200 | 13.200 |
| Titanium Dioxide 9729, Dimethicone treated | 2.142 | 2.000 |
| Talc 9742 | 12.372 | 11.550 |
| Red 9753 Color Grind (70%) | 0.000 | 0.000 |
| Yellow 9756 Color Grind (55%) | 0.000 | 0.000 |
| Black 9734 Color Grind (65%) | 0.000 | 0.000 |
| Colorwave Gold | 1.000 | 1.000 |
| Silica (L-1500 Type) | 0.500 | 0.500 |
| Synthetic Wax PT-0602 | 0.100 | 0.100 |
| Arachidyl Behenate | 0.300 | 0.300 |
| Trihydroxystearin | 0.300 | 0.300 |
| Cyclopentasiloxane | 1.000 | 1.000 |
| Laureth-7 | 0.500 | 0.500 |
| Propylparaben | 0.150 | 0.150 |
| Tocopherol Acetate | 0.500 | 0.500 |
| Ethylene Brassylate | 0.050 | 0.050 |
| DI Water | 43.500 | 41.500 |
| Glycerin USP-Tank | 7.000 | 7.000 |
| Sodium Chloride | 2.000 | 2.000 |
| Trisodium EDTA | 0.100 | 0.100 |
| Phenoxyethanol | 0.450 | 0.450 |
| Sodium Dehydroacetate | 0.300 | 0.300 |
| Dexpanthenol | 0.500 | 0.500 |
| Niacinamide | 2.000 | 2.000 |
| N-acetyl Glucosamine | 2.000 | 2.000 |

(continued)

| | Ex. 6 | Ex. 7 |
|---|---|---|
| ***Total*** | 100.000 | 100.000 |
| *1) Trimethylsiloxysilicate (50%) and Cyclopentasiloxane (50%) form Shin-Etsu Chemical Co.<br>*2) PVP (100%) from BASF Corporation<br>*3) Acrylates/Ethylhexyl Acrylate Copolymer (100%) from Daito Kasei Kogyo Co., Ltd.<br>*4) Titanium Dioxide and Aluminum Hydroxide and Talc and Magnesium Stearate and Dimethicone from Miyoshi Kasei, Inc.<br>*5) Titanium Dioxide and Aluminum Hydroxide and Talc and Magnesium Stearate from Miyoshi Kasei, Inc.<br>*6) PEG-9 Polydimethylsiloxyethyl Dimethicone from Shin-Etsu Chemical Co.<br>*7) Isosteareth-2 from Croda, Inc.<br>*8) Steareth-21 from Croda, Inc.<br>*9) Dextrin Palmitate from Chiba Flour Milling Company, Ltd.<br>*10) Titanium Dioxide and Cyclomethicone and Dimethicone and Disodium Stearoyl Glutamate and Aluminum Hydroxide from Miyoshi Kasei, Inc.<br>*11) Iron Oxides and Cyclomethicone and Dimethicone and Disodium Stearoyl Glutamate and Aluminum Hydroxide from Miyoshi Kasei, Inc.<br>*12) Iron Oxides and Cyclomethicone and Dimethicone and Disodium Stearoyl Glutamate and Aluminum Hydroxide from Miyoshi Kasei, Inc.<br>*13) Iron Oxides and Cyclomethicone and Dimethicone and Disodium Stearoyl Glutamate and Aluminum Hydroxide from Miyoshi Kasei, Inc.<br>*14) Iron Oxides and Methicone from Daito Kasei Kogyo Co., Ltd.<br>*15) Iron Oxides and Methicone from Daito Kasei Kogyo Co., Ltd.<br>*16) Iron Oxides and Methicone from Daito Kasei Kogyo Co., Ltd.<br>*17) Titanium Dioxide and Aluminum Hydroxide and Dimethicone from Miyoshi Kasei, Inc.<br>*18) Talc and from Methicone from Miyoshi Kasei, Inc.<br>*19) Silica and Methicone from Miyoshi Kasei, Inc.<br>*20) Talc and from Methicone from Miyoshi Kasei, Inc.<br>*21) Silica from Presperse LLC<br>*22) Titanium Dioxide and Aluminum Hydroxide and Methoxy PEG-10 Propyltrimethoxysilane and Silica from Daito Kasei Kogyo Co., Ltd.<br>*23) Iron Oxides and Methoxy PEG-10 Propyltrimethoxysilane and Silica from Daito Kasei Kogyo Co., Ltd.<br>*24) Iron Oxides and Methoxy PEG-10 Propyltrimethoxysilane and Silica from Daito Kasei Kogyo Co., Ltd.<br>*25) Iron Oxides and Methoxy PEG-10 Propyltrimethoxysilane and Silica from Daito Kasei Kogyo Co., Ltd.<br>*26) Polyacrylamide and Water and C13-14 Isoparaffin and Laureth-7 from Seppic<br>*27) Sodium Polyacrylate Starch from Daito Kasei Kogyo Co., Ltd.<br>*28) DC-5225C from Dow Coming | | |

**[0053]** As for Examples 1-3 and Comparison Example 1, in a suitable vessel, all hydrophilic and water soluble components except a thickener (SEPIGEL 305 *26) were blended together, and mixed until all of the components were dissolved. In another vessel, all hydrophobic and oil soluble components except a thickener (RHEOPEARL KL2 *9) were blended, and mixed until all of the components were homogenized. Mix above hydrophilic and hydrophobic ingredients for emulsification. A thickener was added to the obtained emulsion, and the emulsion was gently mixed. When RHEOPEARL KL2 is a thickener, the emulsion was heated until 90C, then it was cooled down.

**[0054]** As for Example 4, in a suitable vessel, all hydrophilic and water soluble components except a thickener (SEPIGEL 305 *26 and MAKIMOUSSE 12 *27) were blended together, and mixed until all of the components were dissolved. Thickeners were added the mixture and the mixture was gently mixed.

**[0055]** The following Commercial Formulations were also used in testing:

| | |
|---|---|
| Commercial Product 1 ("CP1") | Revlon Color Stay™ (Normal Skin) |
| Commercial Product 2 ("CP2") | Revlon Color Stay™ (Dry Skin) |
| Commercial Product 3 ("CP3") | Maybelline 24 hours Super Stay™ |
| Commercial Product 4 ("CP4") | Maybelline Mousse |

(continued)

| | |
|---|---|
| Commercial Product 5 ("CP5") | L'Oreal Infallible™ 18 hours |
| Commercial Product 6 ("CP6") | L'Oreal True Match |
| Commercial Product 7 ("CP7") | Cover Girl™ Simply Ageless™ |
| Commercial Product 8 ("CP8") | Cover Girl™ Clean |
| Commercial Product 9 ("CP9") | Cover Girl™ Clean Oil Control |
| Commercial Product 10 ("CP10") | Cover Girl™ Clean Sensitive |
| Commercial Product 11 ("CP11") | Cover Girl™ TRUblend™ |
| Commercial Product 12 ("CP12") | Cover Girl™ Outlast 3 in 1 |
| Commercial Product 13 ("CP13") | Temptu™ Pro |

**[0056]** The following applicators were also used in testing:

| Silicone applicator | Durometer |
|---|---|
| App#1 | Shore A 39.8 |
| App #2 | Shore A 47 |
| App #3 | Shore A 59 |

Examples of Skin Compositions

**[0057]** Non-limiting examples of skin care compositions that may be used in combination with the applicator of the present invention include: US 2005/0255059 A1, paragraph 202, examples 12 and 13; WO 97/17057; and US 2005/0238679 A1. One non-limiting example of a composition comprises: 0.3 - 10 wt% (preferably 3 - 6 wt%) of a silicone resin (e.g., MQ resins (trimethylsiloxysilicate) and MQ resins blends from Dow Corning); 5 - 15 wt% (preferably 8-12 wt%) of glycerin; 2 -10 wt% (preferably 4 to 8 wt%) of $TiO_2$ (e.g., $TiO_2$ coated talc or silicone treated $TiO_2$); and 30% to 70% water. Film forming skin compositions are well known in the beauty care arts.

**[0058]** The following examples further describe and demonstrate embodiments of compositions that are useful in combination with the present invention. The examples are given solely for the purpose of illustration and are not to be construed as limitations of the present invention, as many variations thereof are possible without departing from the spirit and scope of the invention.

Test Methods

Hair Lay-Down Measurement #1:

**[0059]** 21 arm hairs with various lengths are implanted in artificial skin such as Bio Skin (model No.HO64-001) from Beaulax Co., Ltd. (Japan) Hair length is in the range of 0.5-1.8cm after implanted in the artificial skin. Excess hairs at the backside of the artificial skin are cut and glue such as cyanoacrylate type instant glue is applied to the backside to adhere hairs on the artificial skin. 0.0125g (0.0005g/cm2) of a test sample is applied on the Bio Skin by a finger with finger sack until the sample is evenly distributed. 5 min later, each hair is rated based on a grading sheet of Fig. 1. An average hair lay down rate is calculated by dividing total of rating numbers by total numbers of hair. The number of hairs and the amount of a sample can be adjusted.

Hair Lay-Down Measurement #2:

**[0060]** The arms of human subjects were treated with product using a rubber finger sack and evaluated using the following procedure:

1. Set a rectangle area of 3.8cm x 10cm on one forearm.
2. Wipe the area with sheet make-up remover, wash with warm water and wipe with paper towel.
3. Measure test product (0.03ml) via syringe and apply on the forearm using index finger with rubber finger sack.

4. Spread the product evenly within the area and spread it to the one direction for 10times.
5. Take photos using VISIA from a) the side and b) the top.

a) For hair lay-down evaluation:

i) Magnify the side-view photo to 2X
ii) Measure the height of all hairs that are more than 0.3 cm from the surface of the skin.
iii) Compare a) the height of the hairs, and b) the ratio of lay down hairs as a *t*-test and calculate the average. A *t*-test is any statistical hypothesis test in which the test statistic follows a Student's *t* distribution if the null hypothesis is supported. It can be used to determine if two sets of data are significantly different from each other, and is most commonly applied when the test statistic would follow a normal distribution if the value of a scaling term in the test statistic were known. When the scaling term is unknown and is replaced by an estimate based on the data, the test statistic (under certain conditions) follows a Student's *t* distribution.

b) For hair camouflage, use a top-view photo to visually assess the treated area.

Measurement of Hair lay down

**[0061]** Select examples were tested according to Hair Lay-Down Measurement #1, and provided the following average hair lay down rate.

| | Ex. 1 | Ex. 2 | Ex. 3 | Ex. 4 | Ex. 5 | Com. 1 |
|---|---|---|---|---|---|---|
| Hair Lay-Down with random application | 1.3 | 1.1 | 1.8 | 2.4 | | |
| Hair Lay-Down with the direction of hair growth application | 1.9 | 1.5 | 3.0 | 5.1 | 1.9 | 0.9 |

Comparison to Commercial Products

**[0062]** Products were tested according to Hair Lay-Down Measurement #2.

Results of the analysis using Hair Lay-Down Measurement #2:

| Test | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| Product | None | Ex. 3 | CP1 | CP2 | CP3 | CP4 | CP5 | CP7 | CP8 |
| Subject 1 | | | | | | | | | |
| Avg. Height (cm) | 1.51 | 0.11 | 0.22 | 0.52 | 0.45 | 0.52 | 0.73 | 0.94 | 1.14 |
| % of Hairs lay down | 0 | 81 | 68 | 51 | 42 | 46 | 36 | 27 | 20 |
| Subject 2 | | | | | | | | | |
| Avg. Height (cm) | 0.98 | 0.07 | 0.19 | 0.43 | 0.56 | 0.29 | 0.53 | 0.37 | 0.39 |
| % of Hairs lay down | 0 | 91 | 77 | 58 | 48 | 64 | 55 | 61 | 47 |

Viscosity/Hardness Examples

**[0063]** The following examples further describe and demonstrate embodiments of compositions that are useful in combination with the present invention. The examples are given solely for the purpose of illustration and are not to be construed as limitations of the present invention, as many variations thereof are possible without departing from the spirit and scope of the invention.

Test Method

**[0064]** Applied 0.15 gram of each formulation on 3 different durometer silicone applicators and then the applied product to a Lenetta Card (5.5 X10") Form 2A B#4201 Opacity charts at two different speed 6"/sec and 1"/sec. All tests were conducted with at least 4 replicates per test.

**[0065]** A visual grading scale, as shown in Fig. 12, was used. It shows grade variety with pictures. The visual results

were translated into relative quantitative data.

| Formulations tested | Formulation type | Brookfield Viscosity (cps) | Shear rate viscosity 10sec$^{-1}$ (cps) | Shear rate viscosity 100 sec $^{-1}$ (cps) | Best applicators | Good applicator |
|---|---|---|---|---|---|---|
| CPI3 | Alcohol and Oil | N/a | 120 | 100 | None (product too dilute) | None (too dilute) |
| Ex. 3 | Water in silicone | 19,000 | 3290 | 665 | Shore A 47 | Shore A 47 |
| Ex. 7 | Water in silicone | 30,000 | 3810 | 580 | Shore A 47 | Shore A 47 |
| Ex. 3 processed to be a higher viscosity | Water in silicone | 68,000 | 10760 | 1900 | Shore A 47 | Shore A 59 |
| Ex. 6 | Water in silicone | 90,000 | 14610 | 1180 | Shore A 59 | Shore A 47 |
| CP9 | Water in silicone | 9,000 | 5770 | 1000 | None good | None good |
| CP8 | Oil in Water | 2,500 | 1250 | 265 | Shore A 47 | Shore A 59 |
| CP11 | Silicone in water | 20,000 | 7080 | 1130 | Shore 47 | Shore 59 |
| CP1 | Silicone in water | | | | Shore 47 | Shore 47 |

| Product | Applicator @ 6°/s | L* | C* | h | WI-ASTM | Visual scale assessment 6"/sec | Visual assessment | Brookfield Viscosity (cps) |
|---|---|---|---|---|---|---|---|---|
| Ex. 3 processed to be a higher viscosity | App #1 | 67.308 | 18.894 | 60.53 | -8.292 | 4 | | |
| Ex. 3 processed to be a higher viscosity | App #3 | 63.898 | 16.484 | 99.712 | -4.126 | 4 | | |
| Ex. 3 processed to be a higher viscosity | App #2 | 72.158 | 24.256 | 57.686 | -17.61 | 5 | best | 68,000 |
| Ex. 3 | App #1 | 63.118 | 23.302 | 56.698 | -15.154 | 4 | best | 19,000 |
| Ex. 3 | App#3 | 59.666 | 17.422 | 61.246 | -6.78 | 4 | | |
| Ex. 3 | App #2 | 60.518 | 17.858 | 61.234 | -7.09 | 4 | | |
| CP1 | App #1 | 61.948 | 19.91 | 60.104 | -10.598 | 4 | same | |
| CP1 | App #3 | 61.088 | 19.11 | 60.562 | -9.194 | 4 | same | |

(continued)

| Product | Applicator @ 6°/s | L* | C* | h | WI-ASTM | Visual scale assessment 6"/sec | Visual assessment | Brookfield Viscosity (cps) |
|---|---|---|---|---|---|---|---|---|
| CP1 | App #2 | 60.79 | 17.422 | 61.936 | -6.704 | 4 | same | |
| CP8 | App #1 | 52.878 | 22.622 | 59.808 | -13.898 | 5 | best | 2,500 |
| CP8 | App #3 | 51.98 | 19.08 | 62.69 | -9.97 | 4 | | |
| CP8 | App #2 | 52.902 | 22.48 | 59.524 | -13.698 | 5 | best | |
| CP11 | App #1 | 64.024 | 10.806 | 64.018 | 7.738 | 4 | | |
| CP11 | App #3 | 58.518 | 4.538 | 106.366 | 16.738 | 4 | | |
| CP11 | App #2 | 65.908 | 11.874 | 67.438 | 5.398 | 5 | best | 20,000 |

| Product Name | Applicator @ 6°/s | L* | C* | Visual scale assesment 6"/sec | Visual application | Viscosity |
|---|---|---|---|---|---|---|
| Ex. 7 | App #1 | 66.366 | 5.372 | 3 | Best | 30,000 |
| Ex. 7 | App #3 | 39.94 | 5.052 | 2 | | |
| Ex. 7 | App #2 | 50.802 | 5.582 | 3 | best | 30,000 |
| Ex. 6 | App #1 | 46.472 | 5.536 | 3 | | |
| Ex. 6 | App #3 | 59.97 | 5916 | 5 | best | 90,000 |
| Ex. 6 | App #2 | 66.92 | 5.418 | 4 | | |

The CIE Lch Colour Space or Colour Model

**[0066]** The L* axis represents Lightness. This is vertical; from 0, which has no lightness (i.e. absolute black), at the bottom; through 50 in the middle, to 100 which is maximum lightness (i.e. absolute white) at the top.

**[0067]** The c* axis represents Chroma or 'saturation'. This ranges from 0 at the centre of the circle, which is completely unsaturated (i.e. a neutral grey, black or white) to 100 or more at the edge of the circle for very high Chroma (saturation) or 'colour purity'.

**[0068]** The h* axis represents Hue. If we take a horizontal slice through the centre, cutting the 'sphere' ('apple') in half, we see a coloured circle. Around the edge of the circle we see every possible saturated colour, or Hue. This circular axis is known as h° for Hue. The units are in the form of degrees° (or angles), ranging from 0° (red) through 90° (yellow), 180° (green), 270° (blue) and back to 0°.

| Formulation | Type (O/W, W/O, Si/O etc) | Viscosity | Total Pigment, TiO2 & talc levels | TiO2 levels | Hair softeners in formualtion and conc tested | Film forming polymers in formulation and conc tested |
|---|---|---|---|---|---|---|
| Water | | | | | | |
| Ex. 3 | Water in silicone | 82,500 Cps (BB) & 51,800 Cps (SH) | 8.19% | 4.5% pigmentary 1.26% SPF | 5.0% Isotridecyl Isononanoate, 2.5% Pentanediol, 0.5% Hexanediol, 2.0%Ethylhexy 1 Methoxycinna mate | 4.0% KF-7312J (Trimethysiloxysili cate) |
| Ex. 3 with 3.5% TiO2 | Water in silicone | 32,000 Cps | 8.19% | 3.5% pigmentary 1.26% SPF | Same as above | 4.0% KF-7312J (Trimethysiloxysili cate) |

(continued)

| Formulation | Type (O/W, W/O, Si/O etc) | Viscosity | Total Pigment, TiO2 & talc levels | TiO2 levels | Hair softeners in formualtion and conc tested | Film forming polymers in formulation and conc tested |
|---|---|---|---|---|---|---|
| Water | | | | | | |
| Ex. 3 with 4.0% TiO2 | Water in silicone | 46,000 Cps | 8.19% | 4.0% pigmentary 1.26 % SPF (Less for ethnic) | Same as above | 4.0% KF-7312J (Trimethysiloxysilicate) |
| Ex. 3 with 4.5% TiO2 | Water in silicone | 60,000 Cps | 8.19% | 4.5% pigmentary 1.215% SPF | Same as above | 4.0% KF-7312J (Trimethysiloxysilicate) |
| CP8 | Oil in water | RVT SP#3, 20 rpm, 1 min Dial 16-55 | 13 - 13.8% pigments & talc | ≈ 5 - 9.0% TiO2 | 5.66% Mineral Oil, 8.5% Isopropyl Myristate, (≈5-7%*) Propylene Glycol | None |
| CP10 | Water in silicone | Target 8,500 Cps | ≈ 13.5 % | 8.50% Total TiO2 | 8.0 % Propyl Glycol, 3% Glycerin 2.0% Cetyl Octanoate | None |
| CP6 | | | | | | |
| CP12 | Water in silicone | 10,000 - 40,000 Cps | | 0.5% - 6.0% | 8.0% Propylene Glycol | PVP K17 (Polyvinylpyrolidone) |
| CP11 | Silicone in Water | | Varies | 3.0 - 8.2% | 2.04% PCA Dimethicone, 7.142% Tridecyl Neopentanoate , 5.0% Propylene Glycol | |
| *Varies across shade palette | | | | | | |

Film Forming Polymers

| Name | Vendor | Description |
|---|---|---|
| KF-7312J | Shin-Etsu | Mixture of 50% Trimethylsiloxysilicate and 50% cyclopentasiloxane. |
| 5000SJ | Kobo | Acrylates/Ethylhexyl Acrylate Copolymer |
| KP550 | Shin-Etsu | Isododecane (and) Acrylate/ Dimethicone Copolymer |
| X-21-5595 | Shin-Etsu | Mixture of Trimethylsiloxysilicate (60%) and Isododecane (40%). |
| KP545 | Shin-Etsu | Cyclopentasiloxane (and) Acrylate/ Dimethicone Copolymer |
| DC670 | Dow Corning | Approximately 50 percent cyclopentasiloxane and approximately 50 percent polypropylsilsesquioxane |
| DC593 | Dow Corning | Blend of polydimethylsiloxane and high molecular weight silicone resin |
| KF7312J | Shin Etsu | Trimethlsiloxsilicate and cyclopentasiloxane |

Methods of Application

**[0069]** An advantage of the embodiments is the flexibility in how the applicator may be used to apply a skin care

composition to a face. Based on Applicant's unpublished consumer research, many women are unsatisfied with prior art applicators (for various reasons) and will even resort to simply using their finger(s). Indeed the human face has a complicated geometry. Areas around the nose need a relatively small applicator whereas a cheek is a relatively large area that lends itself to applicators that cover broader areas. Having an applicator that also is efficient, i.e., minimizes application time, is also desired by many women. Therefore, there is is a need to provide an applicator, that not only that provides hair lay-down benefits, but also is adaptable to the complex geometry of the human face.

**[0070]** Turning to Figures 8a and 8b, the applicator (1) lends itself to applying skin compositions to the relatively confining skin areas around the nose and around the eye (49) where more precise control is desirable. In one embodiment, as illustrated in Figure 8b, the user may lay a index finger (41) along the major axis of the applicator (1) on first surface (31) of the applicator (1). The index finger (41) or fore finger is located between a user's middle finger (42) and thumb (43). Although not shown, the user may then roll the opposing edges of the minor axis of the applicator (1) by way of the middle finger (42) and the thumb (43) so the applicator (1) rolls at least partially around the index finger (41) and his held in the position by pressure being exerted by the thumb (43) and middle finger (42) on to the applicator (1) against the index finger (41). The use of this configuration is shown in Figure 8a where the user is essentially using her index finger (41) to apply the applicator to the area between the nose (44) and cheek (45), wherein the second surface (32) of the applicator (1) is making contact with the target facial skin.

**[0071]** The index finger is typically not completely along the length of the applicator (i.e., along the major axis) as to allow some portion of the second surface (32) of the applicator (1) to make contact with the target skin area. This way, a portion of the applicator can bend and conform around relatively confining areas of face (e.g., nose intersecting the cheek). Although not shown in Figures 8a and 8b, there are a number of variations that within the scope of the methods described herein. For example, the index finger (41) may be along the minor axis of the applicator (1). Alternatively, the index finger (41) may be placed along the second surface (32) of the applicator. How much the index finger goes across the major or minor axis of the applicator (1), and how much the applicator (1) rolls around the index finger (41) may be best left to the user's own preferences.

**[0072]** Figures 9a and 9b are directed to an alternative method. Figure 9b demonstrates the user rolling the applicator (1) into a roll by pressing either side of the first surface (31) of the applicator (1) along the minor axis between the index finger (41) and the thumb (43) to form a pinched roll shape. The use of this configuration is shown in Figure 9a where the user contacts the second surface (32) of the applicator (31) to the skin area between the nose (44) and the cheek (47).

**[0073]** Figures 10a and 10b are directed to a method that is likely best used for broader areas of the face such as cheeks (47). Figure 10b illustrates the user's thumb (43) contacting the second surface (32) of the applicator (1), and the index finger (1) and the middle finger (42) contacting the first surface (31) of the applicator (1) essentially straddling the thumb (43). Pressure exerted between the index finger (41) and the middle finger (42), and that of the thumb (43) with the applicator (1) there between, holds the applicator (1) in place during use and generally provides a curved shape to the applicator (1). The fingers (41,42) are generally not along the entire major axis of the applicator (1), but rather, some area of the applicator (1) is left without contacting the fingers (41 and 42) to allow a portion of the circumferential edge (not show) of the applicator (10) to better follow the contours of the face during application. The use of this configuration is shown in Figure 10a. The user gripps the applicator (1) between her fingers (41 and 42) and thumb (43), and guides the applicator (1) along her cheek (47). It is the second surface (32) of the applicator (1) that is making contact with the skin of her cheek (47).

**[0074]** Figures 11a and 11b are directed to a method that is likely best for broader areas of the face such as cheeks. Figure 11b illustrates the user's thumb (43) contacting the second surface (32) of the applicator (1), and the index finger (41), the middle finger (42) and the ring finger (49) generally along the major axis of the applicator (1) contacting the first surface (31) of the first applicator (1). The ring finger (49) is next to the middle finger (42). Pressure exerted between the index finger (41), middle finger (42), and ring finger (49) and that of the thumb with the applicator there between, holds the applicator (1) in place during use and generally provides a curved shape to the applicator (1). The fingers (41, 42, and 49) are generally not along the entire major axis of the applicator (1), but rather, some area of the applicator (1) is left without contacting the fingers (41,42, and 49) to allow a portion of the circumferential edge (not show) of the applicator (10) to better following the contours of the face during application. The use of this configuration is shown in Figure 11b. The user grips the applicator (1) between her three fingers (41, 42, and 49) and thumb (43), and guides the applicator (1) along her cheek (47). It is the second surface (32) of the applicator (1) that is making contact with the skin of her cheek (47).

**[0075]** A user can interchange between any one of these methods during a single facial application event.

**[0076]** One aspect of the embodiments provides for a method of hair minimization or hair lay-down benefits to a face, preferably a human female face, comprising the step of topically applying a composition, preferably film-forming composition, to the face by an applicator of the present invention. In one embodiment, the method further comprises the step of assessing a directional axis of facial hair growth; and where the step of topically applying the composition with the applicator is conducted along the assessed directional axis of the facial hair growth. Without wishing to be bound by theory, the hair minimization or hair lay-down benefit is optimized by such an approach.

Kit

**[0077]** A non-limiting example of a kit containing an applicator and facial skin care composition is provided as Figure 7. The composition is fine facial hair minimizing foundation. The foundation minimizes the appearance of fine facial hair when used in combination with the applicator. The kit may advertise: "Combined foundation coverage with a hair softening serum and smoothing applicator to cover fine facial hair so it's less noticeable. The foundation instantly evens skintone upon application, yet feels smooth, comfortable, and lightweight." Copyright P&G 2012. The applicator may be a multiuse article that can be cleaned (e.g., soap and water) between uses. In one embodiment, the applicator and skin care composition are sold separately.

Instructions for Use

**[0078]** Instructions may be provided in the kit or with the applicator. Instructions instruct the user how to use the applicator and optionally the skin care composition (preferably consistent with the methods described herein). Further, the user may be instructed to apply the skin care composition with the applicator along a directional axis of facial hair growth.

**[0079]** In one embodiment, the user is instructed to dose from 0.05 ml to 0.25 ml of the skin care composition, alternatively from 0.1 ml to 0.2 ml, alternatively from 0.05 ml to 2 ml, alternatively combinations thereof. In another embodiment, the user is instructed to dose from 0.05 g to 0.25 g of the skin care composition, alternatively from 0.1 g to 0.2 g. The container containing the skin care composition may contain from 10 ml to 100 ml, alternatively from 20 ml to 50 ml, alternatively from 15 ml to 35 ml.

**[0080]** For optimal for skin lay-down benefits, it is best to apply the skin care composition with the applicator along the direction of the any hair growth (i.e., hair growth grain). A non-limiting example of use instructions include: "To Use: Check the direction of any facial hair growth. Use the applicator to apply the foundation where you normally would, but ensure you apply in the same direction as the facial hair growth and fully cover facial hair for best hair lay down." P&G Copyright 2012.

**[0081]** Directions may also include those described in the U.S. Patent Application Publication claiming benefit to U.S. Provisional Application Ser. No. 61/652976, filed May 30, 2012, entitled "Cosmetic Products for Reducing Hair Appearance," to Tanaka et al. (attorney docket no. P&G AA834P).

**[0082]** The dimensions and values disclosed herein are not to be understood as being strictly limited to the exact numerical values recited. Instead, unless otherwise specified, each such dimension is intended to mean both the recited value and a functionally equivalent range surrounding that value. For example, a dimension disclosed as "40 mm" is intended to mean "about 40 mm."

**[0083]** Every document cited herein, including any cross referenced or related patent or application, is hereby incorporated herein by reference in its entirety unless expressly excluded or otherwise limited. The citation of any document is not an admission that it is prior art with respect to any invention disclosed or claimed herein or that it alone, or in any combination with any other reference or references, teaches, suggests or discloses any such invention. Further, to the extent that any meaning or definition of a term in this document conflicts with any meaning or definition of the same term in a document incorporated by reference, the meaning or definition assigned to that term in this document shall govern.

**[0084]** While particular embodiments of the present invention have been illustrated and described, it would be obvious to those skilled in the art that various other changes and modifications can be made without departing from the spirit and scope of the invention. It is therefore intended to cover in the appended claims all such changes and modifications that are within the scope of this invention.

## Claims

1. An applicator (1) configured for topically applying a composition to a face comprising: a first surface (31) and an opposing second surface (32) configured to make contact with the skin or facial substrate;
   wherein the applicator is non-porous, free of a non-woven material, and free of an adhesive; wherein the second surface (32) is a concave surface, being configured to contain a volume from 0.1 ml to 10 ml;
   wherein the first surface (31) is generally convex;
   wherein the first surface (31) and the second surface (32) each comprise a non-absorbing elastomeric material;
   wherein the applicator has a curvilinear shape as defined by a circumferential edge (9), said curvilinear shape being elliptical;
   wherein the applicator has a length from 45 mm to 70 mm, and a thickness not exceeding 6mm.

2. The applicator (1) of claim 1, the second surface is configured to contain a volume from 1 ml to 8 ml.

3. The applicator (1) of claim 1, wherein the applicator has a length from 50 mm to 65 mm; and a thickness not exceeding 6 mm, preferably not exceeding 5 mm, more preferably where the thickness is from 1 mm to 5 mm.

4. The applicator (1) of claim 1, wherein the elastomeric nonabsorbing material comprises a polymer containing a heteroatom, preferably the elastomeric material is selected from the group consisting of thermoplastic elastomers, urethanes, robbers, polyvinylchloride, polyurethanes, polyamides, polyesters, polyacrylates, and polycarbonates, and more preferably the material comprises a hydrogenated styrene butadiene block copolymer and optionally a silicone fluid.

5. The applicator (1) of claim 1, wherein:

(a) the applicator is elliptical shaped as defined by circumferential edge (9);
(b) the applicator has a length from 50 mm to 65 mm; and a width from 50 mm to 65 mm;
(c) the applicator has a thickness not exceeding 5 mm;
(d) the non-absorbing concave surface of the applicator is configured to contain a volume from 0. 1 ml to 8 ml;
(e) the applicator further comprising as inner zone (3) and an outer zone (6), wherein the outer zone (6) is defined between the circumferential edge (9) and the inner zone (3), wherein the inner zone (3) is thicker than the outer zone (6);
(f) a thickest portion of the applicator (1) is in center of the applicator and is from 1 mm to 5 mm.

6. The applicator (1) of claim 5, wherein the intersection of the outer zone (6) and inner zone (3) is defined by a inter-zone border (13), wherein the inter-zone border defines a curvilinear shape.

7. The applicator (1) of claim 6, wherein the first surface (31) has a first bending force measured at the circumferential edge (9), and the second surface (32) has a second bending force measured at the circumferential edge (9), wherein the second bending force is from 2 to 5 times greater than the first bending force; and wherein the material comprises a hydrogenated styrene butadiene block copolymer and a silicone fluid.

8. A method of providing hair minimization to a face comprising the step of topically applying a film-forming composition to the face by the applicator of any preceding claims.

9. The method of claim 8, wherein the film-forming composition has a Brookfteld viscosity from 1,000 cps to 200,000 cps, preferably from 15,000 cps to 90,000 cps.

10. The method of claim 8, wherein the film-forming composition at a shear rate of 10 $s^{-1}$ has a viscosity from 100 cps to 15,000 cps, preferably from 1500 cps to 8000 cps.

11. The method of claim 8, wherein the film-forming composition at a shear rate of 100 $s^{-1}$ has a viscosity from 100 cps to 12,000 cps, preferably from 500 cps to 1000 cps.

12. The method of claim 8, wherein the applicator has a Shore A hardness of about 39 to 45, and further, wherein the film-forming composition has a viscosity of about 15,000 cps to 40,000 cps.

13. A kit comprising an applicator of claim 1; a container containing a skin care composition; and optionally, use instructions.

**Patentansprüche**

1. Applikator (1), der zum topischen Auftragen einer Zusammensetzung auf ein Gesicht konfiguriert ist, umfassend: eine erste Oberfläche (31) und eine gegenüberliegende zweite Oberfläche (32), die zum Kontakt mit dem Haut- oder Gesichtssubstrat konfiguriert sind;

wobei der Applikator nicht porös ist, frei von einem Vliesmaterial und frei von einem Klebstoff ist;
wobei die zweite Oberfläche (32) eine konkave Oberfläche ist, die so konfiguriert ist, dass sie ein Volumen von 0,1 ml bis 10 ml enthält;
wobei die erste Oberfläche (31) im Allgemeinen konvex ist;
wobei die erste Oberfläche (31) und die zweite Oberfläche (32) jeweils ein nicht absorbierendes elastomeres

Material umfassen;
wobei der Applikator eine krummlinige Form hat, wie durch eine Umfangskante (9) definiert, wobei die krummlinige Form elliptisch ist;
wobei der Applikator eine Länge von 45 mm bis 70 mm und eine Dicke von nicht mehr als 6 mm aufweist.

**2.** Applikator (1) nach Anspruch 1, wobei die zweite Oberfläche so konfiguriert ist, dass sie ein Volumen von 1 ml bis 8 ml enthält.

**3.** Applikator (1) nach Anspruch 1, wobei der Applikator eine Länge von 50 mm bis 65 mm aufweist; und eine Dicke von nicht mehr als 6 mm, vorzugsweise nicht mehr als 5 mm, besonders bevorzugt, wenn die Dicke 1 mm bis 5 mm beträgt.

**4.** Applikator (1) nach Anspruch 1, wobei das elastomere nicht absorbierende Material ein Polymer umfasst, das ein Heteroatom enthält, wobei das elastomere Material vorzugsweise aus der Gruppe ausgewählt ist, die aus thermoplastischen Elastomeren, Urethanen, Räubern, Polyvinylchlorid, Polyurethanen, Polyamiden, Polyestern, Polyacrylaten und Polycarbonaten besteht, und bevorzugter das Material ein hydriertes Styrol-Butadien-Blockcopolymer und gegebenenfalls ein Silikonfluid umfasst.

**5.** Applikator (1) nach Anspruch 1, wobei:

(a) der Applikator, wie durch die Umfangskante (9) definiert, elliptisch geformt ist;
(b) der Applikator eine Länge von 50 mm bis 65 mm; und eine Breite von 50 mm bis 65 mm aufweist;
(c) der Applikator eine Dicke von nicht mehr als 5 mm aufweist;
(d) die nicht absorbierende konkave Oberfläche des Applikators so konfiguriert ist, dass sie ein Volumen von 0,1 ml bis 8 ml enthält;
(e) der Applikator ferner eine innere Zone (3) und eine äußere Zone (6) umfasst, wobei die äußere Zone (6) zwischen der Umfangskante (9) und der inneren Zone (3) definiert ist, wobei die innere Zone (3) dicker als die äußere Zone (6) ist;
(f) ein dickster Abschnitt des Applikators (1) sich in der Mitte des Applikators befindet und zwischen 1 mm und 5 mm dick ist.

**6.** Applikator (1) nach Anspruch 5, wobei der Schnittpunkt der äußeren Zone (6) und der inneren Zone (3) durch eine Interzonengrenze (13) definiert ist, wobei die Interzonengrenze eine gekrümmte Form definiert.

**7.** Applikator (1) nach Anspruch 6, wobei die erste Oberfläche (31) eine erste an der Umfangskante (9) gemessene Biegekraft aufweist und die zweite Oberfläche (32) eine zweite an der Umfangskante (9) gemessene Biegekraft aufweist, wobei die zweite Biegekraft 2 bis 5 mal größer ist als die erste Biegekraft; und wobei das Material ein hydriertes Styrol-Butadien-Blockcopolymer und eine Silikonflüssigkeit umfasst.

**8.** Verfahren zur Bereitstellung einer Haarminimierung für ein Gesicht, umfassend den Schritt des topischen Aufbringens einer filmbildenden Zusammensetzung auf das Gesicht durch den Applikator nach einem der vorhergehenden Ansprüche.

**9.** Verfahren nach Anspruch 8, wobei die filmbildende Zusammensetzung eine Brookfteld-Viskosität von 1.000 cps bis 200.000 cps, vorzugsweise von 15.000 cps bis 90.000 cps aufweist.

**10.** Verfahren nach Anspruch 8, wobei die filmbildende Zusammensetzung bei einer Schergeschwindigkeit von 10 $s^{-1}$ eine Viskosität von 100 cps bis 15.000 cps, vorzugsweise von 1.500 cps bis 8.000 cps aufweist.

**11.** Verfahren nach Anspruch 8, wobei die filmbildende Zusammensetzung bei einer Schergeschwindigkeit von 100 $s^{-1}$ eine Viskosität von 100 cps bis 12.000 cps, vorzugsweise von 500 cps bis 1.000 cps aufweist.

**12.** Verfahren nach Anspruch 8, wobei der Applikator eine Shore-A-Härte von etwa 39 bis 45 aufweist und ferner die filmbildende Zusammensetzung eine Viskosität von etwa 15.000 cps bis 40.000 cps aufweist.

**13.** Kit, umfassend einen Applikator nach Anspruch 1; einen Behälter, der eine Hautpflegezusammensetzung enthält; und optional Gebrauchsanweisungen.

## Revendications

1. Applicateur (1) configuré pour l'application topique d'une composition sur un visage comprenant : une première surface (31) et une seconde surface opposée (32) configurées pour établir un contact avec le substrat cutané ou facial ;
où l'applicateur est non poreux, dépourvu de matériau non tissé et dépourvu d'adhésif;
où la seconde surface (32) est une surface concave, configurée pour contenir un volume de 0,1 ml à 10 ml ;
où la première surface (31) est généralement convexe ;
où la première surface (31) et la seconde surface (32) comprennent chacune un matériau élastomère non absorbant ;
où l'applicateur a une forme curviligne telle que définie par un bord circonférentiel (9), ladite forme curviligne étant elliptique ;
où l'applicateur a une longueur comprise entre 45 mm et 70 mm et une épaisseur n'excédant pas 6 mm.

2. Applicateur (1) selon la revendication 1, la seconde surface est configurée pour contenir un volume de 1 ml à 8 ml.

3. Applicateur (1) selon la revendication 1, dans lequel l'applicateur a une longueur comprise entre 50 mm et 65 mm ; et une épaisseur ne dépassant pas 6 mm, de préférence ne dépassant pas 5 mm, idéalement où l'épaisseur est comprise entre 1 mm et 5 mm.

4. Applicateur (1) selon la revendication 1, dans lequel le matériau élastomère non absorbant comprend un polymère contenant un hétéroatome, de préférence le matériau élastomère est choisi dans le groupe composé d'élastomères thermoplastiques, d'uréthanes, de caoutchoucs, de polychlorure de vinyle, de polyuréthannes, de polyamides, de polyesters, de polyacrylates, et de polycarbonates, et idéalement le matériau comprend un copolymère bloc styrène-butadiène hydrogéné, et éventuellement un fluide de silicone.

5. Applicateur (1) selon la revendication 1, dans lequel :

(a) l'applicateur est de forme elliptique tel que défini par un bord circonférentiel (9) ;
(b) l'applicateur a une longueur comprise entre 50 mm et 65 mm ; et une largeur comprise entre 50 mm à 65 mm ;
(c) l'applicateur a une épaisseur n'excédant pas 5 mm ;
(d) la surface concave non absorbante de l'applicateur est configurée pour contenir un volume compris entre 0,1 ml et 8 ml ;
(e) l'applicateur comprenant en outre une zone interne (3) et une zone externe (6), où la zone externe (6) est définie entre le bord circonférentiel (9) et la zone interne (3), où la zone interne (3) est plus épaisse que la zone externe (6) ;
(f) une partie la plus épaisse de l'applicateur (1) se trouve au centre de l'applicateur et mesure de 1 mm à 5 mm.

6. Applicateur (1) selon la revendication 5, dans lequel l'intersection de la zone externe (6) et de la zone interne (3) est définie par une bordure interzone (13), où la bordure interzone définit une forme curviligne.

7. Applicateur (1) selon la revendication 6, dans lequel la première surface (31) exerce une première force de flexion mesurée au niveau du bord circonférentiel (9) et la seconde surface (32) exerce une seconde force de flexion mesurée au niveau du bord circonférentiel (9), dans lequel la seconde force de flexion est de 2 à 5 fois supérieure à la première force de flexion ; et dans lequel le matériau comprend un copolymère bloc styrène-butadiène hydrogéné et un fluide de silicone.

8. Procédé de réduction capillaire sur un visage comprenant l'étape consistant en l'application topique d'une composition filmogène sur le visage au moyen de l'applicateur selon l'une quelconque des revendications précédentes.

9. Procédé selon la revendication 8, dans lequel la composition filmogène a une viscosité Brookfteld comprise entre 1 000 et 200 000 cps, de préférence entre 15 000 et 90 000 cps.

10. Procédé selon la revendication 8, dans lequel la composition filmogène à un taux de cisaillement de 10 $s^{-1}$ a une viscosité comprise entre 100 cps et 15 000 cps, de préférence entre 1 500 cps et 8 000 cps.

11. Procédé selon la revendication 8, dans lequel la composition filmogène à un taux de cisaillement de 100 $s^{-1}$ a une viscosité comprise entre 100 cps et 12 000 cps, de préférence entre 500 cps et 1 000 cps.

**12.** Procédé selon la revendication 8, dans lequel l'applicateur a une dureté Shore A d'environ 39 à 45 et, en outre, dans lequel la composition filmogène a une viscosité d'environ 15 000 cps à 40 000 cps.

**13.** Kit comprenant un applicateur selon la revendication 1 ; un récipient contenant une composition de soin cutané ; et éventuellement, des instructions d'utilisation.

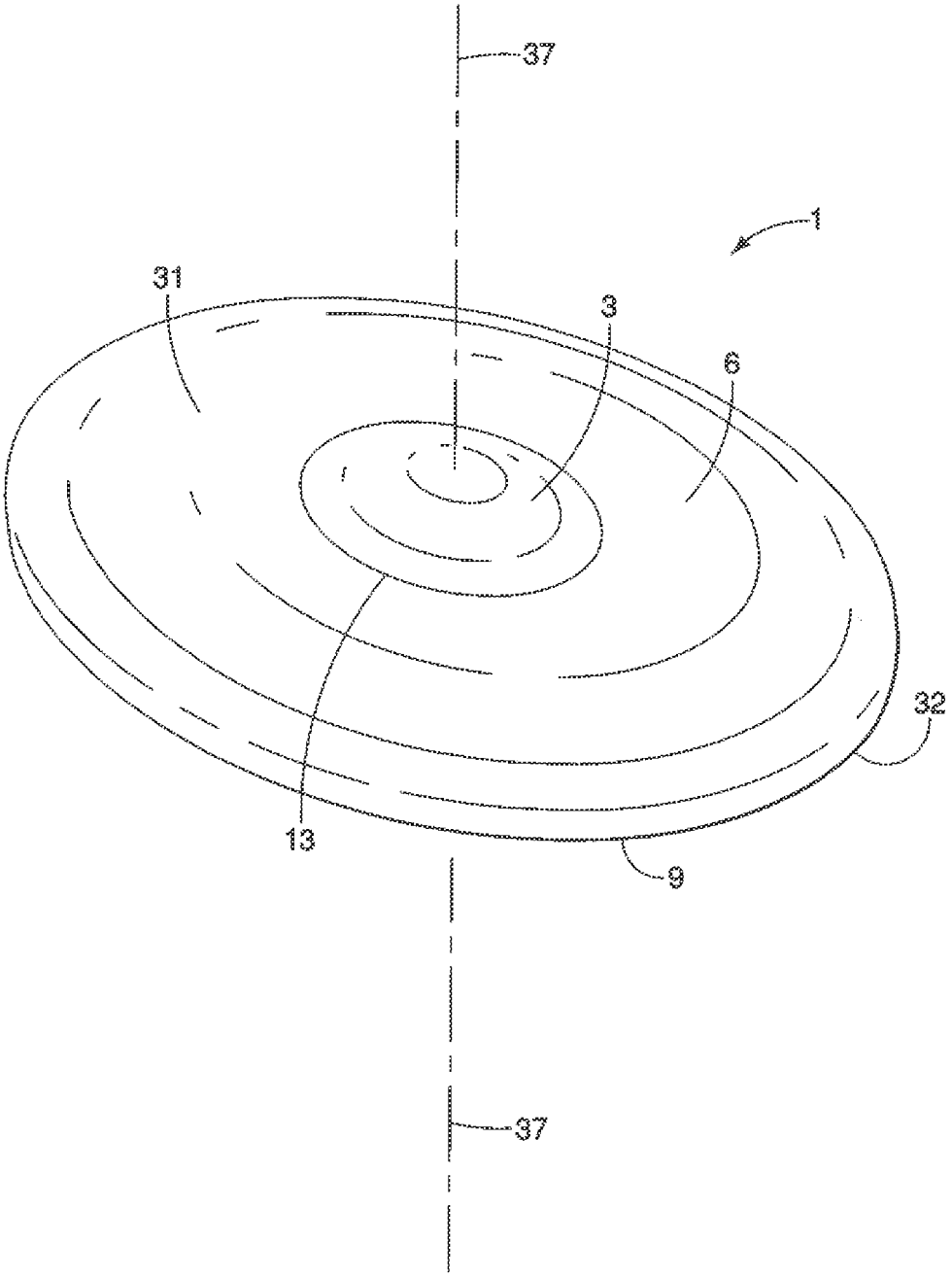



Figure 1

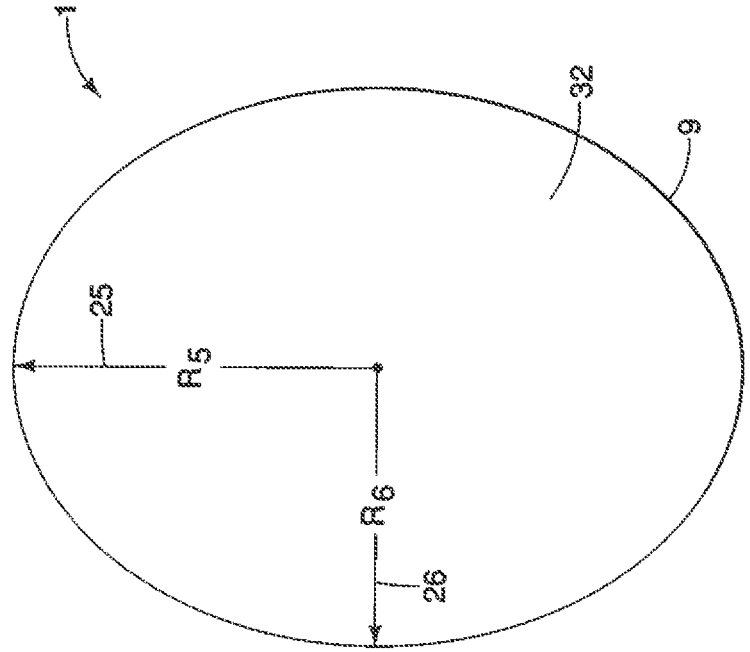



Figure 3

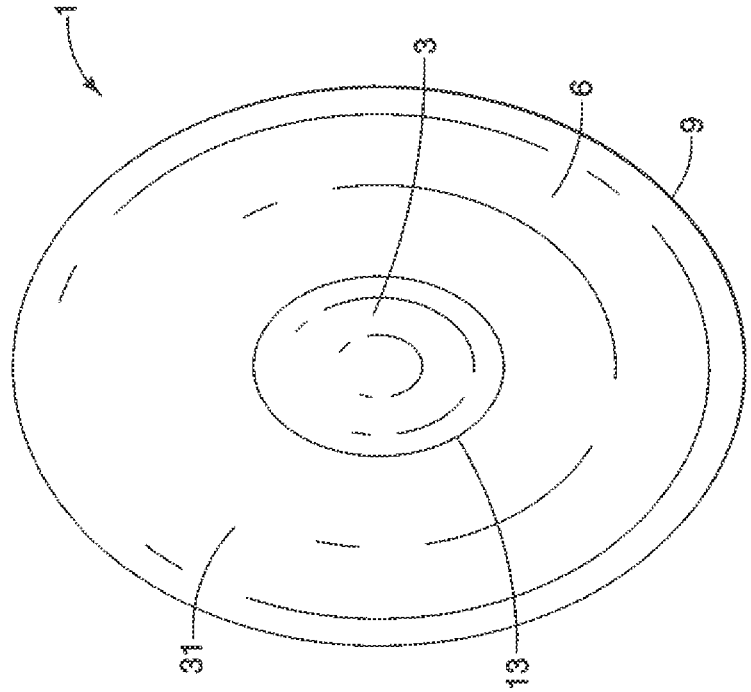



Figure 2

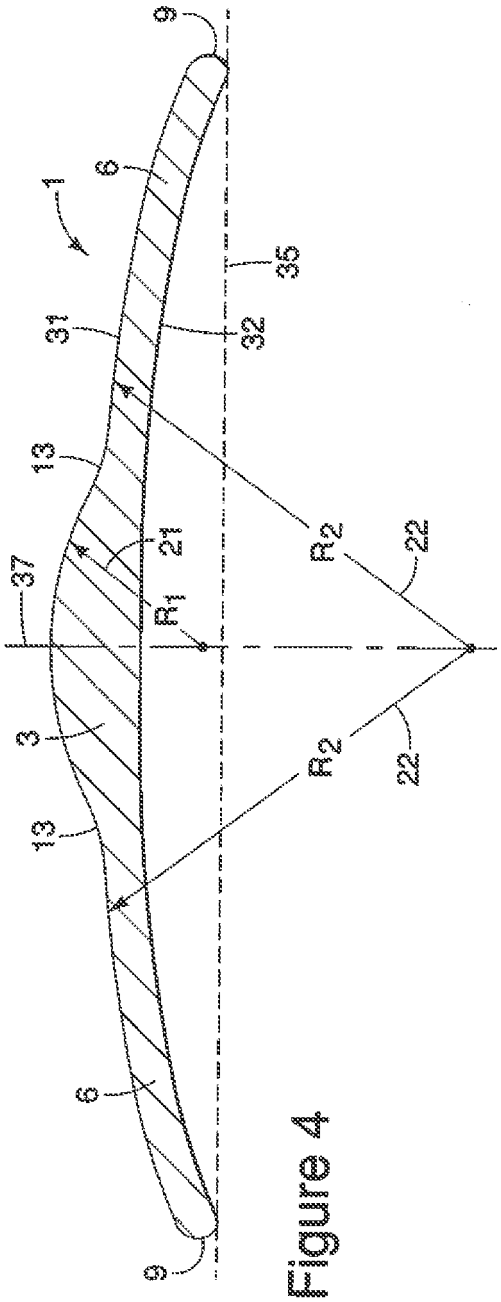



Figure 4

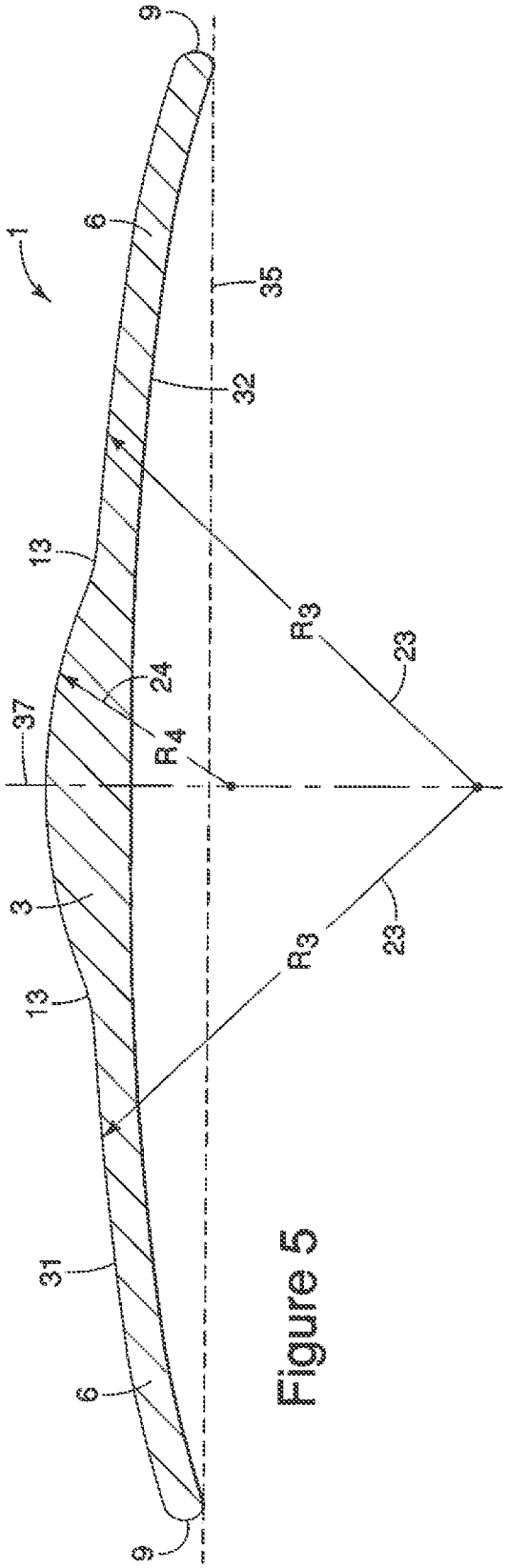



Figure 5

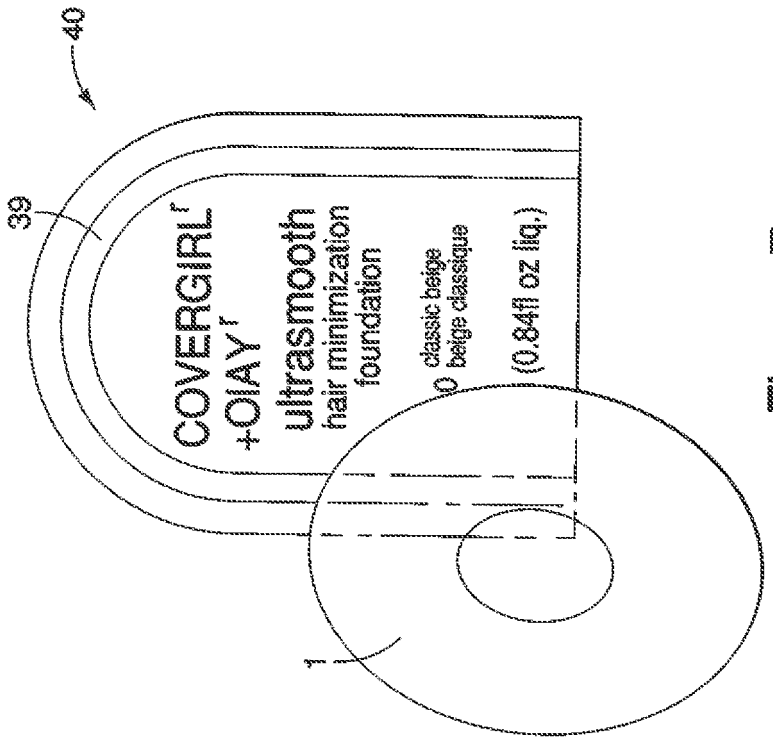



Figure 7

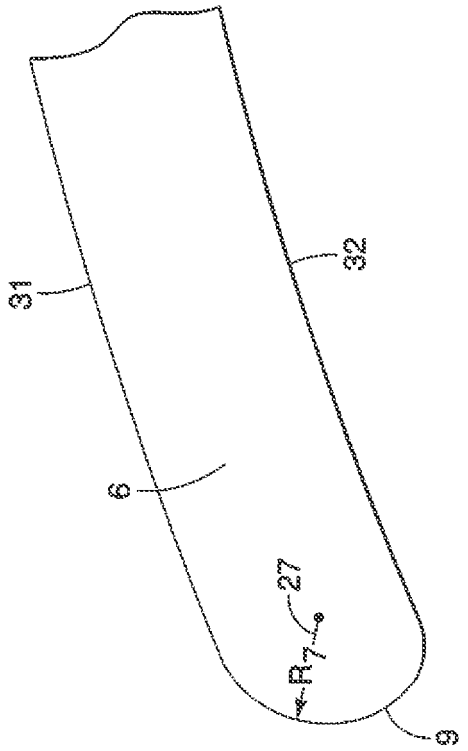



Figure 6

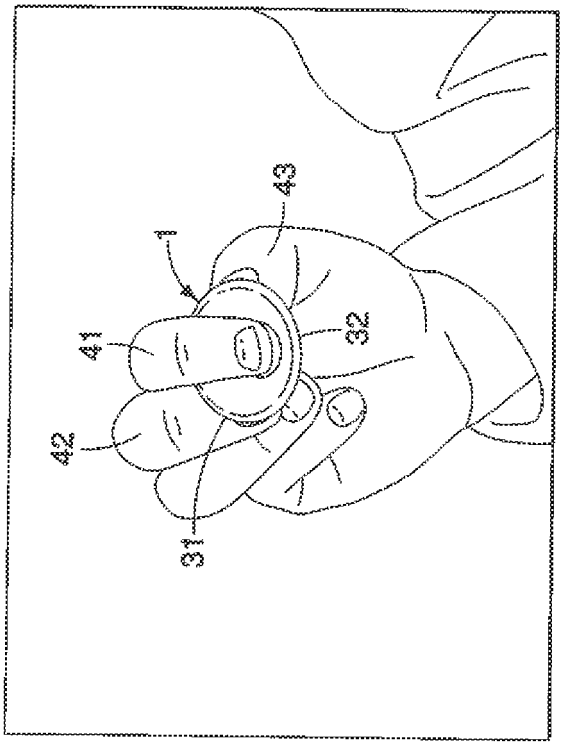



Figure 8b

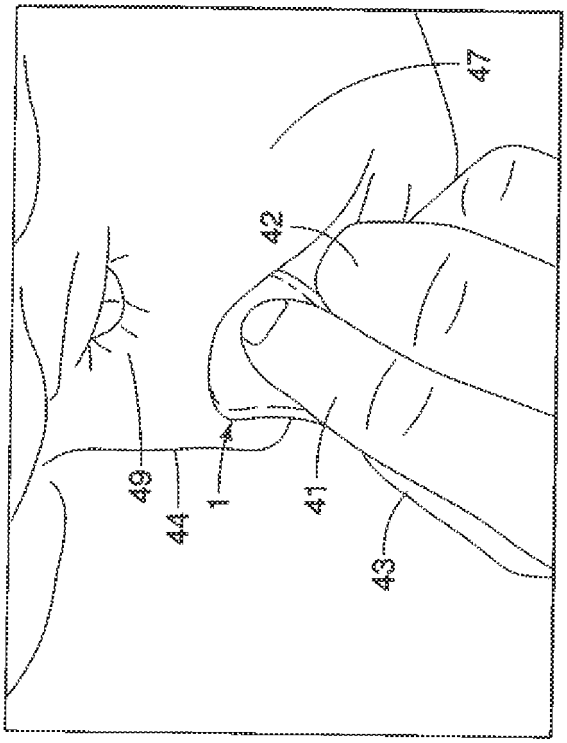



Figure 8a

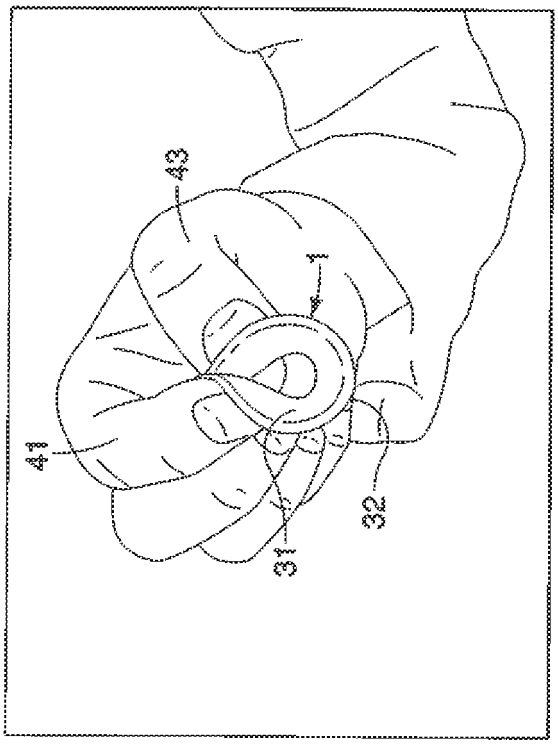



Figure 9b

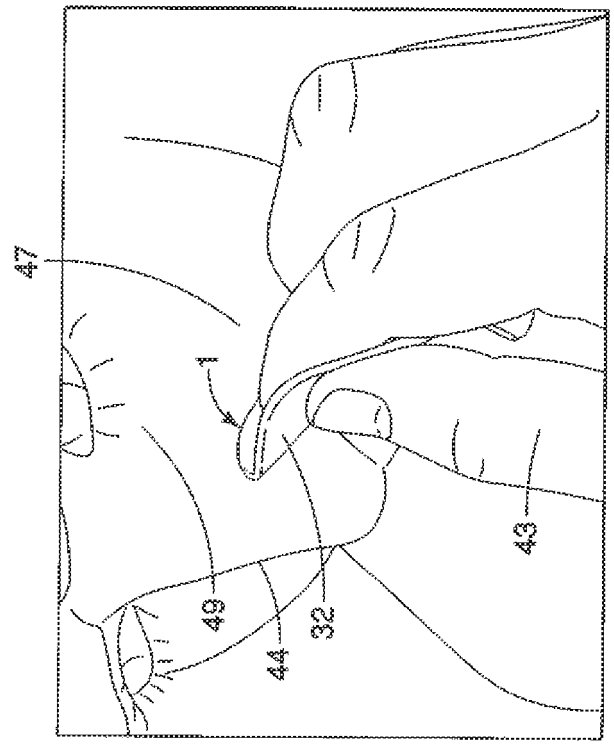



Figure 9a

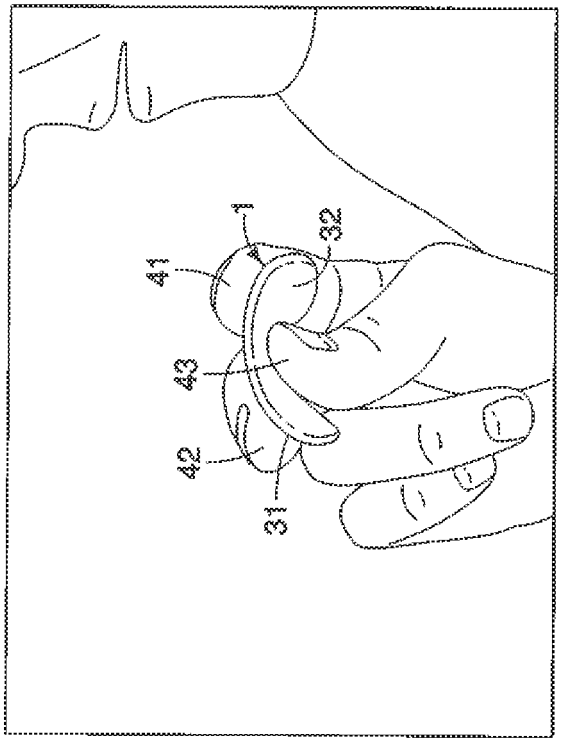



Figure 10b

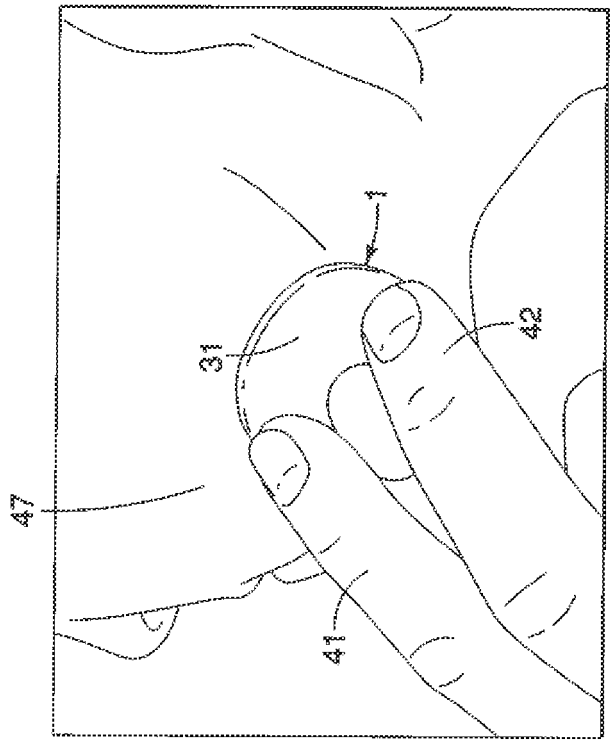



Figure 10a

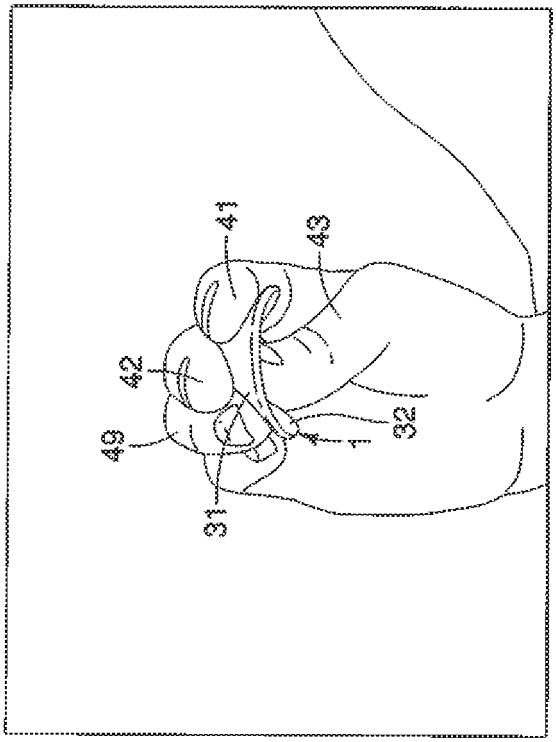



Figure 11b

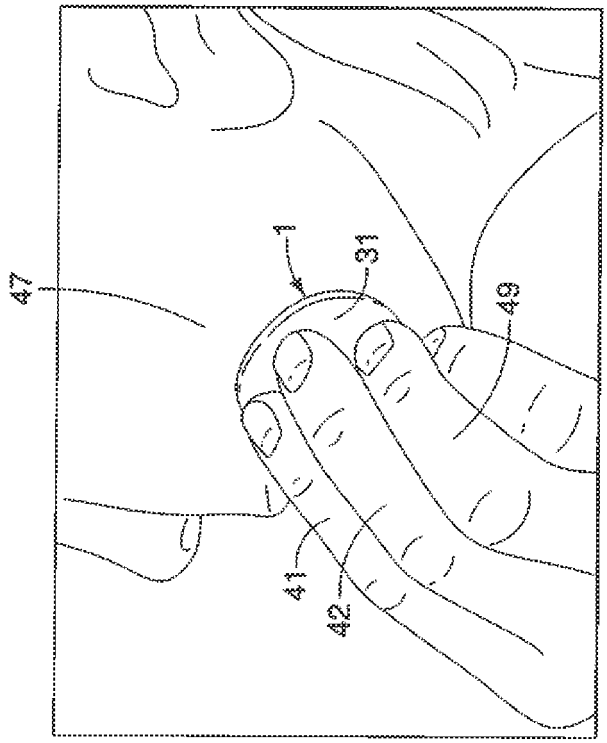
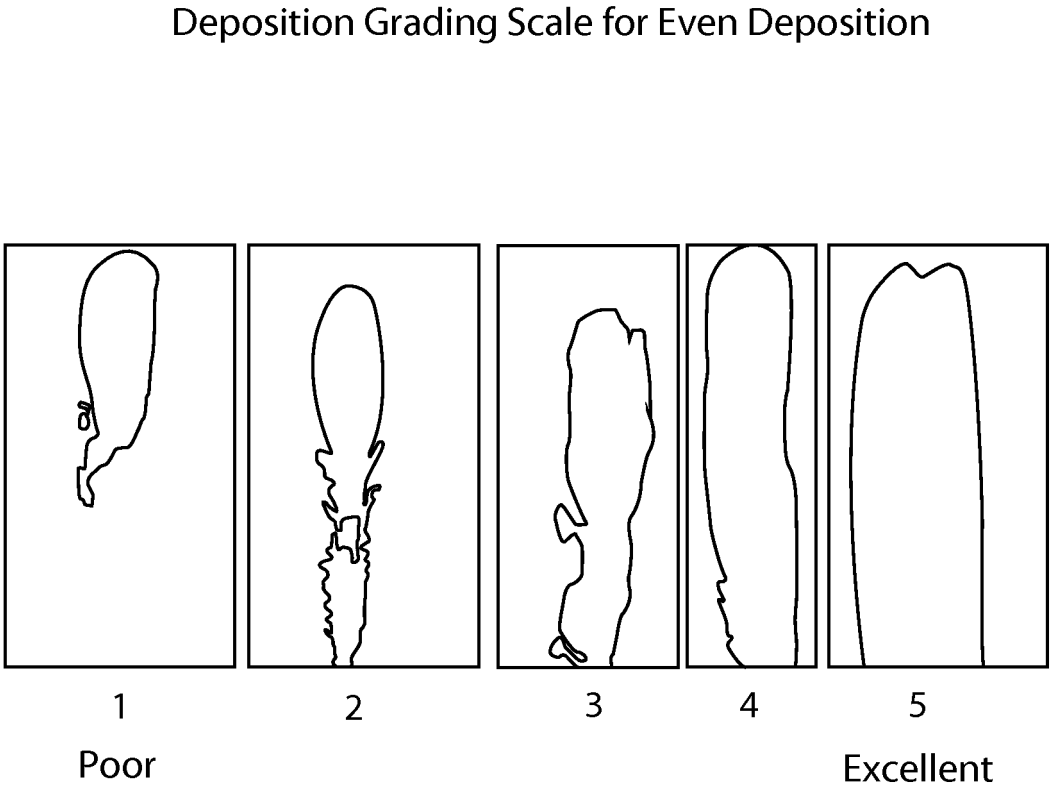



Figure 11a

# Figure 12


Deposition Grading Scale for Even Deposition
1
2
3
4
5
Poor
Excellent

## REFERENCES CITED IN THE DESCRIPTION

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### Patent documents cited in the description


- EP 2486821 A **[0001]**
- WO 9717057 A **[0046] [0057]**
- WO 9852515 A **[0046]**
- US 20050255059 A1 **[0057]**
- US 20050238679 A1 **[0057]**
- US 61652976 A **[0081]**