COSMETIC PRODUCT APPLICATOR

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ABSTRACT

A cosmetic product applicator, typically for mascara, includes a) a cap, typically threaded, b) a longitudinal stem in an axial direction, and c) a brush including an axial support and an application material securely attached to the support by means of a method of attachment, the application material typically forming a multitude of bristles or tufts of bristles, the longitudinal stem being securely attached, at its upper extremity, of the cap and, at its lower extremity, of the axial support of the brush. It is characterized in that the support is made of plastic including part or all of the means of attachment, and in that the application material includes a multitude of bristles or tufts of bristles.
COSMETIC PRODUCT APPLICATOR

FIELD OF THE INVENTION

[0001] The invention involves the field of cosmetic product applicators, typically, mascara.

DESCRIPTION OF RELATED ART

[0002] Mascara applicators are typically designed to operate in conjunction with the neck of a recipient mascara container.

[0003] These applicators consist of a) a cap, typically threaded, designed to operate in conjunction with the said neck of the recipient in order to seal the recipient by screwing in an axial direction to the said neck, b) a stem longitudinal in relation to the said axial direction, and c) a brush consisting of an axial support and a multiplicity of bristles or tufts of bristles, the said longitudinal stem being connected at its said upper extremity to the said cap and at its said lower extremity to the said support of the said brush.

[0004] As it is well known by persons skilled in the field, the said axial support is formed by a helical twist of a metallic wire in a “U” form, or of two metallic wires, in such a way as to form turns which attract the multiplicity of bristles, typically in their median part, as illustrated by way of example in the European patents No. 0 239 270, No. 0 329 606, No. 0 574 572, and in the French patent No. 2 607 373.

[0005] Nearly all the commercial mascara applicator brushes are made by the co-operation of a metallic wire and a multitude of bristles or tuft of bristles.

[0006] The problems encountered with traditional brushes are of many kinds:

[0007] on the one hand, the fabrication technique of these brushes imposes its own constraints and therefore results in brushes which are all similar. Even though a large variety of traditional brushes are accessible by varying, notably the nature and/or the quantity of bristles, this variety is constrained to a relatively narrow domain, such that mascara formulas must be adapted to the existing brushes. Now, there is always a demand for new formulae for which the application is not necessarily optimum with traditional brushes.

[0008] on the other hand, there is a permanent necessity to supply applicators which are not only simple applicators, but which have new functions or which improve the functions of traditional applicators.

[0009] in addition, in the field of cosmetic products in particular, there is a permanent need to renew both the products offered to consumers as well as the methods of application.

SUMMARY OF THE INVENTION

[0010] According to the invention, the cosmetic product applicator, typically one for mascara, designed to operate in conjunction with the neck of a recipient designed to contain the said cosmetic product, consists of a) a cap, typically threaded, designed to operate in conjunction with the said neck for the purpose of sealing the said recipient by screwing on in a direction axial to the said applicator, b) a stem which is longitudinal to the said axial direction, and c) a brush consisting of an axial support and an application material connected to the said support by means of an attachment method, the said application material typically formed of a multitude of bristles or tufts of bristles, the said longitudinal stem being connected at its upper extremity to the said cap, and at its lower extremity to the axial support of the said brush, and is characterized in that the said support is a support made of plastic including part or all of the said means of attachment.

[0011] This plastic support is radically different from the state-of-the-art metallic wire coil. In fact, the plastic support according to the invention opens the door to a totally new field for mascara applicators, with the shaping techniques, as with the properties of plastic materials, being totally different from those involved by the use of a twisted metallic wire forming a multitude of turns.

[0012] As it will appear in the description and the figures, the invention offers a very high degree of fabrication flexibility, whether because of the variety of application materials that can be used, or by the form of the brush itself.

[0013] For all that, the invention simultaneously enables the high volume fabrication of brushes and applicators, and a "custom-designed" fabrication, or one adapted to short runs, in a way that the advantages of the invention are not negated by a redhibitory fabrication cost overrun.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] All the figures pertain to the invention.

[0015] FIGS. 1a to 1g relate to a brush (4) of the brush-comb type (4). Its support (5) is a comb-support (5) constituting a flat support (53), which forms a solid part (7) with the said longitudinal stem (3), and the edge (57) of which is notched with a succession of cut-out parts (570) and raised parts (571), the said cut-out parts forming cavities (50) designed to receive the locking retaining clips (8) for the tufts (61) of bristles.

[0016] FIG. 1a is a cross-cut view of the support (5), as per plan A-A of FIG. 1e containing the axial direction (10) of the support (5) and the brush (4).

[0017] FIG. 1b is a view of the brush (4) corresponding to the support (5) of FIG. 1a, after attaching of the tufts of bristles (61).

[0018] FIGS. 1c and 1d are analogous to FIGS. 1a and 1b and are relative to a variant of the support (5).

[0019] FIGS. 1e and 1f are top views respectively of support (5) of FIG. 1a, and brush (4) of FIG. 1b.

[0020] FIG. 1g is a partial side view of support (5), two designs of cavities (50) being represented, round cavities on the left, and square cavities on the right.

[0021] FIGS. 2a to 2d relate to another variant of the support (5).

[0022] FIG. 2a is a cross-cut view analogous to those of FIGS. 1a and 1c of support (5) and of the longitudinal stem (3) which form a solid piece (7).

[0023] FIG. 2b, analogous to FIG. 2b, represents the brush-comb (4) obtained after attachment of the tufts of bristles (61) to support (5).
FIG. 2c, analogous to FIG. 2b, represents the applicator (1) obtained after positive connection of the upper extremity (30) of the said longitudinal stem (3) to the cap (2).

FIG. 2d, analogous to FIGS. 1e and 1f, is a top view of support (5) of FIG. 2a.

FIGS. 3a to 3c are cross-cut views of various support designs (5).

FIGS. 3 and 3 are relative to a flat support (53).

FIGS. 3c and 3d are relative to a 3-faced dihedral support (55).

FIG. 3e is relative to a circular support (54).

FIGS. 3b and 3d are relative to a comb support (5) whereas FIGS. 3a, 3c and 3e are relative to a support (5) that does not form a comb.

On the brush of FIG. 3f, and contrary to the brush of FIG. 3g, the said retaining clips (8) are fully inserted into the cavities (50), with the said cavities only being rounded in the case of the brush in FIG. 3g.

FIG. 3h is a top view of support (5) of FIG. 3f, a view analogous to that of FIGS. 1e, 1f and 2d.

FIGS. 4a to 4f are relative to supports (5) which have axial grooves (52) in FIGS. 4a, 4b, and helical grooves (52) in FIGS. 4e and 4f.

FIGS. 4a and 4e are side views, whereas FIGS. 4b and 4d are cross-section views of the supports (5) based on FIGS. 4a and 4e respectively.

FIG. 4c represents a rod forming a retaining clip (81) for the axial groove (52) of support (5) of FIG. 4a.

FIG. 4d represents a partial cross-section perpendicular to the said axial direction (10) the co-operation of the said rod (81) and the groove (52) by means of a snap-in process, with the tuft of bristles (60) not being represented.

FIGS. 5a and 5b relate to another design of brush comb (4) in which the said support (5) is a circular support (5, 54) equipped with two axial sets of teeth (540) at 180° to one another in relation to the axial direction (10).

FIG. 5a is a cross-sectional view of the brush (5) perpendicular to the said axial direction (10).

FIG. 5b is a partial axial section of the said circular support (5, 54) of FIG. 5a.

FIGS. 5c and 5d are relative to another support design (5). Support (5) is a composite support (58) consisting of an annular support (580), a support stem (581) with an upper stop (582) and a lower stop (583) stop tightly encircling the said annular support (580).

FIG. 5e is an axial section based on plan D-D of FIG. 5d.

FIG. 5f is a cross-cut view perpendicular to the axial direction (10) based on plan C-C of FIG. 5c.

FIG. 6 is a schematic view of a part of the circular or cylindrical support (54) consisting of 4 single cavities (51) located by their coordinates: axial coordinate Z and angular coordinate 0.

FIGS. 7a and 7b are relative to an applicator (1') consisting of a support (5) forming a bi-dimensional flat bi-dimensional support (55).

FIG. 7a is a top view of the said support, with the location of the single cavities (51) given by their X and Y coordinates.

FIG. 7b is a top view of the corresponding applicator (1'), with the application material (6) being made up entirely of tufts of bristles (61).

FIG. 7c is a cross-sectional view based on plan B-B of FIG. 7b.

FIGS. 8a to 8e are relative to an applicator (1') consisting of a rectangular support (5) forming a bi-dimensional flat support (55), with a part serving as a support for a bonded pile material (62), a part (550) serving for the manual gripping of the said applicator (1').

FIG. 8a is a top view of the said applicator (1').

FIG. 8b is a cross-sectional view based on plan A-A of FIG. 8a, a plan perpendicular to the support plan (55).

FIGS. 9a to 9d represent, in cross section perpendicular to the support (5) and the cavities (50), the portions of the brush which illustrate other designs of application materials (6) and other designs for methods of attachment.

In FIG. 9a, the said application material is formed by a multitude of strips (63), where the foot (630) is force-attached into the cavity (50).

In FIG. 9b, the said application material is formed by a multitude of strips (63) where the foot (630) (translator's note: should be (630)) is attached by means of a retaining clip (80) in the cavity (50).

In FIGS. 9c and 9d, the said application material is a bonded pile material (62) a part of which (620) is inserted into the cavities (50), as a means of forced attachment as illustrated in FIG. 9e or with a view to attaching by use of a retaining clip (80) as illustrated in FIG. 9d.

FIGS. 10a to 10c represent in a cross-sectional view perpendicular to support (5) and cavities (50), portions of the brush which illustrate other types of support (5). In FIG. 10a, the said support consists of a multitude of flexible strips (59), forming a solid piece with the said support.

FIGS. 10b and 10c are cross-sectional views as per plan A-A of FIG. 10a. The said strips (59) are of a triangular form, the said tuft (61) being oriented as per axis (82) of retaining clip (8), that is, perpendicular to the said axial direction (10) of FIG. 10b, that is, parallel to the axial direction of FIG. 10c.

FIG. 11 represents in a schematic manner a fabrication device for applicators or brushes based on the invention, with:

- a support (5, 5') distribution (90) device,
- a support (5, 5') relative displacement device (90)
an application material (6) distribution device (91)
a retaining clip (8) distribution and insertion device (92)
and a unit control (93) device.

DETAILED DESCRIPTION OF THE INVENTION

Based on the invention, the said axial support (5) may consist of one or more plastic parts.

Part or all of the said axial support (5) can form a solid piece (7) with the said longitudinal stem (3).

Generally, the said axial support consists of only a single moulded piece of thermoplastic material, and forms but a one-piece moulded part (7) with the longitudinal stem (3), as appears for example in FIGS. 1a and 2c.

The said axial support (5) can be cylindrical, oval, square or twisted in cross-section, and can have an extremity which is square, cylindrical, semi-cylindrical, solid or hollowed out so as to enable the retention of the product to be applied prior to removal.

On the external part or surface, the said axial support (5) may consist of a multitude of cavities or housings (50), each cavity or housing (50) providing a positive connection with at least one tuft of bristles typically in a "U" shape at its base or foot (610), the said multitude of cavities or housings (50) forming part of the said means of attachment.

Based on a method of the invention, each cavity or housing (50) can be comprised of a single cavity (51) positively connected to a tuft of bristles (61), as illustrated, for example in FIGS. 1a to 3g.

Based on another method of the invention, the said cavity or the said multitude of cavities (50) can be comprised of a groove, typically axial (52) or helical (52) firmly attaching a multitude of tufts of bristles (61), as illustrated in FIGS. 4a to 4f.

Thus, it is possible to have a series or a row of housings (50), or more than one series or rows of housings, distributed around the axis or in the axial direction (10) of the brush, following a constant angle or not, or stacked up on a single face of the support. It is also possible to have a combination of these two configurations.

The number of housings (50) from one series to the other can be constant or variable, by possibly locally varying the length of the tuft of bristles.

In addition, the space between each (pair of) housings (50) can be constant or variable, so as to vary the type of brushing.

The exterior form of each housing can be level, as illustrated in FIGS. 1a and 1b, or conical as illustrated in FIGS. 2a to 2c, where the conical part can have a constant or variable height, and can possibly provide a comb function which could vary according to the section of the brush considered.

The exterior conical part could possibly be concave or convex, so as to guide the distribution of the cosmetic product withdrawn.

The internal diameter of each housing or each cone could be constant or variable from one housing to the next, so as to obtain tufts of bristles of different density or form on the same series or from one series to the other.

Based on a variant illustrated notably in FIGS. 1a to 2c, the said method of attachment (8) could consist of a multitude of retaining clips (80), each retaining clip being adapted to each cavity (50), so as to attach at least one tuft of bristles (61) to each cavity.

In this case, the said support (5) could consist of a multitude of single cavities (51), with each single cavity (51) consisting of a retaining clip (80) blocking a tuft of bristles (61). The multitude of retaining clips could be clipped or snapped in, inserted by force or possibly welded to the support.

These retaining clips (80) can be formed of rigid plastic or of elastomer, so as to introduce more flexibility into the brushing.

In this way, brushes (4) can be obtained with a length or larger dimension typically going up to 20 to 32 mm, and a width or smaller dimension typically going to 2 to 10 mm.

Based on another variant illustrated in FIGS. 4a to 4f, the said support (5) can include one or more grooves, typically axial (52) or helical (52), with each groove including a retaining clip, typically in the form of a rod (81) blocking a multiplicity of tufts of bristles (61). The said axial support (5) can include at least one row of single cavities (51) and at least one groove (52, 52), with the support forming in this case a mixture of the two preceding variants.

As illustrated in FIGS. 3a and 3b, the said support can include two rows of single cavities (51) or two grooves (52), typically oriented at 180° to one another with respect to the said axial direction (10).

In this case, the said support (5) can be a flat support (53), with an edge (56) of a thickness E, the said two rows of cavities (51) or two grooves (52) being located in the said edge (56).

As also illustrated in FIGS. 1a to 2c, the said edge (56) can be a slotted, notched or undulated edge (57), forming a succession of hollowed out parts (570) and raised parts (571), each hollowed out part (570) comprised typically of a single cavity (51), so as to have one brush forming a brush-comb (4) due to the succession of raised parts (571).

As illustrated in FIGS. 3c and 3d, the said support (5) can include three rows, typically axial, of single cavities (51) or three grooves (52), typically oriented at 120° to one another in relation to the said axial direction (10).

As illustrated in FIG. 3e, the said support (5) can include four rows of single cavities (51) or four slots (52), oriented at 90° to one another as per the said axial direction (10). The said support (5) can be a dihedral support (53) analogous to that in FIG. 3d, but with four faces instead of the three faces in FIG. 3d.
In other respects, the invention is not limited to a limited number of rows; thus, it is possible to have 4 to 12 rows of single cavities or slots.

Based on the invention, the said tufts of bristles (61) can typically be identical as to the nature of the bristles, typically their chemical nature, and/or their diameter, and/or their length, and/or their form.

However, as a function of the needs or the effects sought, the said tufts of bristles (61) cannot be identical as to the nature of the bristles, typically their chemical nature, and/or their diameter, and/or their length, and/or their form.

The bristles can be of animal, vegetable, mineral, metallic or synthetic origin.

Depending on their origin, they can be mixed or ordered in each housing.

The brush can include a “comb” configuration, in which there can be 6 to 10 fibres per housing, these fibres having a diameter typically ranging from 0.20 to 0.30 mm, and for example, a diameter of 0.254 mm, as well as a “brush” configuration in which the fibres, of a smaller diameter, with a diameter typically ranging from 0.03 to 0.10 mm, are in very large numbers, typically greater than 20.

Based on the surface to be applied, based on the type of cosmetic product or formula in question—for example, based on the viscosity of the formula, or according to the effect sought—for example, the obtaining of volume or the lengthening of eyelashes, the bristles can be positioned in each housing at an angle of 90° in relation to the said axial direction (10), or set at another angle or at an upgradeable angle, with an asymmetric tuft in relation to the retaining clip (80) when fitting the bristles in the housing (50). See in this regard, for example, FIGS. 10b and 10c.

The form of the bristles can be straight or undulating.

Another objective of the invention consists of a fabrication process for an applicator based on the invention, typically, a mascara applicator.

In this process:

a) the said support (5, 5') can be supplied, typically connected to the said stem (3), the said support (5, 5') including the said multitude of cavities or housings (50, 51, 52), the said cavities (50, 51, 52, 52) being located and situated by a system of angular coordinates θ, and axial coordinates z, according to the said axial direction, each cavity C being situated by the system of angular coordinates θi and axial coordinates zj.

b) the said support (5, 5) can be automatically oriented, typically by means of a displacement device (90) typically driven by a control device or by a computer (93), so that the said cavities C are placed in front of a device (91) for supplying or distributing tufts of bristles T1 and a retaining clip distribution device V1 (80, 81).

Based on the invention, the said retaining clip (80, 81) can be inserted or projected by force into the said cavity (50, 51, 52, 52), the said retaining clip V1 (80, 81) carrying along with it a tuft of bristles T1.
But, as illustrated in FIGS. 8a to 8c, 9c and 9d, the said material can also be a material in bands, typically chosen from among the bands of non-woven material or from among the bands of foam, or among the pieces of cotton wool, the said bands of non-woven material, or of foam, or the said pieces of cotton wool being identical or not as to their nature, typically their chemical nature, and or their width, and/or their thickness, and/or their length, and/or their form.

As illustrated in FIG. 8c, the said application material can be divided once firmly connected to the said support, so as to form a multitude of portions of material (60).

EXAMPLES

All the figures constitute examples of creation:

FIGS. 1a to 6 are relative to mascara applicators (1)

FIGS. 7a to 8c are relative to flat applicators (1') other than mascara applicators.

FIGS. 9a to 10c are relative to mascara applicators (1) or flat applicators (1).

Supports have been fabricated (5, 5', 5") forming a solid piece (7) with the longitudinal stem (3), by moulding of PP (polypropylene plastic) or POM (polypolyoxymethylene plastic), materials which have flexibility and rigidity as well as being chemically inert.

Brush-combs have been fabricated (4) as per FIGS. 1a to 2c, brush-combs (4) where the support (5) is a flat support (53) of length L, thickness E and a width 1 in which the edge (56) is a slotted edge (57).

The support (5) includes a multitude of teeth (571) of height HD, and a multitude of hollowed out parts (570), each of the hollowed out parts (570) including a tuft of bristles (61) of length HT. The foot (560) of each tuft of bristles is locked in a cavity or housing (50), in the form of a single cavity (51) with a depth Hp.

This cavity or housing, in the brushes as per FIGS. 1c to 2c, includes one exterior part (510), typically conical, of height Hc, this height Hc being equal to the depth Hp in the case of the brush-comb in FIG. 1c, and being less than the depth Hc in the case of the brush-comb in FIGS. 2a to 2c.

Tests on the brush-combs were carried out with the values underlined in the following table. Other tests of brush-combs were conducted in the range of values in the table that follows.

<table>
<thead>
<tr>
<th>TESTS of brush-combs</th>
<th>TEST as per FIG. 1a and 1b</th>
<th>TEST as per FIG. 1c and 1d</th>
<th>TEST as per FIG. 2a to 2c</th>
</tr>
</thead>
<tbody>
<tr>
<td>L (mm)</td>
<td>2.4 to 2.8±2.6</td>
<td>2.4 to 2.8±2.6</td>
<td>2.4 to 2.8±2.6</td>
</tr>
<tr>
<td>H (mm)</td>
<td>8 to 12±10</td>
<td>8 to 12±10</td>
<td>8 to 12±10</td>
</tr>
<tr>
<td>F (mm)</td>
<td>3.6 to 5±4.5</td>
<td>3.6 to 5±4.5</td>
<td>3.6 to 5±4.5</td>
</tr>
<tr>
<td>Hc (mm)</td>
<td>2 to 5±4</td>
<td>3 to 7±4</td>
<td>2 to 5±4</td>
</tr>
<tr>
<td>He (mm)</td>
<td>4.4 to 8.4±6.5</td>
<td>4.4 to 8.4±6.5</td>
<td>4.4 to 8.4±6.5</td>
</tr>
<tr>
<td>Ho (mm)</td>
<td>1 to 3±2</td>
<td>1 to 3±2</td>
<td>1 to 3±2</td>
</tr>
</tbody>
</table>

Supports have been fabricated as per FIGS. 3a to 3g.

The support (5) of brush (4) based on FIG. 3a is a support analogous to that of FIG. 1c, but excluding teeth (571).

Support (5) of brush (4) as per FIG. 3b is a support of the type of that of FIG. 1a, with teeth (571) with a triangular section.

Support (5) of brush (4) as per FIG. 3c is analogous to that of FIG. 3a, but it forms a dihedral support (53) with three faces having an angle of 120° between them.

Support (5) of brush (4) as per FIG. 3d is analogous to that of FIG. 3b, but it forms a dihedral support (53) with three faces with an angle of 120° between them.

Support (5) of brush (4) as per FIG. 3e is a cylindrical support comprised of 4 rows of cavities or housings.

Brushes (4) (partial) based on FIGS. 3f and 3g use retaining clips (8) with square and circular sections respectively, the brush based on FIG. 3g included, as an alternative, tufts of large diameter bristles (61) suitable for creating a combing effect.

The brush supports (5) based on FIGS. 4a to 4f include a multitude of grooves, that is, four axial grooves (52) in the case of the support based on FIGS. 4a and 4b, two helical grooves (52) in the case of support based on FIGS. 4e and 4f.

In the case of the support based on FIGS. 4a and 4b, the method of attachment (8) is a rod (81) represented in FIG. 4e, and adapted to the profile of the groove as illustrated in FIG. 4d.

FIGS. 5a and 5b illustrate another model of brush comb (4') in which the support (5) is a support consisting of four rows of cavities or four grooves as per FIGS. 4a and 4b, a support including among other features, an axial succession of teeth (540) forming a comb.

FIGS. 5c to 5d illustrate another model of support (5), that is, a composite support (580) formed by the cooperation of an annular support (580) carrying the cavities (50) or the grooves (52) and a stem (581) forming a solid piece with the longitudinal stem (3). The annular support (580) is typically blocked between a top stop (582) on the solid piece, and a bottom stop (583) assembled at the extremity of the stem (581).

Thus the annular support (580) can be formed by extrusion in the case where it includes a multitude of axial grooves (52)—grooves which have not been represented in FIG. 5c.
FIG. 6 illustrates the location of the cavities on the cylindrical support (54) of the mascara applicator (1), by coordinates Z and θ, which can be used to implement the process based on the invention in an automated manner.

FIGS. 7a to 8c illustrate various models of flat applicators (I) other than mascara applicators (I).

FIG. 7a illustrates the location of cavities in the case of a flat support (55) by X and Y coordinates.

FIG. 7b represents in a schematic manner a flat applicator (1) of an oval form designed to be used in a case of the same oval form. This applicator (1) includes as application material (6) a multitude of tufts of bristles.

In FIGS. 8a to 8c, the application material (6) is a bonded pile material (62), typically fibrous such as cotton wool, as represented in enlarged form in FIG. 8a, in a square surrounded by a stippled line.

In FIG. 8c, the bonded pile material was cut out after attachment to the flat support (55), in a manner to form a cut-out bonded pile material (62).

FIGS. 9a to 10a illustrate partial views of applicators (1) or (I).

The application material of applicator (1,1) based on FIG. 9b is made of a multitude of strips (63), typically flexible, the foot of which (630) is force inserted into the cavity (50). The application material of applicator (1,1) based on FIG. 9b is made of a multitude of strips (63), typically flexible, the foot of which (630) is force inserted into the cavity (50) by means of a retaining clip (80).

The application material of applicator (1,1) based on FIG. 9e is made of a bonded pile material (62), a part of which (620) is force inserted into the cavity (50). The application material of applicator (1,1) based on FIG. 9e is made of a bonded pile material (62), a part of which (620) is force inserted into cavity (50) by use of a retaining clip (80).

The application material of applicator (1,1) based on FIG. 10a is made of a multitude of flexible strips (59).

FIGS. 10b to 10c illustrate applicators (I) including a multitude of flexible strips (59) or of teeth (571) for the purpose combing, and a multitude of tufts of bristles (61) oriented in two different ways in relation to the axial direction (10) of the brush (4).

All these brushes were obtained with a pilot device schematized in FIG. 11.

The invention offers substantial advantages.

In fact, in comparison to the state-of-the-art brushes, the mascara applicators (I) based on the invention enable the simultaneous reconciliation the need for a high-volume, automated production, and the need to have a “tailor-made” applicator at the same time as a function of the mascara formula and as a function of the tastes and habits of end users.

In addition, the invention, by the very nature of the process (in play), allows the entire location of a given material at a given site on the brush, which wasn’t obtainable with the obtaining process of the former style.

In addition, the mascara applicators based on the invention can add to the brush itself various complementary functions, such as the combing function, or again, the reservoir function, with the support of these brushes providing space suitable for retaining large quantities of mascara by capillary action.

Finally, the invention opens the way for a wide variety of applicators of mascara or other liquid cosmetic products, as well as to a large variety of flat applicators typically designed for the application of cosmetic product in compact powder form.

List of References

Mascara applicator 1
Other applicator 1
Axial direction 10
Cap for 12
Internal thread 20
Longitudinal stem for 13
“Top” extremity 30
“Bottom” extremity 31
Brush for 14
Brush-comb for 14
Mascara support for 45
Support-comb for 45°
Other support 5°
Cavities or housings 50
Single cavity 51
Exterior part 510
Axial groove 52
Helical groove 52°
Flat support 53
Dihedral support 53°
Circular support 54
Axial series of teeth 540
Flat support of 5°55
Portion of manual gripping 550
Edge of 5356
Slotted edge of 53, comb format 57
Hollowed-out part 570
Raised parts forming comb teeth 571
Composite support 58
Annular support 580
Support stem for 580581
Upper stop 582
Lower stop 583
Flexible strip 59
What is claimed is:

1. Cosmetic product applicator (1), typically for mascara, designed to operate in conjunction with the neck of a recipient designed to contain the cosmetic product, the applicator (1) consisting of a) a cap (2), typically threaded (20), designed to operate in conjunction with the neck in order to seal the recipient by screwing on in an axial direction (10) of the applicator, b) a stem (3), longitudinal in relation to the axial direction, and c) a brush (4) consisting of an axial support (5) and an application material (6) firmly connected to the support (5) by means of a connection method, the application material (6) typically forming a multitude of bristles or tufts of bristles (61), the longitudinal stem (3) being connected at its upper extremity (30), to the cap, and at its lower extremity (31) to the axial support (5) of the brush, characterized in that:

1) the support (5) is a support made of plastic, including part or all of the means of attachment, and in that the application material includes a multitude of bristles or tufts of bristles,

2) the axial support (5) includes a multitude of cavities or housings (50), each cavity or housing firmly connected to at least one tuft of bristles, typically in a "U" shape at its base or its foot, the multitude of cavities or housings forming part of the means of attachment,

3) and in that the means of attachment (8) consists of a multitude of retaining clips (80), each retaining clip (80) being adapted to each cavity (50), in a manner to secure at least one tuft of bristles (60) in each cavity,

2. An applicator according to the claim 1 in which the axial support (5) includes one or more plastic parts.

3. An applicator according to claim 1 in which part or all of the axial support (5) forms a solid piece (7) with the longitudinal stem (3).

4. An applicator according to claim 1 in which the cavity or housing (50) is made up of a single cavity (51) firmly connected to a tuft of bristles (61).

5. An applicator according to claim 1 in which the cavity or multitude of cavities (50) is made up of a groove, typically axial (52) or helical (52) firmly connected to a multitude of tufts of bristles (61).

6. An applicator according to claim 4 in which the support (5) includes a multitude of single cavities (51), each single cavity (51) including a retaining clip (80) blocking a tuft of bristles (61).

7. An applicator according to claim 1 in which the support (5) includes one or more grooves, typically axial (52) or helical (52), each groove including a retaining clip, typically in the form of a rod (81), blocking a multitude of tufts of bristles (61).

8. An applicator according to claim 1 in which the axial support (5) includes at least a row of single cavities (51) and at least one groove (52, 52).’

9. An applicator according to claim 8 in which the support (5) includes two rows of single cavities (51) or two grooves (52), typically oriented at 180° to one another according to the axial direction (10).

10. An applicator according to claim 9 in which the support (5) is a flat support (53), with an edge (56) of thickness E, the two rows of cavities (51) or two grooves (52) being located on the edge (56).

11. An applicator according to claim 10 in which the edge (56) is a slotted edge (57) forming a succession of hollowed out parts (570) and raised parts (571), each hollowed out part (570) typically including a single cavity (51), so as to have a brush forming a brush-comb (4) due to the succession of raised parts (571).

12. An applicator according to claim 8 in which the support (5) includes three rows, typically axial, of single cavities (51) or three grooves (52), typically oriented at 120° to one another in relation to the axial direction.

13. An applicator according to claim 8 in which the support (5) includes four rows of single cavities (51) or four grooves (52), oriented at 90° to one another in relation to the axial direction (10).

14. A fabrication process for an applicator according to claim 1 in which:

a) The support (5, 5) is supplied typically securedly connected to the stem (3), the support (5, 5) including the multitude of cavities or housings (50, 51, 52, 52), the cavities (50, 51, 52, 52) being situated and located by a system of angular coordinates $\theta$ and axial coordinates $z$ according to the axial direction, each cavity C being located by a system of angular coordinates $\theta$ and axial coordinates $z$. 

b) The support (5, 5) is supplied typically securedly connected to the stem (3), the support (5, 5) including the multitude of cavities or housings (50, 51, 52, 52), the cavities (50, 51, 52, 52) being situated and located by a system of angular coordinates $\theta$ and axial coordinates $z$. 


b) the support (5, 5') is automatically oriented typically by means of a displacement device (90) typically controlled by a command device or by a computer (93), so that the cavities C_i are placed facing a supply or distribution device (91) for tufts of bristles T_i, and a retaining clip distribution device (92) V_j (!80, 81).

17. Process according to claim 16 in which the retaining clip (80, 81) is inserted or projected by force into the cavity (50, 51, 52, 52'), the retaining clip V_j (80, 81) carrying along with it a tuft of bristles T_j.

18. Process according to claim 16 in which the cavities (50) include single cavities C_i (51) or are typically made up of single cavities C_i (51).

19. Process according to claim 16 in which the cavities (50) include grooves C_i (51, 52'), typically axial grooves (52), or are made up of grooves C_i (52, 52').

20. Process according to claims 16 in which the supply or distribution device (91) for tufts of bristles T_i (61) includes at least two tuft T_1 and tuft T_2 supply channels, so as to obtain a brush (4, 4) including a predetermined distribution of tufts T_1 and tuft T_2.

21. An applicator fabrication process (1, 1') of a product, typically a cosmetic product comprising a support (5, 5', 5', 53, 53', 54, 55, 58) to which is attached an application material (6) in which:

a) the support (5, 5', 53, 53', 54, 55, 58) is formed or supplied, the support (5, 5', 5') including on part or all of its surface a multitude of housings or cavities (50), cavities that are isolated (51) or in contact to form at least one groove (52, 52'),

b) to the multitude of housings or cavities (50, 51, 52, 52') is applied the application material (6), the application material (6) forming or not, portions of material (60), typically in the divided state,

c) into each housing or cavity (50, 51, 52, 52') is inserted, typically by projection or force, a portion of the application material (610, 620, 620', 630, 630') in such a way that the application material (6, 60, 61, 62, 62', 63, 63') is firmly connected to the support (5, 5', 5', 53, 53', 54, 55, 58), at the level of each housing or cavity (50, 51, 52, 52').

22. A process as per claim 21 by which is inserted into each housing or cavity (50, 51, 52, 52') a piece forming a retaining clip (80, 81), in such a way as to block the portion of said application material (610, 620, 620', 630, 630') in each housing or cavity (50, 51, 52, 52').

23. A process according to claim 16 in which the support (5, 5', 5', 53, 53', 54, 55, 58), is a support made of plastic, forming typically a moulded part and preferably a support to form a cream, powder or liquid applicator.

24. A process according claim 16 in which the application material (6) is material, typically in the divided state, forming a multitude of portions of material (60), typically chosen from among the tufts of bristles (61), identical or not as to the nature of the bristles, typically their chemical nature, and/or their diameter, and/or their length, and/or their form, or from among the elastomer bands or strips, identical or not as to their nature, typically the chemical nature of the elastomer, and/or their size, and/or their thickness, and/or their length, and/or their form.

25. A process according to claim 16 in which the material is in band form, typically chosen from among the non-fabric bands of material, or from among the bands of foam, or from among pieces of absorbent cotton, the bands of non-fabric material, or of foam, or the pieces of absorbent cotton, being identical or not as to their nature, typically their chemical nature, and/or their width, and/or their thickness, and/or their length, and/or their form.

26. A process according to the claim 25 in which the application material is divided once attached to the support, so as to produce a multitude of portions of material (60).