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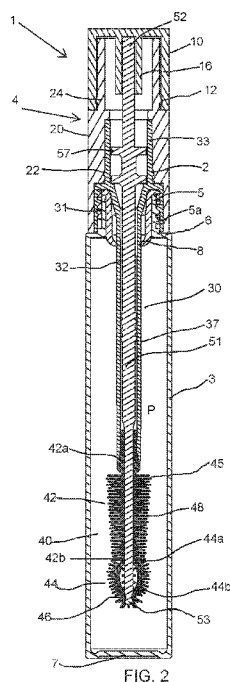
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(54) Title: ADJUSTABLE APPLICATOR



(57) Abstract: An adjustable applicator comprising an application member comprising a first portion, a second portion and an end cap. The first portion comprises of a hollow core having a cavity and a plurality of application elements on an outer surface of the hollow core. The second portion comprises at least two flexible arms extending from a distal end of the first portion towards the end cap of the application member. The adjustable applicator is capable of being adjusted between a first configuration in which the at least two flexible arms of the second portion take up a convex shape and a second configuration in which the at least two flexible arms of the second portion are twisted.



ADJUSTABLE APPLICATOR

CROSS REFERENCE TO RELATED APPLICATIONS

The present application claims the benefit of and priority to Indian Patent Application Serial
5 Number 201711005606, filed on February 16, 2017, the disclosure of which is incorporated
herein by reference.

TECHNICAL FIELD

Embodiments of the present disclosure relate to an adjustable applicator for applying a cosmetic
10 or personal care composition, e.g. mascara to eyelashes or eyebrows. More particularly, the
disclosure, relates to an applicator that can be adjusted as per a user's convenience for
application of a cosmetic or a care product.

BACKGROUND

15 Mascara, an important make-up accessory used to darken and define eyelashes to accentuate the
eyes, is difficult to apply because of the target area of application. The eyelashes offer a very
small application area, while being soft, flexible, delicate and in close proximity to very
sensitive eye tissue. Therefore, a mascara product would be liked by the consumers when a right
kind of applicator is provided to them for easy application as the overall consumer experience
20 depends on both the product and on the applicator used to apply it.

Conventional mascara brushes are in the form of a generally cylindrical straight rod carrying a
plurality of bristles extending radially outwardly from its outer surface. However, straight
mascara brushes are not thought by some people to be ideal for all purposes and curved mascara
25 brushes are also known. One applicator may be generally straight and have short, densely
arrayed bristles and may be employed for applying mascara to eyelashes to achieve a desired
effect (e.g., to volumize eyelashes). While another applicator may incorporate a bend and have
longer, less densely arrayed bristles for applying mascara to eyelashes to achieve an alternative
desired effect (e.g., to separate and define eyelashes).

30 Curved mascara brushes permit contact of the brush with more eyelashes along a
correspondingly curved eyelid. However, the curved brush is more difficult to use in the
confines of the eye area, particularly the corners of the eye where a straight brush works better.
Another drawback of a pre-curved brush is that it is not readily adjustable to conform to a

particular user's eyelid curvature. In addition, the curvature of the upper and lower eyelids is rarely the same and a brush curved to fit the upper lid will not properly fit the lower lid. Adjustable mascara brushes are known in the prior art. It is also known to provide adjustment of the angle of the brush or applicator relative to the applicator wand or handle.

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Thus, existing applicators have limited functionality and are not conducive to applying mascara to eyelashes using different techniques and/or different orientations. Accordingly, there remains a need in the art for improved applicator systems that allow application of mascara using different techniques and/or orientations to achieve multiple desired effects.

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Therefore, there exists a need for an applicator that provides ease-of-use as well as is modifiable to adapt to the shape requirement of the user.

SUMMARY

15 The present disclosure generally is an adjustable applicator employed for application of a cosmetic or a care product such as for application of mascara, coloring strands of hair, for dental flossing or for applying pharmaceuticals or cleaning agents. The use of adjustable applicator of the present disclosure for removal of make-up products is also contemplated.

20 According to an embodiment of the present disclosure, there is provided an adjustable applicator including an application member that can be adjusted as per user's convenience for application of a cosmetic or a care product.

In accordance with an embodiment of the disclosure, the adjustable applicator extends along a longitudinal axis and comprises of an application member; a stem and a cap wherein the application member is connected at a distal end of the stem and the cap is connected at a proximal end of the stem.

25 In accordance with an embodiment of the disclosure, the adjustable applicator includes an actuator formed by an upper portion of the cap, which when actuated initiates a mechanism for progressive modification in the shape of the application member.

30 According to an embodiment of the disclosure, the actuator is a dialer but in other alternate embodiments, the dialer can be replaced by another actuator selected from a group consisting of

a slider, a push button and the like which can be actuated using manual, mechanical, magnetic, electrical or any other suitable force.

According to an embodiment of the disclosure, the adjustable applicator includes a transmission member having a distal end and a proximal end. The distal end of the transmission member is connected at an end of the application member and the proximal end of the transmission member is connected to a dialer of the adjustable applicator.

The dialer is rotated for rotating the transmission member about the longitudinal axis to cause progressive modification in shape of the application member.

According to an embodiment of the disclosure, the application member comprises a first portion, a second portion and an end cap.

The first portion comprises a hollow core having a cavity and a plurality of application elements on an outer surface of the hollow core. Further, the first portion comprises a proximal end portion formed as a shank for stacking the application member at the distal end of the stem.

The second portion extends from a distal end of the first portion. The second portion is more flexible as compared to the first portion.

The second portion comprises a proximal end and a distal end. The proximal end of the second portion is in contact with the distal end of the first portion of the application member. The second portion comprises at least two flexible arms extending from the distal end of the first portion towards the end cap of the application member with a gap between the at least two flexible arms. Further, a plurality of application elements are provided on an outer surface of each of the at least two flexible arms and the end cap.

Further, the application member has a circular cross-section. However, the application member may have a shape selected from non-circular, oval, polygonal, rectangular shape etc.

The application elements are in the form of tines molded integrally on the outer surfaces of the first portion, second portion and the end cap. However, it would not be beyond the scope of the present disclosure, if the application elements are in form of flocking of fibers, sponge, metal or

any other material known in the art. In another example, the application elements may take the form of bristles attached to or passing through a surface material or mesh of fibers.

Independently or in combination with the above, exemplary embodiments of the disclosure provide a cosmetic package for packaging and dispensing a substance, for example, a cosmetic, comprising an adjustable applicator as defined above. The device may comprise a receptacle and the adjustable applicator. The adjustable applicator in such a device may comprise a cap, a stem having a cavity, and an application member.

According to an embodiment of the disclosure, the proximal end portion of the application member formed as a bristle free shank portion which is fixedly and non-rotatably connected to the distal end of the stem. Further, the distal end of the application member in the form of the end cap is also fixedly and non-rotatably connected to the distal end of the transmission member. For example, the transmission member and the end cap can be engaged by a snap fit.

The transmission member has at least one projection at its distal end which is fitted into correspondingly at least one groove of the end cap so that the distal end/end cap of the application member is fixedly and non-rotatably connected to the distal end of the transmission member. However, it would not be beyond the scope of the present disclosure if alternate engagement means known in the art are used. Similar fitment can be used to non-rotatably connect the proximal end portion/shank portion of the application member and the distal end of the stem.

According to an embodiment of the disclosure, the dialer is structured in a closed- end cylindrical shape. The dialer further includes an internal annular skirt projecting from an inner surface of a top wall of the dialer and the internal annular skirt extends towards the receptacle. The internal annular skirt has a small outer diameter. An annular groove is provided on an inner peripheral surface of a sidewall of the dialer for attaching the dialer to the sleeve of the cap. The sleeve of the cap is attached with the dialer such that the sleeve is free to rotate relative to the dialer via a snap-fit system comprising the annular groove of the dialer and a complementary annular protruding portion of the sleeve. The dialer can thus be turned by the user relative to the sleeve.

Further, according to an embodiment of the disclosure, the internal annular skirt has a rectangular cross-section into which is fitted a corresponding rectangular shaped proximal end

of a portion of the transmission member so that the transmission member is non-rotatable with respect to the dialer and is rotatable along with the dialer with respect to the sleeve of the cap. Further, the transmission member is not capable of moving axially with respect to the sleeve as there is no axial space provided in the dialer for axial movement of the transmission member.

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Further according to an embodiment of the disclosure, for engaging the stem to the sleeve of the cap, an upper tubular portion of the stem has a protruding portion on its outer surface which engages with a complementary groove present on inner surface of the sleeve. On the interfaces where the stem is joined to the sleeve of the cap, the stem and the sleeve of the cap both may have complementary longitudinal protrusions and positioning longitudinal grooves (not shown) that engage with each other for non-rotatably locking the stem and the sleeve together. However, it is not beyond ambit of the present disclosure that any other non-rotatable engagement known in the art may be employed for locking any relative rotation between the stem and the sleeve.

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Further according to an embodiment of the disclosure, the stem comprises the upper tubular portion, a downward skirt and an elongated hollow shaft. The threads are provided on the inner peripheral surface of the downward skirt of the stem to attach the cap to an externally threaded neck of the container. With the cap so attached, the applicator head is immersed in the product to be applied. The elongated hollow shaft extends beyond the neck in the receptacle. Preferably, the elongated hollow shaft of the stem is disposed around at least a portion of the transmission member so that the transmission member is rotatable with respect to the shaft. In the embodiment illustrated, the shaft and the transmission member have circular transverse cross-sections. However, the proximal portion of the transmission member has a rectangular cross-section. In other embodiments, the shaft and the transmission member may have non-circular transverse cross-sections throughout their length.

In the present embodiment, the stem further includes such features that allow smooth rotation of the transmission member when the dialer is rotated with respect to the sleeve. For example, the transmission member includes two annular flanges which guide rotation of the transmission member with respect to the sleeve.

According to an embodiment of the disclosure, the application member can adopt at least two stable configurations that is to say a first configuration and a second configuration.

In both the first configuration and the second configuration, the proximal end of the transmission member is in contact with the top wall of the dialer such that the transmission member cannot move in axial direction with respect to the stem.

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During assembly of the adjustable applicator, the application member is assembled with the stem, transmission member, sleeve and the dialer, in such a way that the flexible arms of the second portion are slightly pulled towards the cap when the proximal end of the transmission member contacts the top wall of the dialer, thus the flexible arms of the second portion become
10 convex shaped. Thus, the second portion of the application member has a ball shape having convex arms with a gap between the convex arms. This shape corresponds to the first stable configuration of the application member. In other alternate embodiments, the flexible arms can be made into a convex shape directly during molding of the application member.

15 In the second configuration of the application member, the flexible arms of the second portion of the application member are twisted in a helical shape with respect to the longitudinal axis of the application member.

In an alternate embodiment, in the second configuration, the first portion of the application
20 member may also be twisted slightly. In such a case where both the first portion and the second portion are twisted in the second configuration, the ratio of twisted angle between the first portion and the second portion is the range of 1-10:99-90. In other words, the first portion may also twist, but to a lesser extent than that of the second portion.

25 Further, the adjustable applicator has the first configuration in closed position of the cosmetic package. However, it would not be beyond the scope of the present invention, if the adjustable applicator has the second configuration in the closed position of the cosmetic package.

During use, when the adjustable applicator is removed from the container, it has a first
30 configuration. In the open position of the cosmetic package, when the dialer is rotated with respect to the sleeve, the transmission member rotates with respect to the shaft which causes twisting of the application member as explained above. When a suitable adjustment of the profile of the application member has been made it will be retained while the application member is used. The adjustment is retained until the user intentionally rotates the dialer and the

sleeve with respect to each other once again to achieve a different adjustment.

In order to transform the profile of the application member to a second configuration, the dialer is rotated in a first direction and the rotational movement of the dialer is converted into rotational movement of the transmission member fixedly connected within the inner skirt of the dialer. Therefore, the transmission member is now able to rotate with respect to the shaft of the stem. As the transmission member is fixedly and non-rotatably connected to the distal end/ end cap of the application member, the flexible arms of the second portion of the application member get twisted and compressed towards the transmission member and the application member is transformed to a second configuration. The transmission member can be adjusted to various relative longitudinal positions with respect to the shaft depending on degree of twisting, such that as adjustment is made, profile of the application member varies. Once the adjustment is made, it will be retained without any action by the user, until further adjustment is desired and intentionally made.

Further, the user can rotate the dialer in opposite direction to rotate the transmission member in opposite direction with respect to the shaft of the stem. As the transmission member is rotated in opposite direction, the flexible arms again take up the convex shape and, the application member is transformed again to the first configuration.

The material suitable for forming the application member could be any elastomeric polymer, nylon, sponge, metal etc. which possess both flexibility and elasticity. The materials suitable for forming the receptacle could be polypropylene while the dialer, the sleeve, the transmission member and the stem could be formed of acrylonitrile butadiene styrene or any other suitable polymeric material. The material of the transmission member could be any polymeric material like nylon, TPE, PP or could be a suitable metal. The stem may be formed of polyacetal or any other suitable polymeric material. The material for forming the wiper could be low-density polyethylene. The aforementioned materials for forming various parts of the package of the present disclosure are an example, however other suitable materials may also be used.

The above and other objects, features and advantages of the present disclosure will become clear from the following description of the preferred embodiments when the same is read in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

So that the manner in which the above recited features of the present disclosure can be understood in detail, a more particular description of the disclosure, briefly summarized above,
5 may be had by reference to embodiments, some of which are illustrated in the appended drawings. It is to be noted, however, that the appended drawings illustrate only typical embodiments of this disclosure and are therefore not to be considered limiting of its scope, for the disclosure may admit to other equally effective embodiments.

10 FIG. 1 illustrates a front view of a cosmetic package in closed position according to an embodiment of the present disclosure;

FIG. 2 illustrates a cross sectional view of the cosmetic package of FIG. 1;

FIG. 3 illustrates exploded view of the cosmetic package of FIG. 1;

15 FIG. 4 illustrates first configuration of an adjustable applicator of the cosmetic package of FIG. 1;

FIG. 5a illustrates a cross sectional view taken along axis A-A of the adjustable applicator shown in FIG. 4;

FIG. 5b illustrates a cross sectional view taken along axis B-B of the adjustable applicator shown in FIG. 4;

20 FIG. 6 illustrates a cross sectional view of the first configuration of the adjustable applicator shown in FIG. 4;

FIG. 7 illustrates second configuration of an adjustable applicator of the cosmetic package of FIG. 1;

25 FIG. 8 illustrates a cross sectional view of the second configuration of the adjustable applicator shown in FIG. 7;

FIG. 9 illustrates enlarged perspective view of the first configuration of a portion of the adjustable applicator shown in FIG. 4; and

FIG. 10 illustrates enlarged perspective view of the second configuration of a portion of the adjustable applicator shown in FIG. 7.

30 To facilitate understanding, identical reference numerals have been used, where possible, to designate identical elements that are common to the figures. It is to be noted, however, that the appended drawings illustrate only typical embodiments of this disclosure and are therefore not to be considered limiting of its scope, for the disclosure may admit to other equally effective embodiments.

DETAILED DESCRIPTION

FIGS. 1 and 2 show a cosmetic package 1 in closed position in accordance with the present disclosure. The cosmetic package 1 includes an adjustable applicator which can be adjusted as
5 per user's convenience for application of a product including a cosmetic or a care product.

The cosmetic package 1 having a longitudinal axis X--X, comprises an adjustable applicator 2 and a receptacle 3. The receptacle 3 and the adjustable applicator 2 are intended to be fastened to each other by screwing. Alternatively, other methods of fastening the receptacle 3 and the
10 applicator 2 can be used. The receptacle 3 includes a neck 5 extending along the longitudinal axis X-X, a shoulder 6, and an end wall 7 forming a reservoir for a product P.

The adjustable applicator 2 includes a cap 4 suitable for closing the receptacle 3, an application member 40 and a stem 30 having a cavity 32. The stem 30 may be connected to the application
15 member 40 at one end and to the cap 4 at another end. The application member 40 is secured to the stem 30 and intended for being inserted in said receptacle 3 in order to be loaded with the product P to be applied.

The neck 5 of the receptacle 3 is provided with an external thread 5a intended for cooperating
20 with a complementary thread 31 carried by the stem 30, allowing the receptacle 3 to be closed by screwing. For some cosmetic products, such as mascara or a lip gloss, it is preferable to provide a wiper 8 positioned into the neck 5 of the receptacle 3 to wipe excess product P from the adjustable applicator 2 as the adjustable applicator 2 is withdrawn from the receptacle 3. The wiper 8 is preferably made of an elastomeric plastic material.

The cap 4 comprises an upper portion comprising a dialer 10 and a lower portion comprising a sleeve 20 connected to the dialer 10. According to other embodiments, the dialer 10 can be replaced by other actuator selected from a group consisting of a slider, a push button and the like which can actuated using manual, mechanical, magnetic, electrical or any other suitable force.
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As shown in FIG. 2, the adjustable applicator 2 includes a transmission member 51 having a distal end 53 and a proximal end 52. The distal end 53 of the transmission member 51 is connected at an end of the application member 40 and the proximal end 52 of the transmission member 51 is connected to a dialer 10 of the adjustable applicator 2.
30

As shown in FIGS. 4, 6, 7 and 8, the dialer 10 is rotated for rotating the transmission member 51 about the longitudinal axis X--X of the adjustable applicator 2 to cause progressive modification in shape of the application member 40.

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As shown in FIGS 3, 4, 6, 7-10, the application member 40 comprises a first portion 42, a second portion 44 and an end cap 46. The first portion 42 comprises of a hollow core having a cavity 45 and a plurality of application elements 48 on an outer surface of the hollow core. Further, the first portion 42 comprises a proximal end portion formed as a shank 42a for
10 stacking the application member 40 at the distal end of the stem 30. The second portion extends from a distal end 42b of the first portion 42. The second portion 44 is more flexible as compared to the first portion 42.

The second portion 44 comprises a proximal end 44a and a distal end 44b. The proximal end
15 44a of the second portion 44 is in contact with the distal end 42b of the first portion 42 of the application member 40. The second portion 44 comprises at least two flexible arms 43 extending from the distal end 42b of the first portion 42 towards the end cap 46 of the application member 40 with a gap 43a between the at least two flexible arms 43. Further, a plurality of application elements 48 are provided on an outer surface of each of the at least two flexible arms 43 and the
20 end cap 46.

Further, in this example, the application member 40 has a circular cross-section. However, in other examples, the application member 40 may have a cross-section selected from non-circular, oval, polygonal, rectangular, etc.

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The application elements 48 are in form of tines molded integrally on the outer surfaces of the first portion 42, second portion 44 and the end cap 46. However, it would not be beyond the scope of the present disclosure, if the application elements 48 are in form of flocking of fibers, sponge, metal or any other material known in the art.

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As shown in FIGS. 2, 6 and 8, the proximal end portion of the application member 40 formed as a bristle free shank portion 42a is fixedly and non-rotatably connected to the distal end of the stem 30. Further, the distal end of the application member 40 in form of the end cap 46 is also fixedly and non-rotatably connected to the distal end 53 of the transmission member 51. As

specifically shown in FIG. 5b, transmission member 51 and the end cap 46 are engaged by snap fit. The transmission member 51 has at least one projection 51a at its distal end 53 which is fitted into corresponding at least one groove 46a of the end cap 46 so that the distal end/end cap 46 of the application member 40 is fixedly and non-rotatably connected to the distal end 53 of the transmission member 51. However, it would not be beyond the scope of the present disclosure if alternate engagement means known in the art are used. Similar fitment can be used to non-rotatably connect the proximal end portion/shank portion 42a of the application member 40 and the distal end of the stem 30.

As shown in FIGS. 2, 4, 6 and 8, the dialer 10 is structured in a closed-end cylindrical shape. The dialer 10 further includes an internal annular skirt 16 projecting from an inner surface of a top wall of the dialer 10 and the internal annular skirt 16 extends towards the receptacle 3. The internal annular skirt 16 has a small outer diameter. An annular groove 12 is provided on an inner peripheral surface of a sidewall of the dialer 10 for attaching the dialer 10 to the sleeve 20 of the cap 4. The sleeve 20 of the cap 4 is attached with the dialer 10 such that the sleeve 20 is free to rotate relative to the dialer 10 via a snap-fit system comprising the annular groove 12 of the dialer 10 and a complementary annular protruding portion 24 of the sleeve 20. The dialer 10 can thus be turned by the user relative to the sleeve 20.

Further as shown in FIG. 5a, the internal annular skirt 16 has a rectangular cross-section into which is fitted a corresponding rectangular shaped proximal end 52 of a portion of the transmission member 51 so that the transmission member 51 is non-rotatable with respect to the dialer 10 and is rotatable along with the dialer 10 with respect to the sleeve 20 of the cap 4. Further, the transmission member 51 is not capable of moving axially with respect to the sleeve 20 as there is no axial space provided in the dialer 10 for axial movement of the transmission member 51.

Further, as seen in FIGS. 2, 3, 6 and 8 for engaging the stem 30 to the sleeve 20 of the cap 4, an upper tubular portion 33 of the stem 30 has a protruding portion 34 on its outer surface which engages with a complementary groove 22 present on inner surface of the sleeve 20. On the interfaces where the stem 30 is joined to the sleeve 20 of the cap 4, the stem 30 and the sleeve 20 of the cap 4 both may have complementary longitudinal protrusions and positioning longitudinal grooves (not shown) that engage with each other for non-rotatably locking the stem 30 and the sleeve 20 together. However, it is not beyond ambit of the present disclosure that any

other non-rotatable engagement known in the art may be employed for locking any relative rotation between the stem 30 and the sleeve 20.

Further, as seen in FIGS. 2 and 3, the stem 30 comprises the upper tubular portion 33, a downward skirt 36 and an elongated hollow shaft 37. The threads 31 are provided on the inner peripheral surface of the downward skirt 36 of the stem 30 to attach the cap 4 to an externally threaded neck 5 of the container 3. With the cap 4 so attached, the application member 40 is immersed in the product P to be applied. The elongated hollow shaft 37 extends beyond the neck 5 in the receptacle 3. Preferably, the elongated hollow shaft 37 of the stem 30 is disposed around at least a portion of the transmission member 51 so that the transmission member 51 is rotatable with respect to the shaft 37. In the embodiment illustrated, the shaft 37 and the transmission member 51 have circular transverse cross-sections. However, proximal portion of the transmission member 51 has a rectangular cross-section as shown in FIG. 5a. In other embodiments the shaft 37 and the transmission member 51 may have non-circular transverse cross-sections throughout their length.

In the present embodiment, the stem 30 further includes such features that allow smooth rotation of the transmission member 51 when the dialer 10 is rotated with respect to the sleeve 20. For example, as seen in FIGS. 2, 3 and 4, the transmission member 51 includes two annular flanges 57 which guide rotation of the transmission member 51 with respect to the sleeve 20.

According to an embodiment of the disclosure, the application member 40 can adopt at least two stable configurations that is to say a first configuration as shown in FIGS. 4, 6 and 9 and a second configuration as shown in FIGS. 7, 8 and 10. In both the first configuration and the second configuration, as shown in FIGS. 6 and 8; the proximal end 52 of the transmission member 51 is in contact with the top wall of the dialer 10 such that the transmission member 51 cannot move in axial direction with respect to the stem 30. This is in contrast to certain of the prior art, such as US Patent 8,141,561, in which a twisting motion on the cap is used to move a transmission member axially, applying a pulling force to the applicator at the end of the shaft and thereby imparting curvature.

During assembly of the adjustable applicator 2, as shown in FIGS. 3 and 6, the application member 40 is assembled with the stem 30, transmission member 51, sleeve 20 and the dialer 10, in such a way that the flexible arms 43 of the second portion 44 are slightly pulled towards the

cap 4 when the proximal end 52 of the transmission member 51 contacts the top wall of the dialer 10, thus the flexible arms 43 of the second portion become convex shaped. Thus, the second portion 44 of the application member 40 has a ball shape having convex arms 43 with a gap 43a between the convex arms 43. This shape as shown in FIGS. 4, 6 and 9 corresponds to the first stable configuration of the application member 40. In other alternate embodiments, the flexible arms 43 can be made into a convex shape directly during molding of the application member 40.

As shown in FIGS. 7, 8, and 10, the application member 40 has a second stable configuration, in which the flexible arms 43 of the second portion 44 of the application member 40 are twisted in a helical shape with respect to the longitudinal axis X-X. The inclusions of first and second stable configurations is in contrast to the disclosure of US Patent 8,881,745, in which an applicator is elastically deformed from a “resting” configuration to a twisted configuration, which would thus require the user to carefully hold the apparatus in the twisted configuration to prevent relaxation back to the “resting” configuration. In some examples, there is no need to apply force to the handle to maintain either the first configuration or the second configuration, unlike prior examples that rely on elastic deformation of an applicator to impart shape change.

In an alternate embodiment, in the second configuration, the first portion 42 of the application member 40 may also be twisted slightly. In such a case where both the first portion 42 and the second portion 44 are twisted in the second configuration, the ratio of twisted angle between the first portion and the second portion is the range of 1-10:99-90. In other words, the first portion 42 may also twist, but to a lesser extent than that of the second portion 44. Further, as shown in FIG. 2, the adjustable applicator 2 has the first configuration in closed position of the cosmetic package 1. However, it would not be beyond the scope of the present invention, if the adjustable applicator 2 has the second configuration in the closed position of the cosmetic package 1.

During use, when the adjustable applicator is removed from the container 2, it has a first configuration as shown in FIG. 4. In an open position of the cosmetic package 1, when the dialer 10 is rotated with respect to the sleeve 20, the transmission member 51 rotates with respect to the shaft 37 which causes twisting of the application member 40 as explained above. When a suitable adjustment of the profile of the application member 40 has been made it will be retained while the application member 40 is used. The adjustment is retained until the user intentionally rotates the dialer 10 and the sleeve 20 with respect to each other once again to achieve a

different adjustment.

In order to transform the profile of the application member 40 to a second configuration as shown in FIGS. 7, 8 and 10, the dialer 10 is twisted in first direction and the rotational movement of the dialer 10 is converted into rotational movement of the transmission member 51 fixedly connected within the inner skirt 16 of the dialer 10. Therefore, the transmission member 51 is now able to rotate with respect to the shaft 37 of the stem 30. As the transmission member 51 is fixedly and non-rotatably connected to the distal end/ end cap 46 of the application member 40, the flexible arms 43 of the second portion of the application member 40 get twisted and compressed towards the transmission member 51 and the application member 40 is transformed to a second configuration. The transmission member 51 can be adjusted to various relative longitudinal positions with respect to the shaft 37 depending on degree of twisting, such that as adjustment is made, profile of the application member 40 varies. Once the adjustment is made, it will be retained without any action by the user, until further adjustment is desired and intentionally made.

Further, the user can rotate the dialer 10 in an opposite direction to rotate the transmission member 51 in the opposite direction with respect to the shaft 37 of the stem 30. As the transmission member 51 is rotated in opposite direction, the flexible arms 43 again take up the convex shape and, the application member 40 is transformed again to the first configuration as shown in FIGS. 2, 4, 6, and 9.

The material suitable for forming the application member 40 could be any elastomeric polymer, nylon, sponge, metal etc. which possess both flexibility and elasticity. The application member 40 and/or the application elements 48 may be formed of rubber, low density polyethylene (LDPE), thermoplastic elastomers (TPE), silicone, plastic (e.g. polypropylene (PP)), fabric mesh, or any other suitable material. It is contemplated that the first portion 42, second portion 44, and/or end cap 46 may be formed from the same material or different materials, as desired. Furthermore, the application member 40 and/or the application elements 48 may be formed integrally (e.g. as unitary structure) with bristles as an injection molded unit, as a series of installed bristles (e.g., like a toothbrush), as a series of tied bristles (e.g., like a pipe cleaner), or other configuration. Further, various components of the application member 40 and/or the application elements 48 may be over-molded as a single unit. Alternatively, rather than over-molding, instead, another body comprising bristles may be over-molded to an over-molded

brush and tip unit without bristles. Further, end cap 46 may not be over-molded to the application member 40, and instead, the end cap may be over-molded to the transmission member 51 or other stem structure.

5 Further, while the application member 40 has been generally described as a bristled structure, it is contemplated that the application member 40 may take the form of other applicators including, but not limited to: a sponge, a stick, a synthetic bristle brush (e.g., plastic, silicone, latex or composites thereof), a natural bristle brush (e.g., hair, cellulose fibers, cotton, hemp, flax or composites thereof), a combination of synthetic or natural bristles, a comb, foam,
10 silicone, a doe foot, metallic bristles, flocking, a solid applicator member (e.g., a paddle or spatula), etc.

The materials suitable for forming the receptacle 3 could be polypropylene while the dialer 10, the sleeve 20, the transmission member 51 and the stem 30 could be formed of acrylonitrile
15 butadiene styrene or any other suitable polymeric material. The material of the transmission member 51 could be any polymeric material like nylon, TPE, PP or could be a suitable metal. The stem 30 may be formed of polyacetal or any other suitable polymeric material. The material for forming the wiper 8 could be low-density polyethylene. The aforementioned materials for forming various parts of the package of the present disclosure are an example, however other
20 suitable materials may also be used.

Although the above description and drawings show the package being cylindrical, the shapes and profile cross section thereof are not limited to the same. While the foregoing is directed to embodiments of the present disclosure, other and further embodiments of the disclosure may be
25 devised without departing from the basic scope thereof, and the scope thereof is determined by the claims that follow.

What is claimed is:

1. An adjustable applicator for applying a product to a surface, the adjustable applicator comprising:
 - a cap, the cap having an upper portion and a lower portion;
 - a stem having an upper portion coupled to the lower portion of the cap, a distal end and, having a cavity therein;
 - an application member having a first portion coupled to the distal end of the stem, a second portion, and an end cap, the application member including a hollow core; and
 - a transmission member having a proximal end coupled to the upper portion of the cap and a distal end coupled to the end cap of the application member, the transmission member disposed within the cavity of the stem and the hollow core of the application member;wherein the upper portion of the cap comprises an actuator which is actuatable to initiate a progressive modification of a shape of the application member from a first configuration to a second configuration with a plurality of configurations therebetween;
 - characterized in that the first and second configurations do not require elastic deformation of the applicator.
2. The adjustable applicator of claim 1, wherein the actuator is a rotatable dialer.
3. The adjustable applicator of claim 1, wherein the actuator is configured to rotate the transmission member about a longitudinal axis of the adjustable applicator.
4. The adjustable applicator of claim 1, wherein the second portion of the application member comprises a first flexible arm and a second flexible arm, the first and second flexible arms extending from a distal end of the first portion towards the end cap.
5. The adjustable applicator of claim 4, wherein the first and second flexible arms have a convex shape in the first configuration.
6. The adjustable applicator of claim 4, wherein in response to actuation of the actuator, the first and second flexible arms are configured to twist in a helical shape relative to a longitudinal axis of the adjustable applicator.

7. The adjustable applicator of claim 1, wherein the second portion of the application member is more flexible than the first portion of the application member.
8. The adjustable applicator of claim 1, further comprising a plurality of application elements molded on an outer surface of the first portion, the second portion, and the end cap.
9. The adjustable applicator of claim 1, wherein the transmission member is axially fixed relative to the upper portion of the cap along a longitudinal axis of the adjustable applicator.
10. An adjustable applicator for applying a product to a surface, the adjustable applicator comprising:
- a cap having a dialer and a sleeve, the dialer rotatably coupled to the sleeve;
 - a stem having an upper portion coupled to the sleeve of the cap, a distal end, and having a cavity therein;
 - a transmission member having a proximal end coupled to the dialer of the cap and a distal end, the transmission member extending, at least in part, through the cavity of the stem;
 - an application member including a plurality of application elements extending from an outer surface thereof, the application member comprising:
 - a first portion having a proximal shank configured to fixedly couple the application member to the stem and a distal portion extending to a distal end;
 - a second portion having a first flexible arm, a second flexible arm, and the gap between the first flexible arm in the second flexible arm, the first and second flexible arms extending distally from the distal end of the first portion; and
 - an end cap fixedly secured to the distal end of the transmission member;
- wherein rotation of the dialer in a first direction is configured to initiate a progressive modification of a shape of the application member between at least a first configuration and a second configuration.
11. The adjustable applicator of claim 10, wherein the rotation of the dialer results in a corresponding rotation of the transmission member about a longitudinal axis of the adjustable applicator.
12. The adjustable applicator of claim 10, wherein rotation of the dialer in a second direction opposite the first direction is configured to move the application member from the second

configuration towards the first configuration.

13. The adjustable applicator of claim 10, wherein the first and second flexible arms have a convex shape in the first configuration.

14. The adjustable applicator of claim 10, wherein in response to rotation of the dialer in the first direction, the first and second flexible arms are configured to twist in a helical shape relative to a longitudinal axis of the adjustable applicator.

15. The adjustable applicator of claim 13, wherein in response to rotation of the dialer in a second direction opposite the first direction, the first and second flexible arms are configured to resume the convex shape.

16. The adjustable applicator of claim 10, wherein once the dialer has positioned the application member in the first configuration or the second configuration, the dialer is configured to retain the application member in the first configuration or the second configuration without any action by a user.

17. The adjustable applicator of claim 10, wherein the transmission member is rotatable relative to the stem.

18. The adjustable applicator of claim 10, wherein the dialer further comprises an annular skirt extending from an inner surface of the top wall of the dialer towards the application member, the annular skirt having a generally rectangular cross-section.

19. The adjustable applicator of claim 18, wherein the proximal end of the transmission member is coupled within the annular skirt of the dialer.

20. An adjustable applicator system for applying a product to a surface, the adjustable applicator system comprising:

an adjustable applicator, the adjustable applicator comprising:

a cap, the cap having an upper dialer portion and a lower sleeve portion;

a stem having an upper portion coupled to the lower portion of the cap, a distal end and having a cavity therein;

an application member having a first portion coupled to the distal end of the stem, a second portion, and an end cap, the application member including a hollow core; and

a transmission member having a proximal end coupled to the upper portion of the cap and a distal end coupled to the end cap of the application member, the transmission member disposed within the cavity of the stem and the hollow core of the application member;

wherein the upper dialer portion of the cap is configured to be rotatable relative to the lower sleeve portion to move the application member from a first configuration to a second configuration and a plurality of configurations therebetween; and

a receptacle configured to receive a product, the receptacle configured to be releasably coupled to the lower portion of the cap.

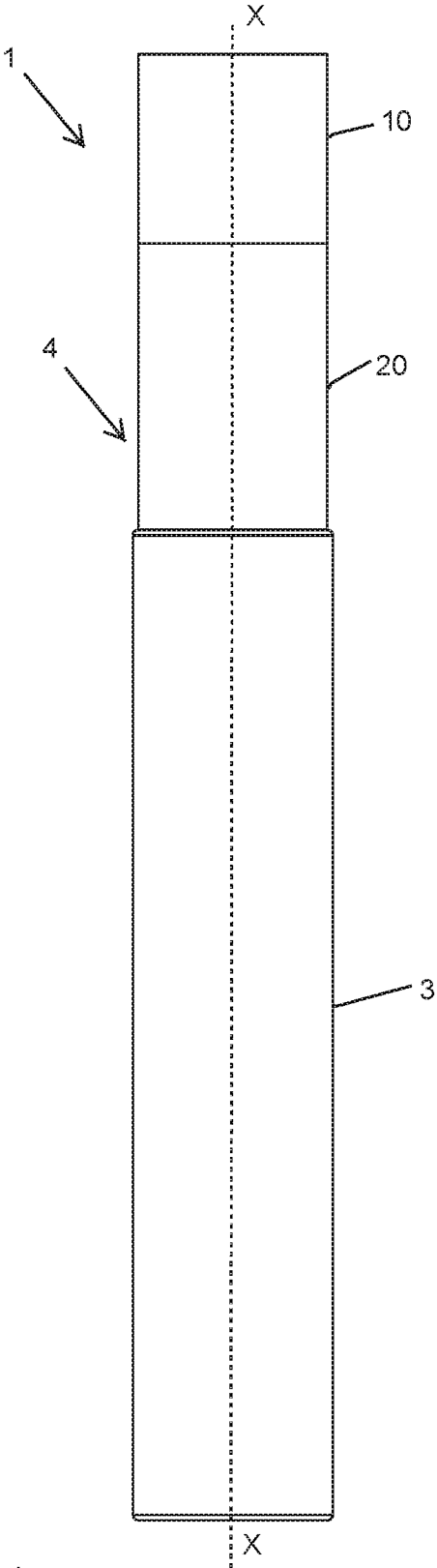


FIG. 1

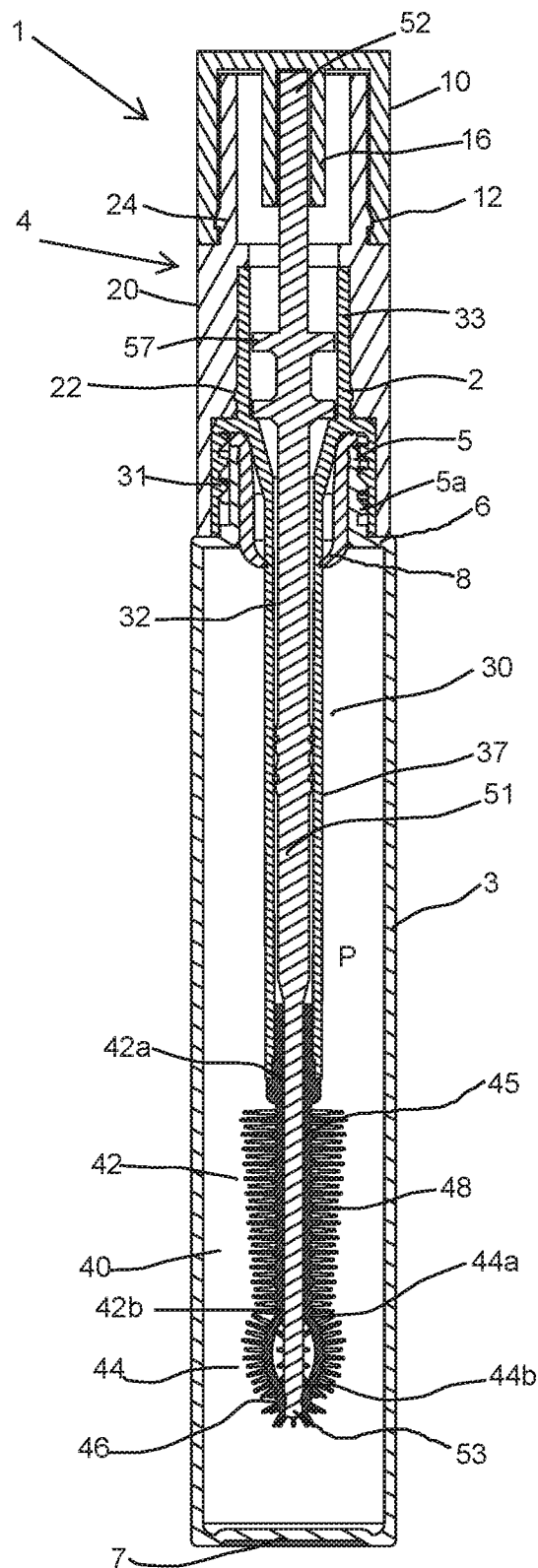


FIG. 2

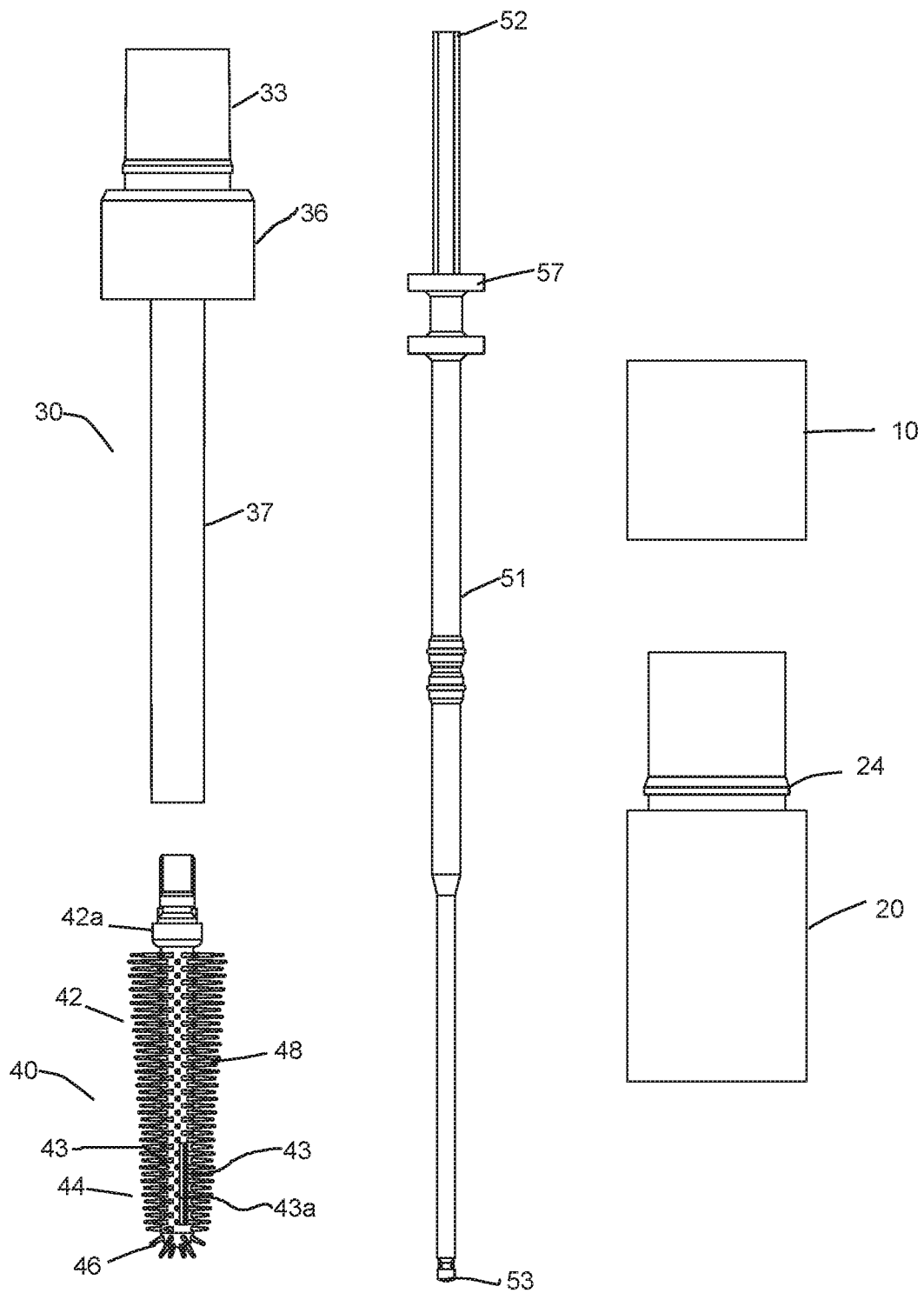


FIG. 3

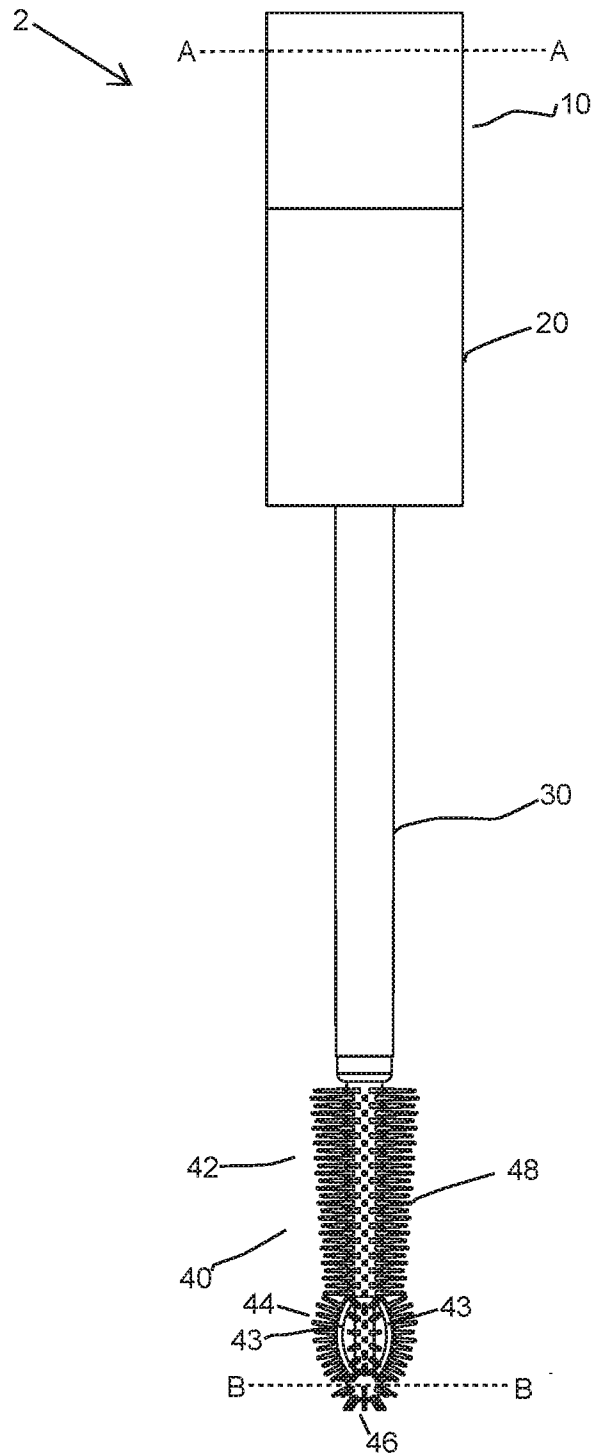


FIG. 4

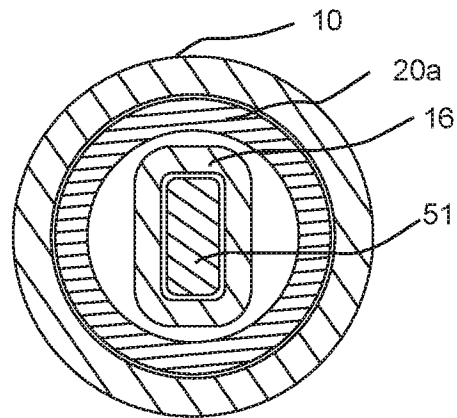


FIG. 5a

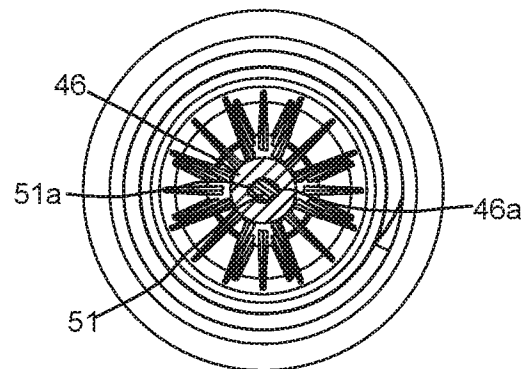


FIG. 5b

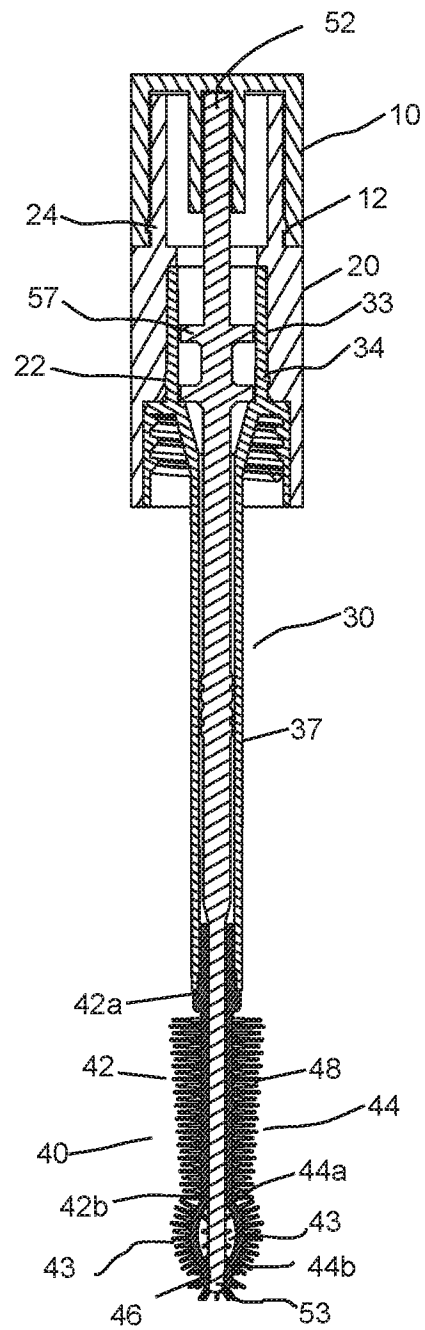


FIG. 6 □

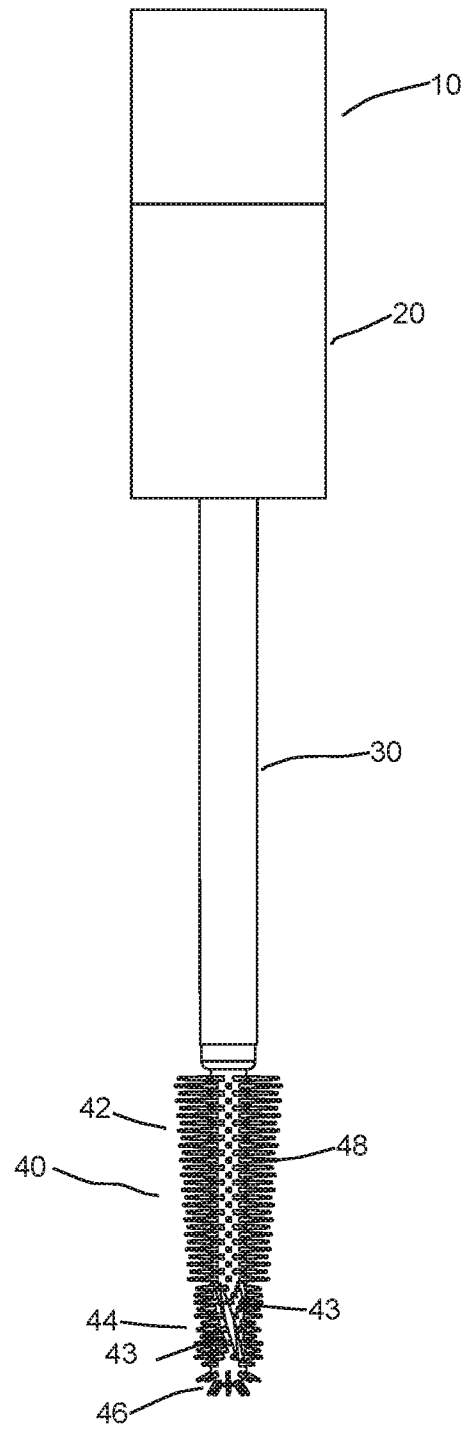


FIG. 7

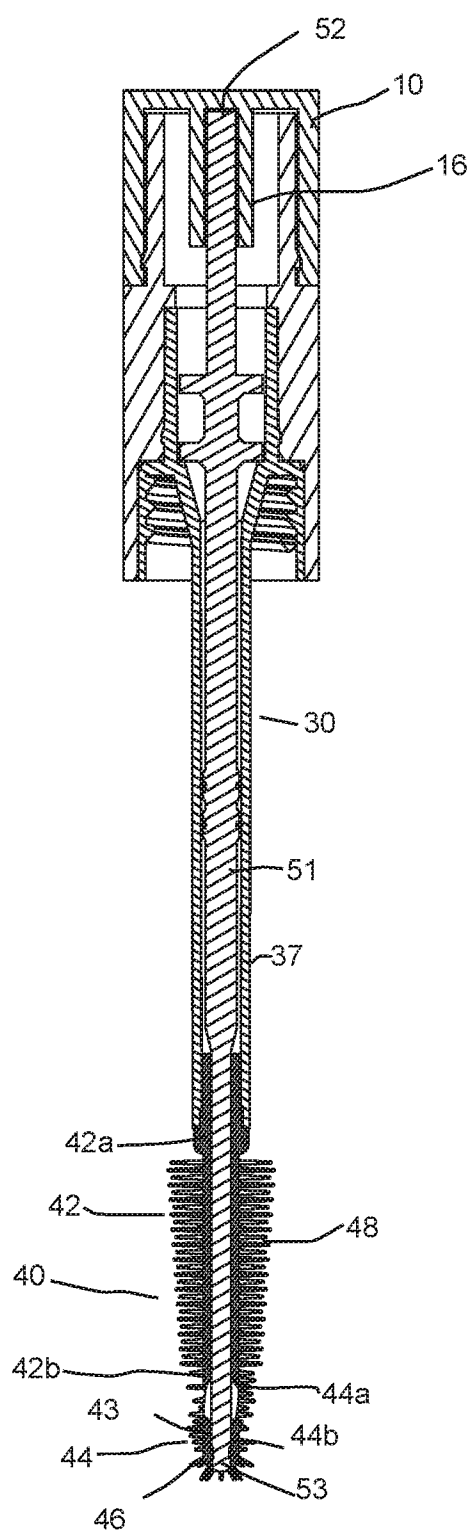


FIG. 8

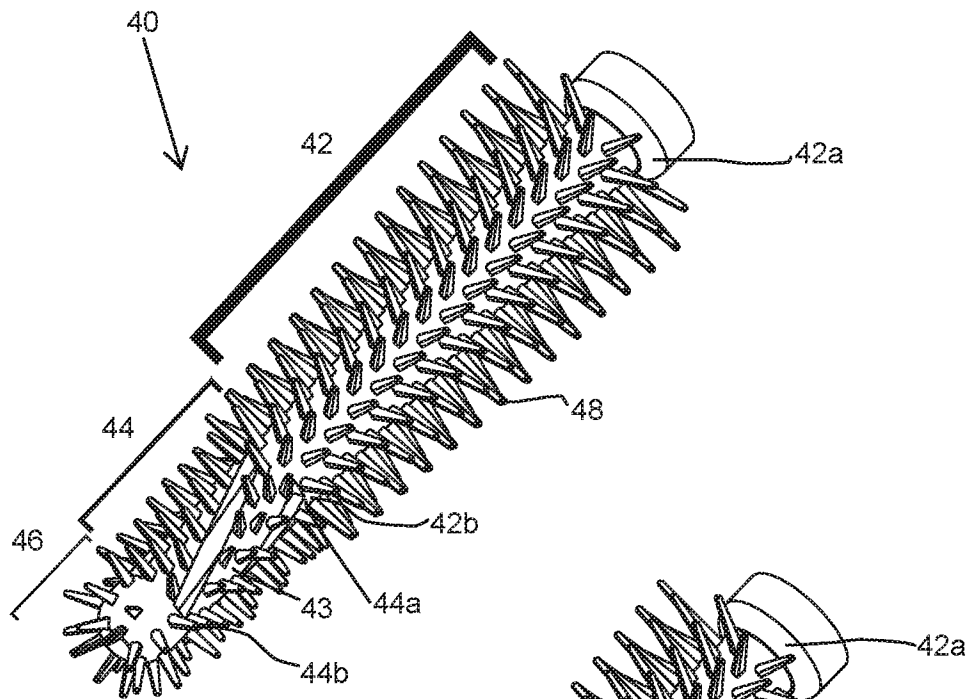


FIG. 10

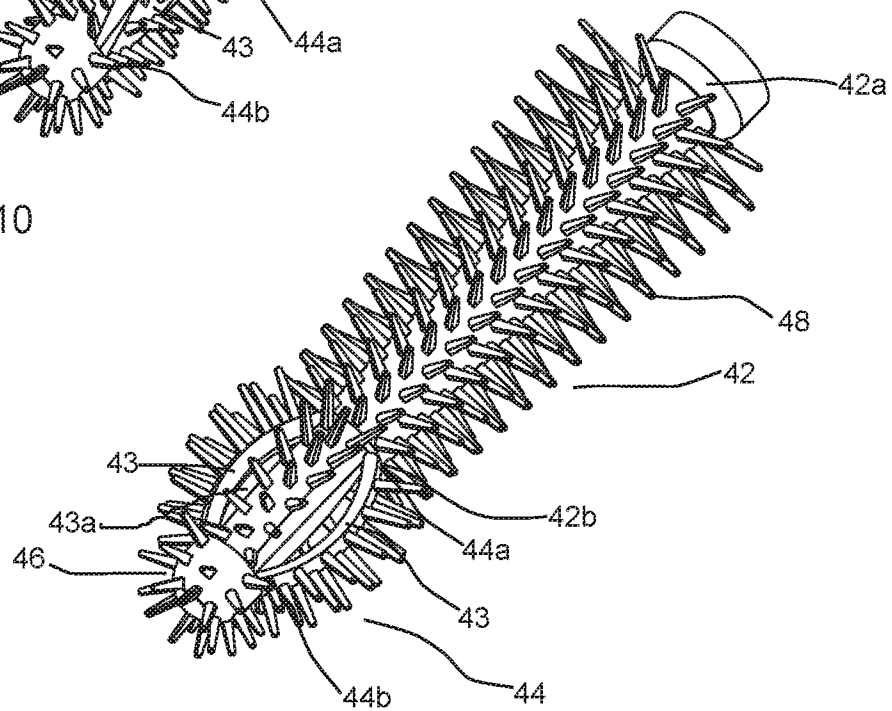


FIG. 9

A. CLASSIFICATION OF SUBJECT MATTER**A45D 34/04(2006.01)i, A45D 40/26(2006.01)i, A46B 9/02(2006.01)i, B65D 51/32(2006.01)i**

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A45D 34/04; A45D 40/26; A45D 20/26; A46B 9/10; A45D 34/00; A46D 1/00; A46B 9/02; B65D 51/32

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: mascara, adjustable applicator, cap, stem, application member, transmission member, helical shape, convex shape

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2010-098997 A1 (ZEN DESIGN SOLUTIONS LIMITED) 02 September 2010 See abstract; claims 1-8; paragraphs [0031]-[0040]; and figures 1-4, 5a-5b, 6.	1-20
Y	US 2009-0014022 A1 (SALCIARINI, CHRISTIAN) 15 January 2009 See abstract; paragraphs [0007], [0071]-[0101]; and figures 1B, 10A-10B.	1-20
A	US 2012-0167910 A1 (WEIGEL, FRIEDRICH) 05 July 2012 See the whole document.	1-20
A	WO 2016-177827 A1 (L'OREAL) 10 November 2016 See the whole document.	1-20
A	KR 20-0472950 Y1 (TAESUNG INDUSTRIAL CO., LTD.) 30 May 2014 See the whole document.	1-20



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

25 May 2018 (25.05.2018)

Date of mailing of the international search report

25 May 2018 (25.05.2018)

Name and mailing address of the ISA/KR

International Application Division

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2018/018167

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