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(54) **ADJUSTABLE APPLICATOR**

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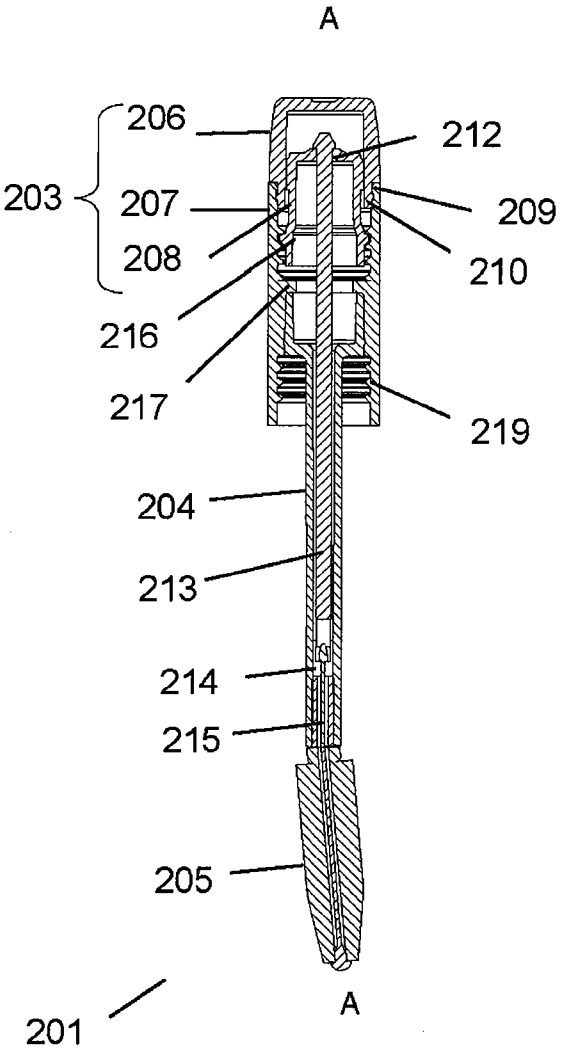
(57) **ABSTRACT**

The present invention 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 invention discloses an adjustable applicator comprising an applicator element having a non-centrally aligned bore, a filament wherein the filament is housed inside the bore of the applicator element and a clasping means wherein the applicator element angularly deforms when a force is applied on the clasping means. Also disclosed is a device for packaging and dispensing a substance comprising said adjustable applicator.



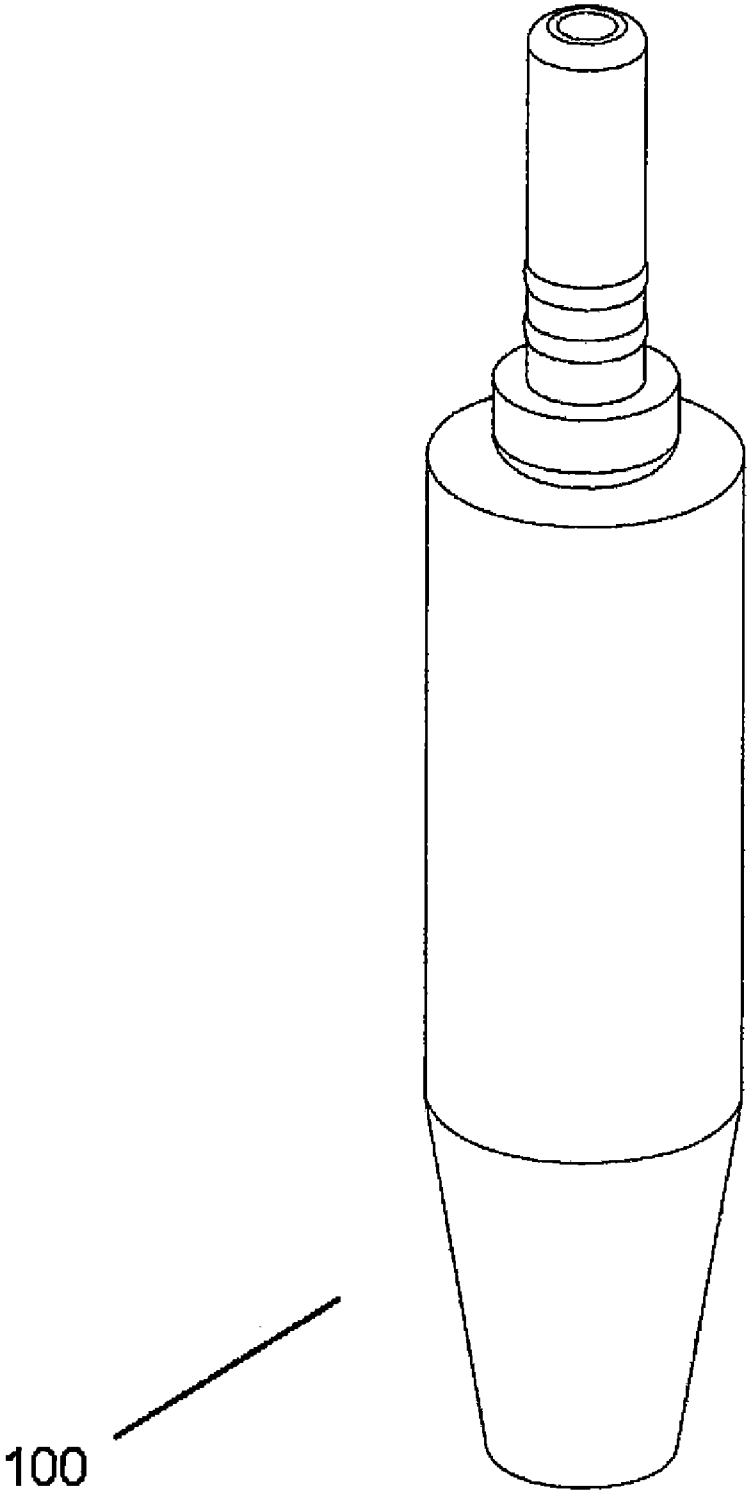


Fig. 1

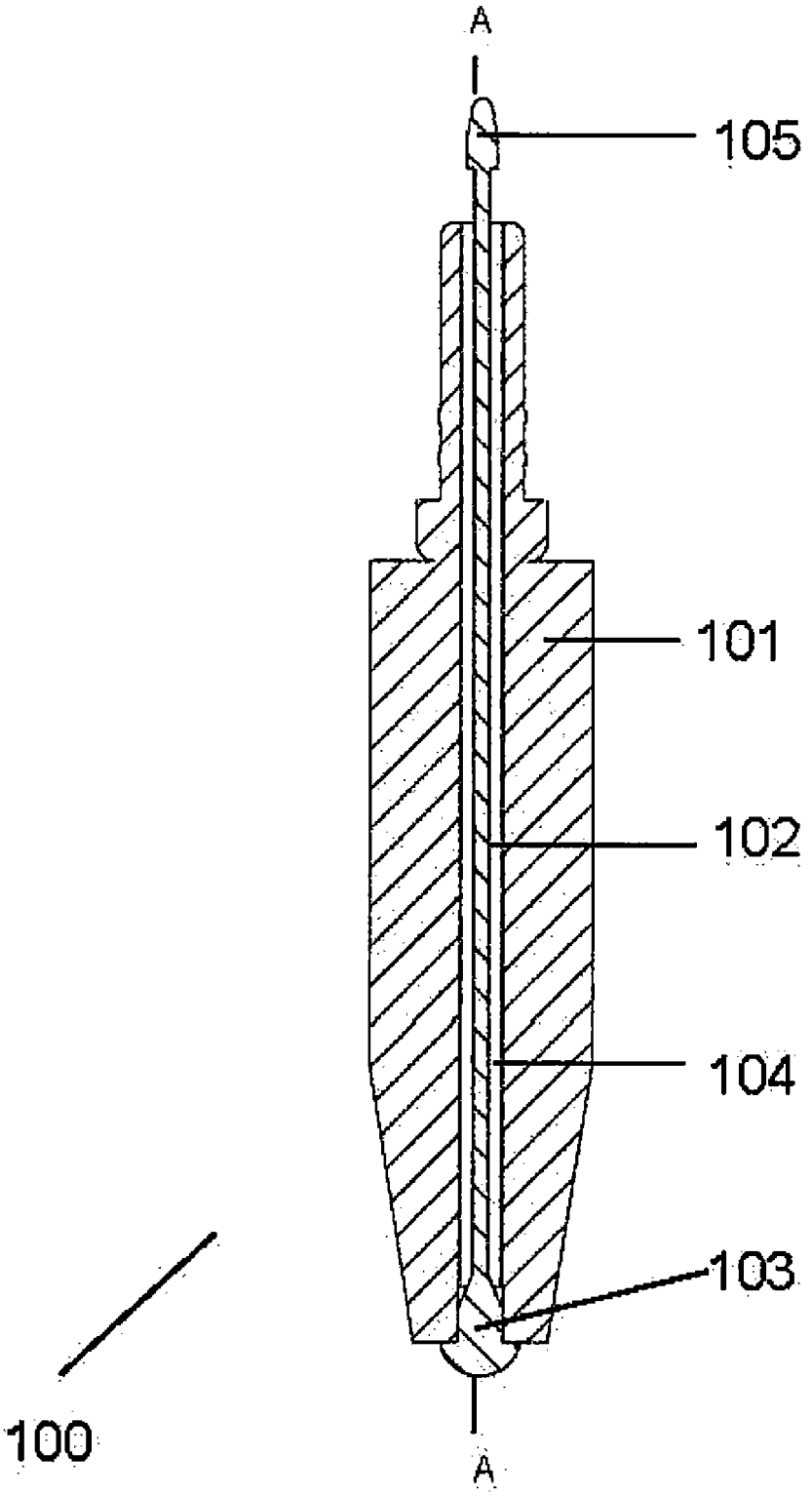


Fig. 2

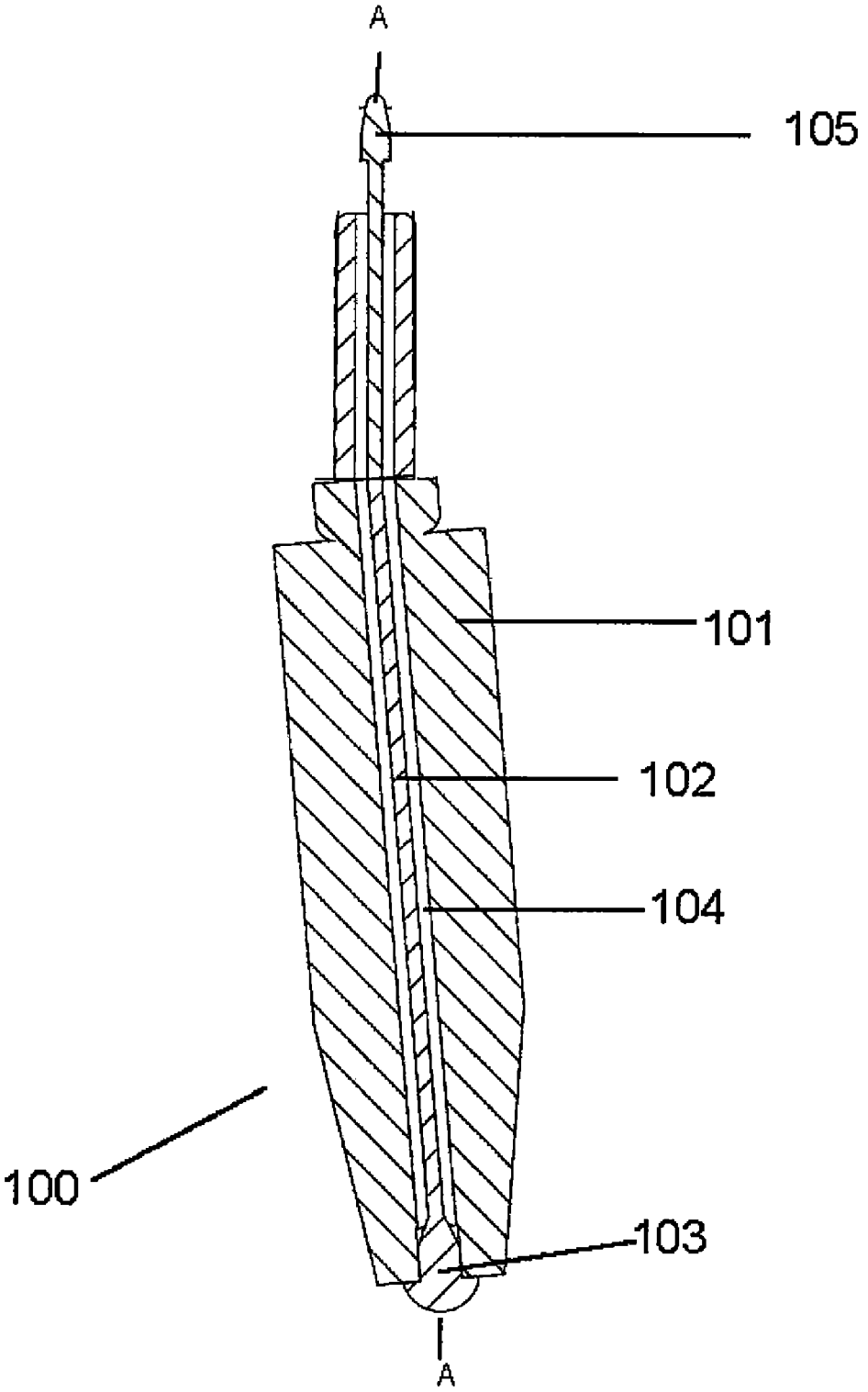


Fig. 3

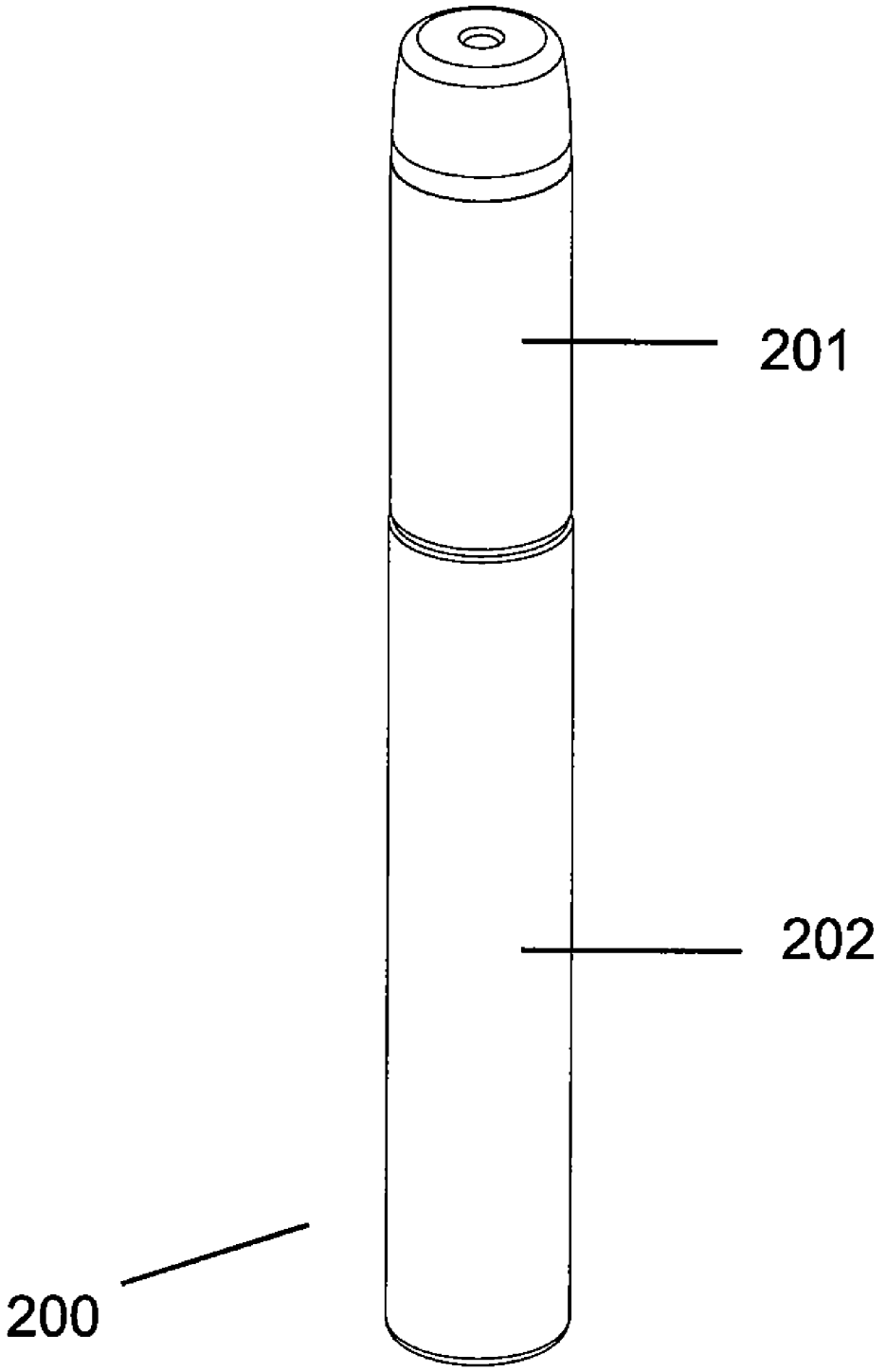


Fig. 4

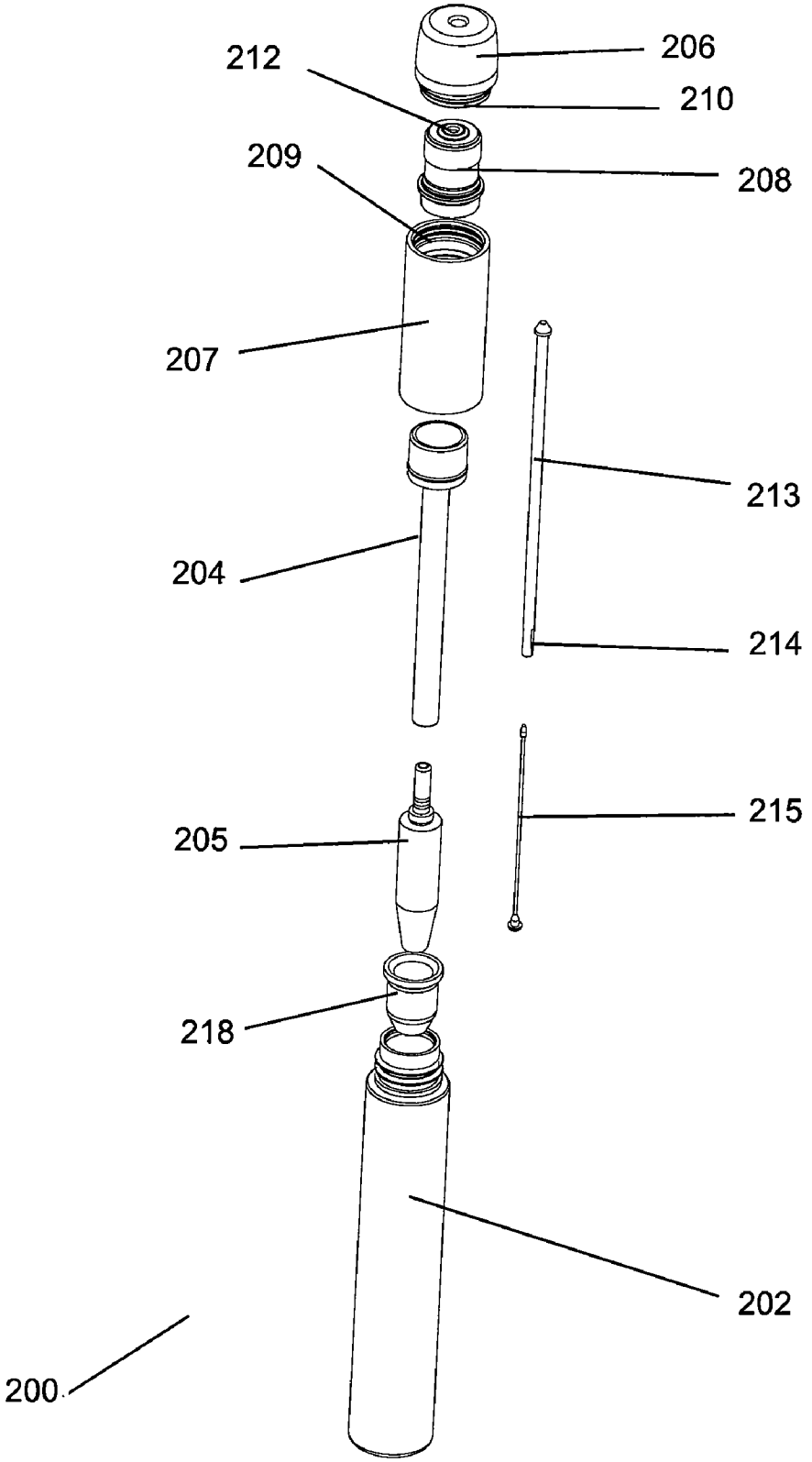


Fig. 5

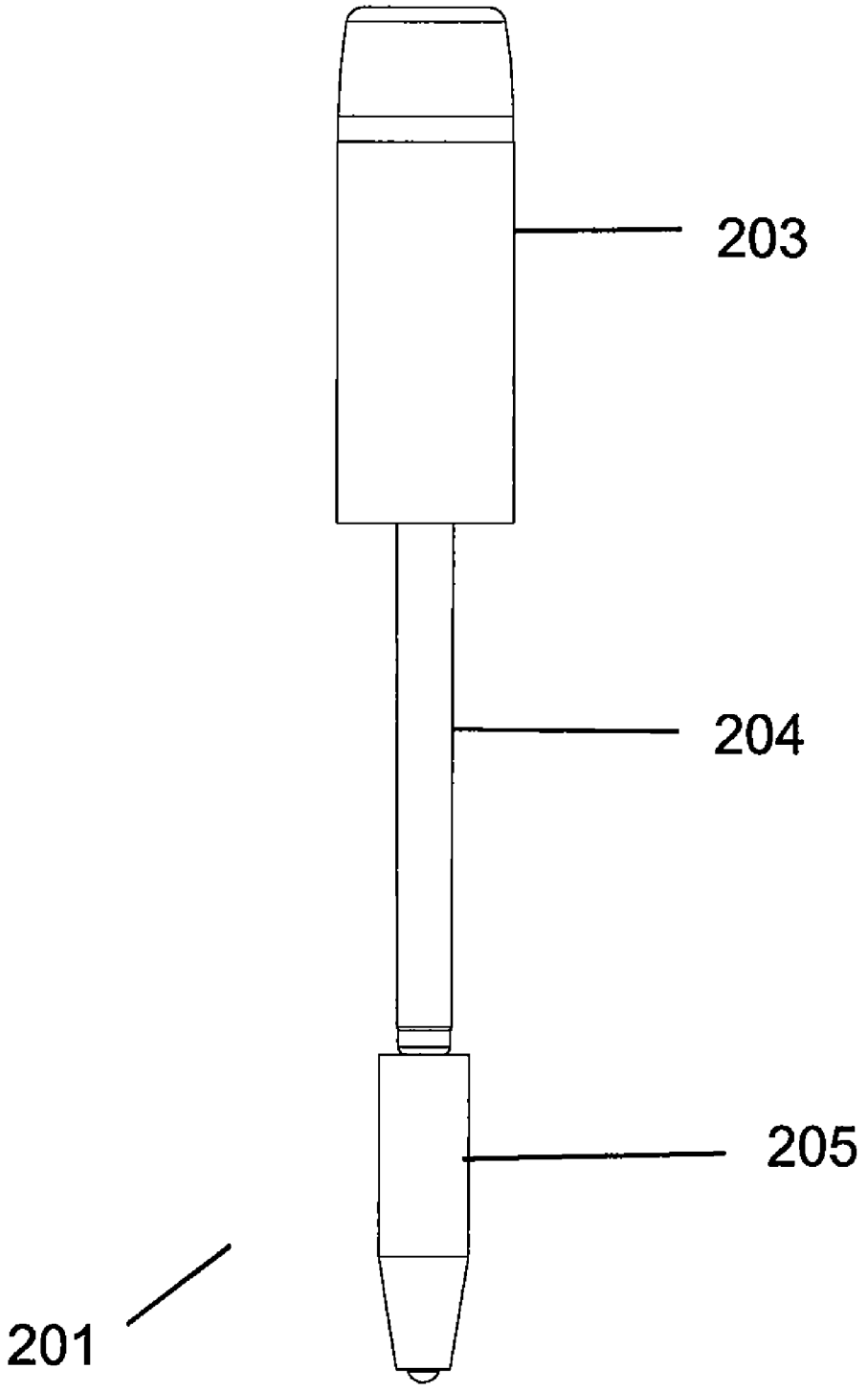
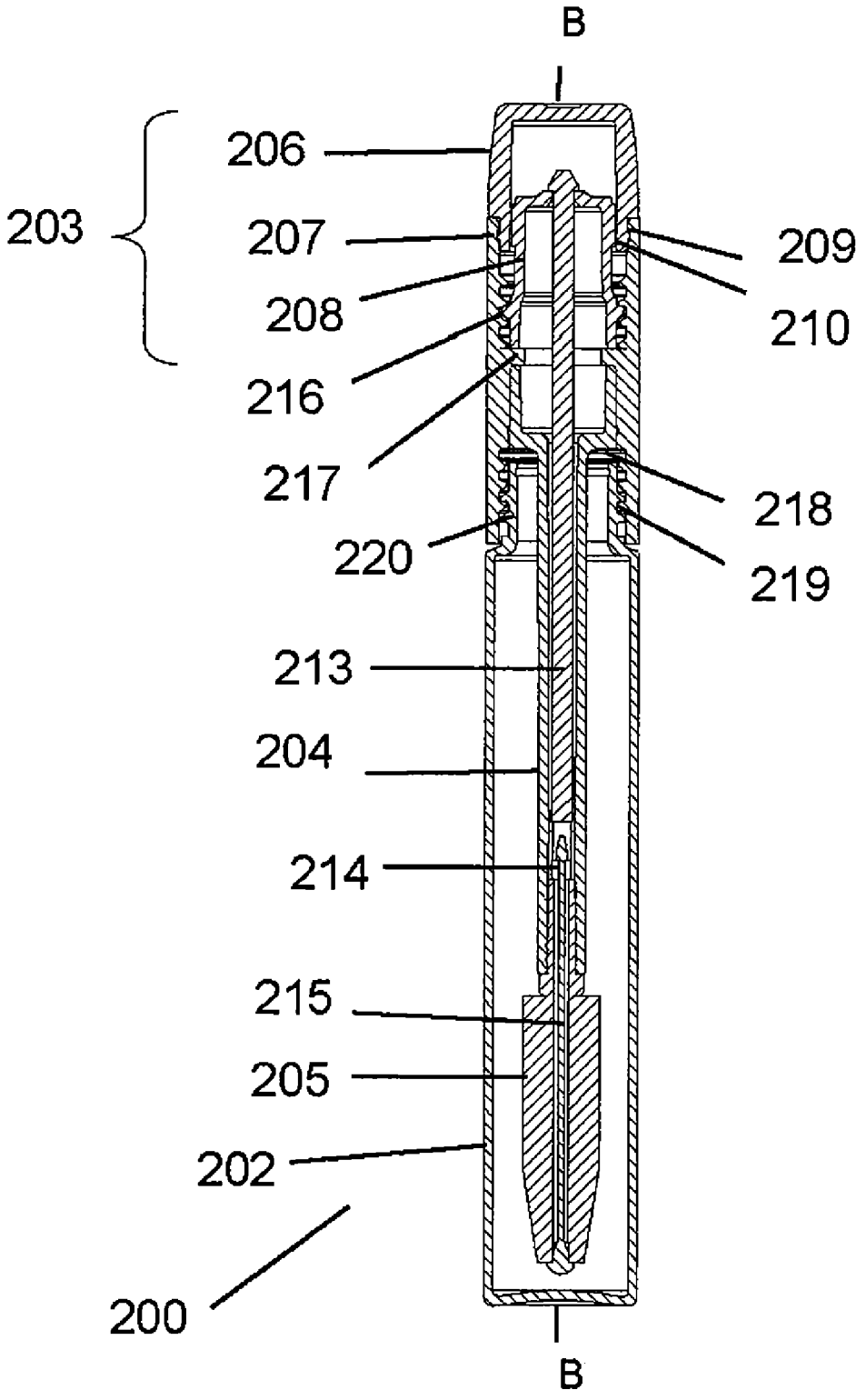


Fig. 6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B

Fig. 7

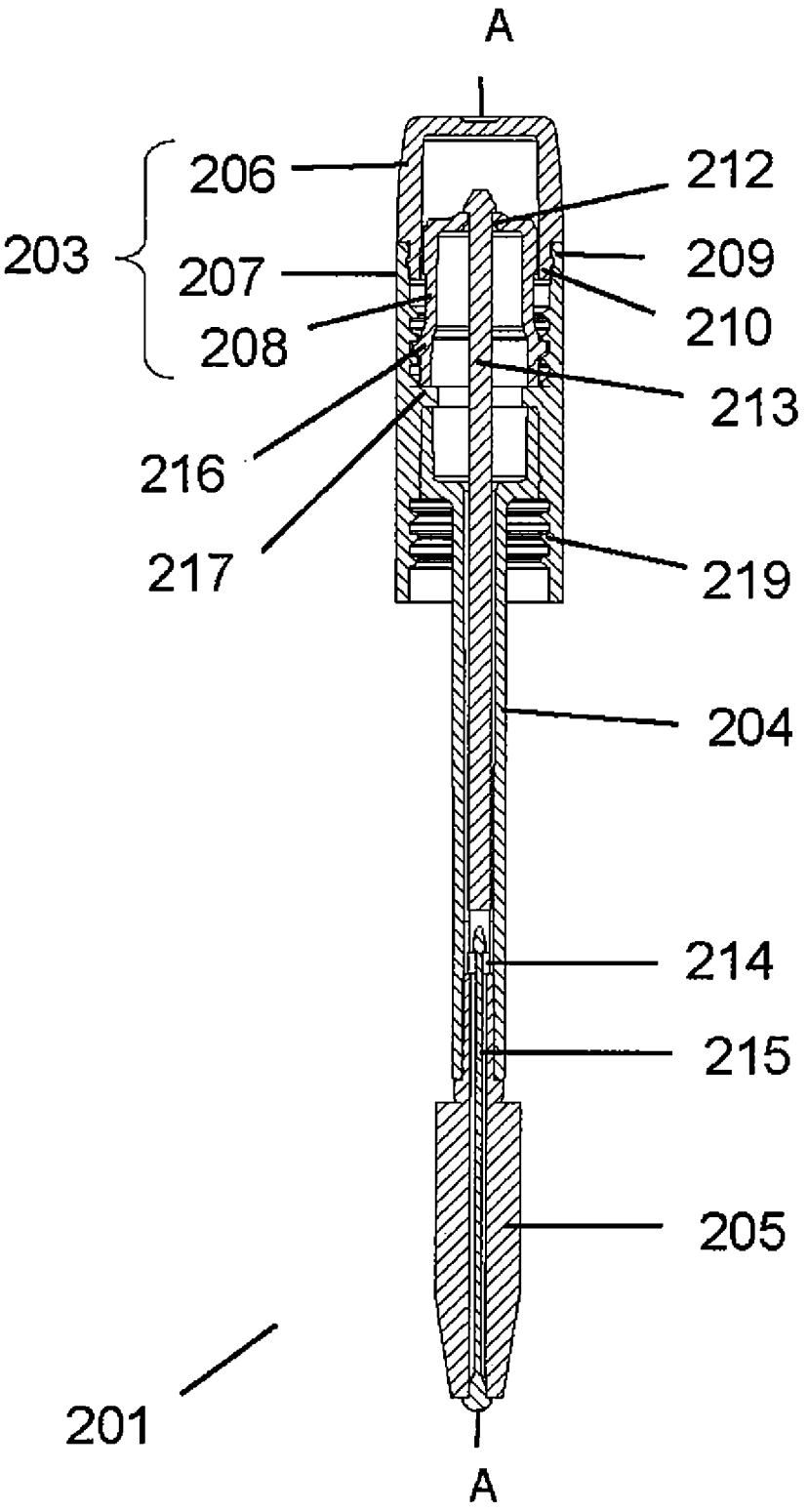
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Fig. 8

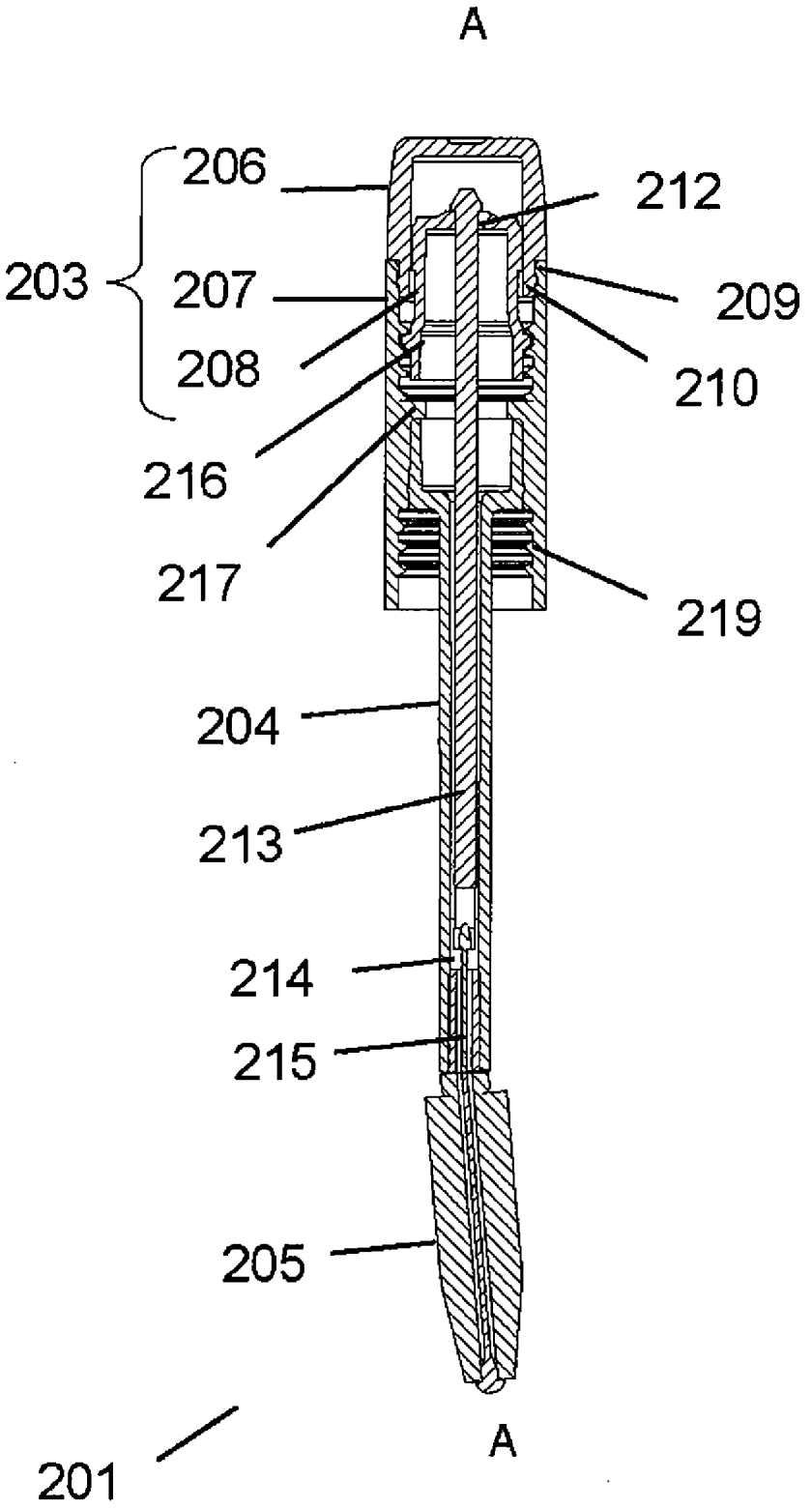
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Fig. 9

ADJUSTABLE APPLICATOR

BACKGROUND

[0001] 1. Field of the Invention

[0002] Embodiments of the present invention generally relate to adjustable applicators. More particularly the invention relates to applicators that can be adjusted as per user's convenience for application of a cosmetic or a care product.

[0003] Applicators of the present invention can be employed in application of various products, such as for viscous cosmetics, for coloring strands of hair, and for dental flossing or for applying pharmaceuticals or cleaning agents.

[0004] 2. Description of the Related Art

[0005] Various applicators for applying a substance are known. There are certain application areas where there is a requirement of curving the applicator as per user's convenience. Some such areas include application of mascara or in the cleaning of dental interstices. Majority of the existing applicators for such usages are pre-curved at a certain angle. For example U.S. Pat. No. 4,326,548 to Wagner discloses an oral hygiene tool comprising of a pen barrel shaped holder that carries a curved dental pick. Another example is that of U.S. Pat. No. 6,082,999 to Tcherny, et al. which discloses a reusable flexible interdental device that has advantages of a toothpick and an interdental brush and also provides flexibility in two mutually perpendicular directions. However, the flexibility achieved is not controllable by the user. Therefore, there exists a need for a personal oral hygiene tool which can be used as per convenience by the user.

[0006] Also, 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 depends on both the product and on the applicator used to apply it.

[0007] Mascara applicators such as twisted wire mascara brushes, curved mascara brushes and adjustable mascara applicators are known in the art. Curved mascara brushes permit contact of the brush with more eyelashes along a correspondingly curved eyelid. However, the rigid curved brush is a more difficult instrument to learn to use in the confines of the eye area, particularly the corners of the eye where a straight brush works better. Another drawback of 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.

[0008] Adjustable mascara brushes are known in the prior art. It is known to provide adjustment of the angle of the brush or applicator relative to the applicator wand or handle as in U.S. Pat. No. 4,428,388 to Cassai et al. and the amount of brush exposed as in U.S. Pat. No. 4,598,723 to Cole.

[0009] U.S. Pat. No. 5,137,038 to Kingsford discloses an adjustable mascara applicator which can be adjusted by a user from straight to curved by the help of an extendable rod which is slidably disposed in the applicator wand. This rod may be straight to straighten a precurved applicator or curved so as to impart curvature to a straight applicator.

[0010] U.S. Pat. No. 6,309,125 to Andrea Peters discloses an adjustable mascara applicator that includes a brush attached to a bendable wand which is characterized by recovery memory in which it automatically assumes a predetermined bend angle in the absence of bending force.

[0011] While International Patent application WO 2007/117091A1 to Amorepacific Corporation, discloses an adjustable mascara brush that includes a brush stick provided in a cap, a brush provided at the end of the brush stick and an elevating bar which is connected to the brush stick in a manner of screw wherein the brush gets straightened when the elevating bar is lowered and the brush gets curved when the elevating bar is elevated up.

[0012] Although many of these prior art adjustable applicators are relevant with respect to the present invention, most of them use an additional component i.e. a rod that is either pre-bent or has a recovery memory. Moreover, none of the designs propose a mechanism by which the applicator element could be straightened or curved to varying degrees without the usage of additional component.

[0013] 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

[0014] The present invention 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 invention for removal of make up products is also contemplated.

[0015] According to an embodiment of the invention, there is provided an applicator which employs an inventive mechanism to enable angular deformation of the applicator element to varying degrees of deformation.

[0016] In accordance with an embodiment of the invention, the adjustable applicator of the invention comprises of an applicator element and a filament. In the applicator element is provided a non-centrally aligned bore providing passage for the filament. The filament is arranged to be movable inside the bore of the applicator element.

[0017] According to yet another embodiment of the invention, the applicator element may be molded as a single piece from an elastically deformable material. The applicator element may be produced from an elastomer or any other elastic material allowing compression and expansion of the applicator element.

[0018] According to an embodiment of the invention, the filament may be made out of a material selected from a polymeric material and metals.

[0019] According to an embodiment of the invention, the filament is so arranged as to cause progressive modification in the shape of the applicator element. The filament facilitates adjustment of the angular deformation of the applicator element.

[0020] According to yet another embodiment of the invention, one end of the filament is fixed at the distal end of the applicator element and the other end of the filament is attached to a clasping means such that when force is applied on the clasping means to cause tension along the axis of the filament, it results in angular deformation of the applicator

element. Further, the force applied to the clasping means is directly proportional to the deformation angle of the applicator element achieved.

[0021] According to an embodiment of the invention the clasping means could be provided at the proximal end of the filament itself or the filament could be engaged with another element having clasping or any other suitable means. Further, the mode of application of force on the clasping means could be manual, mechanical, magnetic, electrical or any other suitable mode to cause tension along the axis of the filament.

[0022] According to an embodiment of the invention the applicator element may have a substantially circular outside cross-section, but the case in which the deformable applicator element has a cross-section of different shape, such as polygonal, is also contemplated by this invention.

[0023] According to yet another embodiment of the invention, the filament could be fixed tautly at both the ends of the applicator element such that the angular deformation in the applicator element will be caused by application of force along the axis of the applicator.

[0024] Independently or in combination with the above, exemplary embodiments of the invention provide a device for packaging and dispensing a substance, for example, a cosmetic, comprising an applicator as defined above. The device may comprise a receptacle and an adjustable applicator. The adjustable applicator in such a device may comprise a gripping member, a stem having a cavity and an applicator element wherein the stem may be connected to the applicator element at one end and to the gripping member at another end. The said device may also include a wiper member. The gripping member may comprise a cap for closing the receptacle and a manipulating means for adjusting the angular deformation of the applicator element. The said manipulating means could be connected to a movable member present inside the cap in such a way that its rotational movement with respect to the cap is restricted while translational movement is allowed and said movable member is connected to the filament in the applicator element.

[0025] According to another embodiment of the invention the movable member of the packaging device may be connected to the filament via another filament that passes through the cavity inside the stem and hooks up the filament of the applicator. In such a case, the force provided by the manipulating means effects synchronous movement of both the filament in the stem as well as the filament in the applicator with respect to the handle for adjusting the angular deformation of the applicator element.

[0026] According to yet another embodiment of the invention, the adjustable applicator may comprise a stem connected to the applicator element at one end and a gripping member provided at another end of the stem. The stem may be hollow from inside. The gripping member may comprise a handle member and a manipulating means for adjusting the angular deformation of the applicator element. The said manipulating means could be connected to a movable member present inside the handle in such a way that its rotational movement with respect to the handle is restricted while translational movement is allowed and said movable member is directly connected to the filament that passes through the cavity in the stem to the applicator element. In a further embodiment, the movable member may also be connected to the filament via a separate filament that passes through the cavity inside the stem and hooks up the filament of the applicator member. In such a case, the force provided by the manipulating means effects synchronous movement of both the filament in the stem as well as the filament in the applicator with respect to the handle for adjusting the angular deformation of the applicator element.

[0027] According to an embodiment of the invention, there is provided an adjustable applicator wherein the user has more control over the curved angle achieved in the applicator. Further, a constant rigidity of the applicator is provided as no additional component is inserted or withdrawn to achieve the straight or curved shape.

[0028] According to another embodiment of the invention, the applicator element is capable of being used for application of a care product such as a dental floss or in a cosmetic product such as mascara. Further, the adjustable applicator could also be used for removal of a cosmetic product such as mascara.

[0029] These and further aspects which will be apparent to the expert of the art are attained by an adjustable applicator in accordance with the main claim.

BRIEF DESCRIPTION OF THE DRAWINGS

[0030] So that the manner in which the above recited features of the present invention can be understood in detail, a more particular description of the invention, briefly summarized above, 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 invention and are therefore not to be considered limiting of its scope, for the invention may admit to other equally effective embodiments.

[0031] FIG. **1** illustrates an isometric view of the applicator according to an embodiment of the invention;

[0032] FIG. **2** is a cross sectional view of the applicator taken along the line A-A of FIG. **1**

[0033] FIG. **3** is a cross sectional view of the applicator in curved position taken along the line A-A of FIG. **1**;

[0034] FIG. **4** illustrates an isometric view of the device comprising the adjustable applicator according to one embodiment of the present invention;

[0035] FIG. **5** illustrates an exploded view of the the device comprising the adjustable applicator according to one embodiment of the present invention;

[0036] FIG. **6** is an isometric view of the adjustable applicator according to one embodiment of the present invention;

[0037] FIG. **7** is cross sectional view of the device comprising the adjustable applicator taken along the line B-B of FIG. **3**;

[0038] FIG. **8** is cross sectional view of the adjustable applicator according to one embodiment of the present invention taken along the line A-A of FIG. **3**;

[0039] FIG. **9** is cross sectional view of the adjustable applicator in curved position according to one embodiment of the present invention taken along the line A-A of FIG. **3**.

[0040] 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 invention and are therefore not to be considered limiting of its scope, for the invention may admit to other equally effective embodiments.

DETAILED DESCRIPTION

[0041] The adjustable applicator according to one embodiment of the present invention is shown in FIGS. **1** to **3**.

[0042] FIG. **1** is one embodiment of the present invention showing the adjustable applicator **100**. The adjustable appli-

cator **100** of the invention comprises of an applicator element **101** and a filament **102**. In the applicator element **101** is a non-centrally aligned bore **104** providing passage for the filament **102**. The filament **102** is arranged to be movable inside the bore **104** of the applicator element **101**. The applicator element **101** may be produced from an elastomer or any other elastic material allowing compression and expansion of the applicator. Further, the filament **102** may be made out of a material selected from a polymeric material and metals. The filament **102** is so arranged as to cause progressive angular deformation of the applicator element **101**.

[0043] As shown in FIGS. **2** and **3**, one end of the filament **102** is fixed at a distal end **103** of the applicator **100** and the other end of the filament **102** is attached to a clasping means **105** such that when force is applied on the clasping means **105** to cause tension along the axis of the filament **102**, it results in angular deformation of the applicator element **101** as is illustrated in FIG. **3**. Further, the force applied on the filament **102** is directly proportional to the deformation angle of the applicator element **101** achieved. The mode of application of force on the clasping means **105** could be manual, mechanical, magnetic, electrical or any other suitable mode to cause tension along the axis of the filament **102**. Moreover, the applicator element **101** may have a substantially circular outside cross-section, but the case in which the deformable applicator element **101** has a cross-section of different shape, such as polygonal, is also contemplated by this invention.

[0044] A device **200** for packaging and dispensing a substance comprising the said applicator is illustrated by FIGS. **4** and **5**. The device **200** comprises a gripping means **201** and a receptacle **202** containing the substance. As shown in FIG. **6**, the gripping means **201** further comprises a handle **203**, a stem **204** and an applicator **205**. The proximal end of the stem **204** is connected to the handle **203** while its distal end is connected to the applicator **205**. The handle **203** acts as a manipulating means for adjusting the deformation of the applicator **205**. The handle **203** further comprises a cap **206** and a casing **207** that houses a movable member **208**. FIGS. **6** to **8** illustrate the gripping means **201** in further details and the arrangement of various parts of the device **200**. As shown in FIGS. **7** to **9**, one end of the casing **207** has ledges **209** which mate with complimentary ledges **210** in the cap **206**, thereby restricting movement of the cap **206** along its longitudinal axis and at the same time allowing rotational movement of the cap **206** with respect to the casing **207**. However, any lock and key arrangement between the casing and cap could be used for restricting axial movement of the cap with respect to the casing. The movable member **208** is hollow from inside and is so arranged with the cap **206** that its rotational movement with respect to the cap **206** is restricted. The casing **207** has threads **216** in its inner surface just above its centre towards its proximal end that mate with the threads in the movable member **208**, thereby allowing movement of the movable member **208** along its axis. Further, below the center point of casing **207** is present an annular ridge **217** through which it cooperates with the stem **204**. Also present are threads **219** at distal end of the casing **207** which cooperate with the threads **220** in the neck of the receptacle **202** helping in fastening and unfastening of the gripping member **201** with respect to the receptacle **202**. The stem **204** houses a separate filament **213**. At the proximal end of the movable member **208** is provided a feature **212** to hold one end of the filament **213**. The filament **213** has a groove **214** at its distal end which engages the applicator filament **215**. The applicator **205** is hollow from inside and houses the applicator filament **215**. Also, one end of the applicator filament **215** is fitted inside the applicator **205**. The applicator filament **215** is adjusted with the groove **214** such that it is off-centered and provides a favorable and consistent plane along which angular deformation of the applicator occurs. Further, in such an arrangement, the force exerted via the gripping means **201** effects synchronous movement of both the filament **213** in the stem as well as the applicator filament **215** with respect to the applicator **205** to cause the desired angular deformation of the applicator **205**. The said device **200** may also include a wiper member **218**.

[0045] FIG. **9** illustrates the applicator **205** in its angularly deformed condition. The rotation of the cap **206** with respect to the casing **207** results in the axial displacement of the movable member **208** thereby displacing the filament **213** and the applicator filament **215** along with it. The displacement in the applicator filament **215** causes the applicator **205** to angularly deform.

[0046] During use, the user rotates the cap **206** with respect to the casing **207** of the gripping means to cause the applicator **205** to be suitably deformed along a desired axis. Also, the user can control the magnitude of deformation during use.

[0047] The materials suitable for forming the receptacle **202** and the filament **213** could be polyprolpylene while the cap **203**, the casing **207** and the movable member **208** could be formed of acrylonitrile butadiene styrene. The material of applicator filament **215** could be any polymeric material as nylon or could be a suitable metal. The stem **204** may be formed of polyacetal. The material for forming wiper **216** could be low-density polyethylene. The aforementioned materials for forming various parts of the device of the present invention are an example, however other suitable materials may also be used.

[0048] Depending upon the substance being used in the receptacle, a variety of sizes and shapes of the applicator can be utilized. The applicator **205** may be constructed of a porous or non-porous rubber, fabric mesh, felt material, foamed polymers, sponge material, Hydrel™, TPE or any other suitable material. Also, the applicator could have any suitable shape depending on the kind of application required. It could have a shape other than cylindrical such as ovular, tapered or any other suitable shape.

[0049] Although the above description and drawings show the device being cylindrical, the shapes and profile cross section thereof are not limited to the same.

[0050] These and further aspects which will be apparent to the expert of the art are attained by an adjustable applicator in accordance with the main claim.

[0051] While the foregoing is directed to embodiments of the present invention, other and further embodiments of the invention may be 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 comprising:

an applicator element having a non-centrally aligned bore; and

a filament; wherein the filament is housed inside the bore of the applicator element.

2. The adjustable applicator according to claim **1** further comprising a clasping means, wherein said clasping means is attached to a proximal end of the filament, and wherein a distal end of the filament is fixed inside the applicator.

3. The adjustable applicator according to claim **2** wherein the applicator element angularly deforms when a force is applied on the clasping means.

4. The adjustable applicator according to claim **1** wherein said filament is fixed at both ends of the applicator and application of external force onto the applicator causes its angular deformation.

5. A device for packaging and dispensing a substance comprising:

a gripping member, said gripping member comprising a handle, a stem and an applicator element, the applicator element having a non-centrally aligned bore housing an applicator filament; and

a receptacle.

6. The device according to claim **5** comprising a wiper member.

7. The device according to claim **5** wherein said handle has a manipulating means for adjusting an angular deformation of the applicator element.

8. The device according to claim **5** wherein said handle comprises a cap and a casing.

9. The device according to claim **8** wherein a proximal end of stem is connected to the handle while a distal end of the stem is connected to the applicator.

10. The device according to claim **9** further comprising:

a lock and key arrangement between the cap and the casing to restrict the axial movement of the cap with respect to the casing.

11. The device according to claim **10** wherein the casing houses a movable member.

12. The device according to claim **11** wherein said movable member is directly connected to the applicator filament in the applicator.

13. The device according to claim **11** wherein said stem has a cavity that houses a stem filament.

14. The device according to claim **13** wherein said stem filament in the stem cavity has a groove at a distal end.

15. The device according to claim **14** wherein said movable member is connected to the applicator filament via the stem filament hooks up the applicator filament at its groove.

16. The device according to claim **15** wherein the applicator filament is adjusted with said groove in the stem filament such that it is at an off-centered position.

17. The device according to claim **16** wherein the cap of the handle when rotated exerts force to effect synchronous movement of both the stem filament as well as the applicator filament with respect to the handle for adjusting the angular deformation of the applicator element.

18. The device according to claim **17** wherein the handle has means to help in fastening and unfastening of the gripping member with respect to the receptacle.

19. The applicator according to claim **1** wherein the applicator element is capable of being used for application of a cosmetic or a care product or for removal of a product.

20. A method of applying a substance comprising providing a device according to claim **5** and rotating the cap of said device with respect to the casing to bring the applicator into a desired angular deformation.

21. An adjustable applicator comprising:

an applicator element having a non-centrally aligned bore;

a filament, wherein the filament is housed inside the bore of the applicator element; and

a clasping means wherein said clasping means is attached to a proximal end of the filament, and a distal end of the filament is fixed inside the applicator, wherein the applicator element angularly deforms when a force is applied on the clasping means.

22. An adjustable applicator comprising:

an applicator element having a non-centrally aligned bore; and

a filament housed inside the bore of the applicator element, the filament fixed at both ends of the applicator; and wherein application of external force onto the applicator causes its angular deformation.

23. A device for packaging and dispensing a substance comprising:

a gripping member, a receptacle and optionally comprising a wiper;

wherein said gripping member comprises a handle, a stem having a cavity and an applicator element having a non-centrally aligned bore housing a filament;

wherein said handle comprises a cap and a casing which are arranged by means of a lock and key arrangement such that the axial movement of the cap with respect to the casing is restricted;

wherein the casing houses a movable member, wherein said movable member is either directly connected to the filament in the applicator or said movable member is connected to the applicator filament via another filament housed in the cavity of the stem that hooks up the applicator filament at its groove which is at an off-centered position at the distal end of the filament in the stem; and

wherein the proximal end of stem is connected to the handle while its distal end is connected to the applicator;

wherein the cap of the handle when rotated exerts force to effect synchronous movement of both the filament in the stem as well as the applicator filament with respect to the handle for adjusting the angular deformation of the applicator element; and

wherein the handle has means to help in fastening and unfastening of the gripping member with respect to the receptacle.

* * * * *