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(54) Cosmetic product applicator

Applikator für ein Kosmetikum

Applicateur pour produit cosmétique

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(73) Proprietor: **Albéa Services**
92230 Gennevilliers (FR)

(72) Inventors:
- **Schrepf, Volker**
  East Islip 11730 (US)
- **Thorne, Nicholas**
  38180, Seyssins (FR)
- **Lhoyer, Patrick**
  60250 Mouy (FR)

(74) Representative: **Gevers & Orès**
41 avenue de Friedland
75008 Paris (FR)

(56) References cited:
EP-A1- 2 229 838
DE-A1- 10 258 519
DE-A1-102004 038 926
US-A- 3 998 235
US-A- 4 545 393
US-A- 5 137 038
US-A- 5 937 871

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Description

FIELD OF THE INVENTION

[0001] This invention relates to a cosmetic product applicator, and in particular to a mascara applicator that can grab, pull and release a user's lashes.

BACKGROUND OF THE INVENTION

[0002] For many years there has been a continuous effort amongst cosmetic brands and packaging suppliers to provide mascara applicators, commonly mascara brushes, that are able to load the lashes of a user with a desired amount of mascara, separate them to avoid clumping and lengthen them to obtain the final result.

[0003] Many designs have been proposed over the years, but to optimize the result the user still has to possess a certain level of skill or expertise. For example, over the last few years relatively sophisticated applicators have been devised, which include motors and driving arrangements in order to generate a vibration, translation or rotation of the applicator. For example, US 5137038 discloses a mascara brush which can be adjusted by a user from a straight to a curved configuration and vice versa, by means of an adjusting rod which is adapted to slide. The overriding object of these designs is to provide a professional gesture without needing the expertise; in other words, to allow the user to simply place the applicator near the user's lashes, and then allow the applicator to do the rest.

[0004] However, to separate and lengthen the lashes requires a critical step during application, namely the pulling of the lashes. In theory, an electrically driven applicator to move the applicator vibrationally, translationally or rotationally is supposed to help in this respect in that the movement ought to help the lashes penetrate the applicator brush, so as to locate between the fibres or the bristles of the applicator brush, in order to facilitate the pulling of the lashes by the user. The desired effect relies on the fact that if the lashes penetrate the brush more, then when the brush is pulled there is a greater amount of friction between the lashes and the fibres/bristles. In reality, however, this form of electrically assisted applicator does not provide the desired result. The primary difficulty with these devices is that the space or gap between the fibres/bristles into which the lash must enter remains the same, and no matter how you try to penetrate the lashes into the brush the amount of friction created, and hence the "pull" of the lash, is limited at best. Ultimately these devices still require some skill on the user's part to achieve the desired result.

[0005] A number of alternate ways of achieving a lash pulling effect have been proposed in which the inventors have attempted to create features that will increase the pull by physically trapping the lashes. One such solution includes providing mascara applicators, typically fibre wire wound brushes, with a distorted or modified fibre geometry, in order to create a series of hooks to provide the desired pulling effect. For example, WO2006/130642 discloses a number of ways in which fiber distribution in mascara applicators may be modified. In this prior art document, a cosmetic product applicator head with both flexible protrusions and a combination of flexible and stiff protrusions are provided on an axially moving applicator head. Axial movement of the applicator head is performed at frequencies which aim to enhance distribution of cosmetic material to the ends of the protrusions. In the version with flexible protrusions only, the protrusions flex in response to axially downward and upward movement, the axial movement being tuned to produce a harmonic motion of the protrusions, thereby advancing cosmetic material from the base to the tip of each protrusion. In this version, however, all bristles essentially move in the same direction, at the same time, and thus there is no grabbing of the lashes to enable the lashes to be pulled, as described above. In the version with a combination of flexible and stiff protrusions, the axially moving applicator head will result in movement of some of the protrusions, while others will stay in place, thereby reducing the space between individual protrusions. In one embodiment, a first set of protrusions includes more mass at their tips to promote flexibility, while a second set of protrusions are tapered to promote stiffness. Alternatively or additionally, the protrusions may be formed of different materials to create the relative differences in stiffness and flexibility. However, the primary purpose of this prior art arrangement is to enhance distribution of cosmetic material to the ends of the protrusions, and thus does not provide the desired grabbing and pulling of the lashes.

OBJECT OF THE INVENTION

[0006] It is thus an aim of the present invention to provide a mascara applicator that allows lashes to penetrate the applicator effectively and to then be entrapped, in order to allow the lashes to be pulled through the applicator and then released. In this manner, the application of mascara is facilitated, with the lashes being given a lengthening effect that is difficult or impossible to obtain without professional expertise.

SUMMARY OF THE INVENTION

[0007] According to a first aspect of the invention there is provided a cosmetic product applicator comprising:

an applicator head comprising:

a hollow sleeve that is at least partially flexible, with at least the partially flexible portion of the sleeve being fitted with a plurality of bristles; and

a rod having a proximal end and a distal end, the rod being movable with respect to the hollow sleeve, with at least the distal end being movably accommodated within the hollow sleeve, the dis-

tal end of the rod comprising a deforming arrangement snugly accommodated within the hollow sleeve, the deforming arrangement being arranged to deform the flexible portion of the hollow sleeve proximate the deforming arrangement, thereby varying the relative angles at which the bristles, proximate the deformed portion of the hollow sleeve, extend from the hollow sleeve, whereby the bristles on the deformed portion of the hollow sleeve flare open to define a lash release configuration, and simultaneously the bristles on the sleeve adjacent the deformed portion of the sleeve are forced closer together to define a lash grab configuration. This means that in the release position the degree of penetration of the lashes into the brush is far higher than seen before, and at the same time the adjacent grabbing position ensures that on pulling the lashes the friction or "pulling" force will be far higher.

[0008] In an embodiment, the peripheral wall of the hollow sleeve is flexible, with the bristles accordingly being fitted to the entire peripheral wall of the hollow sleeve and extending along the length of the hollow sleeve.

[0009] In an alternate embodiment, the peripheral wall of the hollow sleeve comprises a flexible portion to which the bristles are fitted and a rigid, reinforcing portion to which no bristles are fitted, or which contains non-moving bristles, with this combination of flexible and rigid wall portions extending along the length of the hollow sleeve.

[0010] In an embodiment, for the duration of a cosmetic application process, the rod is continuously moved with respect to the hollow sleeve, with the bristles on the flexible portion of the sleeve accordingly alternating between the lash grab configuration, in which a user's lashes are grabbed to allow them to be pulled, and the lash release configuration, in which the user's lashes are either released from or allowed to penetrate the bristles.

[0011] In an embodiment, the cosmetic product applicator comprises a handle to accommodate driving means to move the rod with respect to the hollow sleeve, the driving means being arranged to move the rod rotationally and/or translationally with respect to the hollow sleeve.

[0012] In an embodiment, a hollow stem extends between the handle and the hollow sleeve of the applicator head, the hollow stem movably accommodating part of the rod, with the handle, stem and sleeve being fixed relative to one another.

[0013] Alternatively, or in addition, the cosmetic product applicator comprises a securing pin to keep at least the handle and hollow sleeve fixed relative to each other.

[0014] In an embodiment, the rod is a hollow rod, with the securing pin extending through the hollow rod, the securing pin defining a proximal end that can be secured to the handle and a distal end that can be secured to a distal end tip of the hollow sleeve.

[0015] In an embodiment, the deforming arrangement comprises at least one disc fitted to the distal end of the rod.

[0016] In an embodiment, the deforming arrangement comprises a plurality of discs arranged longitudinally along the length of the rod.

[0017] In an embodiment, the deforming arrangement comprises at least one cam fitted to the distal end of the rod.

[0018] In an embodiment, the deforming arrangement comprises a plurality of cams arranged radially around and/or longitudinally along the length of the distal end of the rod.

[0019] In an embodiment, the deforming arrangement comprises a thread arranged longitudinally along the length of the rod.

[0020] In an embodiment, the driving means comprises a motor.

[0021] In an embodiment, the hollow flexible sleeve is made of a suitable soft plastic material such as, for example, a "Hytrel" thermoplastic polyester elastomer commercially available from DuPont, a "Pellethane" Thermoplastic polyurethane elastomer commercially available from Dow, of "T-BLENDTM" compounded thermoplastic material composed primarily of SBS or SEBS, Polyurethane, polyethylene, TPE. The rod may be made of metal, POM, nylon, polypropylene, polyethylene or some alternative rigid material. The fact that the rod is not in direct contact with the mascara formulation means that the choice of material is not limited to materials compatible with the contents of the mascara formula and can be selected from any common material based on price, mechanical performance and ease of manufacturing.

[0022] According to a second aspect of the invention there is provided an applicator head for a cosmetic product applicator, the applicator head comprising:

a hollow sleeve that is at least partially flexible, with at least the partially flexible portion of the sleeve being fitted with a plurality of bristles; and

a rod having a proximal end and a distal end, the rod being movable with respect to the hollow sleeve, with at least the distal end being movably accommodated within the hollow sleeve, the distal end of the rod comprising a deforming arrangement snugly accommodated within the hollow sleeve, the deforming arrangement being arranged to deform the flexible portion of the hollow sleeve proximate the deforming arrangement, thereby varying the relative angles at which the bristles, proximate the deformed portion of the hollow sleeve, extend from the hollow sleeve.

[0023] In an embodiment, the bristles on the deformed portion of the hollow sleeve flare open to define a lash release configuration, and simultaneously the bristles on the hollow sleeve adjacent the deformed portion of the hollow sleeve are forced closer together to define a lash

grab configuration.

[0024] In an embodiment, the peripheral wall of the hollow sleeve is flexible, with the bristles accordingly being fitted to the entire peripheral wall of the hollow sleeve and extending along the length of the hollow sleeve.

[0025] In an alternate embodiment, the peripheral wall of the hollow sleeve comprises a flexible portion to which the bristles are fitted and a rigid, reinforcing portion to which no bristles are fitted, or which contains non-moving bristles, with this combination of flexible and rigid wall portions extending along the length of the hollow sleeve.

[0026] In an embodiment, the rod can be fitted to driving means of the cosmetic product applicator, the rod being movable rotationally and/or translationally with respect to the hollow sleeve.

[0027] In an embodiment, the applicator head comprises a hollow stem that accommodates part of the rod, the stem and hollow sleeve being fixed relative to each other thereby facilitating movement of the rod relative to the sleeve.

[0028] Alternatively, or in addition, the applicator head comprises a securing pin to keep the stem and hollow sleeve fixed relative to each other.

[0029] In an embodiment, the rod is a hollow rod, with the securing pin extending through the hollow rod, the securing pin defining a proximal end that can be secured to a handle of the cosmetic product applicator and a distal end that can be secured to a distal end tip of the hollow sleeve.

[0030] In an embodiment, the deforming arrangement comprises at least one disc fitted to the distal end of the rod.

[0031] In an embodiment, the deforming arrangement comprises a plurality of discs arranged longitudinally along the length of the rod.

[0032] In an embodiment, the deforming arrangement comprises at least one cam fitted to the distal end of the rod.

[0033] In an embodiment, the deforming arrangement comprises a plurality of cams arranged radially around and/or longitudinally along the length of the distal end of the rod.

[0034] In an embodiment, the deforming arrangement comprises a thread arranged longitudinally along the length of the rod.

BRIEF DESCRIPTION OF THE DRAWINGS

[0035]

Figure 1 shows a side view of a cosmetic product applicator according to an example embodiment of the present invention;

Figure 2 shows a cross-sectional side view of one version of a handle and applicator head that can be used in the cosmetic product applicator shown in Figure 1;

Figure 3 shows a cross-sectional side view and a cross-sectional top view of part of an alternate version of a handle and applicator head that can be used in the cosmetic product applicator shown in Figure 1;

Figure 4 shows a cross-sectional side view of yet a further version of a handle and applicator head that can be used in the cosmetic product applicator shown in Figure 1; and

Figure 5 shows a cross-sectional side view and a cross-sectional top view of part of yet another version of a handle and applicator head that can be used in the cosmetic product applicator shown in Figure 1.

DESCRIPTION OF PREFERRED EMBODIMENTS

[0036] Referring to the drawings, a cosmetic product applicator 10, 100, 200, 300, 400 comprises an applicator head 12, 102, 202, 302, 402 fitted with bristles 14, 104, 204, 304, 404, the applicator head 12, 102, 202, 302, 402 extending from a handle 16, 106, 206, 306, 406. The cosmetic product applicator 10, 100, 200, 300, 400 may be secured to a cosmetic product container 17, as is well known in the art, to enable the bristles 14, 104, 204, 304, 404 to be loaded with cosmetic product housed in the container 17.

[0037] Turning now specifically to Figures 2 to 5, the applicator head 102, 202, 302, 402 comprises a hollow sleeve 108, 208, 308, 408 that is at least partially flexible, with the flexible portion typically being plastic injected from a soft material. In an embodiment, only the flexible portion of the sleeve 108, 208, 308, 408 is fitted with a plurality of bristles 104, 204, 304, 404 that are arranged on the sleeve 108, 208, 308, 408 in much the same way as in a traditional plastic injected brush. The hollow interior of the flexible sleeve 108, 208, 308, 408 typically has a fixed diameter along its length of between 2 and 0.5 mm.

[0038] In the embodiments shown in Figures 2, 3 and 4, the entire peripheral wall of the hollow sleeve 108, 208, 308 is flexible, with the bristles 104, 204, 304 accordingly being fitted to the entire peripheral wall of the hollow sleeve108, 208, 308, as best shown in Figure 3, and then extending along the length of the hollow sleeve 108, 208, 308.

[0039] In an alternate embodiment, as shown in Figure 5, only a portion of the peripheral wall of the hollow sleeve 408 is flexible, as indicated by numeral 409.1, to which the bristles 404 are fitted. The remaining portion of the peripheral wall, as indicated by numeral 409.2, is rigid so as to reinforce the hollow sleeve 408. This combination of flexible and rigid wall portions 409.1, 409.2 extends along the length of the hollow sleeve 408. The rigid, reinforcing portion 409.2 is typically plastic injected from a relatively rigid material.

[0040] While in the embodiment illustrated in Figure 5,

no bristles are fitted to the rigid, reinforcing portion 409.2, in other embodiments, it may be envisaged to provide bristles on the reinforcing portion 409.2, so as to provide an area with fixed bristles. An array of such fixed bristles can advantageously serve as a comb, for example, to separate lashes following mascara application.

[0041] In an embodiment, the flexible portion 409.1 extends for less than 180°, and typically approximately 120°, around the peripheral wall of the hollow sleeve 408.

[0042] The applicator head 102, 202, 302, 402 further comprises a relatively rigid rod 110, 210, 310, 410, having a proximal end 112, 212, 312, 412 and a distal end 114, 214, 314, 414. The rod 110, 210, 310, 410 is movable with respect to the hollow sleeve 108, 208, 308, 408 with at least the distal end 114, 214, 314, 414 being movably accommodated within the hollow sleeve 108, 208, 308, 408.

[0043] The distal end 114, 214, 314, 414 of the rod 110, 210, 310, 410 comprises a deforming arrangement 116, 216, 316, 416 snugly accommodated within the hollow sleeve 108, 208, 308, 408. Each deforming arrangement 116, 216, 316, 416 is arranged to deform the flexible portion of the sleeve 108, 208, 308, 408 proximate the deforming arrangement 116, 216, 316, 416 as indicated by arrows 118, 218, 318, 418. This deformation of the flexible portion of the sleeve 108, 208, 308, 408 varies the relative angles at which the bristles 104, 204, 304, 404 proximate the deformed portion of the sleeve 108, 208, 308, 408 extend from the hollow sleeve 108, 208, 308, 408.

[0044] As indicated above, the rod 110, 210, 310, 410 is made of a material significantly stiffer or harder than the soft injected applicator material of the flexible portion of the hollow sleeve 108, 208, 308, 408. In the embodiments illustrated in Figures 2 to 5, the rod 110, 210, 310, 410 is shown as an integral piece that is connected to driving means 120, 220, 320, 420 but it may be made as a separate piece that is then fitted to the driving means 120, 220, 320, 420 in any one of a number of well known ways.

[0045] In particular, the bristles 104, 204, 304, 404 on the deformed portion 118, 218, 318, 418 of the hollow sleeve 108, 208, 308, 408 flare open to define a lash release configuration, as indicated by arrows 122, 222, 322, 422. Simultaneously, the bristles 104, 204, 304, 404 on the hollow sleeve 108, 208, 308, 408 on either side of the deformed portion 118, 218, 318, 418 of the hollow sleeve 108, 208, 308, 408 are forced closer together to define a lash grab configuration, as indicated by arrows 124, 224, 324, 424.

[0046] In use, for the duration of a cosmetic application process, the rod 110, 210, 310, 410 is continuously moved with respect to the hollow sleeve 108, 208, 308, 408 with the bristles 104, 204, 304, 404 on the sleeve 108, 208, 308, 408 accordingly alternating between the lash grab configuration 124, 224, 324, 424 in which a user's lashes are grabbed to allow them to be pulled, and the lash release configuration 122, 222, 322, 422 in which the user's lashes are released. Thus, one of the objectives of the present invention is to open the space between the applicator fibres or bristles 104, 204, 304, 404 in order to leave enough space for the lash to easily penetrate the applicator head 102, 202, 302, 402. After a short but controlled period of time, the fibres or bristles 104, 204, 304, 404 will then close on the lashes in order to allow the user to pull and lengthen the lash. Finally, the fibres or bristles 104, 204, 304, 404 will open again to release the lashes. In use, the applicator head 102, 202, 302, 402 is such that the lashes penetrate the fibres or bristles 104, 204, 304, 404 are grabbed to allow them to be gently pulled, and then released.

[0047] In an embodiment, the handle 106, 206, 306, 406 accommodates the driving means 120, 220, 320, 420 to move the rod 110, 210, 310, 410 with respect to the sleeve 108, 208, 308, 408.

[0048] In one version, the driving means 120, 420 is arranged to move the rod 110, 410 translationally with respect to the sleeve 108, 408, as shown in Figures 2 and 5, at a controlled speed. In these versions, for example, the proximal end 112, 412 of the rod 110, 410 defines a plurality of teeth 126, 426 arranged to engage a toothed gear 128, 428 that is rotationally driven by a motor 130, 430. This arrangement allows the rod 110, 410 to move translationally, as indicated by arrow 132, 432. A sufficiently sized chamber 133, 433 is defined in the handle 106, 406 to accommodate the moving rod 110, 410.

[0049] In an alternate version, the driving means 220, 320 is arranged to move the rod 210, 310 rotationally with respect to the sleeve 208, 308, as shown in Figures 3 and 4, at a controlled speed. In this version, the proximal end 212, 312 of the rod 210, 310 is fitted directly to a shaft that is rotationally driven by a motor 230, 330. This arrangement allows the rod 210, 310 to rotate, as indicated by arrow 232, 332.

[0050] Instead of using a motor 130, 230, 330, 430 the driving means 120, 220, 320, 420 may instead take the form of a spring wound driver or a manually driven arrangement. Although not shown, the driving means 120, 220, 320, 420 may be arranged to move the rod 110, 210, 310, 410 both rotationally and translationally simultaneously.

[0051] In an embodiment, a hollow stem 134, 234, 334, 434 extends between the handle 106, 206, 306, 406 and the flexible sleeve 108, 208, 308, 408 of the applicator head 102, 202, 302, 402. A connector 135, 235, 335, 435 may facilitate the connection of the hollow stem 134, 234, 334, 434 to the flexible sleeve 108, 208, 308, 408. The hollow stem 134, 234, 334, 434 movably accommodates part of the rod 110, 210, 310, 410 with the handle 106, 206, 306, 406 stem 134, 234, 334, 434 and sleeve 108, 208, 308, 408 being fixed relative to one another to facilitate and control the movement of the rod 110, 210, 310, 410 relative to the sleeve 108, 208, 308, 408.

[0052] Alternatively, or in addition, as shown in Figures 2 to 4, the cosmetic product applicator 100, 200, 300

comprises a securing pin 136, 236, 336 to keep at least the handle 106, 206, 306 and flexible sleeve 108, 208, 308 fixed relative to each other. This is particularly useful when the hollow flexible sleeve is made of very soft material that would otherwise tend to twist or otherwise deform when the cam or disc is made to move with respect to it. In this version, the rod 110, 210, 310 is hollow, with the securing pin 136, 236, 336 extending through the hollow rod 110, 210, 310 and being held stationary with respect to the moving rod 110, 210, 310. The securing pin 136, 236, 336 defines a proximal end 138, 238, 338 that can be secured to the handle 106, 206, 306 and a distal end 140, 240, 340 that can be secured to a distal end tip 108.1, 208.1, 308.1 of the hollow flexible sleeve 108, 208, 308.

[0053] The securing pin 136 in Figure 2, for example, may extend through the entire length of the applicator 100, with its proximal end 138 being secured to an end wall 142 of the handle 106. In Figures 3 and 4, for example, the proximal end 238, 338 of the securing pin 236, 336 may terminate at or within the motor 230, 330.

[0054] An advantage of the embodiment shown in Figure 5 is that the rigid, reinforcing portion 409.2 of the sleeve 408 does away with the need to provide a securing pin, as described in the previous paragraph.

[0055] In the embodiment shown in Figure 2, the deforming arrangement 116 comprises at least one radial disc fitted to the distal end 114 of the rod 110. Although not shown, the deforming arrangement 116 may comprise a plurality of radial discs arranged longitudinally along the length of the rod 110. Thus, translation of the rod 110, as described above, causes the bristles 104 to open and close around the brush as the relatively larger diameter of the disc moves so as to deform the surrounding soft applicator sleeve 108.

[0056] In the embodiments shown in Figures 3 and 5, the deforming arrangement 216, 416 comprises a plurality of cams, having a non-constant outer diameter, which are fitted to the distal end 214, 414 of the rod 210, 410. The cams are arranged radially around and/or longitudinally along the length of the distal end of the rod, but, again, as the relatively larger diameter of the cams rotate, the surrounding flexible portions of the sleeve 208, 408 will deform as described above.

[0057] In yet a further embodiment, as shown in Figure 4, the deforming arrangement 316 comprises a helical thread arranged longitudinally along the length of the rod 310. Again, as the thread rotates, the surrounding soft applicator sleeve 308 will deform to achieve the desired opening and closing of the adjacent bristles 304, as described above.

[0058] In one version, the deforming arrangement 116, 216, 316, 416 may be described as having a non-constant or varying outer diameter, and may take numerous forms over and above the discs, cams and thread described above, including but not limited to protuberances and ridges of various shapes, sizes and configurations. Ultimately, any member or arrangement that can deform the surrounding sleeve 108, 208, 308 may be used.

Claims

1. A cosmetic product applicator (10, 100, 200, 300, 400) comprising:

   an applicator head (12, 102, 202, 302, 402) comprising:

   a hollow sleeve (18, 108, 208, 308, 408) that is at least partially flexible, with at least the partially flexible portion of the sleeve being fitted with a plurality of bristles (14, 104, 204, 304, 404) ; and
   a rod (110, 210, 310, 410) having a proximal end (112, 212, 312, 412) and a distal end (114, 214, 314, 414), the rod being movable with respect to the hollow sleeve, with at least the distal end being movably accommodated within the hollow sleeve, the distal end of the rod comprising at least one deforming arrangement (116, 216, 316, 416) snugly accommodated within the hollow sleeve, the at least one deforming arrangement being arranged to deform the flexible portion of the hollow sleeve proximate the deforming arrangement, thereby varying the relative angles at which the bristles, proximate the deformed portion(s) (118, 218, 318, 418) of the hollow sleeve, extend from the hollow sleeve, the cosmetic product applicator being **characterized in that** the bristles on the deformed portion(s) of the hollow sleeve flare open to define a lash release configuration (122, 222, 322, 422), and simultaneously the bristles on the sleeve adjacent the deformed portion(s) of the sleeve are forced closer together to define a lash grab configuration (124, 224, 324, 424).

2. The cosmetic product applicator of claim 1, wherein the peripheral wall of the hollow sleeve is flexible, with the bristles accordingly being fitted to the entire peripheral wall of the hollow sleeve and extending along the length of the hollow sleeve.

3. The cosmetic product applicator of claim 1, wherein the peripheral wall of the hollow sleeve comprises a flexible portion and a rigid, reinforcing portion with this combination of flexible and rigid wall portions extending along the length of the hollow sleeve.

4. The cosmetic product applicator of claim 3, wherein the flexible portion contains bristles and the reinforcing portion contains no bristles.

5. The cosmetic product applicator of claim 1, wherein, for the duration of a cosmetic application process, the rod is continuously movable with respect to the hollow sleeve, with the bristles on the flexible portion of the sleeve accordingly alternating between the lash grab configuration (124, 224, 324, 424), in which a user's lashes are grabbed to allow them to be pulled, and the lash release configuration (122, 222, 322, 422), in which the user's lashes are either released from or allowed to penetrate the bristles.

6. The cosmetic product applicator of any one of the preceding claims, further comprising a handle (16, 106, 206, 306, 406) to accommodate driving means (120, 220, 320, 420) to move the rod with respect to the hollow sleeve, the driving means being arranged to move the rod rotationally and/or translationally with respect to the hollow sleeve.

7. The cosmetic product applicator of claim 6, wherein a hollow stem extends between the handle and the hollow sleeve of the applicator head, the hollow stem movably accommodating part of the rod, with the handle, stem and sleeve being fixed relative to one another.

8. The cosmetic product applicator of claim 7, further comprising a securing pin (136, 236, 336, 436) to keep at least the handle and hollow sleeve fixed relative to each other.

9. The cosmetic product applicator of claim 8, wherein the rod is a hollow rod, with the securing pin extending through the hollow rod, the securing pin defining a proximal end (138, 238, 338, 438) that can be secured to the handle and a distal end (140, 240, 340, 440) that can be secured to a proximal end tip (108.1, 208.1, 308.1) of the hollow sleeve.

10. The cosmetic product applicator of any one of the preceding claims, wherein the deforming arrangement comprises at least one disc fitted to the distal end of the rod.

11. The cosmetic product applicator of claim 10, wherein the deforming arrangement comprises a plurality of discs arranged longitudinally along the length of the rod.

12. The cosmetic product applicator of any one of the preceding claims 1 to 9, wherein the deforming arrangement comprises at least one cam fitted to the distal end of the rod.

13. The cosmetic product applicator of claim 12, wherein the deforming arrangement comprises a plurality of cams arranged radially around and/or longitudinally along the length of the distal end of the rod.

14. The cosmetic product applicator of any one of the preceding claims 1 to 9, wherein the deforming arrangement comprises a thread arranged longitudinally along the length of the rod.

15. The cosmetic product applicator of claim 9, wherein the driving means comprises a motor.

Patentansprüche

1. Kosmetikproduktapplikator (10, 100, 200, 300, 400) umfassend:

einen Applikatorkopf (12, 102, 202, 302, 402) umfassend:

eine Hohlhülse (18, 108, 208, 308, 408), die zumindest teilweise flexibel ist, mit zumindest dem teilweise flexiblen Abschnitt der Hülse, welche mit einer Vielzahl von Borsten (14, 104, 204, 304, 404) ausgerüstet ist; und
einem Stab (110, 210, 310, 410), welcher ein proximales Ende (112, 212, 312, 412) und ein distales Ende (114, 214, 314, 414) aufweist, wobei der Stab in Bezug auf die Hohlhülse bewegbar ist, mit zumindest dem distalen Ende, welches bewegbar in der Hohlhülse aufgenommen ist, wobei das distale Ende des Stabs zumindest eine Deformationsanordnung (116, 216, 316, 416) umfasst, welche enganliegend in der Hohlhülse aufgenommen ist, wobei die zumindest eine Deformationsanordnung so angeordnet ist, um den flexiblen Abschnitt der Hohlhülse benachbart zur Deformationsanordnung zu deformieren, wodurch die relativen Winkel variiert werden, unter welchen die Borsten, benachbart zu dem/den deformierten Abschnitt(en) (118, 218, 318, 418) der Hohlhülse, sich von der Hohlhülse erstrecken, wobei der Kosmetikproduktapplikator dadurch charakterisiert ist, dass die Borsten auf dem/den deformierten Abschnitt(en) der Hohlhülse sich aufweiten, um eine Wimpernfreigabekonfiguration (122, 222, 322, 422) zu definieren, und gleichzeitig die Borsten auf der Hülse benachbart zu der/den deformierten Abschnitt(en) der Hülse näher aneinander gedrängt werden, um eine Wimperngreifkonfiguration (124, 224, 324, 424) zu definieren.

2. Kosmetikproduktapplikator nach Anspruch 1, wobei die Umfangswand der Hohlhülse flexibel ist, mit den Borsten, welche entsprechend zu der ganzen Um-

fangswand der Hohlhülse angepasst sind, und sich entlang der Länge der Hohlhülse erstrecken.

3. Kosmetikproduktapplikator nach Anspruch 1, wobei die Umfangswand der Hohlhülse einen flexiblen Abschnitt und eine steifen, verstärkenden Abschnitt mit dieser Kombination von flexiblen und steifen Wandabschnitten umfasst, welche sich entlang der Hohlhülse erstrecken.

4. Kosmetikproduktapplikator nach Anspruch 3, wobei der flexible Abschnitt Borsten enthält und der verstärkende Abschnitt keine Borsten enthält.

5. Kosmetikproduktapplikator nach Anspruch 1, wobei, für die Dauer eines Kosmetikapplikationsprozesses, der Stab in Bezug auf die Hohlhülse kontinuierlich bewegbar ist, mit den Borsten auf dem flexiblen Abschnitt der Hülse demgemäß abwechselnd zwischen der Wimperngreifkonfiguration (124, 224, 324, 424), in welcher die Wimpern eines Nutzer gegriffen werden, um ihnen zu erlauben, gezogen zu werden, und einer Wimpernfreigabekonfiguration (122, 222, 322, 422), in welcher die Wimpern des Nutzers entweder freigegeben werden von oder die Borsten durchdringen können.

6. Kosmetikproduktapplikator nach einem der vorhergehenden Ansprüche, weiterhin umfassend einen Griff (16, 106, 206, 306, 406), um ein Antriebsmittel (120, 220, 320, 420) aufzunehmen, um den Stab in Bezug auf die Hohlhülse zu bewegen, wobei das Antriebsmittel angeordnet ist, um den Stab rotierend und/oder translatorisch in Bezug auf die Hohlhülse zu bewegen.

7. Kosmetikproduktapplikator nach Anspruch 6, wobei ein Hohlschaft sich zwischen dem Griff und der Hohlhülse des Applikatorkopfes erstreckt, wobei der Hohlschaft bewegbar einen Teil des Stabes aufnimmt, mit dem Griff, dem Schaft und der Hülse, die relativ zueinander fixiert sind.

8. Kosmetikproduktapplikator nach Anspruch 7, weiterhin umfassend einen Sicherungsbolzen (136, 236, 336, 436), um zumindest den Griff und die Hohlhülse relativ zueinander zu fixieren.

9. Kosmetikproduktapplikator nach Anspruch 8, wobei der Stab ein Hohlstab ist, mit dem Sicherungsbolzen, welcher sich durch den Hohlstab erstreckt, wobei der Sicherungsbolzen ein proximales Ende (138, 238, 338, 438) definiert, dass an dem Griff gesichert werden kann, und ein distales Ende (140, 240, 340, 440), das an einer proximalen Endspitze (108.1, 208.1, 308.1) der Hohlhülse gesichert werden kann.

10. Kosmetikproduktapplikator nach einem der vorhergehenden Ansprüche, wobei die Deformationsanordnung zumindest eine am distalen Ende des Stabes angepasste Scheibe umfasst.

11. Kosmetikproduktapplikator nach Anspruch 10, wobei die Deformationsanordnung eine Vielzahl von Scheiben, welche längs entlang der Länge des Stabes angeordnet sind, umfasst.

12. Kosmetikproduktapplikator nach einem der Ansprüche 1 bis 9, wobei die Deformationsanordnung zumindest eine Nocke, welche an dem distalen Ende des Stabes angepasst ist, umfasst.

13. Kosmetikproduktapplikator nach Anspruch 12, wobei die Deformationsanordnung eine Vielzahl von Nocken, welche radial um und /oder längs entlang der Länge des distalen Endes des Stabes angeordnet sind, umfasst.

14. Kosmetikproduktapplikator nach einem der vorhergehenden Ansprüche 1 bis 9, wobei die Deformationsanordnung einen Faden, welcher entlang der Länge des distalen Ende des Stabes angeordnet ist, umfasst.

15. Kosmetikproduktapplikator nach Anspruch 9, wobei das Antriebsmittel einen Motor umfasst.

Revendications

1. Applicateur de produit cosmétique (10, 100, 200, 300, 400) comprenant :

une tête d'applicateur (12, 102, 202, 302, 402) comprenant :

un manchon creux (18, 108, 208, 308, 408) qui est flexible au moins en partie, au moins la partie partiellement flexible du manchon étant munies d'une pluralité de poils (14, 104, 204, 304, 404) ; et
une tige (110, 210, 310, 410) possédant une extrémité proximale (112, 212, 312, 412) et une extrémité distale (114, 214, 314, 414), la tige étant mobile par rapport au manchon creux, au moins l'extrémité distale venant se loger en mobilité au sein du manchon creux, l'extrémité distale de la tige comprenant au moins un arrangement de déformation (116, 216, 316, 416) qui vient se loger parfaitement dans le manchon creux, ledit au moins un arrangement de déformation étant arrangé pour déformer la portion flexible du manchon creux à proximité de l'arrangement de déformation, pour ainsi faire varier les angles relatifs auxquels les poils,

à proximité de la/des portions déformée(s) (118, 218, 318, 418) du manchon creux, s'étendent à partir du manchon creux, l'applicateur de produit cosmétique étant **caractérisé en ce que** les poils sur la/les portions déformée(s) du manchon creux s'ouvrent en s'évasant pour définir une configuration de libération des cils (122, 222, 322, 422), et de manière simultanée, les poils sur le manchon en position adjacente à la/aux portions déformée(s) du manchon se resserrent de manière forcée pour définir une configuration de saisie des cils (124, 224, 324, 424).

2. Applicateur de produit cosmétique selon la revendication 1, dans lequel la paroi périphérique du manchon creux est flexible, les poils venant par conséquent se disposer contre toute la paroi périphérique du manchon creux et s'étendant sur la longueur du manchon creux.

3. Applicateur de produit cosmétique selon la revendication 1, dans lequel la paroi périphérique du manchon creux comprend une portion flexible et une portion rigide, de renforcement, cette combinaison de portions de paroi flexible et rigide s'étendant sur la longueur du manchon creux.

4. Applicateur de produit cosmétique selon la revendication 3, dans lequel la portion flexible contient des poils et la portion de renforcement ne contient pas de poils.

5. Applicateur de produit cosmétique selon la revendication 1, dans lequel, pendant la durée d'un processus d'application cosmétique, la tige est mobile en continu par rapport au manchon creux, les poils sur la portion flexible du manchon alternant en conséquence entre la configuration de saisie des cils (124, 224, 324, 424), dans laquelle les cils d'un utilisateur sont saisis pour permettre leur traction, et la configuration de libération des cils (122, 222, 322, 422), dans laquelle les cils d'un utilisateur soit sont libérés des poils, soit peuvent pénétrer dans les poils.

6. Applicateur de produit cosmétique selon l'une quelconque des revendications précédentes, comprenant en outre une poignée (16, 106, 206, 306, 406) dans laquelle vient se loger un moyen d'entraînement (120, 220, 320, 420) pour déplacer la tige par rapport au manchon creux, le moyen d'entraînement étant conçu pour déplacer la tige en rotation et/ou en translation par rapport au manchon creux.

7. Applicateur de produit cosmétique selon la revendication 6, dans lequel une barre creuse s'étend entre la poignée et le manchon creux de la tête d'applicateur, une partie de la tige venant se loger en mobilité dans la barre creuse, la poignée, la tige et le manchon étant fixes les uns par rapport aux autres.

8. Applicateur de produit cosmétique selon la revendication 7, comprenant en outre une broche de fixation (136, 236, 336, 436) pour maintenir au moins la poignée et le manchon creux fixes l'un par rapport à l'autre.

9. Applicateur de produit cosmétique selon la revendication 8, dans lequel la tige est une tige creuse, la broche de fixation s'étendant à travers la tige creuse, la broche de fixation définissant une extrémité proximale (138, 238, 338, 438) qui peut être fixée à la poignée et une extrémité distale (140, 240, 340, 440) qui peut être fixé à une pointe terminale proximale (108.1, 208.1, 308.1) du manchon creux.

10. Applicateur de produit cosmétique selon l'une quelconque des revendications précédentes, dans lequel l'arrangement de déformation comprend au moins un disque monté sur l'extrémité distale de la tige.

11. Applicateur de produit cosmétique selon la revendication 10, dans lequel l'arrangement de déformation comprend une pluralité de disques disposés en direction longitudinale sur la longueur de la tige.

12. Applicateur de produit cosmétique selon l'une quelconque des revendications précédentes 1 à 9, dans lequel l'arrangement de déformation comprend au moins une came montée sur l'extrémité distale de la tige.

13. Applicateur de produit cosmétique selon la revendication 12, dans lequel l'arrangement de déformation comprend une pluralité de cames disposées en direction radiale autour de la tige et/ou en direction longitudinale sur la longueur de l'extrémité distale de la tige.

14. Applicateur de produit cosmétique selon l'une quelconque des revendications précédentes 1 à 9, dans lequel l'arrangement de déformation comprend un filetage disposé en direction longitudinale sur la longueur de la tige.

15. Applicateur de produit cosmétique selon la revendication 9, dans lequel le moyen d'entraînement comprend un moteur.

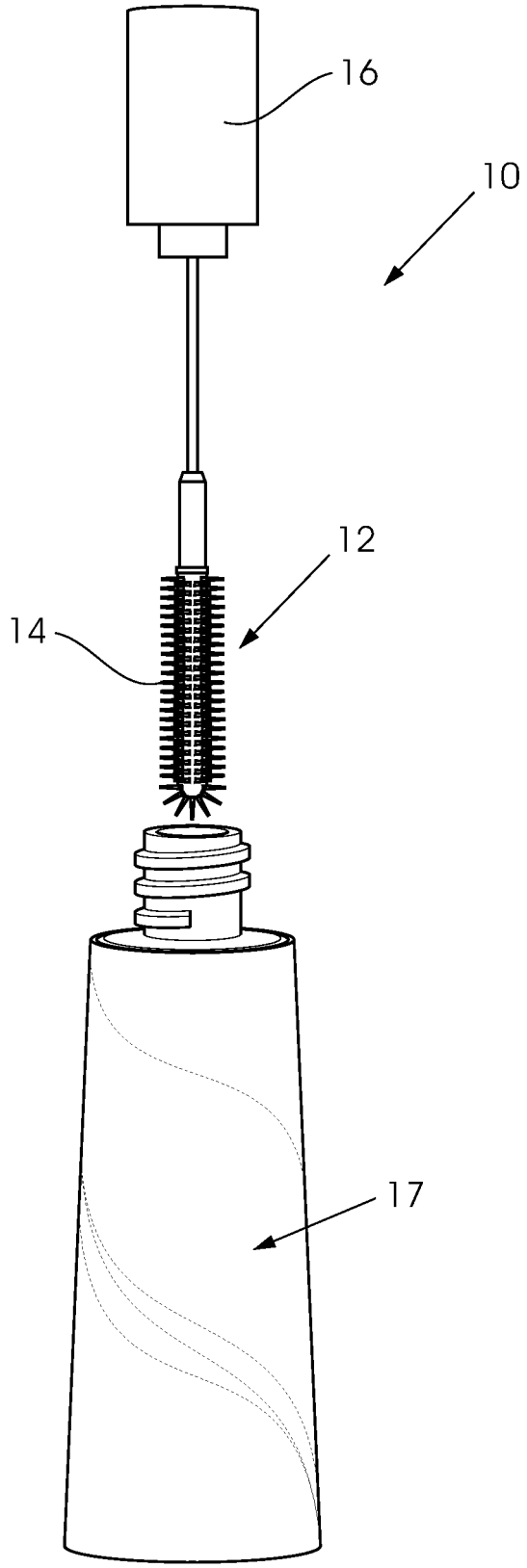
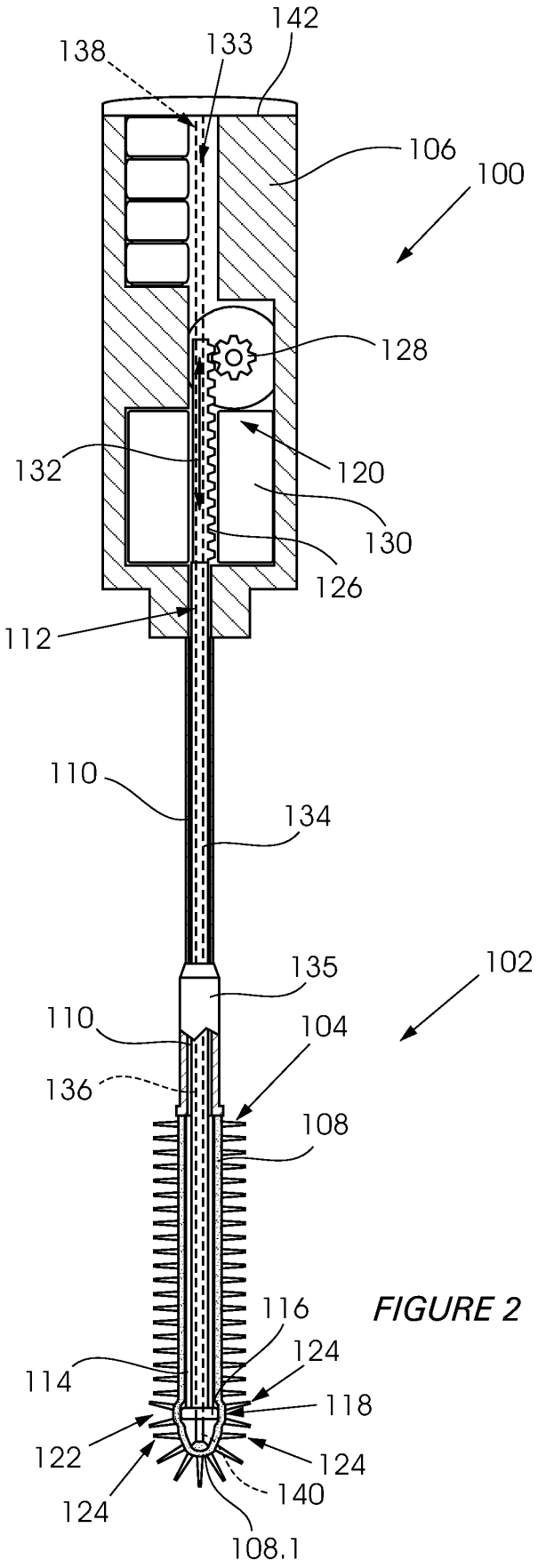


FIGURE 1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112
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122
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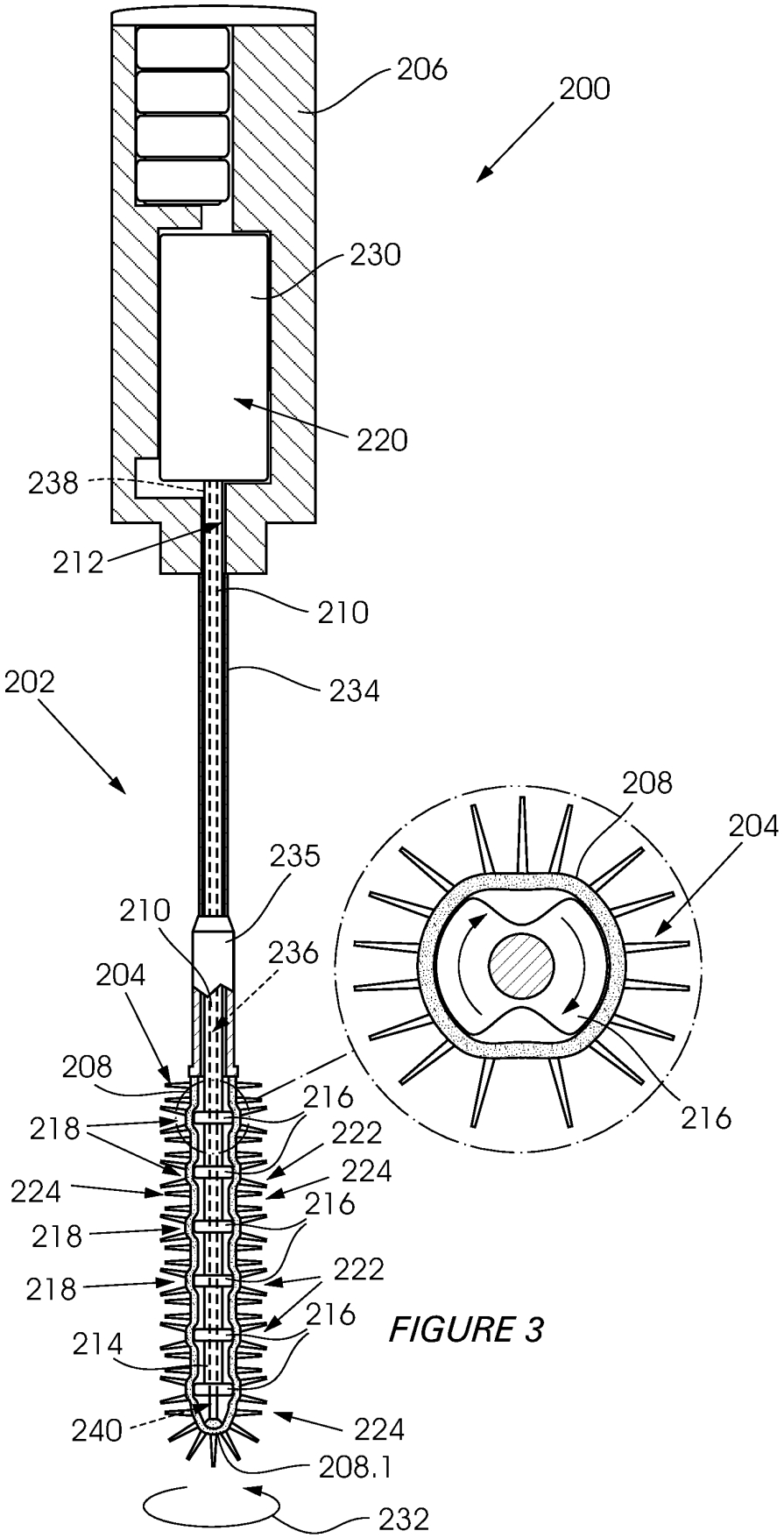
124
140
108.1

FIGURE 2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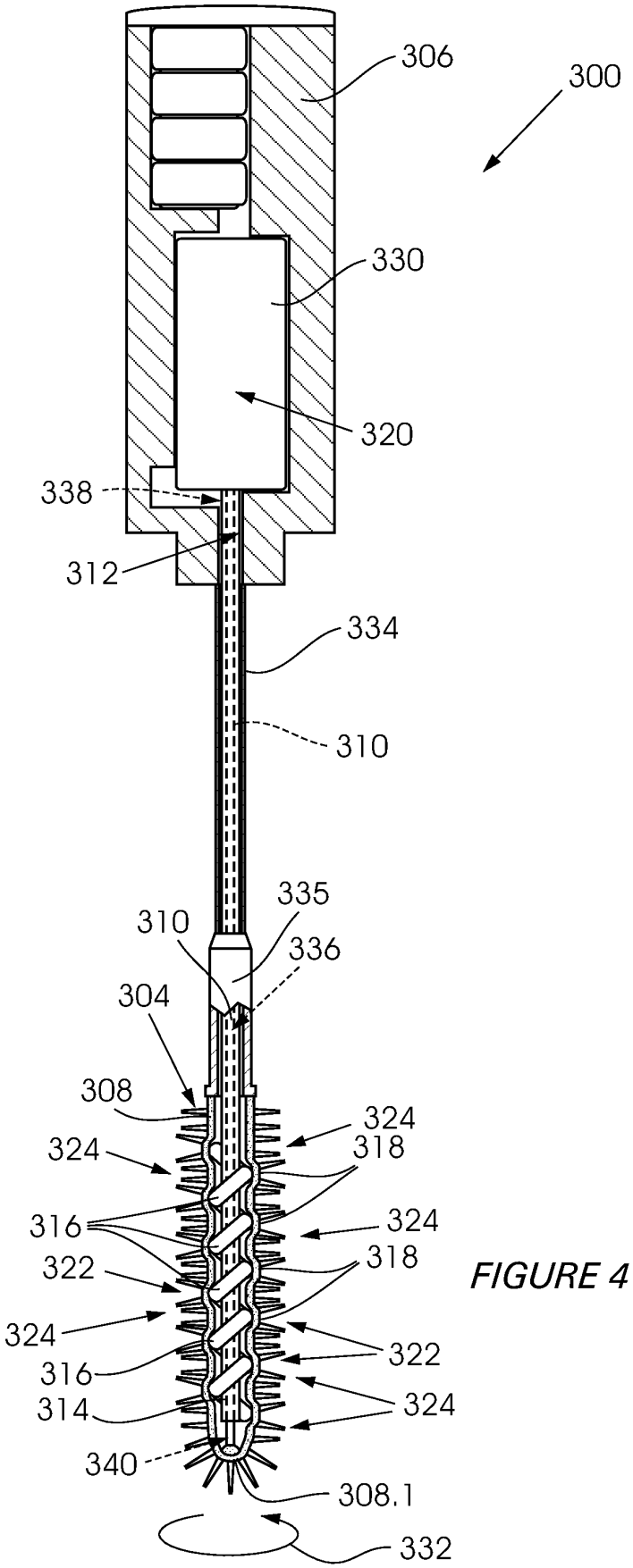
224
216
218
222
218
216
214
240
224
208.1
232
216

FIGURE 3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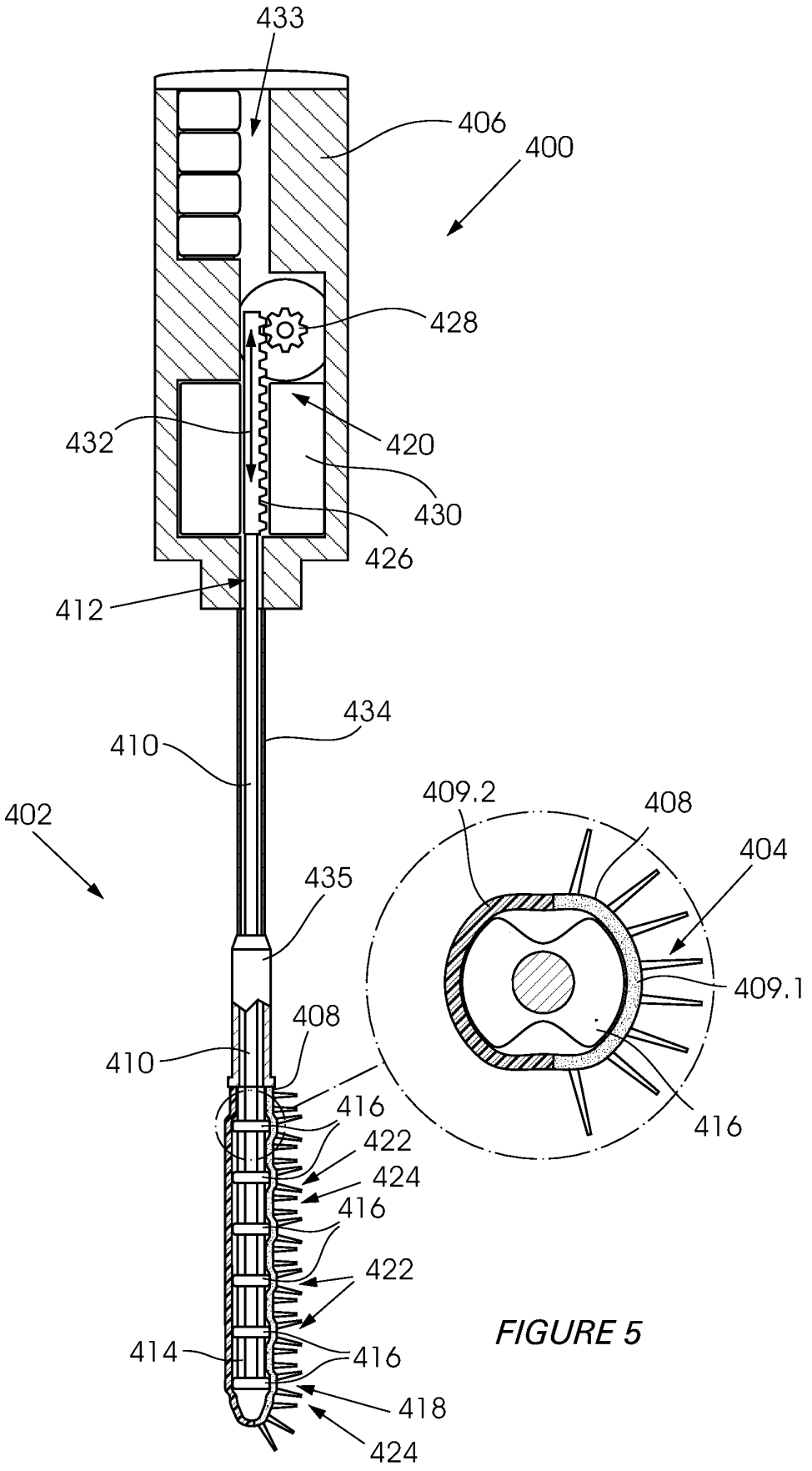
316
314
324
340
308.1
332

FIGURE 4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410
402
435
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409.1
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416

FIGURE 5

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 5137038 A **[0003]**
- WO 2006130642 A **[0005]**