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(54) **MASCARA BRUSH**

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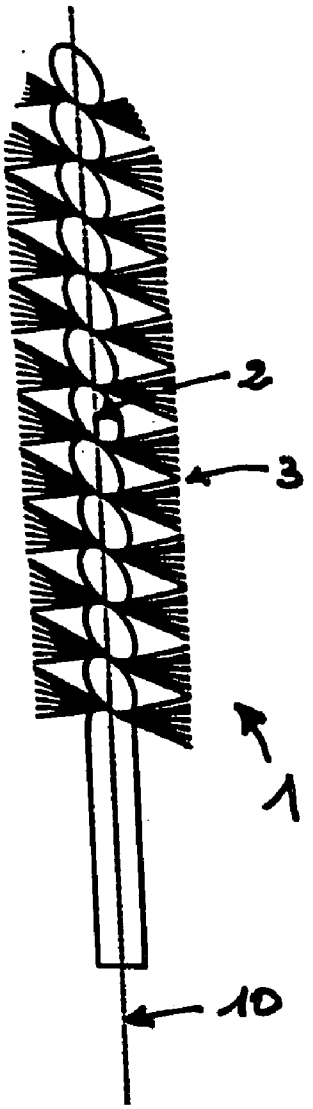
(57) **ABSTRACT**

Mascara brush includes (a) a core formed by a helicoidal twist of a wire having a succession of turns, (b) a plurality of bristles, with N bristles per turn, extending radially with respect to the said core. The plurality of bristles is formed by a mixture of at least one multitubular fiber, the multitubular fiber being a typically cylindrical fiber having internally t distinct tubes with t typically 2-6, and at least one other non-tubular fiber.



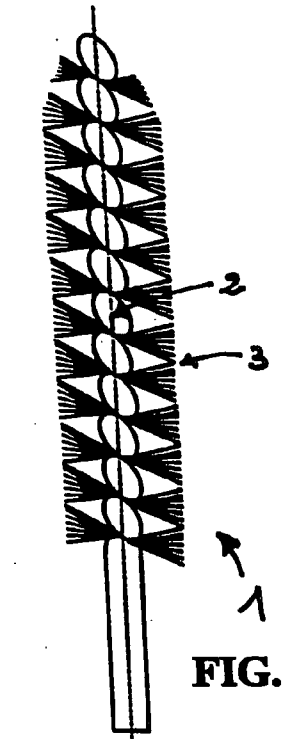


FIG. 1a

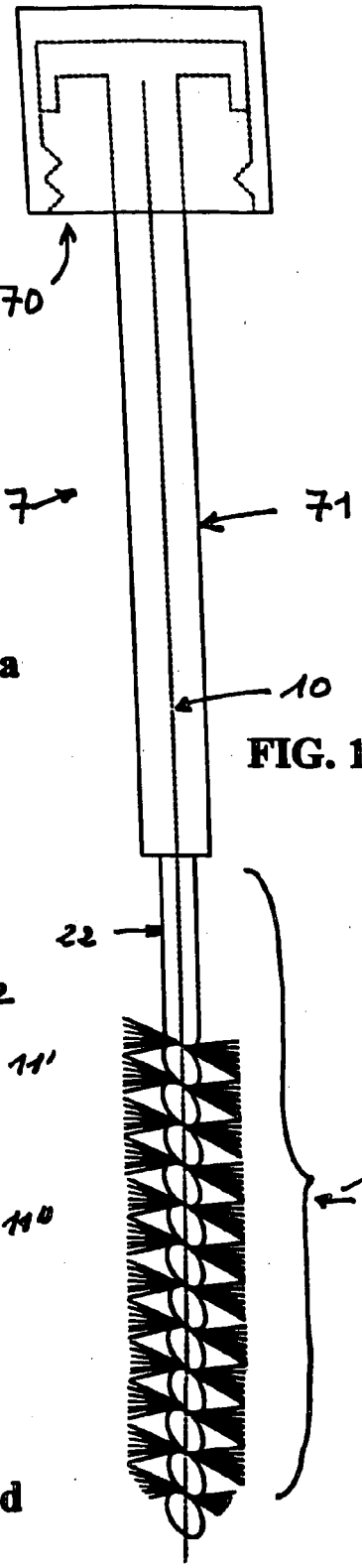


FIG. 1b

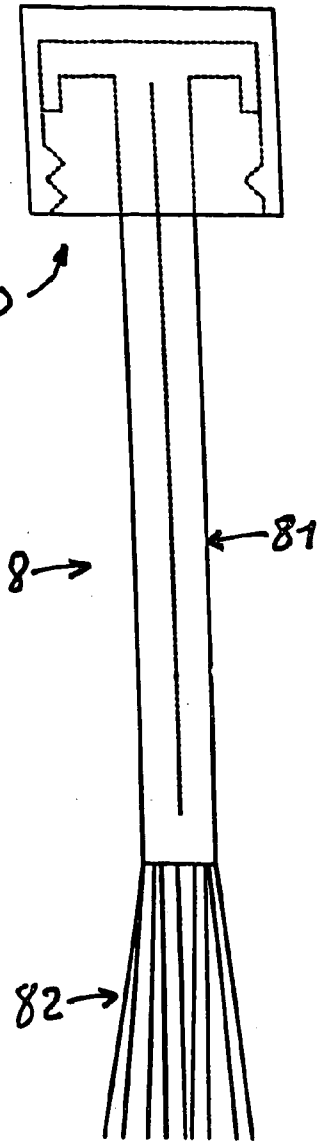


FIG. 1c

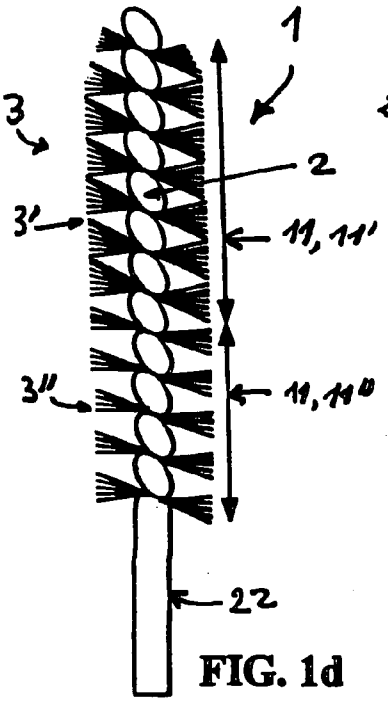


FIG. 1d

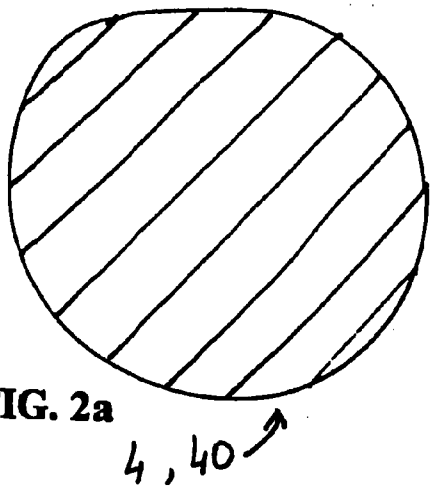


FIG. 2a

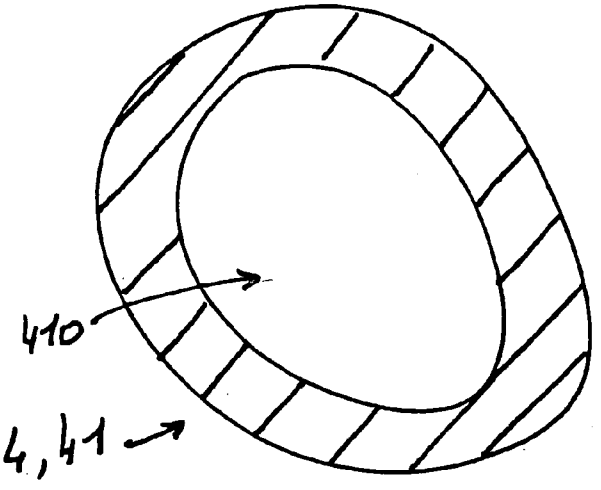


FIG. 2b

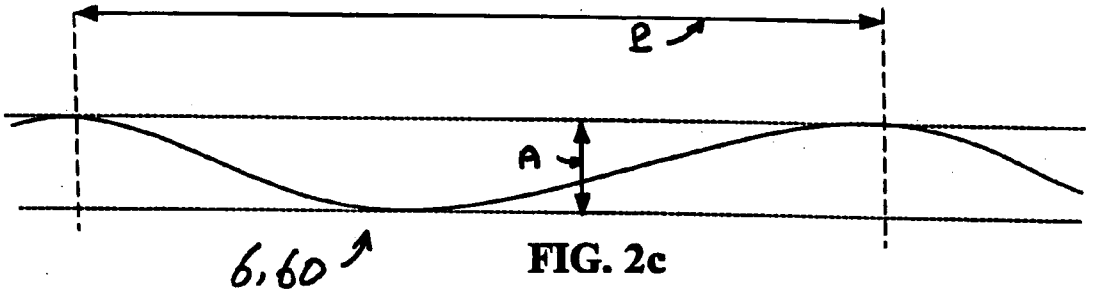


FIG. 2c

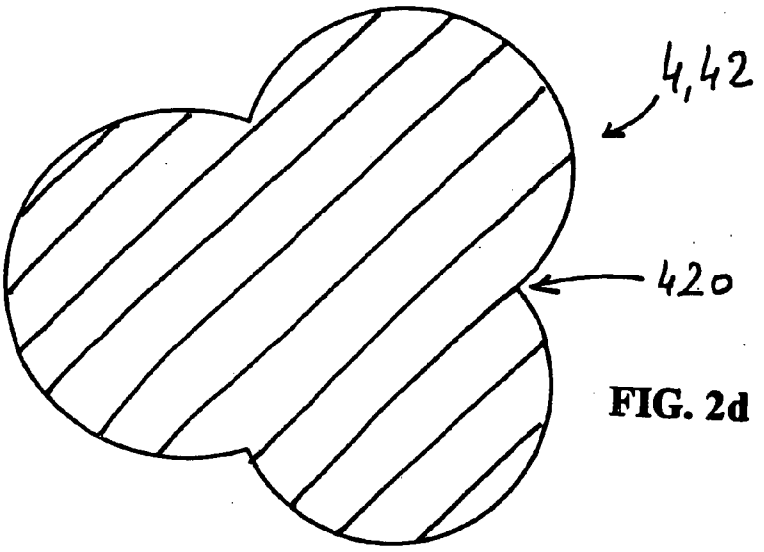


FIG. 2d

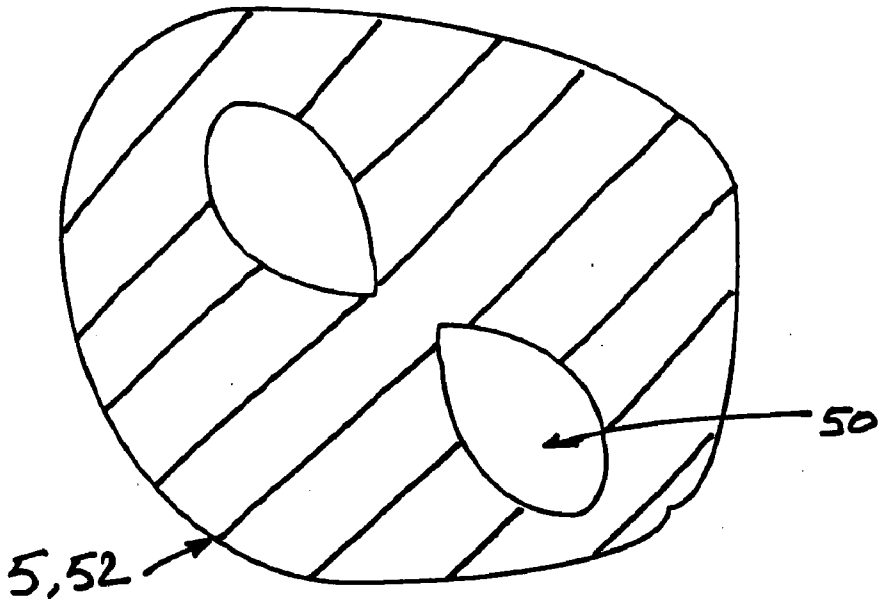


FIG. 3a

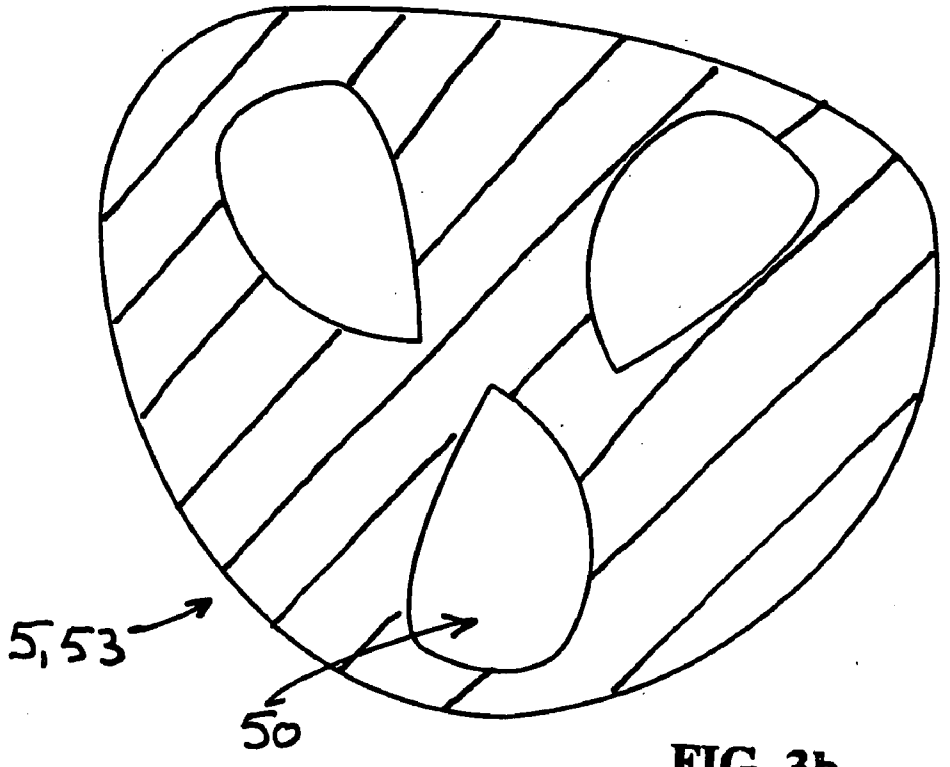


FIG. 3b

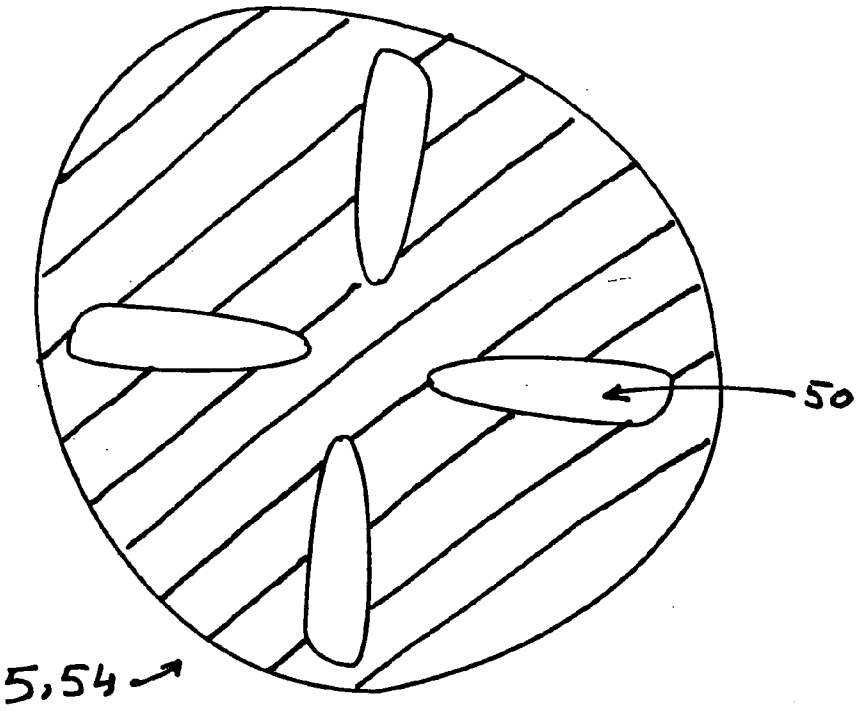


FIG. 4a

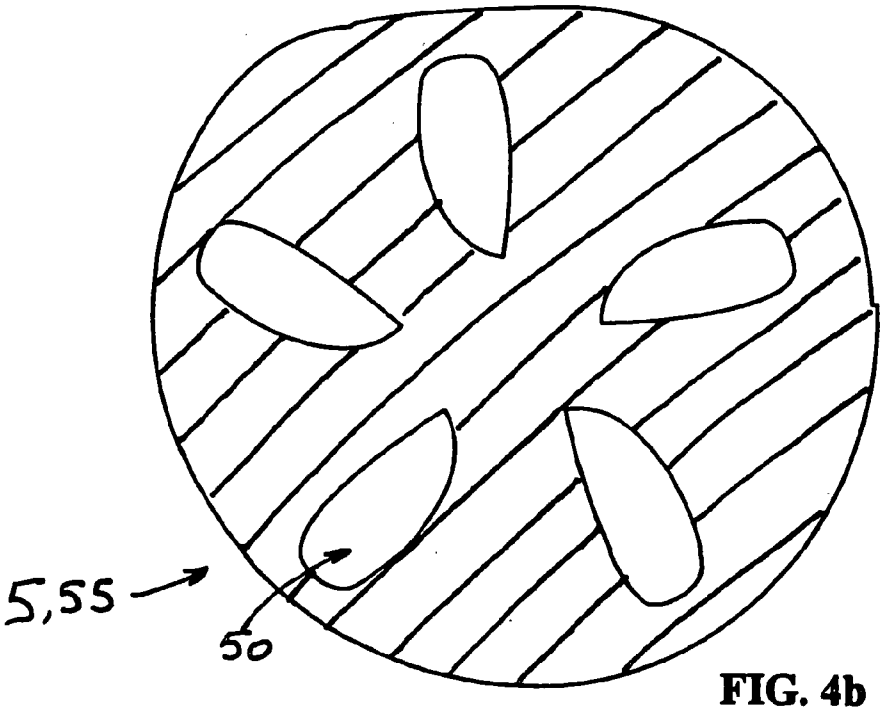


FIG. 4b

FIG. 5a

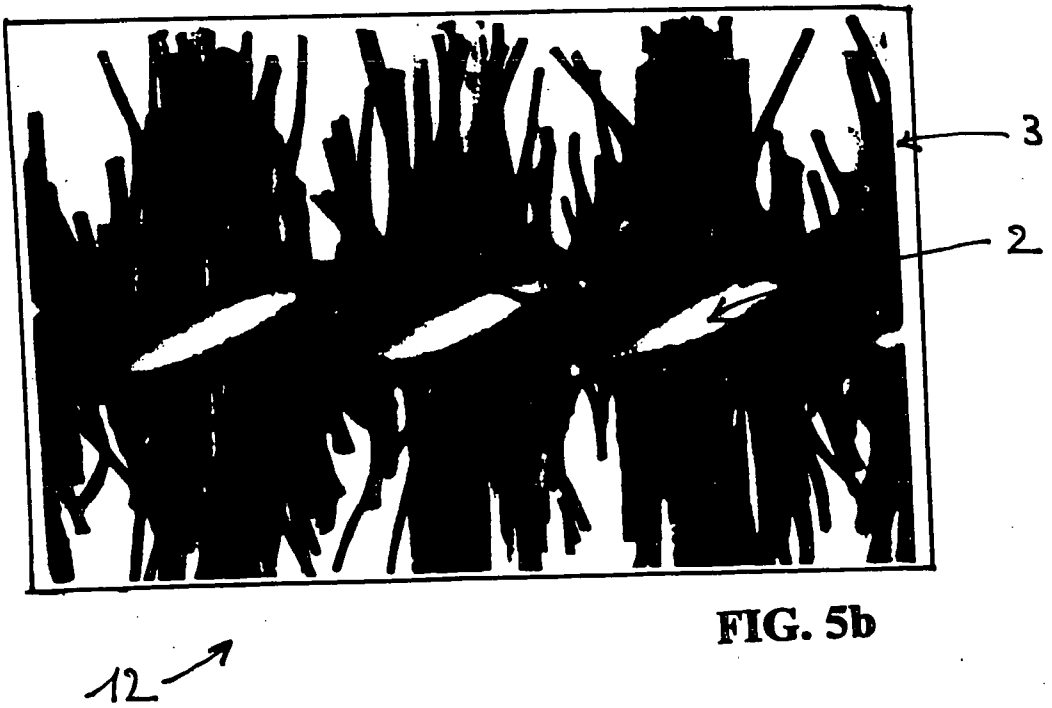


FIG. 5b

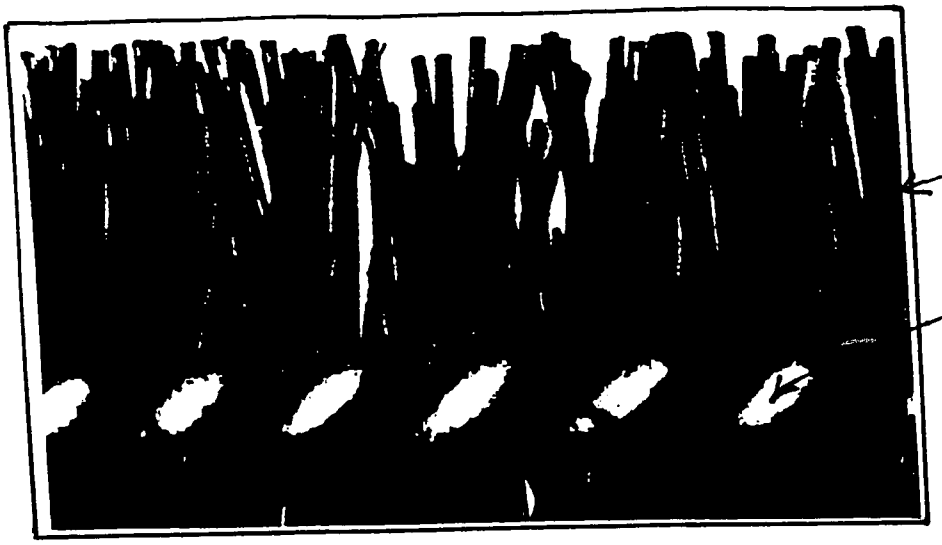


FIG. 6a

FIG. 6b

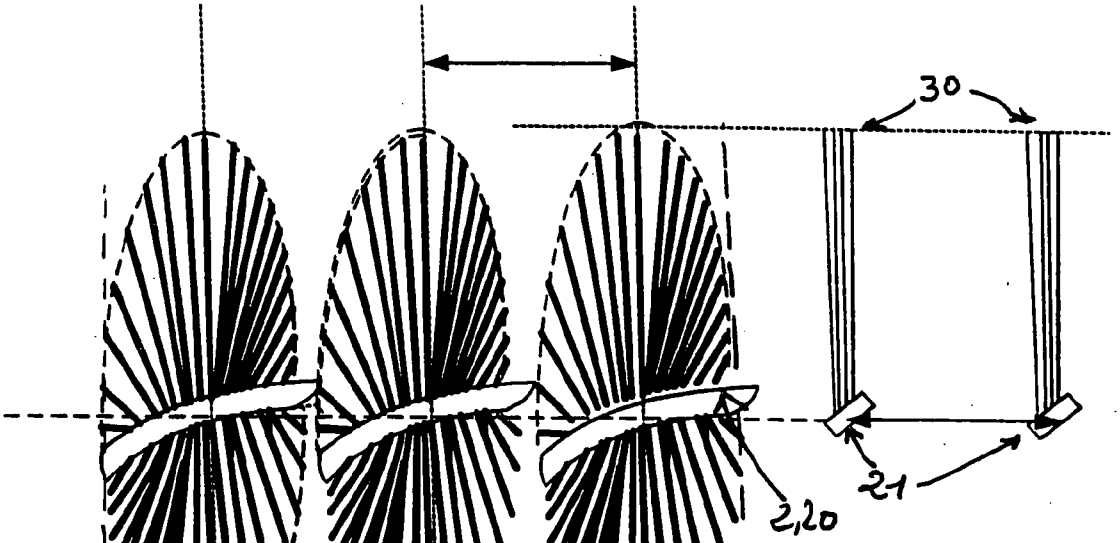


FIG. 7a

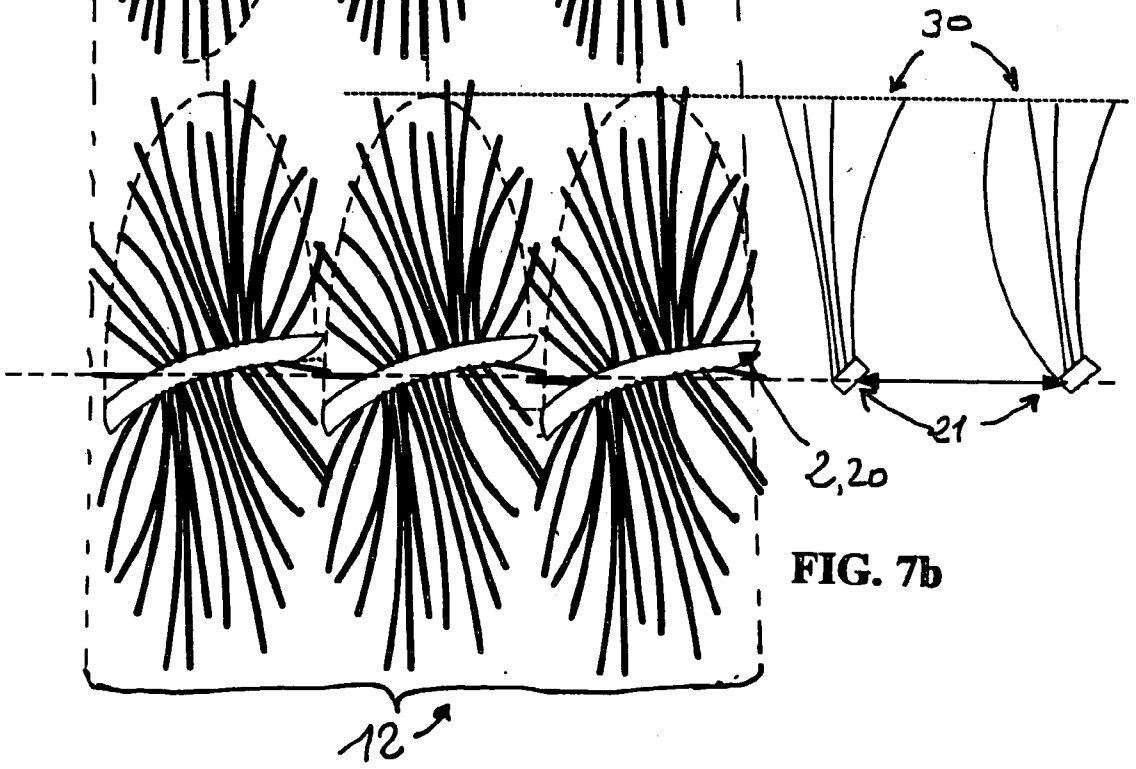


FIG. 7b

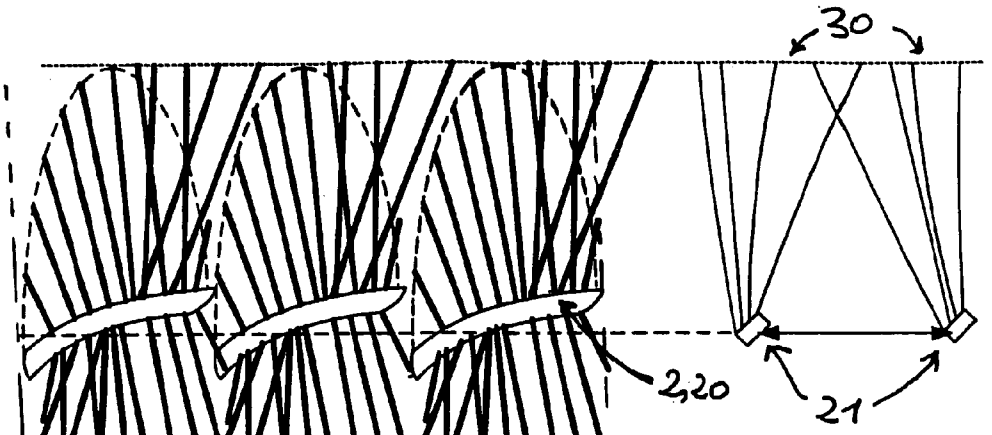


FIG. 8a

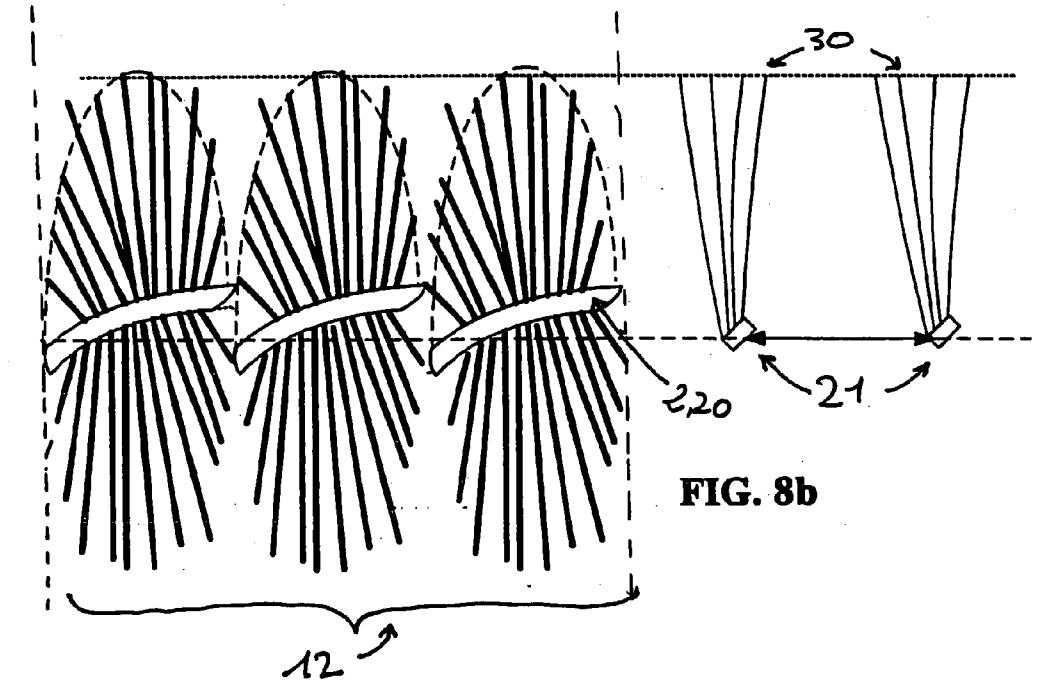


FIG. 8b

MASCARA BRUSH

FIELD OF THE INVENTION

[0001] The invention relates to applicators for cosmetic products, typically mascara applicators having a brush.

STATE OF THE ART

[0002] A great number of mascara applicators are already known.

[0003] These applicators, intended to cooperate with a receptacle forming a reservoir for the mascara, typically comprise:

[0004] (a) a cap intended to close the receptacle and to act as a means for gripping said applicator,

[0005] (b) an axial rod,

[0006] (c) and a brush,

[0007] said rod being fixed at one of its ends to the said cap and at the other end to the said brush,

[0008] said brush comprising a metallic twist joining plural bristles together.

[0009] As regards the said brush, very numerous kinds of brush are already known.

[0010] Thus the brushes are known, described in the French patents: FR 2 505 633, FR 2 605 505, FR 2 607 372, FR 2 607 373, FR 2 627 068, FR 2 627 363, FR 2 637 471, FR 2 637 472, FR 2 650 162, FR 2 663 826, FR 2 668 905, FR 2 675 355, FR 2 685 859, FR 2 690 318, FR 2 701 198, FR 2 706 749, FR 2 715 038, FR 2 745 481, FR 2 748 913, FR 2 749 489, FR 2 749 490, FR 2 753 614, FR 2 755 693, FR 2 774 269, FR 2 796 531, FR 2 796 532, FR 2 800 586

[0011] The brushes described in the U.S. Pat. Nos. 4,733,425, 4,861,179, 5,357,987, 5,595,198, 6,241,411, 6,427,700 are likewise known.

[0012] Problems Posed

[0013] On the one hand, because of the continuing evolution of mascara formulations, it is necessary to put novel brushes to use to permit the application of these formulations, and typically adapted to each new formulation.

[0014] On the other hand, users likewise need to dispose of a wide range of brushes to obtain different effects, for example different degrees of loading of the brush with the product to be applied and/or different effects of combing the eyelashes.

[0015] Finally, in the field of cosmetic products, there is a permanent demand for new products, particularly so as to personalize the products, which concerns formulations, applicators and also packaging in general, to the extent that the renewal of the products becomes an absolute commercial necessity, the alternative being to disappear from the market.

DESCRIPTION OF THE INVENTION

[0016] According to the invention, the mascara brush comprises: (a) a core formed by a helical twist of a wire having a succession of n turns, (b) a plurality of bristles, with N bristles per turn, extending radially with respect to the said core, and is characterized in that the said plurality of bristles is wholly or partially formed by at least one multitubular fiber, the said multitubular fiber being a typically cylindrical fiber comprising internally t distinct tubes, t typically being 2-6.

[0017] The Applicant has observed that multitubular fibers with a typically cylindrical surface are of particular interest.

[0018] In fact, these fibers are comparable to standard solid fibers having a typically cylindrical surface, but are unique in their flexibility, which is intermediate between that of the solid fibers and the hollow fibers already known and used to form brushes.

[0019] In fact, multitubular fibers have plural internal longitudinal channels, so that they have controlled flexibility without their external surface being modified, and thereby without modifying the contact surface with the mascara, with a constant fiber diameter,

[0020] By the expression "typically cylindrical" is understood a fiber whose specific surface is substantially that of a cylindrical fiber. Such a fiber can if necessary be ovalized. Nevertheless, such a fiber is devoid of axial notches or deep axial grooves, known for increasing the contact surface with the mascara or, more generally, with the cosmetic product to be applied.

[0021] In fact, as is known, the external surface of the fiber will control, particularly by surface tension and capillarity effects, the load of mascara taken up at each removal of the applicator from its distributor for application to the eyelashes.

[0022] Multitubular fibers thus in themselves permit access to a new region in the "flexibility—external surface" plane, flexibility controlling, besides the degree of effect of combing the eyelashes, quality itself or the comfort of the action of mascara application itself, and the external surface controlling in particular the load of mascara to be applied, as already mentioned.

DESCRIPTION OF THE DRAWINGS

[0023] **FIG. 1***a* shows a schematic side view of a mascara brush (**1**) comprising a metallic core (**2**) of 12 turns (**20**) formed by two twisted metallic wires fixing a plurality of bristles (**3**).

[0024] **FIG. 1***b* shows a side view of a mascara applicator (**6**) comprising the brush (**1**) of **FIG. 1***a*. This applicator comprises a cap (**60**) shown dotted in axial section, an axial rod (**61**) fixed to the said cap (**60**) at one end, and the to said brush at the other end.

[0025] **FIG. 1***c* shows a side view of a nail varnish applicator (**7**). This applicator comprises a cap (**71**) shown dotted in axial section, a tuft of bristles (**7**) forming a brush (**72**), and an axial rod (**71**) integral with the said cap (**70**) at one end and with the said the said tuft at its other end.

[0026] **FIG. 1***d*, analogous to **FIG. 1***a*, shows a brush having two zones distinguished by the said plurality of bristles (**3**), one zone (**11'**) having a plurality of bristles (**3'**) and the other zone (**11"**) having a plurality of bristles (**3'**).

[0027] **FIGS. 2***a*-**4***b* relate to fibers (**4**, **5**) forming the said bristles of the said plurality of bristles (**3**) of the mascara brush (**1**) or of the tuft of bristles (**72**) of the nail varnish applicator (**7**).

[0028] **FIG. 2***a* shows, in cross section perpendicular to the fiber direction, a solid fiber (**40**) of the prior art.

[0029] **FIG. 2***b,* analogous to **FIG. 2***a,* shows a hollow fiber (**41**) of the prior art.

[0030] **FIG. 2***c* shows a side view of a portion of a wavy solid fiber (**42**) of the prior art.

[0031] **FIG. 2***d* shows a grooved surface fiber (**42**) with three grooves (**420**).

[0032] **FIGS. 3***a*-**4***b* are sectional views, analogous to **FIGS. 2***a* and **2***b*, relating to multitubular fibers (**5**) according to the invention:

[0033] bi-tubular fiber (**52**) in **FIG. 3***a,*

[0034] tri-tubular fiber (**53**) in **FIG. 3***b,*

[0035] tetra-tubular fiber (**54**) in **FIG. 4***a,*

[0036] penta-tubular fiber (**55**) in **FIG. 4***b.*

[0037] **FIGS. 5***a*-**6***b* are enlarged photographs of portions of brush (**12**) in side view.

[0038] **FIG. 5***a* corresponds to an embodiment of a brush (**1**) of the prior art, with the plurality of bristles (**3**) constituted by solid fibers (**40**).

[0039] **FIG. 5***b* corresponds to an embodiment of a brush (**1**) according to the invention, with the plurality of bristles (**3**) comprising quadri-tubular fibers (**54**) and solid wavy fibers (**42**).

[0040] **FIG. 6***a* corresponds to an embodiment of a brush (**1**) of the prior art, with the plurality of bristles (**3**) constituted by hollow fibers (**41**).

[0041] **FIG. 6***b* corresponds to an embodiment of a brush (**1**) according to the invention, with the plurality of bristles constituted by quadri-tubular fibers (**54**).

[0042] **FIGS. 7***a*-**8***b* are schematic diagrams of portions of the brushes (**12**) of **FIGS. 5***a*-**6***b.*

[0043] On the left-hand side of each Figure, three turns (**20**) have been shown, and on the right-hand portion, two portions (**20**) of a turn (**21**) and of the corresponding portion (**30**) of the said plurality of bristles (**3**), the portion (**30**) having the same medium vertical orientation, so as to illustrate the bulking of the corresponding brushes:

[0044] very low bulking for the brush corresponding to **FIGS. 7***a* and **5***a,*

[0045] very high bulking for the brush corresponding to **FIGS. 8***a* and **6***a,*

[0046] fairly high bulking for the brush corresponding to **FIGS. 7***b* and **5***b,*

[0047] medium bulking for the brush corresponding to **FIGS. 8***b* and **6***b.*

DETAILED DESCRIPTION OF THE INVENTION

[0048] According to s first embodiment of the invention shown in **FIGS. 6***b* and **8***b,* the said plurality of bristles (**3**) may be wholly formed by one or more multitubular fibers (**5**).

[0049] This plurality of bristles (**3**) may be formed by the same multitubular fiber (**5**), as shown in **FIGS. 6***b* and **8***b.* But it may also be formed by mixtures of multitubular fibers (**5**).

[0050] According to another, second, embodiment of the invention, the said plurality of bristles (**3**) may be formed by a mixture comprising, other than at least one multitubular fiber (**5**), at least one other non-multitubular fiber (**4**), as shown in **FIGS. 5***b* and **7***b.*

[0051] In fact, to develop a brush suited to a specific formulation of mascara, it is more often necessary to proceed to a mixture of different fibers.

[0052] By "different fibers" is to be understood fibers, which may vary in their diameter, chemical nature, external shape (grooved or smooth surface, etc.), flexibility, according to whether they are solid, hollow, multitubular, etc.

[0053] According to a third embodiment of the invention, and as illustrated for example in **FIG. 1***d,* the said plurality of bristles (**3**) may be formed by a succession of at least two zones (**11**, **11'**, **11"**) which are distinct in the said plurality of bristles (**3**, **3'**, **3"**), at least one zone (**11'**) comprising a plurality of bristles (**3'**) distinct from another plurality of bristles (**3"**) of another contiguous zone (**11"**), at least one of the said pluralities of bristles (**3'**) and (**3"**) comprising the said multitubular fiber.

[0054] Typically, the said multitubular fiber (**5**) may be a quadri-tubular fiber (**54**), with t=4.

[0055] According to an alternative to the second embodiment of the invention, the said mixture may comprise at least two fibers F**1** and F**2**, typically of different respective diameters D**1** and D**2**, with D**1**<D**2**, one of these two fibers being a multitubular fiber (**5**), the other fiber being a non-multitubular fiber (**4**).

[0056] In this case, the ratio of these two diameters D**2**/D**1** is at least equal to 1.2 and may typically go up to 3, so to be able to obtain the suppleness and the level of bulking particularly required for the formulation of mascara.

[0057] But the said mixture may comprise at least three distinct fibers F**1**, F**2** and F**3**, of respective mean diameters D**1**, D**2** and D**3**, at least one of these two fibers being constituted by the said multitubular fiber (**5**), at least one of these fibers being constituted by the said other non-multitubular fiber (**4**).

[0058] In this case, the relation may be D**1**<D**2**<D**3**, with the ratios D**2**/D**1**>1.3 and D**3**/D**2**>1.2, the diameter D**1** being the said "small diameter", the diameter D**2** being the said "medium diameter", and the diameter D**3** being the said "large diameter".

[0059] Typically, the said fiber F**1** may have a small diameter D**1** less than 0.127 mm (5 mils), the fiber F**2** having a medium diameter D**2** of 0.127 mm (5 mils) to 0.178 mm (7 mils), and the fiber F**3** having a large diameter D**3** greater than 0.178 mm (7 mils).

[0060] The small diameter D**1** may be greater than 0.05 mm (about 2 mils).

[0061] The large diameter D**3** may be less than 0.3 mm (about 12 mils).

[0062] According to an alternative to the second embodiment of the invention, the said mixture may be a mixture constituted by the said three fibers F1, F2, and F3. This is the case of the brush (1) shown in **FIGS. 5***b* and **7***b*.

[0063] In this case, the said small diameter D1 may be from 0.076 mm (3 mils) to 0.127 mm (5 mils).

[0064] The medium diameter D2 may be from 0.127 mm (5 mils) to 0.278 mm (7 mils).

[0065] The large diameter D3 may be 0.178 mm (7 mils) to 0.229 mm (9 mils).

[0066] According to another alternative, two of the three fibers F1, F2 and F3 may be constituted by the said multitubular fibers (5) or, preferably, by the said tetra-tubular fibers (54).

[0067] Thus the said fibers F2 of medium diameter and F3 of large diameter may be constituted by the said multitubular fibers (5) or, preferably, by the said tetra-tubular fibers (54), as is the case for the brush (1) shown in **FIGS. 5***b* and **7***b*.

[0068] According to the invention, the said non-multitubular fibers (4) may be chosen from: solid fibers (40), hollow fibers (41), and grooved-surface fibers (43).

[0069] Furthermore, the said mixture may comprise at least one wavy fiber (6, 60), the said other non-multitubular fiber (4), typically the said solid fiber (40), and/or the said multitubular fiber (5) being wavy.

[0070] As shown in **FIG. 2***c*, the said wavy fiber (6, 60) may comprise undulations of amplitude A of 0.3-0.8 mm and a length or pitch P of 3-10 mm.

[0071] However, the said non-multitubular fiber (4) may be a wavy fiber, typically a wavy solid fiber (60), as is the case for the brush of **FIGS. 5***b* and **7***b*.

[0072] According to the invention, the said multitubular fiber (5) and particularly the quadri-tubular fiber (54) may be formed of a thermoplastic, typically chosen from polyamides, PET, polyolefins, and preferably polyamide 6-12.

[0073] The said other non-multitubular fiber (4) may be formed of a thermoplastic chosen from polyamides, PET and polyolefins.

[0074] However, the multitubular fiber (5) and/or the said non-multitubular fiber (4) may be a fiber formed of elastomer.

[0075] In this case, the said fiber formed of elastomer may typically be the fiber F3 of large diameter D3.

[0076] According to the invention, the number N of bristles per turn (20) may be 8-60 bristles per turn, and the said succession of n turns may comprise 10-24 turns.

[0077] According to a more limited alternative of the invention, the said fiber F1 of small diameter may be present in the mixture at a concentration of 40-80 wt. %, the said fiber F2 may be present in the said mixture at a concentration of 10-30 wt. %, and the said fiber F3 may be present in the said mixture at a concentration of 10-30 wt. %.

[0078] In a brush (1) of the invention, there may be:

[0079] (a) a number of bristles equal to n.N±10%

[0080] (b) n=11±1,

[0081] (c) the said fiber F1 as a non-multitubular fiber (4) of polyamide 6-12, of nominal diameter 0.102 mm (4 mils),

[0082] (d) the said fiber F2 as a tetratubular fiber 0.142 mm in nominal diameter (6 mils),

[0083] (e) the fiber F3 as a tetratubular fiber 0.203 mm in nominal; diameter (8 mils),

[0084] Furthermore, the said non-multitubular fiber (4) may be a wavy solid fiber (60).

[0085] In this case, the said mixture may have a composition by weight of 70% of fiber F1, 15% of fiber F2 and 15% of fiber F3.

[0086] The said mixture may, according to another alternative, have a composition by weight of 50% of fiber F1, 20% of fiber F2 and 30% of fiber F3.

[0087] Another subject of the invention is formed by a cosmetic products applicator (7), typically for mascara, comprising a brush (1) according to the invention.

[0088] Another subject of the invention is formed by a cosmetic products distributor, typically for mascara, comprising an applicator (7) according to the invention.

[0089] Such an applicator is shown in **FIG. 1***b*.

[0090] Another subject of the invention is formed by a cosmetic product applicator (8), typically for nail varnish, comprising a cap (80), an axial rod (51), fixed at one end to the cap and at the other end to a tuft of bristles (82), and characterized in that the said tuft of bristles (82) is formed wholly or partially by a multitubular fiber (5), the said multitubular fiber being a typically cylindrical fiber comprising interiorly t distinct internal tubes (50), t being typically 2-6.

[0091] Such an applicator (8) is shown in **FIG. 1***c*.

[0092] Another subject of the invention is formed by a cosmetic product distributor, typically for nail varnish, comprising the applicator (8) according to the invention.

EMBODIMENT EXAMPLES

[0093] Brushes corresponding to **FIGS. 5***b* and **7***b* on the one hand (brush I) and **FIGS. 6***b* and **8***b* on the other hand (brush II), were conventionally manufactured on a Zaboranski® machine.

[0094] Prior art brushes shown in **FIGS. 5***a* and **7***a* on the one hand (brush III) and **FIGS. 6***a* and **8***a* on the other hand (brush IV) were also manufactured in the same manner.

[0095] In every case, a stainless steel wire 0.7 mm in diameter was used to make the spiraled metal core (3).

[0096] Brushes 37.7 mm in length were manufactured, 27.6 mm being for the brush portion (22) having the said plurality of bristles and 10.1 mm for the brush portion (22) corresponding to the bare portion of the core (2) intended to be fixed to the axial rod (71) to form the applicator (7).

[0097] These brushes are round brushes, 6.4 mm in diameter.

[0098] These brushes have 11 turns (20) and about 530 bristles for the 11 turns.

[0099] As regards the nature of the fibers forming the said plurality of bristles (3):

[0100] Brush I: mixture of three fibers F1, F2 and F3.

[0101] Fiber F1 is a commercial solid wavy fiber (60) of polyamide 6-12, 4 mils or 0.102 mm in diameter.

[0102] Fibers F2 and F3 are quadri-tubular fibers (54) manufactured by Dupont de Nemours (trademark TYNEX®) of respectively 0.152 mm (6 mils) and 0.203 mm (6 mils).

[0103] The proportions by weight of this mixture are: 70% of F1, 15% 0f F2, 15% of F3.

[0104] Brush II: fiber F3 alone

[0105] Brush III: solid fiber (40) of polyamide 6-12, 0.203 mm in diameter (8 mils)

[0106] Brush IV: Hollow fiber (41) of polyamide, 0.203 mm in diameter (8 mils).

[0107] As may be seen in **FIGS. 5***a* and **5***b*, the bulking of these brushes varies greatly from one brush to the other. It is furthermore the same for the flexibility of the brush.

[0108] However, brushes I and II, and brush I in particular, are distinguished by the fact of reconciling flexibility and rigidity so as to obtain the application of mascara on the eyelashes and an effect of combing the eyelashes.

ADVANTAGES OF THE INVENTION

[0109] As already mentioned, the invention enables combinations of properties to be obtained, as regards in particular the flexibility of the brush and its bulking which were not previously accessible.

[0110] The invention therefore enables an easier response to the various demands, arising particularly on mascara formulations, the ever-increasing variety of mascara formulations imposing a constant evolution and adaptation of the brushes, in order to obtain the desired effects when applying it to the eyelashes, both as regards the quantity of mascara taken up by the applicator and as regards the quality of the deposit formed on the eyelashes, if necessary with an effect of combing the eyelashes.

[0111] Furthermore, the brushes according to the invention, and in particular as regards the flexibility of the brushes, and in particular the brushes with a mixture of three fibers, open a path to a great variety of brushes, adaptable to a great number of formulations and highly satisfactory during their use.

List of reference numerals

Mascara brush	1
Axial direction	10
Distinct zone	11, 11', 11"
Portion of brush 1	12
Twisted metallic core of 1	2
Turns	20
Portion of turn 20	21
Bare portion fixed to 71	22
Plurality of bristles of 1	3, 3', 3"
Portion of plurality 3	30
Fiber forming bristle other than 5	4

-continued

List of reference numerals

Solid fiber	40
Hollow fiber	41
Internal cavity	410
Grooved-surface fiber	42
Axial groove of 42	420
Multitubular fiber	5
Internal tubes	50
External surface	51
Bi-tubular fiber	52
Tri-tubular fiber	53
Quadri-tubular fiber	54
Penta-tubular fiber	55
Wavy fiber	6
Solid wavy fiber	60
Multitubular wavy fiber	61
Mascara applicator	7
Cap	70
Axial rod	71
Nail varnish applicator	8
Cap	80
Axial rod	81
Tuft of bristles forming brush	82

1. Mascara brush (**1**) comprising (a) a core (**2**) formed by a helicoidal twist of a wire comprising a succession of turns (**20**), (b) a plurality of bristles (**3**), with N bristles per turn, extending radially with respect to the said core (**2**), characterized in that the said plurality of bristles (**3**) is formed by a mixture of at least one multitubular fiber (**5**, **52**, **53**, **54**, **55**), the said multitubular fiber (**5**) being a typically cylindrical fiber comprising internally t distinct tubes (**50**) with t typically 2-6, and at least one other non-tubular fiber (**4**).

2. Brush according to claim 1, wherein the said plurality of bristles (**3**) is formed by a succession of at least two zones (**11**, **11'**, **11"**) distinguished by the said plurality of bristles (**3**, **3'**, **3"**), at least one zone comprising a plurality of bristles (**3'**) distinct from another plurality of bristles (**3"**) of another contiguous zone (**11'**), at least one of the said plurality of bristles (**3'**) and (**3"**) comprising the said multitubular fiber.

3. Brush according to claim 1, wherein the said multitubular fiber (**5**) is a quadri-tubular fiber (**54**) with t=4.

4. Brush according to claim 1, wherein the said mixture comprises at least two fibers F1 and F2, typically of different respective diameters D1 and D2, one of these two fibers being a multitubular fiber (**5**), the other fiber being a non-multitubular fiber (**4**).

5. Brush according to claim 4, wherein the said mixture comprises at least three distinct fibers F1, F2 and F3 of mean diameters respectively denoted by D1, D2 and D3, at least one of these three fibers being formed by the said multitubular fiber (**5**), at least one of these fibers being formed by the said other non-multitubular fiber (**4**).

6. Brush according to claim 5 wherein D1<D2<D3, with the ratios D2/D1>1.3 and D3/D2>1.2, the diameter D1 being the said "small diameter", the diameter D2 being the said "medium diameter", and the diameter D3 being the said "large diameter".

7. Brush according to claim 6, wherein the fiber F1 has a small diameter D1 less than 0.127 mm, the fiber F2 has a medium diameter D2 of 0.127-0.178 mm, and the fiber F3 has a large diameter D3 greater than 0.178 mm.

8. Brush according to claim 6, wherein the said small diameter is greater than 0.05 mm.

9. Brush according to claim 6, wherein the said large diameter is less than 0.3 mm.

10. Brush according to claim 5, wherein the said mixture is a mixture formed by the three fibers F**1**, F**2** and F**3**.

11. Brush according to claim 6, wherein the said small diameter is 0.076-0.127 mm.

12. Brush according to claim 6, wherein the said medium diameter D**2** is 0.127-0.178 mm.

13. Brush according to claim 6, wherein the said large diameter is 0.178-0.229 mm.

14. Brush according to claim 6, wherein two of the three fibers F**1**, F**2** and F**3** are formed by the said multitubular fibers **(5)** or preferably by the said tetra-tubular fibers **(54)**.

15. Brush according to claim 14, wherein the said fibers F**2** of medium diameter and F**3** of large diameter are constituted by the said multitubular fibers **(5)** or preferably by the said tetra-tubular fibers **(54)**.

16. Brush according to claim 1, wherein the said non-multitubular fibers **(4)** are chosen from: solid fibers **(40)**, hollow fibers **(41)**, and grooved-surface fibers **(43)**.

17. Brush according to claim 1, wherein the said mixture comprises at least one wavy fiber **(6, 60)**, the said other, non-tubular fiber **(4)**, typically the solid fiber **(40)** and/or the multitubular fiber **(5)** being wavy.

18. Brush according to claim 17, wherein the wavy fiber **(6, 60)** comprises undulations of amplitude A of 0.3 mm-0.8 mm and a length or pitch of 3-10 mm.

19. Brush according to claim 1, wherein the said non-multitubular fiber **(4)** is a wavy fiber **(6)**, typically a solid wavy fiber **(60)**.

20. Brush according to claim 1, wherein the said multi-tubular fiber **(5)**, and particularly the said quadri-tubular fiber **(54)** are formed of a thermoplastic, typically chosen from polyamide, PET, polyolefins, and preferably of polyamide 6-12.

21. Brush according to claim 1, wherein the said other non-multitubular fiber **(4)** is formed of a thermoplastic chosen from polyamide, PET, and polyolefins.

22. Brush according to claim 1, wherein the said multi-tubular fiber **(5)** and/or the said non-multitubular fiber **(4)** are a fiber formed of elastomer.

23. Brush according to claim 22, wherein the said fiber formed of elastomer is typically the said fiber F**3** of large diameter D**3**.

24. Brush according to claim 1, wherein the number N of bristles per turn is 8-60 bristles per turn.

25. Brush according to claim 1, wherein the said succession of n turns **(20)** comprises 10-24 turns.

26. Brush according to claim 6, wherein the said small diameter fiber F**3** is present in the mixture in a concentration by weight of 40-80%, the said fiber F**2** is present in the mixture in a concentration by weight of 10-30%, and the said fiber F**3** is present in the said mixture in a concentration by weight of 10-30%.

27. Brush according to claim 7, wherein

(a) the number of bristles is equal to n.N±10%,

(b) n=11±1,

(c) the said fiber F**1** is a non-multitubular fiber **(4)** of polyamide 6-12, of 0.102 mm nominal diameter,

(d) the said fiber F**2** is a tetra-tubular fiber of nominal diameter 0.152 mm,

(e) the said fiber F**3** is a tetra-tubular fiber of nominal diameter 0.203 mm.

28. Brush according to claim 27, wherein the said non-multitubular fiber **(4)** is a solid wavy fiber **(60)**.

29. Brush according to claim 27, wherein the said mixture has a composition by weight of 70% of fiber F**1**, 15% of fiber F**2** and 15% of fiber F**3**.

30. Brush according to claim 27, wherein the said mixture has a composition by weight of 50% of fiber F**1**, 20% of fiber F**2** and 30% of fiber F**3**.

31. Cosmetic product applicator **(7)**, typically for mascara, comprising a brush **(1)** according to claim 1.

32. Cosmetic product distributor **(8)**, typically for mascara, comprising an applicator **(7)** according to claim 31.

33. Cosmetic product applicator **(8)**, typically for nail varnish, comprising a cap **(80)**, an axial rod **(51)** fixed at one of its ends to the said cap, and at its other end to a tuft of bristles **(82)**, characterized in that the said tuft of bristles **(82)** is wholly or partially formed by a multitubular fiber **(5)**, the said multitubular fiber being a typically cylindrical fiber comprising internally t distinct internal tubes **(50)**, with t typically 2-6.

34. Cosmetic product distributor, typically for nail varnish, comprising the applicator **(8)** according to claim 33.

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