

MASCARA BRUSH**BACKGROUND OF THE INVENTION**

5 The invention relates generally to the field of mascara brushes and specifically to brushes having a core bent to form a reservoir for retaining and transferring mascara or other pasty product to the eye lashes.

10 A mascara brush of the generic type is known for instance from GB-A-2 174 895 and DE-A-42 05 935. In these prior art mascara brushes, the bending of the core was such that the bent core sections rest directly and closely on each other, externally substantially giving the appearance of a
15 conventional mascara brush. According to these prior art solutions, the purpose of the bending resides in that bristles project in the bent portion in prolongation of the axial direction of the core sections resting on each other, a paintbrush-like section thus being formed that ensures the
20 application of mascara to peripheral parts of the eyelashes.

Fundamentally, mascara brushes pose the problem that the arrangement of the bristles must be such as to ensure the uniform application of mascara and the separation of the individual lashes when combing the latter. To this end, it
25 has been known per se to equip mascara brushes with bristles of differing length or differing rigidity or to provide different sections of the brush for the application on the one hand and for the combing on the other.

A further general problem with the mascara brushes of
30 the species resides in the liquid transfer from the reservoir of a mascara unit to the eyelashes. To this end, the mascara brush must have a receptivity and storage capacity for the liquid. On the one hand, this is accomplished on every individual fiber or bristle. To this effect it is known to
35 design the fibers for instance as hollow fibers, as fibers with a capillary outer groove or to otherwise provide for some structuring and enlarging of the surface of the

individual fibers. Moreover, storage capacity is available in the interspace between the individual fibers where mascara liquid is retained because of the surface tension.

Ultimately, the distribution of the tips along the
5 envelope curve of the brush is of some importance, too. Whereas a helical tip distribution was preferred formerly, the aim has recently been to achieve at least partially as uniform as possible a tip distribution, there being the proposal to achieve this aim by means of hollow fibers or of
10 fibers consisting of glued fiber segments which are treated with a solvent after the production of the brush so that the fiber segments dissolve and very fine, separated fiber segments result that are uniformly distributed over the surface.

15 Finally, for the construction of mascara brushes, it has to be taken into account that the users exhibit a high degree of individual demands and wishes resulting from differing usage and types of lashes. For individual adaptation it is even known to make applicators for applying mascara
20 individually adaptable through adjustable axial tensions by means of a corresponding mechanism.

SUMMARY OF THE INVENTION

It is accordingly the object of the invention to embody
25 a mascara brush such that optimal properties for the transfer of the mascara are achievable, that a unique appearance is created and that ultimately, there is the possibility to adapt the brush to the individual wishes of the user.

In accordance with the invention this object is attained
30 in that the core of the mascara brush formed by the intertwined wire segments is bent, forming at least one loop or eye-type configuration. Preferably, the ends of the bent core are united, forming a handle.

The at least one loop or eye-type configuration improves
35 the transfer properties because, as a result of the surface tension of the mascara liquid, the loop or eye forms a reservoir, whereby greater quantities of mascara can be

transferred. As a further result of the eye, the brush has a certain deformability so that the user can adjust or correct the specific form by pressing from the outside to make it comply with her wishes. Further, as a result of such an eye-
5 type configuration, there is inherently a deviation from the cylindrical envelope curve, so that in combination with a corresponding wiper or scraper, zones can be realized on the brush that are moistened more or less densely with mascara. If, for example, the scraper has a circular cross-section and
10 the envelope curve of the mascara brush has an oval cross-section, then the scraping effect will be more pronounced at the stronger ends of the oval than at the less curved oval areas.

The foregoing shows that the brush according to the
15 invention ensures not only a distinct improvement over the transferring properties of conventional mascara brushes, but simultaneously helps create an unmistakable appearance accompanied by a plurality of possible variations to suite an individual user's desires.

20 The production of such a mascara brush according to the invention can be effected conventionally, the production of a brush part having a straight core simply being followed by operations of bending and connecting the free core ends with each other to form a handle. In order to form the eye-type
25 configuration, the core may be bent by approximately 180°. The wire preferably exhibits a diameter of from about 0.25 mm to about 1.25 mm.

The number of bristles per wire twist can range from about 5 to about 60 bristles, preferably more than 50
30 bristles are used. The bristles may consist of natural fibers or plastic fibers having circular, non-circular and hollow cross-sections. In the case of plastic fibers, they may be polyamide, polyester or polyacrylic fibers having a diameter of from about 0.05 mm to about 0.35 mm.

35 In an alternative embodiment, at least one end of the bristles are mechanically split by a mechanical or chemical

treatment such as is described in U.S. Patent No. 5,133,590, which is incorporated herein by reference.

In case bristles are used having a changing diameter or a changing diameter configuration or a noncircular diameter
5 configuration instead of a cylindrical configuration, it is conceivable to provide a theoretical cylindrical envelope around the bristles, the diameter thus defined then ranging from about .05 mm to about .10 mm.

Within the scope of the invention, the at least one loop
10 or eye-type configuration may be approximately rectangular as well as oval, drop-shaped or circular. Alternatively, a brush having an elongated eye-type configuration may be further twisted to form a figure eight configuration thereby creating two or more loops or eyes.

15 In an alternative embodiment, a plurality of cores of eye-type configuration are united to form a brush. This embodiment is especially suitable when wire of a particularly small cross-section, for example, about 0.25 mm, is used to form the cores. The free ends of the cores are then
20 connected to form a handle.

A preferred embodiment of the present invention provides for the bristles extending towards the inside or interior of the at least one loop or eye-type configuration to be spaced at least sectionally such that an inside cavity or open
25 reservoir is formed, encased by the ends of the bristles. Alternatively, the bristles extending inward will at least touch and may overlap so that the reservoir is entirely filled with bristles.

In an alternative embodiment of the invention, the
30 bristles are clipped prior to the core being bent, in particular to form longitudinal or transverse grooves in the bristle surface or to form a helical envelope curve. The bristles may be milled in the bending portions of the loop to reduce the density of the bristles at the bends. In this
35 regard, account has to be made for the strong densification of the bristles taking place in the bight of more strongly

bent sections. Where desired, the provided milling can counteract such a densification of bristles.

Alternatively, the bristles may be milled after the bending of the core. For example, if the eye-type
5 configuration has an approximately rectangular cross-section, the bristle trimming may be milled such that the resulting outline is substantially cylindrical. It can further be provided that the eye-type configuration has an approximately rectangular cross-section and the bristles are milled such
10 that the resulting bristle outline is substantially rotationally symmetrical, the cores are off-center, and a portion of short fibers of greater rigidity and portions of longer and softer fibers are created.

Further details of the invention will become apparent
15 from the ensuing description of preferred embodiments, taken in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a conventional mascara
20 brush,

FIG. 2 is a view illustrating the production of a mascara brush of the species;

FIG. 3 is a perspective view on an enlarged scale of the twists constituting the core of the mascara brush;

25 FIG. 4 is a plan view on an enlarged scale of a bristle or a fiber;

FIGS. 5 to 12 are plan views of various embodiments of a mascara brush according to the invention;

FIGS. 13a and 13b illustrate a further embodiment of the
30 invention wherein FIG. 13a is a plan view of the brush and FIG. 13b shows a cross-section of the core and bristles on an enlarged scale;

FIGS. 14a and 14b illustrate a further embodiment of the invention wherein FIG. 14a is a plan view of the brush and
35 FIG. 14b shows a cross-section of the bristles on an enlarged scale;

FIGS. 15a and 15b illustrate a further embodiment of the invention wherein FIG. 15a is a plan view of the brush and FIG. 15b shows a cross-section of the core and bristles on an enlarged scale;

5 FIGS. 16a and 16b illustrate a further embodiment of the invention wherein FIG. 16a is a plan view of the brush and FIG. 16b shows a cross-section of the core and bristles on an enlarged scale; and

FIG. 17 is a perspective view of a mascara container
10 utilizing a brush according to the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

A conventional mascara brush shown in FIG. 1 comprises a handle 1, in which two intertwisted wire segments 2 are fixed
15 in place. As seen in FIG. 2, bristle fibers 3 are placed between two wire segments 2 and are then fixed in place by the wire segments 2 being twisted, as seen in FIG. 3. The most various fibers may be used for the bristles 4, depending on the desired properties of the finished brush. In the
20 embodiment according to FIGS. 3 and 4, so-called BICO bristle fibers are used. These bristles are formed by chemically treating coagulated fibers 3 to separate the individual bristles 4. The method of making these bristles is disclosed in U.S. Patent No. 5,133,590 which is incorporated herein by
25 reference.

The intertwisted wire segments 2 form a core 5 and, as described below and shown in FIGS. 5 to 16b, the core 5 is bent to form a loop or eye-type configuration, the free ends of the core being connected with each other by being threaded
30 through an eye - not shown in the drawing - to form a handle 6. The bristles held between the twisted wires of the core 5 project from the core in all directions resulting in the bristle envelope 8 shown in FIGS. 5 to 12. Each of the loops or eye-type configurations shown in the drawing comprises an
35 internal chamber or reservoir 7 entirely encased by the respective core 5 and only partially filled with bristles, as is the case with the embodiments according to FIGS. 5 to 13b,

or entirely filled with bristles in accordance with the embodiments of FIGS. 14a to 16b.

In the embodiment according to FIG. 5, the eye-type configuration has a substantially rectangular shape, while the embodiments according to FIGS. 6 to 9 illustrate symmetric oval (FIG. 6) and asymmetric drop-shaped configurations (FIGS. 7 to 9). The embodiments according to FIGS. 10 through 12 illustrate alternatives comprising two eye-type configurations formed from a single core 5. In the embodiment according to FIG. 12, the bent core 5 is twisted once again by 180° to take a figure eight shape.

FIGS. 13a and 13b show the bristles 4 in the case of an oval configuration, FIG. 13a illustrating a plan view and FIG. 13b a cross-section taken at the line shown. In this embodiment, the bristles 4' projecting toward the interior of the eye-type configuration do not meet, the gap between the bristle tips thereby resulting in an open internal chamber or reservoir 7. An alternative embodiment is illustrated in FIGS. 14a and 14b, wherein the interior bristles 4' meet and/or overlap resulting in an internal chamber or reservoir 7 entirely filled with bristles.

FIGS. 15a and 15b illustrate an embodiment of a substantially elongated, rectangular eye-type configuration, the resulting envelope curve 8 of the bristles 4 being clipped along the lines 9 so that the finished brush has bristles exhibiting a cylindrical envelope curve 8. Consequently, as shown in the section view of FIG. 15b, the lateral portions 10 of a brush thus produced have short bristles suitable for combing and separating the lashes, and the lateral portions 11 have longer bristles for applying the mascara. The bristles of lateral portion 11 are being fed from a liquid reservoir formed by the internal chamber 7 of the eye-type configuration. Further, such a brush exhibits bristles 4 projecting in paint-brush fashion in the vicinity of its distal end 12.

Finally, FIGS. 16a and 16b illustrate an embodiment in which the mascara brush is formed by at least four

intertwisted wire segments fashioned into two separate cores 5,5' preferably fitted together at 90° and whose ends are joined to form a handle 6. In this embodiment, use may be made of especially thin wire of a diameter of about 0.25 mm.

5 FIG. 17 illustrates mascara container 20 as used with brush 22 according to the present invention. Brush 22 may be constructed according to any of the embodiments previously described herein. As illustrated in FIG. 17, brush 22 is provided with handle 24. As is known in the art, container
10 20 has an opening surrounded by wiper 26. The wiper and brush are configured and dimensioned to cooperate upon removal of the brush so as to remove excess mascara from the brush as it is withdrawn from the container.

While there have been described what are at present
15 considered to be the preferred embodiments of this invention, it will be obvious to those skilled in the art that various changes and modifications may be made without departing from the invention and it is, therefore, aimed to cover all such changes and modifications that fall within the true spirit
20 and scope of the invention.

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**WHAT IS CLAIMED IS**

1. A mascara brush comprising a plurality of bristles fixed in place by a core, wherein said core is bent to form at least one reservoir of eye-type configuration, said brush
5 being configured and dimensioned to be passed through an opening of a mascara container and with said reservoir being configured and dimensioned to receive mascara for application to eye lashes.
- 10 2. A brush according to claim 1, wherein said bent core consists of a first end and a second end, said first and second ends united to form a handle.
3. A brush according to claim 1, wherein said
15 reservoir of eye-type configuration is approximately rectangular, oval, drop-shaped or circular.
4. A brush according to claim 1, wherein said brush has an elongated reservoir of eye-type configuration and is
20 then twisted to form a figure eight shape.
5. A brush according to claim 1, wherein a plurality of cores of eye-type configuration are combined to form a brush.
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6. A brush according to claim 1, wherein said bristles extending towards the inside of said at least one reservoir of eye-type configuration apart such that an open inside cavity is formed, said cavity encased by the ends of the
30 bristles.
7. A brush according to claim 1, wherein said bristles are clipped prior to said core being bent to form longitudinal or transverse grooves in the brush surface or to
35 form a helical envelope curve.





8. A brush according to claim 7, wherein said bristles are milled to establish a uniform density of bristles throughout said brush.

5 9. A brush according to claim 1, wherein said bristles are milled after said bending of said core.

10. A brush according to claim 9, wherein said reservoir of eye-type configuration has an approximately rectangular cross-section and said bristles are milled such that said resulting brush is substantially rotationally symmetrical, said cores are off-center, and said bristles comprise portions of short fibers of greater rigidity and portions of longer fibers exhibiting greater flexibility.

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11. A brush according to claim 1, wherein said wire exhibits a diameter of from about 0.25 mm to about 1.25 mm.

12. A brush according to claim 1, wherein about 5 to about 60 bristles are fixed in place between each said wire twist.

13. A brush according to claim 12, wherein the diameter or theoretical envelope of said bristles is from about 0.05 mm to about 0.10 mm.

14. A brush according to claim 1, wherein said bristles comprise natural or synthetic fibers of circular, noncircular or hollow cross-sections and exhibit a diameter of about 0.05 mm to about 0.35 mm.

15. A brush according to claim 1, wherein at least one end of said bristles is split by a mechanical or chemical treatment.

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16. A brush according to claim 1, wherein said core is bent by approximately 180°.





17. A cosmetic brush comprising:
a handle;
a wire core extending from said handle, said core bent to form at least one loop; and
5 a plurality of bristles mounted to said core, said bristles extending towards the interior of said loop to form a reservoir adapted to receive mascara or a similar pasty product for application to eyelashes.
- 10 18. A brush according to claim 17, wherein said bristles are clipped prior to said core being bent to form longitudinal or transverse grooves in the brush surface or to form a helical envelope curve.
- 15 19. A brush according to claim 18, wherein said bristles are milled after said core is bent to create a uniform bristle density throughout said brush.
20. A brush according to claim 17, wherein said wire
20 core comprises two intertwisted wire segments and said bristles are held between said twisted wire segments.
21. A brush according to claim 20, wherein said wire segments exhibit a diameter of from about 0.25 mm to about
25 1.25 mm.
22. A brush according to claim 21, wherein from about 5 to 60 bristles are held between each wire twist.
- 30 23. A brush according to claim 22, wherein more than 50 bristles are held between each wire twist.
24. A brush according to claim 17, wherein said bristles consist of natural or synthetic fibers of circular,
35 noncircular or hollow cross-section, said bristles having a diameter of from about 0.05 mm to about 0.35 mm.





25. A brush according to claim 24, wherein said bristles are synthetic fibers chosen from the group consisting of polyamide, polyester and polyacrylic.

5 26. A brush according to claim 25, wherein at least one end of each said bristle is split by a mechanical or chemical treatment.

27. A brush according to claim 24, wherein said
10 bristles exhibit a diameter of from about 0.05 mm to about 0.10 mm.

28. A brush according to claim 17, further comprising:
a mascara container adapted to contain mascara and
15 defining an opening for access to the mascara; and
a wiper element surrounding the opening wherein the wiper element and brush are configured and dimensioned to cooperate to remove excess mascara from the brush as it is withdrawn from the container.

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29. A brush according to claim 1, wherein said core comprises at least two intertwined wire segments with said bristles fixed in place between said segments.

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