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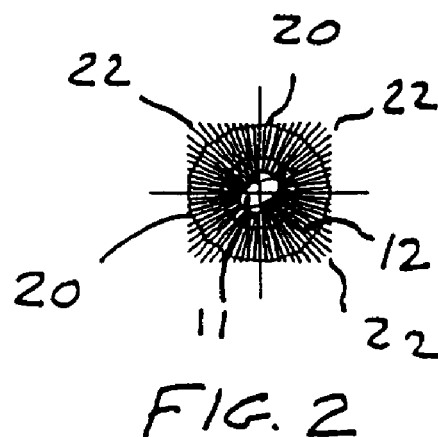
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(54) **Mascara brush with square cross-sectional profile**

(57) A twisted-in-wire mascara brush with an array of bristles in which the tips of the bristles define an envelope having a profile that is square in cross-section.



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Description

BACKGROUND OF THE INVENTION

[0001] This invention relates to twisted-in-wire bristle brushes for applying mascara.

[0002] The type of brush with which the invention is specifically concerned is a mascara brush having an axially elongated twisted wire core with a multiplicity of fibers such as bristles clamped at their midpoints in the core and extending radially outwardly therefrom to form a brush bristle array surrounding the core over a substantial portion of the length of the core, typically to the outer (distal) end of the core. The core is constituted of two runs of wire, which may be initially separate but are more usually opposed legs of a single U-shaped wire, twisted together into an axially rectilinear helix to hold the bristles between them. This combination of a twisted wire core and a radiating array or bristles clamped in the core provides a simple, low-cost and effective brush structure for application of mascara.

[0003] Such mascara brushes are well known and widely used in the cosmetics industry. Commonly, the proximal end of the brush is mounted within the threaded cap of a mascara container, so that the brush projects into the container when the cap is in container-closing position. Upon removal of the cap, the brush carries a quantity of mascara out of the container, and is manipulated to deliver and apply the mascara to the user's eyelashes, the cap serving as a handle for the brush.

[0004] In many conventional mascara brushes of the described twisted wire and bristle construction, the overall profile of the brush bristle array (such profile being the notional envelope defined by the bristle extremities) is cylindrical and/or smoothly tapering, with progressively shorter bristles, toward the distal end of the brush, although other bristle array profiles have been proposed, for example in U.S. patent No. 5,357,987, the entire disclosure of which is incorporated herein by this reference. The bristles within the profile may be arranged in discrete though closely spaced helical rows corresponding to the helical turns of the wire core, or they may be distributed substantially uniformly.

[0005] Market research has demonstrated that the prime mascara characteristics focus on the ease of application as well as the attainment of a highly aesthetic finished look. Since ease of application is a primary goal, the mascara brush must perform exceptionally with little or no effort on the part of the consumer.

SUMMARY OF THE INVENTION

[0006] The present invention broadly contemplates the provision of a mascara brush including an elongated wire core having two runs or wire helically twisted

together about a rectilinear axis forming a succession of turns, and an array of bristles projecting outwardly around the succession of turns, the array including, in each turn, a plurality of bristles each clamped between the runs of wire and having opposed free tips extending radially therefrom, the array having a proximal end and a distal end spaced apart along the rectilinear axis and the tips of the bristles of the array defining a notional envelope, wherein, as a particular feature of the invention, the envelope has a square transverse cross-section in a plane perpendicular to the rectilinear axis of the core.

[0007] Further in accordance with the invention, in currently preferred embodiments thereof, the square transverse cross-section of the envelope is substantially uniform in dimensions along at least a major portion of the envelope. Also, conveniently or preferably, the envelope tapers toward the distal end of the array; and the aforesaid major portion of the envelope advantageously has extended longitudinal edges parallel to the rectilinear axis of the core.

[0008] The bristles of the brush are preferably irregular in shape. In particular embodiments, the bristles are of sea-horse configuration.

[0009] The unusual shape of the brush of the present invention offers the consumer the quick and easy application that she demands, yet there is no special skill or newly-learned technique involved in using this brush. The mascara produce builds up along the four outside edges of the square but most predominantly at the corners and this gives four well-loaded and easily visible application zones. This build-up lays down an adequate amount of mascara to make up the lashes.

[0010] In preferred embodiments as mentioned above, wherein the brush itself is made up of irregularly shaped ("sea-horse" shaped) fibers, the consumer is enabled to fine-tune her finished look by combing through the lashes and distributing the mascara product evenly throughout their length.

[0011] Further features and advantages of the invention will be apparent from the detailed description set forth below, together with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012]

FIG. 1 is a side elevational view of a mascara brush embodying the present invention in a particular form; and

FIG. 2 is an end view, taken from the distal end of the brush along the line 2-2 of FIG. 1.

DETAILED DESCRIPTION

[0013] Referring to the drawings, the embodiment of the invention there shown is a brush 10 comprising

an elongated, axially rectilinear core 11 constituted of two helically twisted-together runs of metal wire, and a multiplicity of fibers or bristles 12 (e.g. nylon fibers) each clamped between the two runs of wire and having opposed free tips extending radially outwardly therefrom to form a brush bristle array 14 surrounding the core over a substantial portion or the length of the core. The manufacture and arrangement of such structures are well known in the art, and accordingly need not be further described. It will be understood that the two wire runs may be separate lengths of wire, or opposed legs of a single initially U-shaped wire. The core has a proximal end 16 and a distal end 18 to which the bristle array extends, the proximal end of the bristle array being spaced distally from the proximal end of the core so as to leave an exposed proximal length of the core for mounting in the plastic stem of a mascara container cap.

[0014] As thus far described, the brush structure 10 may be generally conventional. A conventional brush, however, would typically have a continuous, smoothly cylindrical and/or tapering bristle array profile. It will be understood that when the bristles are initially mounted in the twisted wire core, their free ends project for somewhat randomly unequal distances therefrom, and accordingly the brush is subjected to a trimming step. To produce brushes of conventional round (cylindrical and/or tapering conical) profile, the brushes are rotated through trimmer heads.

[0015] In contrast, in accordance with the present invention, the bristles are trimmed (after initial assembly with the wire core) so that their cut free ends define a notional envelope which has a square transverse cross-sectional profile (i.e., in a plane perpendicular to the rectilinear axis of the wire core) for at least a major, proximal portion 19a of the length of the brush, although the envelope may taper distally, as shown at 19b (FIG. 1). The combination of a square cross-section major (proximal) portion with a distally tapering portion may be designated a duo-taper square profile brush, by analogy with the conventional proximally cylindrical/distally conical brush that is referred to as a duo-tapered brush.

[0016] FIG. 2 illustrates the square transverse profile of the notional envelope of at least the (proximally disposed) major portion of the brush array of the invention. In this case, the major portion of the bristle array has an envelope with four flat sides 20 meeting at right-angle corners which form four 90° longitudinal edges 22 extending along, and parallel to, the rectilinear axis of the wire core. To achieve the square cross-sectional profile configuration, the newly assembled brush (rather than being rotated past trimmer heads) is passed through a shaper that forms each of the four flats 20 individually.

[0017] Advantageously, the individual fibers of the bristle array are of irregular rather than smoothly cylindrical shape. A currently preferred type of irregular fiber is that designated "sea-horse"/nylon fiber, which, under

magnification, resembles a sea-horse.

[0018] By way of specific example, using "sea-horse"/nylon natural color fibers 0.005 ($\pm$.0007) inch in diameter (available from duPont) as the brush bristles, with a fiber density of about 41 to 47 (-2) bristles per turn, stainless steel #305 wire of 0.0286 inch gauge, a bristle array (brush) length of 1.025 (+1/16, -1/32) inches occupying 14 ($\pm$ 1) turns of the wire core has a transverse cross-sectional dimension (in the portion of square cross-section) that is 0.295 ($\pm$ 0.010) inch on a side, in a plane perpendicular to the axis of the core, and a tapering distal portion 0.256 ($\pm$ 1/32) inch long measured along the core axis.

[0019] A particular advantage of the brush of the invention is ease of application of mascara, owing to the square profile configuration. Because the mascara builds up along the outside edges of the square, i.e., predominantly at the corners, four well-loaded and easily visible application zones are provided. This easily lays down adequate amounts of mascara to make up the lashes, while the irregular shape of the fibers allows the consumer to fine-tune the finished appearance by combing through the lashes and distributing mascara evenly throughout their length.

[0020] It is to be understood that the invention is not limited to the features and embodiments hereinabove specifically set forth, but may be carried out in other ways without departure from its spirit.

Claims

1. A mascara brush including:

- (a) an elongated wire core having two runs of wire helically twisted together about a rectilinear axis forming a succession of turns, and
- (b) an array of bristles projecting outwardly around said succession of turns, said array including, in each turn, a plurality of bristles each clamped between the runs of wire and having opposed free tips extending radially therefrom, the array having a proximal end and a distal end spaced apart along the rectilinear axis and the tips of the bristles of the array defining a notional envelope, wherein the improvement comprises:
- (c) said envelope having a square transverse cross-section in a plane perpendicular to said rectilinear axis.

2. A mascara brush as defined in claim 1, wherein said square transverse cross-section is substantially uniform in dimensions along at least a major portion of the envelope.

3. A mascara brush as defined in claim 2, wherein the envelope tapers toward the distal end of the array.

4. A mascara brush as defined in claim 2, wherein said envelope has extended longitudinal edges parallel to said rectilinear axis.
5. A mascara brush as defined in claim 1, wherein said bristles are irregular in shape.
6. A mascara brush as defined in claim 5, wherein said bristles are of sea-horse configuration.

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