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(54) MASCARA BRUSH WITH SMALL DIAMETER BRISTLE FIBERS

(76) Inventors: **Antonio Montoli**, Brookfield, CT (US); **Raymond P. LeGassie**, Laconia, NH (US)

Correspondence Address:
ST. ONGE STEWARD JOHNSTON & REENS, LLC
986 BEDFORD STREET
STAMFORD, CT 06905-5619 (US)

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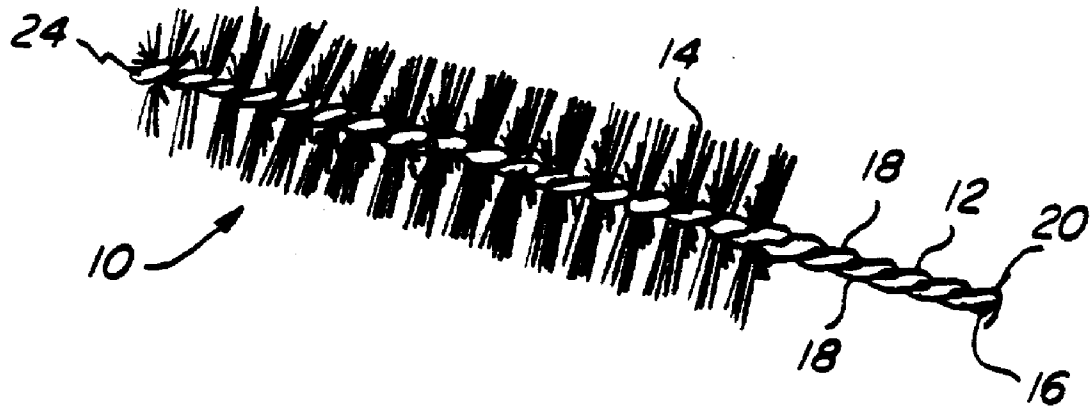
(57) **ABSTRACT**

A mascara brush for a low viscosity mascara product has a typical twisted wire core containing bristles having a relatively small diameter and relatively high bristle density. The bristles have a diameter of from 0.0001 inch to about 0.004 inch, preferably 0.0005 inch to 0.003 inch, and most preferably 0.001 to 0.003 inch. The bristle density is in the range of 18-175 bristles per turn; depending on the bristle diameter.



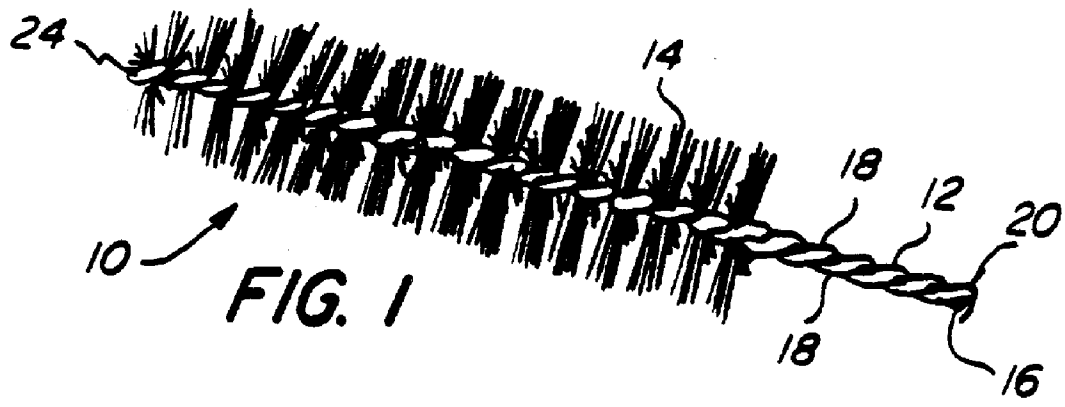


FIG. 1

MASCARA BRUSH WITH SMALL DIAMETER BRISTLE FIBERS

FIELD OF THE INVENTION

[0001] The present invention relates to a brush for applying cosmetic products, in particular, mascara, to eyelashes.

BACKGROUND OF THE INVENTION

[0002] Twisted wire brushes for application of liquid-type cosmetics, such as for application of mascara to the eyelashes, are well known in the art. The brushes are designed to pick up and hold a supply of mascara from the cosmetic container, and then deliver the mascara to the eyelashes as the brush is combed through the lashes by the user.

[0003] Twisted wire brushes conventionally are manufactured by disposing a plurality of individual lengths of bristles transverse to and between substantially parallel, slightly spaced-apart thin metal wire lengths, such that the wire lengths generally bisect the filament lengths at their midpoints. Most typically, the parallel wire lengths comprise the two substantially equal leg lengths formed from bending a single length of wire into a U-shaped configuration. The wire lengths are then twisted together to form a helical core, causing the bristles disposed between the wires to be clamped therebetween at about their midpoints. In the twisting and clamping, the segments of the bristles on either side of the clamped midpoint are caused to flare radially outward from the core and so form an elongate bristle brush portion of generally circular cross-section. The brush is generally provided with a handle which can comprise, or be affixed to, a cap or other closure for the cosmetic container.

[0004] It is known in the art that this helical wire twisting method for forming cosmetic applicator brushes typically leads to a brush configuration in which the bristles tend generally to follow the helical pattern of the twisted wire core, i.e., whereby the tips of the bristles define a helix. The degree of axial spacing between turns of the helix varies depending on the number, type and thickness of bristles employed, the wire thickness employed, the number of helical twists used in forming the wire core, and other like factors. See, for example, U.S. Pat. No. 4,887,622 to Gueret, and U.S. Pat. No. 4,733,425 to Hartel et al.

[0005] The bristles are usually comprised of nylon filaments. The bristles serve the function of collecting mascara from a reservoir and holding the mascara until it is applied to the user's eyelashes. Standard mascara brush designs of the 1960s and 1970s used filaments used smaller diameter bristles in fairly large numbers of bristles per turn (typically, 0.005 inch (5 mil) diameter filaments with a bristle counts in the range of 50 bristles per turn).

[0006] The state of the art then evolved to a somewhat larger diameter bristle, as defined in U.S. Pat. No. 4,887,622 entitled "Brush for the Application of Mascara to the Eyelashes." The patent discloses a mascara brush having a reduced number of bristles, said to be 35% to 80% less than in conventional mascara brushes, ostensibly of larger diameter, than the bristles employed in conventional mascara brushes at the time. This was believed to provide a better application of mascara and separation of lashes. The patent specifies mascara brushes having a bristle diameter from about 0.10 to 0.25 mm (e.g. about 0.004 to 0.010 inch) (4 mil to 10 mil) and with from approximately 10 to 40 bristles per turn of the helix.

[0007] The concept of a mascara brush having larger diameter fibers was further discussed in a recent PCT application no. PCT/US01/04555. This application is directed towards mascara brushes made from filaments that are relatively large but soft. Specifically, the application describes mascara brushes having preferably having 7-14 bristles per turn. The bristle filaments are defined as preferably being from 0.010 inch to 0.013 inch (10 mil to 13 mil). Most critically, the bristles are defined as being relatively soft being made of a thermoplastic elastomer having a durometer of between 62 Shore D and 82 Shore D, but most preferably about 72 Shore D. PCT application PCT/US01/04555 essentially defines a mascara brush made with a duPont Filaments filament sold under the trademark "Supersoft." The "Supersoft" filaments have a durometer of 72 Shore D and are available as solid filaments or as triocular filaments having three hollow voids.

[0008] The state of the art then has been moving in the direction of large diameter bristle fibers, mainly to accommodate high viscosity modern mascara formulations. The viscous mascara formulations have been favored because they provide a thicker application of mascara with fewer strokes. Mascara, which is typically highly viscous, tends to clump when applied to eyelashes. The clumps of mascara are typically combed out as a finishing step to the application process. Stiffer bristles are thought to be better suited for combing out clumps and properly separating lashes. However, the combing and separating functions are thought to be better accomplished with brushes a having relatively open bristle envelope or brush surface, i.e., an envelope or surface that has numerous or wide clearances or spaces between bristles to make the brushes more 'comb-like'. This function is not well served by traditional mascara brush designs having smaller diameter bristles with higher bristle density.

[0009] Very recently, there has been a new trend in mascara formulations, towards a more fluid product. This product requires a completely different mascara brush than the types of brushes which have proposed in the past decade. The present invention proposes a new brush providing a desirable fast application and coating of a consumer's eyelashes with mascara using a less viscous, more fluid mascara product.

SUMMARY OF THE INVENTION

[0010] An improved mascara brush has a typical twisted wire core containing bristles having a relatively small diameter and relatively high bristle density. The bristles have a diameter of from 0.0001 inch to about 0.004 inch, preferably 0.0005 inch to 0.003 inch, and most preferably 0.001 to 0.003 inch. The bristle density is in the range of 18-175 bristles per turn; depending on the bristle diameter.

[0011] The combined decrease in diameter and increase in bristle density, used with a low viscosity mascara product yields a brush suited for rapid application of a mascara product.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] **FIG. 1** is a side elevation view of a mascara brush in accordance with the invention.

DETAILED DESCRIPTION OF THE DRAWINGS

[0013] Referring now to **FIG. 1, a** mascara applicator brush, designated generally by reference numeral **10**, is shown. The brush is intended for use in a typical mascara bottle (not shown) with an opening into which the brush **10** is inserted.

[0014] The brush **10** is comprised of a central twisted wire core **12** containing bristles **14**. The core **12** is a twisted wire core typically made by forming a soft metal wire **16** into a "U" shape. A plurality of bristles **14** are placed between the segments **18** of wire **16**. The wire segments **18** are then twisted about the longitudinal axis to clamp bristles **14** at approximately a midpoints of the bristles **14**. The bristle ends extend radially from the twisted wire core **12**. Core **12** has a lower end **20** connected to a shaft, and an upper end **24** opposite the lower end **20**. The lower end **20** of the core **12** is connected to a handle by way of the shaft, however, the lower end **20** of the core **12** could alternatively be attached to another structure such as a bottle cap.

[0015] After the bristles **14** are mounted to the wire core **12** the brush **10** can be trimmed to have any desired shape, for example, cylindrical, tapered, conical, curved, etc.; or if desired, the bristle ends may be processed by grinding, heating, or other techniques.

[0016] The bristles have a diameter of from 0.0001 inch to about 0.004 inch (0.1 mil to 4 mil), preferably 0.005 inch to 0.003 inch (0.5 mil to 3 mil), and most preferably 0.001 to 0.003 inch (1 mil to 3 mil).

[0017] Bristles **14** are preferably made by cutting short segments from spools of filaments. The filaments are preferably formed from nylon or polyester, or another suitable material. The filaments will typically be circular solids in cross-section, but alternatively may have non-circular cross-sectional shapes, or may have voids therein, thus, the term "diameter" as used herein is intended to mean the maximum distance between any of the possible opposite positions on the outer surface of a bristle filament.

[0018] The bristle density is in the range of 18-175 bristles per turn; depending on the bristle diameter and the viscosity of the mascara product. The bristle density and the bristle diameter are inversely related, in that as bristle diameter increases, the related bristle density will decrease.

[0019] Typical preferred combinations of a bristle diameter range and a bristle density range will be as follows:

Diameter (Inches)	Density (Bristles/turn)
.0001 to .00049	200–60
.0005 to .00099	180–40
.001 to .0019	175–30
.002 to .0029	120–22
.003 to .004	60–18

[0020] The number of bristles per turn can be determined by several methods. One method involves counting bristle ends in one 360 degree turn of the brush and dividing by two to arrive at a count of bristles per turn. Another method involves counting the total number of 360 degree turns of the bristles of the brush along the length of the brush, then counting the total number of bristles, and dividing the total bristle count by the total turn count, to determine an average of bristles per turn. It is contemplated that in a basic brush, there will be a substantially constant bristle density along the length of the brush, with a small variations depending on manufacturing precision. However, it is also possible that the bristle densities are an average bristle density, with greater variation in the bristle density between different zones (such as the ends versus the middle zones of the brush). As used herein, "bristle density" encompasses both definitions.

[0021] In combination, the smaller diameter and the higher bristle densities yields a brush that is excellent in fast and effective application of lower viscosity mascaras to the eyelashes. The mascara brush of the invention provides uniform coating of lower viscosity mascaras on eyelashes.

[0022] While the invention has been described and illustrated as embodied in preferred forms of construction, it will be understood that various modifications may be made in the structure and arrangement of the parts without departing from the spirit and the scope of the invention recited in the following claims.

What is claimed is:

1. A brush for applying mascara to eyelashes, comprising:

a twisted wire core holding a plurality of radially extending bristles to form a brush at an end of the core, said bristles having a diameter of between about 0.0001 inch to about 0.004 inch, said bristles being provided at a bristle density of between about 18 to about 175 bristles per turn.

2. A brush in accordance with claim 1, wherein the bristles have a diameter of about 0.0005 inch to 0.003 inch.

3. A brush in accordance with claim 1, wherein the bristles have a diameter of about preferably 0.001 inch to 0.003 inch.

4. A brush in accordance with claim 1, wherein the bristles have a diameter of about 0.0001 inch to 0.00049 inch and a bristle density of 200–60 bristles per turn.

5. A brush in accordance with claim 1, wherein the bristles have a diameter of about 0.0005 inch to 0.00099 inch and a bristle density of 180–40 bristles per turn.

6. A brush in accordance with claim 1, wherein the bristles have a diameter of about 0.001 inch to 0.001 9 inch and a bristle density of 175–30 bristles per turn.

7. A brush in accordance with claim 1, wherein the bristles have a diameter of about 0.002 inch to 0.0029 inch and a bristle density of 120–22 bristles per turn.

8. A brush in accordance with claim 1, wherein the bristles have a diameter of about 0.003 inch to 0.004 inch and a bristle density of 60–18 bristles per turn.

9. A brush for applying mascara to eyelashes, comprising:

a twisted wire core holding a plurality of radially extending bristles to form a brush at an end of the core, said bristles having a diameter of between about 0.0001 inch to 0.00049 inch and a bristle density of 200–60 bristles per turn.

10. A brush for applying mascara to eyelashes, comprising:

a twisted wire core holding a plurality of radially extending bristles to form a brush at an end of the core, said bristles having a diameter of between about 0.0005 inch to 0.00099 inch and a bristle density of 180–40 bristles per turn.

11. A brush for applying mascara to eyelashes, comprising:

a twisted wire core holding a plurality of radially extending bristles to form a brush at an end of the core, said bristles having a diameter of between about 0.001 inch to 0.0019 inch and a bristle density of 175–30 bristles per turn.

12. A brush for applying mascara to eyelashes, comprising:

a twisted wire core holding a plurality of radially extending bristles to form a brush at an end of the core, said bristles having a diameter of between about 0.002 inch to 0.0029 inch and a bristle density of 120–22 bristles per turn.

13. A brush for applying mascara to eyelashes, comprising:

a twisted wire core holding a plurality of radially extending bristles to form a brush at an end of the core, said bristles having a diameter of between about 0.003 inch to 0.004 inch and a bristle density of 60–18 bristles per turn.

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