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(54) **WIRE CORE MASCARA BRUSH**

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(57) **ABSTRACT**

An improved mascara brush comprises a twisted wire core holding a plurality of radially extending bristles forming a brush at an end of the core. The wire of the twisted wire core has a diameter of about 0.028 inch to about 0.040 inch, and the twisted wire core has a pitch of about 0.130 inch to about 0.250 inch. Preferably, the twisted wire core has a pitch of about 0.135 inch to about 0.200 inch. The wire is preferably formed of brass, copper or stainless steel, or a plastic coated metal wire. The invention further comprises the method of fabricating the brush.

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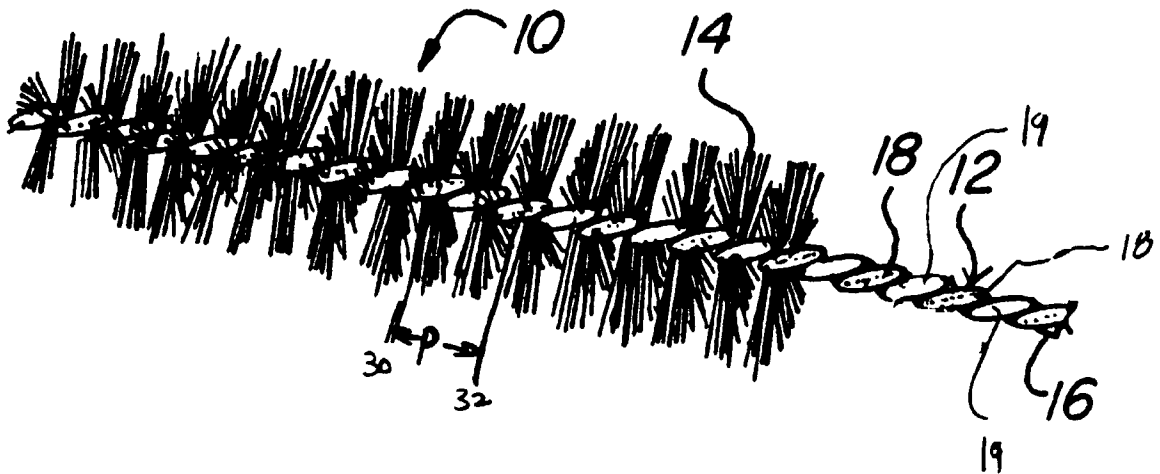


FIG. 1

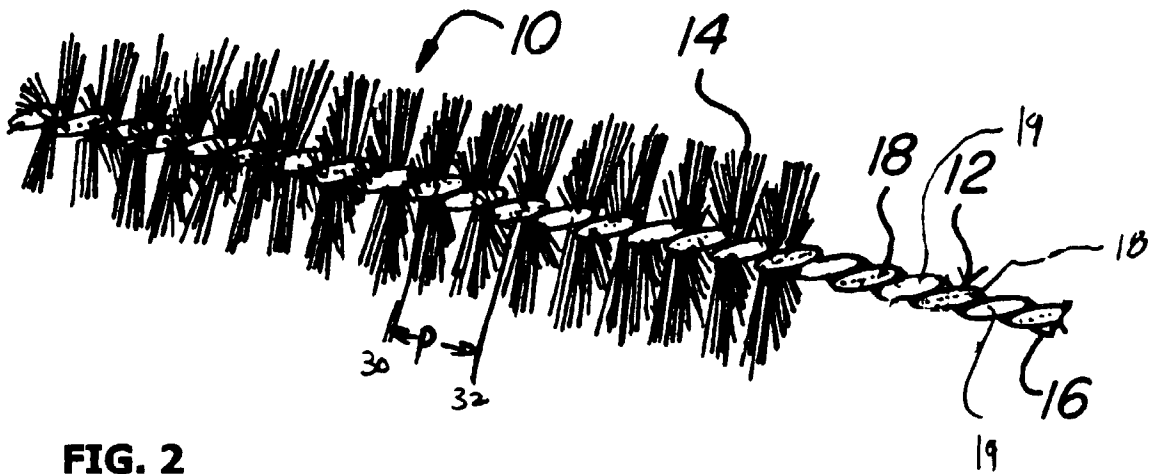
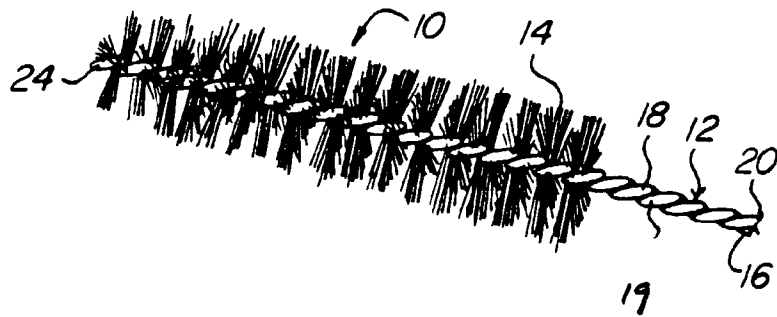


FIG. 2

WIRE CORE MASCARA BRUSH

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 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. The brush is generally affixed to a rod which is mounted to a cap or other closure for the cosmetic container.

[0004] Typical mascara brush designs use metal wire having a diameter of 0.024 inch to 0.028 inch. These wires, when twisted, provide a pitch of 0.100 inch to about 0.135 inch (e.g. a separation of 0.100 inch to about 0.135 inch per full 360° turn of a leg of the wire core). The bristles used with these wire cores have ranged in size from very small diameter bristles, to standard diameter bristles in the range of 0.004 to 0.006 inch, to larger diameter bristles in the range of 0.008 to 0.013 inch (4 mil to 10 mil).

[0005] One issue that has arisen with these known brush designs is the diameter of the brush core limits the size of the rod to which the brush core can be mounted. In typical mascara packaging, a wiper assembly is provided at the mouth of the mascara container. The wiper removes mascara from the rod as the brush is withdrawn from the container. The wiper typically will wipe outer portions of the brush bristles, allowing mascara product to be carried out of the container in inner zones of the brush.

[0006] It is not possible to use a larger diameter rod with conventional brush assemblies without an excessive amount of product being left on the inner core of the brush when the brush is withdrawn from a product container. The typical upper limit to a rod diameter is 0.170 inch, and often it will be less. The typical mascara rod diameter is in the range of 0.145-0.160 inch. A larger diameter rod will require a wiper with a larger diameter aperture. The larger diameter aperture of the wiper will not wipe as much of the inner portions of the brush, leading to excessive loading of mascara product

on the brush, with subsequent messy application of the product to the user's eyes. This limitation means that the rod cannot be made as sturdy as it could be, and prevents use of a design option that is desirable in some brush packaging designs, especially when used with high viscosity mascara products.

[0007] It would be desirable to provide an alternative mascara brush design permitting use of a larger diameter rod without the problems of insufficient wiping associated with conventional brushes.

SUMMARY OF THE INVENTION

[0008] It is an object of the invention to provide a mascara brush design allowing use of a large diameter rod without inferior wiping of the brush.

[0009] It is an object of the invention to provide a mascara brush design providing a good combing and lash separating effect without requiring use of larger diameter bristle filaments or low bristle counts.

[0010] It is an object of the invention to provide a mascara brush suited for use with bristle fibers with a diameter in a conventional range, but which provides good combing and lash separating effect.

[0011] It is an object of the invention to provide a mascara brush having conventional bristle densities for each turn of the bristle helix, but which provides good combing and lash separating effect.

[0012] An improved mascara brush in accordance with the invention comprises a twisted wire core holding a plurality of radially extending bristles forming a brush at an end of the core. The wire of the twisted wire core has a diameter of about 0.028 inch to about 0.040 inch, and the twisted wire core has a pitch of about 0.130 inch to about 0.250 inch. Preferably, the twisted wire core has a pitch of about 0.135 inch to about 0.200 inch. The wire is preferably formed of brass, copper or stainless steel, or a plastic coated metal wire. The invention further comprises the method of fabricating the brush.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] FIG. 1 is a side elevation view of a mascara brush in accordance with the invention.

[0014] FIG. 2 is a side elevation view of the twisted wire core showing the wire pitch.

DETAILED DESCRIPTION OF THE DRAWINGS

[0015] 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.

[0016] 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 having segments 18 and 19. A plurality of bristles 14 are placed between the segments 18 and 19 of wire 16. The wire segments 18 and 19 are then twisted around each other along a 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.

[0017] The wire of the twisted wire core has a diameter of about 0.028 inch to about 0.040 inch, and the twisted wire core has a pitch of about 0.130 inch to about 0.250 inch. The pitch is shown at P in FIG. 2. The pitch is the linear distance along the axis of twisted wire core from the center **30** of wire segment **18** to the center **32** of the wire segment **18** after it has twisted through 360 degrees. (Note that wire segment **19** appears between the centers **30** and **32**). Preferably, the twisted wire core has a pitch of about 0.135 inch to about 0.200 inch.

[0018] The wire pitch of the wire core in the present invention is substantially larger than conventional mascara brushes, which have a typical pitch of 0.100 to 0.135. The mascara brush has a relatively high bristle density, in the range of about 35-80 bristles per turn. However, the larger pitch of the twisted wire core of the present mascara brush creates an attenuation of the bristles to provide adequate spacing of the bristles to provide good combing of the eyelashes.

[0019] The wire is preferably formed of brass, copper or stainless steel, or a thermoplastic coated metal wire. These different materials behave differently when used in wire twisting machinery, and so particular preferred ranges can be determined by using the following guidelines.

[0020] A thermoplastic coated metal wire is effective in the invention, as it provides a larger diameter wire, and thus a greater pitch, without significant difference in the force/torque needed to twist the wire, thus it can easily be adapted for use in typical wire twist machinery.

[0021] A stainless steel wire in the larger diameter will have a rather different behavior. The thicker steel wire will be harder to twist, and thus this wire will have the highest pitch for a given set of twist machinery settings. Brass or copper wires are softer and will have relatively lower pitches at the same settings.

[0022] It is also possible to increase the pitch by providing tension to the wire ends during the twisting step. This tension will stretch the wires and increase the wire pitch.

[0023] 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.

[0024] 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, such as ovals, square, rectangular, or polygons (including hexagons); or the bristles may have voids therein, thus, the term "diameter" as used herein to refer to "bristle diameter" is intended to mean the maximum distance between any of the possible opposite positions on the outer surface of a bristle filament. The bristle lengths

may be slightly longer than is usual in conventional brush designs, but this is not a necessary requirement for effective use of the invention.

[0025] The steps of fabricating the mascara brush **10**, in essence comprise placing bristle filaments in a U-shaped wire which has a diameter of about 0.028 inch to about 0.040 inch and twisting the U-shaped wire to form a twisted wire core to a pitch of about 0.130 inch to about 0.250 inch. In one preferred embodiment, the twisting forms a wire core with a pitch of about 0.135 inch to about 0.200 inch.

[0026] The brush **10**, when fabricated, is then assembled together with a rod. The rod may have a diameter in the range of about 0.100 inch to 0.250 inch, more preferably about 0.125 inch to 0.175 inch. These rod diameters provide a sturdy rod that will not be prone to breakage or bending, or deformation through creep. The larger diameter core of the brush prevents excessive loading of mascara product on the brush **10** that would occur with a smaller diameter wire core were matched with a rod of this size.

[0027] 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 twisted wire core being formed of a wire having a diameter of about 0.028 inch to about 0.040 inch and a pitch of about 0.135 inch to about 0.200 inch.
 2. A brush in accordance with claim 1, wherein said wire is formed of brass, copper or stainless steel.
 3. A brush in accordance with claim 1, wherein said wire is formed of plastic coated metal wire.
 4. 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 twisted wire core being formed of a wire having a diameter of about 0.028 inch to about 0.040 inch and a pitch of about 0.130 inch to about 0.250 inch.
 5. A brush in accordance with claim 1, wherein said twisted wire core has a pitch of about 0.135 inch to about 0.200 inch
 6. A brush in accordance with claim 1, wherein said wire is formed of brass, copper or stainless steel.
 7. A brush in accordance with claim 1, wherein said wire is formed of plastic coated metal wire.
 8. A method of fabricating a mascara brush, comprising the steps of:
 - placing bristle filaments in a U-shaped wire, said wire having a diameter of about 0.028 inch to about 0.040 inch;
 - twisting said U-shaped wire to form a twisted wire core to a pitch of about 0.130 inch to about 0.250 inch.
 9. A method in accordance with claim 8, wherein said twisted wire core has a pitch of about 0.135 inch to about 0.200 inch

10. A brush in accordance with claim 8, wherein said wire is formed of brass, copper or stainless steel.

11. A brush in accordance with claim 8, wherein said wire is formed of plastic coated metal wire.

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 twisted wire core being formed of a wire having a diameter of about 0.028 inch to about 0.040 inch and a pitch of about 0.135 inch to about 0.200 inch;

a rod having a diameter of about 0.100 inch to 0.250 inch, said twisted wire core being mounted to said rod.

13. A brush in accordance with claim 12, wherein said rod has a diameter of about 0.125 inch to 0.175 inch.

14. A brush in accordance with claim 13, wherein said wire is formed of brass, copper or stainless steel.

15. A brush in accordance with claim 13, wherein said wire is formed of plastic coated metal wire.

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