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(54) **MASCARA BRUSH WITH ANTIBACTERIAL BRISTLE FIBERS**

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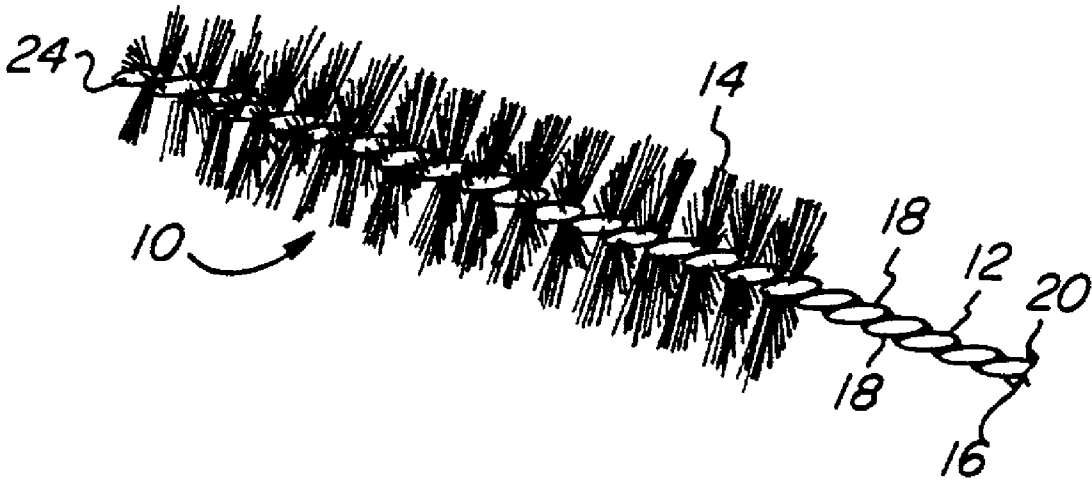
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(57) **ABSTRACT**

An improved mascara brush has core containing bristles having an antibacterial agent. The antibacterial agent will preferably be elemental or ionic silver; alternatively, the antibacterial agent is another form of silver or a chemical antibacterial agent. The mascara brush may be fabricated with all or only a portion of its bristles being of antibacterial character.

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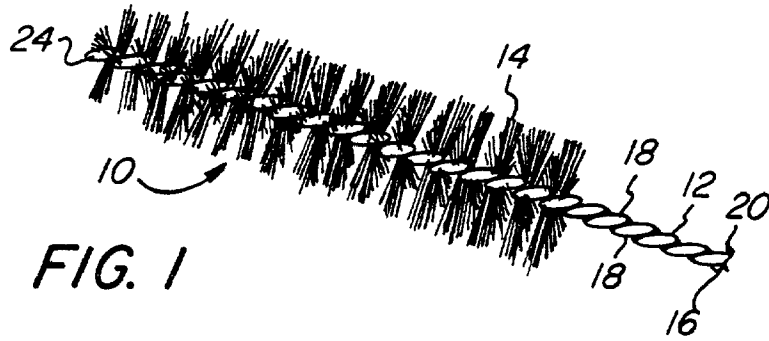


FIG. 1

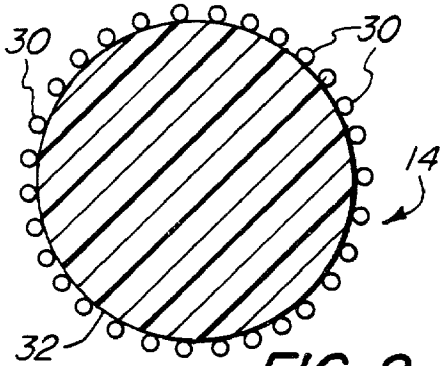


FIG. 2

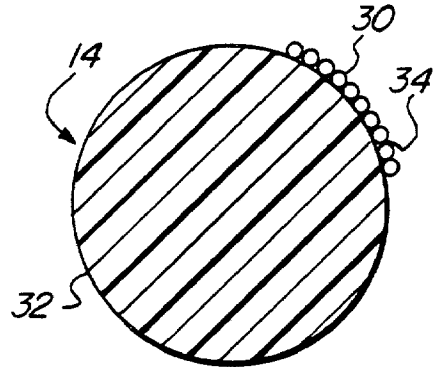


FIG. 3

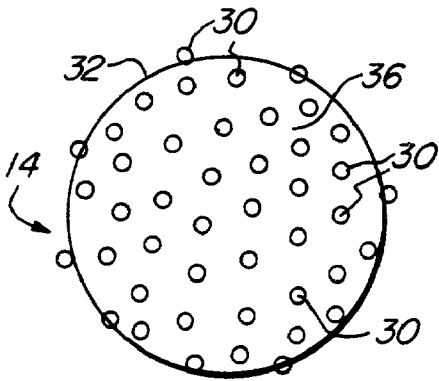


FIG. 4

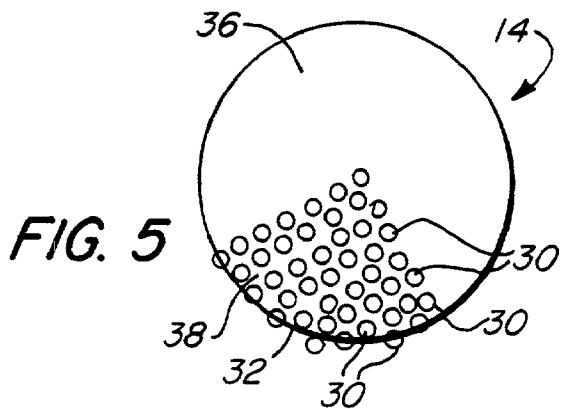


FIG. 5

MASCARA BRUSH WITH ANTIBACTERIAL 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] The bristles are usually comprised of nylon or polyester 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. Mascara, as a product applied near the eyes, should not be susceptible of harboring bacteria, to reduce the risk of infection.

[0005] It is possible for organic matter, for example from the skin or eyelashes, to be coated on the bristles of the mascara brush, and possibly serve as a substrate to harbor the bacteria. Although consumers are instructed to dispose of old mascara products after a certain period of use, this may not occur if the product is used infrequently. The problem of bacterial growth can be exacerbated depending on the mascara formulation, as some formulations can include ingredients that can be attractive to certain bacteria. Mascara compositions can be formulated with an antibacterial ingredient to prevent unintended infection, however, such antibacterial ingredients may alter the appearance or feel of the mascara product.

[0006] It would be desirable for a mascara brush to be resistant to bacteria to minimize chances of inadvertent infection of the user of the mascara product.

SUMMARY OF THE INVENTION

[0007] An improved mascara brush has a typical twisted wire core containing bristles having an antibacterial agent. The antibacterial agent will preferably be silver in any of numerous possible forms, but most preferably elemental or ionic silver; an alternative is to use a chemical antibacterial

agent such as triclosan. The mascara brush may be fabricated with all or only a portion of its bristles being of antibacterial character.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. 1 is a side elevation view of a mascara brush in accordance with the invention.

[0009] FIG. 2 is a cross-sectional view of a bristle showing one embodiment of a bristle having an antibacterial agent provided as a coating on the bristle.

[0010] FIG. 3 is a cross-sectional view of a bristle showing one embodiment of a bristle having an antibacterial agent provided as a coating on a portion of the bristle.

[0011] FIG. 4 is a cross-sectional view of a bristle showing one embodiment of a bristle having an antibacterial agent molded into bristle.

[0012] FIG. 5 is a cross-sectional view of a bristle showing one embodiment of a bristle having an antibacterial agent molded into a portion of the bristle.

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. In other embodiments, the core may be a molded plastic core or other core capable of holding the bristles, but in general, cost and convenience will favor a twisted wire core.

[0015] Bristles 14 are preferably made by cutting short segments from spools of filaments. At least some of said bristles 14 are provided with an antibacterial agent. The antibacterial agent 30 can be incorporated in all of the bristles used in the brush, or only apportion of the bristles.

[0016] Preferably the antibacterial agent 30 comprises silver, most preferably in elemental or ionic form. Elemental silver is a very fine particulate silver. An example of ionic silver is an inorganic ceramic filled with silver ions. An example of a silver ion ceramic is the AgION antimicrobial additive sold by AgION Technologies, LLC, 60 Audubon Road, Wakefield, Mass.

[0017] The antibacterial silver agent may also be a silver compound, however, this is likely to be less preferable. As used herein, a "silver compound" refers to silver proteins, and to silver salts such as AgCl, AgNO₃, and AgSO₄, and to silver complexes such as silver sulfadiazine (e.g. silver complexed to propyleneglycol, stearyl alcohol, and isopropyl myrislate).

[0018] Alternatively, the antibacterial agent 30 can be a chemical antibacterial compound selected from the many

known commercially available antibiotics, including, for example, triclosan. This is also less preferable to use of elemental or ionic silver.

[0019] The antibacterial agent **30** can be coated onto an entire exterior surface **32** of said bristles **14** as shown in **FIG. 2**, or on only a portion **34** of the exterior surface **32** of the bristles **14**, as shown in **FIG. 3**.

[0020] Alternatively, the antibacterial agent **30** can be embedded in the entire body **36** of bristles **14**, as shown in **FIG. 4**, or in only a portion **38** of the body **36** of bristles **14**, as shown in **FIG. 5**. The portion **38** of the body can be just the surface portions of the bristle, or a segment of the body **36**, however, in such case, it is desirable that the portion be exposed at least in part at the exterior surface **32** of the bristle **14**.

[0021] Bristles **14** will typically be formed of nylon or polyester. The bristles **14** (or the filament from which they are made) can be a solid shape in cross-section, or they may be hollow. Hollow cross-section bristles may have a single void or multiple, radially adjacent voids. The bristles **14** may be round in cross-section, or have other cross-sectional shapes, such as oval or triangular. Alternatively, the bristles **14** may be C-shaped or otherwise formed such as in the shape of the duPont "Seahorse" filament or have other shapes with structural details to increase the surface area of the bristle.

[0022] In addition, the bristle ends may be processed in a variety of ways. The bristle ends can be treated by grinding. In a preferred embodiment, the bristle ends are treated by slitting with sharp metal knife blades mounted on a rotating spindle. The flagged ends of the bristles, as shown in **FIG. 3**, provide enhanced mascara holding and application to eye lashes, along with a soft feel to the touch.

[0023] The present invention provides an effective method of minimizing possibility of bacterial infection from a mascara product by providing a brush with a continuous antibacterial activity.

[0024] 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, at least some of said bristles being provided with an antibacterial agent.
2. A brush in accordance with claim 1, wherein the antibacterial agent comprises silver.
3. A brush in accordance with claim 2, wherein the silver is provided in elemental or ionic form.
4. A brush in accordance with claim 3, wherein the silver is coated onto an entire exterior surface of said bristles or a portion of said exterior surface of said bristles.
5. A brush in accordance with claim 3, wherein the silver is embedded in an entire body of said bristles or a portion of said body of said bristles.

6. A brush in accordance with claim 3, wherein the silver comprises an inorganic ceramic filled with silver ions.

7. A brush in accordance with claim 3, wherein the silver comprises elemental silver.

8. A brush in accordance with claim 2, wherein the silver comprises a silver compound.

9. A brush in accordance with claim 1, wherein the antibacterial agent comprises a chemical antibacterial compound.

10. A brush in accordance with claim 1, wherein the antibacterial agent is coated onto an entire exterior surface of said bristles or a portion of said exterior surface of said bristles.

11. A brush in accordance with claim 1, wherein the antibacterial agent is embedded in an entire body of said bristles or a portion of said body of said bristles.

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

a bristle holding core holding a plurality of radially extending bristles to form a brush at an end of the core, at least some of said bristles being provided with an antibacterial agent.

13. A brush in accordance with claim 12, wherein the antibacterial agent comprises silver.

14. A brush in accordance with claim 13, wherein the silver is provided in elemental or ionic form.

15. A brush in accordance with claim 12, wherein the antibacterial agent is coated onto an entire exterior surface of said bristles or a portion of said exterior surface of said bristles.

16. A brush in accordance with claim 12, wherein the antibacterial agent is embedded in an entire body of said bristles or a portion of said body of said bristles.

17. A brush in accordance with claim 14, wherein the silver comprises an inorganic ceramic filled with silver ions.

18. A brush in accordance with claim 14, wherein the silver comprises elemental silver.

19. A brush in accordance with claim 13, wherein the silver comprises a silver compound.

20. A brush in accordance with claim 12, wherein the antibacterial agent comprises a chemical antibacterial compound.

21. 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, at least some of said bristles being provided with an elemental or ionic silver.

22. A brush in accordance with claim 21, wherein the silver is coated onto an entire exterior surface of said bristles or a portion of said exterior surface of said bristles.

23. A brush in accordance with claim 21, wherein the silver is embedded in an entire body of said bristles or a portion of said body of said bristles.

24. A brush in accordance with claim 21, wherein the silver comprises an inorganic ceramic filled with silver ions.

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