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## (54) Mascara brush

## Mascara-Bürste

## Brosse à mascara

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**Description****Background of the Invention**

This invention relates to spiral mascara brushes.

As contemplated herein, a spiral mascara brush comprises a multiplicity of bristles each having opposed free ends, and means for fixedly mounting the bristles in a continuous spiral array such that the free ends of the bristles are disposed along a helix. Typically, the mounting means is an initially U-shaped wire, which is twisted into a light, axially rectilinear helix (after the bristles have been positioned between the legs of the U) to grip the bristles firmly at their midsections and to spread them into the aforementioned spiral array. The bristle array, which may, for example, be cylindrical (having bristles of uniform length from base to tip of the brush) or conical (having bristles of progressively shorter length toward the brush tip), is dimensioned to be inserted within a mascara container. The wire or other mounting means projects beyond the base of the bristle array and is commonly embedded in a plastic shank projecting axially from the interior of a mascara container cap, so that when the cap is mounted in closed position on a container, the brush is disposed inside the container with the bristles immersed as aforesaid. Brushes of this type are well known and widely used at the present day. One such mascara is described in GB-A-1,221,919. in this document an elongate brush with radially extending bristles is withdrawn from the container through an orifice that causes the mascara to impregnate the brush.

The conventional purpose of a spiral mascara brush is to apply mascara to a user's eyelashes, i.e. to pick up and transport mascara from the mascara container and to deposit the transported mascara on the eyelashes. For this purpose, the bristles must be soft (relatively low in flexural strength), because stiff bristles do not satisfactorily pick up, transport, and deposit mascara. An illustrative example of a bristle suitable for applying mascara is a nylon 6/12 fiber commercially available from E.I. duPont de Nemours & Co under the trade name "Tynex", having a diameter of  $7.62 \times 10^{-3}$  cm (0.003 inch)  $\pm 1.27 \times 10^{-3}$  cm (0.0005 inch)  $\pm 15\%$ .

Owing to its high viscosity, mascara as applied to eyelashes tends to deposit unevenly, in the form of clumps. To achieve desired uniformity of distribution on the eyelashes, the applied mascara must be combed through the lashes. Mascara brush bristles soft enough to apply mascara, however, are too soft to comb eyelashes; when pressed against the lashes, they simply flex and do not penetrate the lashes as required to effect combing.

Accordingly, separate implements (e.g., toothed combs) have heretofore sometimes been provided for performing the combing function. The provision of two separate implements for applying and distributing or combing mascara is disadvantageous from the standpoint of cost and convenience to the user. Moreover,

while a mascara-applying brush is protected (when not in use) by insertion in the closed mascara container the second (combing) implement is not thus protected and may be exposed to contamination which can cause infections.

**Summary of the Invention**

The present invention provides the spiral mascara brush defined by claim 1.

The term "flexural strength" as used herein refers to resistance to bending; thus, a bristle of greater flexural strength is stiffer (less flexible) than a bristle of lesser flexural strength.

The requisite difference in stiffness (flexural strength) between the bristles of the first and second quantities may be achieved by using bristles of different diameters and/or different materials. Thus, the bristles of both quantities may be nylon fibers, with the first-quantity bristles having a diameter of about  $6.35 \times 10^{-3}$  cm (0.0025 inch) and the second-quantity bristles having a diameter of about  $0.015$  cm (0.006 inch). Again, the first-quantity bristles may be nylon fibers and the second-quantity bristles may be polyester fibers. If desired, the two quantities of bristles may also differ in color, to enable the user to recognize and distinguish them.

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

**Brief Description of the Drawing**

Fig. 1 is an enlarged fragmentary side view, partly in section, of a spiral mascara brush in which the present invention may be embodied;

Fig. 2 is a further enlarged fragmentary schematic view of a portion of the spiral array of bristles in a mascara brush according to an example which is useful for understanding the invention;

Fig. 3 is a side view, to the same scale as Fig. 1, of the brush head of one embodiment of the invention; Fig. 4 is a similar view of the brush head of a further modified embodiment of the invention; and

Fig. 5 is a schematic view in illustration of a method of making a brush embodying the invention.

**Detailed Description**

Referring first to Fig. 1, there is shown a spiral mascara brush 10 including a brush head 11 and a cap 12 adapted to fit over and close the open top of a conventional mascara container (not illustrated). The brush head comprises a multiplicity of bristles 14 each having opposed free ends, and means 16 for fixedly mounting the bristles in a continuous spiral array such that the free ends of the bristles are disposed along an axially rectilinear open helix extending continuously from the base 18 to the tip 20 of the brush head.

In the form shown, the bristle-mounting means 16 is a metal wire having a midpoint located at the brush tip 20 and bent at that midpoint to provide two legs which are twisted together into a tight helix about a rectilinear axis coincident with the axis of the aforementioned open helix. The bristles of the brush are firmly gripped at their midsections between the twisted legs of the wire 16 so as to be held in the described spiral array, with the two ends of each bristle projecting equidistantly from the wire 16 in directions substantially perpendicular to the helix axis. The brush head is shown as having a conical configuration tapering toward the tip 20; i.e., the constituent bristles of the spiral array are of progressively shorter length toward the tip.

The helically twisted legs of the wire (mounting means) 16 extend for some distance beyond the base of the array of bristles. This bristle-free terminal portion of the wire is fixedly embedded in a plastic shank 22 which projects axially from the interior of the mascara container cap 12. An internally threaded skirt portion 24 of the cap concentrically surrounds the extremity of the shank remote from the bristles, in spaced concentric relation thereto, and opens toward the bristles. Thus, when the cap is threadedly mounted on the neck or open top of a mascara container, the shank 22 and wire 16 project downwardly through the container neck and the brush head 11, including the bristles 14, is entirely disposed inside the container, for immersion of the bristles in the contained mascara and protection of the brush head against contamination. The brush is, of course, appropriately dimensioned for such insertion as well as for application of mascara to a user's eyelashes. In one illustrative example, the length of the array of bristles (from tip 20 to base 18) is 3.175cm (1.250 inch), with a diameter of 0.953cm (0.375 inch) at the base and 0.475cm (0.187 inch) at the tip, and the overall length of the projecting brush, from the open end of the skirt 24 to the brush tip 20, is 8.48cm (3.3340 inches).

As thus far described, the brush 10 is generally conventional, exemplifying spiral mascara brushes heretofore known and used to apply mascara to eyelashes. A conventional brush of this type, however, has a spiral array of bristles 14 constituted entirely of bristles of an essentially uniform flexural strength, which is sufficiently low for satisfactory performance of the operations of picking up mascara from a mascara container while the bristles are immersed therein, transporting the mascara from the container to a user's eyelashes, and depositing the transported mascara on the eyelashes. The spirally arranged multiplicity of bristles 14 in the brush of the present example consists essentially of two sorts of bristles differing from each other in flexural strength, viz. a first quantity of bristles having a flexural strength adapted to apply mascara to a user's eyelashes and a second quantity of bristles having a different and substantially greater flexural strength adapted to comb the applied mascara through the eyelashes. For convenience, the first-quantity bristles will sometimes be referred to herein as "soft" bristles and the sec-

ond-quantity bristles will sometimes be referred to herein as "stiff" bristles.

As best illustrated in Fig. 2 (which is a simplified schematic representation of a fragmentary portion of one turn of the spiral array of bristles 14 as seen from the same view direction as Fig. 1), the soft and stiff bristles are randomly intermingled throughout the entire length of the spiral array. More particularly, the soft or first-quantity bristles 26 (shown as black bristles) are interspersed with stiff or second-quantity bristles 28 (shown as white or neutral-coloured bristles), each quantity of bristles being present in a proportion effective to perform its respective (applying or combing) function. The desired results are achieved when at least about 30% of the total number of bristles present in the spiral array are soft bristles 26 and at least about 10% are stiff bristles 28; preferably, as indicated in Fig. 2 a majority of the bristles are soft bristles.

The bristles of both quantities may be fabricated of the same material but may differ in diameter to provide the requisite respective flexural strengths, the soft bristles being smaller in diameter than the stiff bristles. By way of example, the soft bristles 26 may be made of nylon, with an individual bristle diameter of  $6.35 \times 10^{-3}$  cm (0.0025 inch), and the stiff bristles 28 may likewise be made of nylon, but with an individual bristle diameter of 0.015 cm (0.006 inch). Instead of (or in addition to) differing in diameter, the soft and stiff bristles may be made of respectively different materials which, for a given bristle diameter, have respectively different flexural strengths; thus, as a further example, the soft bristles may be nylon fibers of  $6.35 \times 10^{-3}$  cm (0.0025 inch) diameter and the stiff bristles may be polyester fibers of the same (or greater) diameter.

The brush of Fig. 2 is used in much the same way as a conventional spiral mascara brush. Ordinarily, it is enclosed within a mascara container, with the array of bristles 14 (i.e., including both bristles 26 and bristles 28) immersed in the mascara and the cap 12 threaded in closed position on the neck of the container. When the cap is unscrewed and removed, withdrawing the brush from the container, mascara is transported on the brush (predominantly by the soft bristles 26), and is deposited therefrom onto the user's eyelashes as the brush is brought manually into contact with the eyelashes. Initially, the mascara may deposit as clumps, owing to its high viscosity, but as the brush is manipulated with a combing motion against the eyelashes the stiff bristles 28 comb through the eyelashes to distribute the applied mascara. Thereafter, the brush is reinserted into the mascara container and the cap is returned to container-closing position.

The brush 10 having randomly intermingled soft and stiff bristles thus serves both to apply the mascara and to distribute it by combing through the lashes, in an essentially unitary or integrated manipulative operation requiring only a single implement, which is protected by being enclosed in the mascara container when not in use. The presence of bristles of both kinds (soft and

stiff) is essential to the attainment of these results, because bristles soft enough for satisfactory mascara application are too soft to provide effective combing action.

In the embodiment of the invention shown in Fig. 3 (wherein the shank and cap are omitted for simplicity of illustration), the spiral array of bristles 14 mounted on the twisted wire 16 includes two contiguous portions respectively designated 30 and 32, disposed in tandem along the length of the array. The longer portion 30, extending from the base 18 of the spiral array over most of the length thereof, consists essentially of bristles of the aforementioned first quantity (i.e. soft, mascara-applying bristles), while the shorter portion 32, adjacent the brush tip 20, consists essentially of bristles of the second quantity (i.e. stiff, eyelash-combing bristles), although the two portions 30 and 32 together form a single continuous spiral brush of conical shape, otherwise structurally similar to the brush 10 of Fig. 1. The same types of bristles 26 and 28 as are intermingled in the brush of Fig. 2 can be used, respectively, to constitute the differentiated portions 30 and 32 of the brush of Fig. 3.

The brush of Fig. 3 is used much in the manner of the brush of Fig. 2, except that the portion 30 is first brought into contact with the eyelashes to apply mascara, and the portion 32 is then brought into contact with the lashes to comb the mascara therethrough. Again, as in the case of the Fig. 2 brush, both application and combing are performed by a single implement, which is protected (when not in use) by the mascara container.

Fig. 4 illustrates a modification of the embodiment of Fig. 3 wherein the soft, mascara-applying bristle portion 30' is located adjacent the tip, and the stiff, lash-combing bristle portion 32' is located adjacent the base, of the spiral array of bristles; also, in Fig. 4, the bristle array 14' is shown as cylindrical (formed with bristles of uniform length throughout its extent) rather than conical in shape. As will be appreciated, other arrangements of alternating soft and stiff bristle portions are possible, such as (for example) a three-portion spiral array of bristles with a short, stiff, combing portion at each end and a longer, soft, applying portion between them. Moreover, the cylindrical configuration is equally suitable or the randomly intermingled array of soft and stiff bristles represented by Fig. 2.

The soft and stiff bristles may be differentiated by color as well as by flexural strength, one exemplary color difference (black soft bristles, neutral or white stiff bristles) being represented in Figs. 2-4. This color differentiation initially indicates to the user whether the brush is of the intermingled soft and stiff bristle type (Fig. 2) or of the differentiated soft and stiff portion type (Figs. 3 and 4), and, in the latter case, shows the location of the combing portion. Even though, in use, such color differentiation may be more or less obscured by mascara coating the brush, the initial indication assists the user in understanding how to manipulate the brush. In particular, when the brush is initially packaged outside the

mascara container, i.e. for sale (with the container closed by a temporary cap), the color differentiation is clearly visible prior to the first insertion of the brush into the container.

Brushes embodying the invention may be manufactured in a generally conventional way, as illustrated schematically in Fig. 5, except for the inclusion (and appropriate relative positioning) of both soft and stiff bristles in the bristle feed. The wire 16 is initially in the form of a U between which the bristles 14 are fed transversely; then the legs of the wire are twisted (arrows 36) about longitudinal axis 38 to grip the midsections of the bristles and spread the bristles into the spiral array of Fig. 1. The bristles as fed between the wire legs include soft and stiff bristles randomly intermingled to produce the brush of Fig. 2, or differentiated into soft and stiff portions to produce the brushes of Figs. 3 and 4.

### Claims

1. A spiral mascara brush (10), comprising
  - (a) a multiplicity of bristles (14), each having opposed free ends, and
  - (b) means (16) for fixedly mounting the bristles in a continuous spiral array such that the free ends of the bristles are disposed along a helix, characterized by
    - (c) said multiplicity of bristles consisting essentially of
      - (i) a first quantity of bristles (26) having a flexural strength adapted to apply mascara to a user's eyelashes, and (ii) a second quantity of bristles (28) having a flexural strength, substantially greater than the flexural strength of the bristles of said first quantity, adapted to comb applied mascara through a user's eyelashes, and by
      - (d) said spiral array including at least two contiguous portions (30, 30', 32, 32'), disposed in tandem along the length of the array, one of said two portions (30, 30') being a mascara-applying portion consisting essentially of bristles of said first quantity and the other of said two portions (32, 32') being an eyelash-combing portion consisting essentially of bristles of said second quantity.
2. A mascara brush as defined in claim 1, wherein the first-quantity bristles are smaller in diameter than the second-quantity bristles.
3. A mascara brush as defined in claim 2, wherein the bristles of both said first and second quantities are fabricated of nylon.

4. A mascara brush as defined in claim 3, wherein the first-quantity bristles have a diameter of about  $6.35 \times 10^{-3}$  cm (0.0025 inch) and the second quantity bristles have a diameter of about 0.015cm (0.006 inch).

5. A mascara brush as defined in claim 1, wherein the first-quantity bristles and the second-quantity bristles are respectively fabricated of different materials selected such that, for a given bristle diameter, bristles fabricated of the second-quantity bristle material have greater flexural strength than bristles fabricated of the first-quantity bristle material.

6. A mascara brush as defined in claim 5, wherein the first-quantity bristles are nylon fibers and the second-quantity bristles are polyester fibers.

#### Patentansprüche

1. Spiralförmige Wimperntusch-Bürste (10), mit

- a) einer Vielzahl von Borsten (14), von denen jede entgegengesetzt liegende freie Enden aufweist, und
- b) Mitteln (16) für das Festlegen der Borsten in einer kontinuierlichen spiralförmigen Reihe, so daß deren freie Enden entlang einer Wendel angeordnet sind,

dadurch gekennzeichnet, daß

- c) die Vielzahl der Borsten im wesentlichen besteht aus

- (i) einer ersten Anzahl von Borsten (26) mit einer für das Auftragen von Wimperntusche auf die Augenwimpern eines Benutzers geeigneten Biegefestigkeit und
- (ii) einer zweiten Anzahl von Borsten (28) mit einer gegenüber der ersten Anzahl wesentlich größeren, für das Verteilen der aufgetragenen Wimperntusche auf den Augenwimpern geeigneten Biegefestigkeit und dadurch, daß

d) die spirale Reihe mindestens zwei entlang der Reihe hintereinander angeordnete Anteile (30, 30', 32, 32') umfaßt, von denen einer der zwei Anteile (30, 30') ein Wimperntusche auftragender, im wesentlichen aus Borsten der ersten Anzahl bestehender Anteil ist, und daß der andere Anteil (32, 32') der zwei Anteile ein das Verteilen auf den Augenwimpern bewirkender, im wesentlichen aus Borsten der zweiten Anzahl bestehender Anteil ist.

2. Wimperntusch-Bürste nach Anspruch 1, dadurch gekennzeichnet, daß die Borsten der ersten Anzahl

im Durchmesser kleiner als die Borsten der zweiten Anzahl sind.

5 3. Wimperntusch-Bürste nach Anspruch 2, dadurch gekennzeichnet, daß die erste und die zweite Anzahl von Borsten jeweils aus Nylon gefertigt sind.

10 4. Wimperntusch-Bürste nach Anspruch 3, dadurch gekennzeichnet, daß die Borsten der ersten Anzahl einen Durchmesser von etwa  $6.35 \times 10^{-3}$  cm (0,0025 inch) und daß die Borsten der zweiten Anzahl einen Durchmesser von etwa 0,015 cm (0,006 inch) aufweisen.

15 5. Wimperntusch-Bürste nach Anspruch 1, dadurch gekennzeichnet, daß die erste und die zweite Anzahl von Borsten jeweils aus unterschiedlichem Material gefertigt sind, welches derart ausgewählt ist, daß für einen gegebenen Borstendurchmesser das Borstenmaterial für die zweite Anzahl von Borsten eine größere Biegefestigkeit als das Borstenmaterial für die erste Anzahl von Borsten besitzt.

20 25 6. Wimperntusch-Bürste nach Anspruch 5, dadurch gekennzeichnet, daß die erste Anzahl von Borsten Nylonfasern und die zweite Anzahl von Borsten Polyesterfasern sind.

30 30 **Revendications**

1. Brosse (10) en spirale pour mascara, cette brosse comprenant :

35 (a)une multiplicité de poils (14) dont chacun présente des extrémités opposées libres, et  
(b)un moyen (16) pour monter fixement les poils en un agencement continu en spirale, de sorte que les extrémités libres des poils sont disposées le long d'une hélice, brosse caractérisée en ce que  
(c) ladite multiplicité de poils consiste essentiellement en

40 (i) une première quantité de poils (26) ayant une résistance à la flexion adaptée à l'application de mascara sur les cils d'une personne utilisatrice, et  
(ii) une seconde quantité de poils (28), ayant une résistance à la flexion nettement supérieure à la résistance à la flexion des poils de ladite première quantité et qui convient bien pour peigner le mascara appliqué sur les cils d'une personne utilisatrice, et

45 (d) en ce que ledit agencement en spirale inclut au moins deux parties contiguës (30, 30', 32, 32') disposées en tandem le long de l'agence-

ment, l' une desdites deux parties (30, 30') étant une partie d' application de mascara consistant essentiellement en des poils de ladite première quantité et l' autre desdites deux parties (32, 32') étant une partie destinée au peignage des cils et consistant essentiellement en des poils de ladite seconde quantité. 5

2. Brosse à mascara telle que définie à la revendication 1, dans laquelle les poils faisant partie de la première quantité ont un plus petit diamètre que celui des poils de la seconde quantité. 10
3. Brosse à mascara telle que définie à la revendication 2, dans laquelle les poils de ladite première quantité et également ceux de ladite seconde quantité sont fabriqués en (Nylon) 15
4. Brosse à mascara telle que définie à la revendication 3, dans laquelle les poils de la première quantité ont un diamètre d' environ  $6,35 \times 10^{-3}$  cm (0,0025 pouce) et les poils de la seconde quantité ont un diamètre d' environ 0,015 cm (0,006 pouce). 20
5. Brosse à mascara telle que définie à la revendication 1, dans laquelle les poils de la première quantité et les poils de la seconde quantité sont respectivement fabriqués en des matières différentes choisies de façon que, pour un diamètre donné de poils, les poils fabriqués en la matière de poils de la seconde quantité ont une plus grande résistance à la flexion que les poils fabriqués en la matière de poils de la première quantité. 25
6. Brosse à mascara selon la revendication 5, dans laquelle les poils de la première quantité sont constitués de fibres de (Nylon) et les poils de la seconde quantité sont constitués de fibres de polyester. 30

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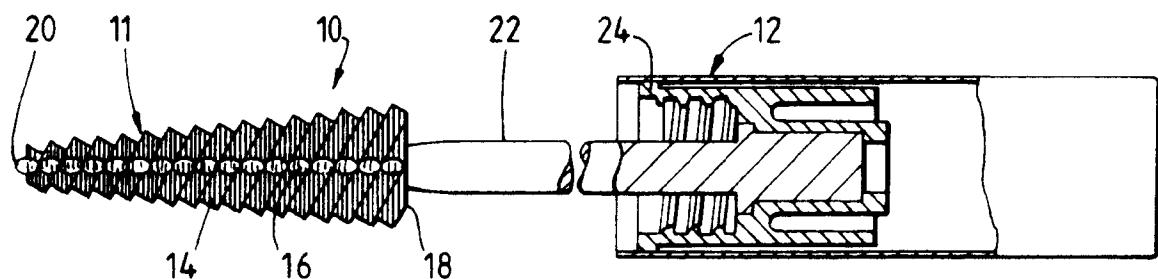
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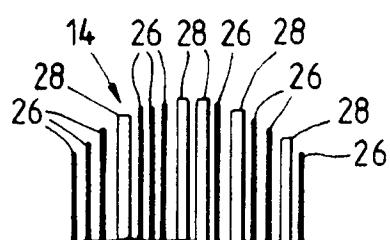
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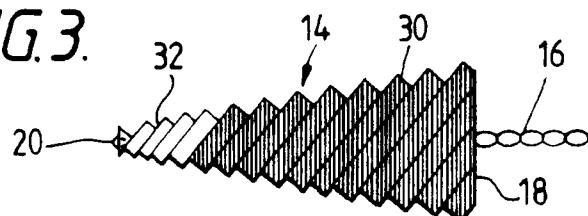
*FIG. 1.*



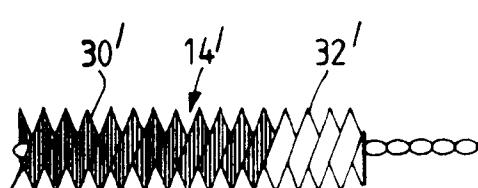
*FIG. 2.*



*FIG. 3.*



*FIG. 4.*



*FIG. 5.*

