

PATENT SPECIFICATION

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- (21) Application No. 48618/76 (22) Filed 22 Nov. 1976
 (31) Convention Application No. 634 703 (32) Filed 24 Nov. 1975 in
 (33) United States of America (US)
 (44) Complete Specification published 19 March 1980
 (51) INT. CL.³ A46B 7/02
 A45D 40/26
 (52) Index at acceptance
 A4K EX
 B8P P



(54) ADJUSTABLE MASCARA APPLICATOR

(71) We, SCHERICO LTD., of Topferstrasse 5, Lucerne, Switzerland, a body corporate constituted under the laws of Switzerland do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:

This invention relates to an improved device for applying a predetermined metered amount of a pasty, liquid or semi-liquid product, for example a cosmetic. More particularly, the invention relates to a mascara applicator in which the quantity of mascara which is retained by the applicator head is predetermined and the distance between at least two of the adjacent coating surfaces is adjustable.

During recent years eye makeup has received increased emphasis and numerous applicators have been designed to apply mascaras which curl, color and lengthen the eyelashes. Certain of the applicators also aid in combing and separating the lashes so that the mascara is more uniformly distributed on the hairs. Examples of the various types of applicators are shown in U.S. Patents No. 2,141,327 (Younghusband); 2,829,655 (Bau); 3,033,213 (Joss et al); 3,214,782 (Masters et al); 3,343,551 (Anderson); 3,363,635 (Wurmbock); 3,690,777 (Costa); 3,756,731 (Aubry); 3,862,639 (Schefer et al); 3,892,248 (Kingsford); and 3,896,823 (Spatz).

In most mascara applicators, as evidenced by the references listed above, the applicator member is disposed in a mascara mass within a container. The excess mascara is removed by an elastic wiper as the applicator is withdrawn from the container. A metered amount of cosmetic remains between the threads, brush hair or comb teeth for application to the eyelashes. In any given applicator, essentially the same metered quantity of mascara is retained for

any individual application for all users regardless of the length, thickness or density of the individuals' lashes, and without regard as to whether the upper or lower lashes are to be treated.

According to the present invention there is provided an applicator for pasty, liquid or semi-liquid products comprising:

- a) a shaft,
- b) handle means at one end of said shaft,
- c) an applicator head having a plurality of surface portions forming coating surfaces axially spaced along said shaft, and
- d) means for adjusting the axial spacing between at least two adjacent coating surfaces.

Applicators according to the invention are of particular utility as part of an eyelash cosmetic package comprising

- a) a bottle,
- b) a mascara composition partially filling said bottle,
- c) a bottle closure,
- d) said applicator attached to said bottle closure and adapted to be immersed in said mascara composition when said bottle closure is attached to said bottle, and
- e) wiper means within said bottle and positioned intermediate said applicator head and said bottle closure when said closure is attached to said bottle, said wiper being adapted to clear excess mascara composition from said applicator head when the applicator head is removed from the bottle.

By employing an applicator in accordance with the present invention to apply mascara, it is possible for the mascara user to retain on the applicator the quantity of mascara suited for both her upper and lower lashes. A user can therefore, at her discretion, apply

either a heavy or thin coating of mascara by merely selecting the volume of mascara which is to be dispensed by the applicator with a simple selection of the distance
 5 between said adjacent coating surfaces. A user with skimpy, sparsely distributed lashes will no longer be burdened with the mess associated with an excessive quantity of mascara, and a user with full dense lashes
 10 will now be able to uniformly coat her lashes more rapidly without the need for constantly recoating the applicator. It will also be possible for the user to select the quantity of mascara suited to her lower
 15 lashes which are invariably shorter and less dense than the upper lashes.

When used as mascara applicators, applicators according to the present invention have the additional advantage of
 20 allowing the mascara user to enhance the lash appearance by selection of the spacing which will optimize the combing and separating action of the applicator. For example, a user with thin, sparse lashes,
 25 who desired a light or touch-up coat of mascara, could compress the applicator head prior to removal from the container. After removal from the container, she could extend the applicator head to control the
 30 degree of combing and separating suited to her lashes. Thus in summary, it is possible according to the invention to construct mascara applicators which will enable the
 35 user to select the amount of mascara which is to be applied and furthermore which can hold the amount of mascara suited for both the upper and lower lashes of any individual user.

The invention can also provide mascara
 40 applicators in which the combing and separating action can be adjusted to suit all users regardless of lash thickness, length or density.

Applicators according to the invention
 45 further can hold a suitable amount of a pasty, semi-liquid or liquid product and can enable a predetermined metered amount of the product to be dispensed.

The invention will now be described, by way of example, with reference to the accompanying drawings in which:

Fig. 1 is a longitudinal sectional view of an adjustable helical compression spring applicator within its associated container.

Fig. 2 is a side elevation of the applicator and container of Fig. 1.

Fig. 3 is an enlarged perspective view of part of a preferred embodiment in which the applicator head is in the form of a
 60 flat spiral spring.

Fig. 4 is an enlarged partial sectional view through a tapered version of the flat spring of Fig. 3.

Fig. 5 is an enlarged partial sectional
 65 perspective view of an embodiment in which

the applicator head is in the form of a helical brush.

Fig. 6 is an enlarged partial sectional view of the helical brush of Fig. 5.

Fig. 7 is an enlarged perspective view of part of an embodiment in which the applicator head is tapered.

Fig. 8 is an enlarged cross-sectional end view of one of the turns of the applicator head of Fig. 7.

Fig. 9 is an enlarged perspective view of part of an embodiment in which the applicator head is in the form of a flat serrated spring.

Fig. 10 is an enlarged partial sectional view of the serrated spring applicator of Fig. 9.

Fig. 11 is an enlarged perspective partial sectional view of an embodiment in which the applicator head is in the form of a
 85 bellows.

Fig. 12 is an enlarged end view of a three tined applicator.

Fig. 13 is an enlarged partial cross-sectional view of an alternative embodiment to that shown in Figure 1 of the tension
 90 adjusting means associated with the cap.

Fig. 14 is an enlarged cross-sectional along the lines 14-14 of Fig. 13.

Referring to Figs. 1 and 2 there is illustrated an eyelash cosmetic package 1 comprising a container or bottle in the form of a tubular reservoir 2 partially filled with
 95 mascara, and an applicator comprising a cap 3 connected to an applicator shaft 8.

Inserted within the mouth of the container is a wiper 6. The wiper has a central aperture 7 that is adapted to seal against the outer surface of applicator shaft 8. The wiper is retained in the neck of the bottle
 100 by head 9, which mates with a corresponding groove in the bottle neck, and a lip 11 that extends above the neck of the bottle. The lip 11 further acts as a seal between the cap and the bottle upon closure
 105 of the bottle. In the preferred embodiment the wiper is made of neoprene rubber or a similar material which would afford resistance to the dispensed material.

The cap 3, which forms a handle for holding the applicator consists of upper
 115 first cap portion 12 and lower second cap portion 13. Cap portion 13 is provided with internal threads 4 which mesh with the external threads 5 of bottle 2. The two
 120 portions of cap 3 are operatively connected by the internal threads 14 of the first portion and the external threads 15 of the second portion for reasons to be more apparent hereafter. Shaft 8 comprises an
 125 outer sheath integrally connected with second cap portion 13, and an adjusting rod 16 which is slidingly disposed within the central aperture 10 of the sheath. Rod 16 is fixedly attached at its upper end to
 130

groove 17 in the first cap portion 12. Seal 25 prevents leakage of any mascara which may have worked its way between the rod and the sheath.

- 5 An applicator head 18 surrounds the lower portion of the adjusting rod 16 of shaft 8 and is held in place at its lower end by a flanged tip 19A, and at its upper end by the base 20 of the sheath of shaft 8.
- 10 It would, of course, be possible to attach the applicator head to either tip 19A, base 20 or both to prevent the wiper from compressing the applicator head during insertion or withdrawal from the container.
- 15 The preferred embodiment of the mascara applicator shown in Figs. 1 and 3 is a helical spring with the distance between coating surfaces formed by surface portions of adjacent turns of the spiral being indicated by the letter "D" in Figures 1 and 3.
- 20 The distance "D" between at least two of these surfaces is adjustable through a tension adjusting means. In Fig. 1 this is primarily accomplished by threads 14 and 15. As the first cap portion 12 is removably rotated with respect to the second cap portion 13, the adjusting rod which is fixedly secured at groove 17 moves axially. The helical spring applicator 18 may thus be
- 25 expanded or compressed between the sheath base 20 and the rod tip 19A to increase or decrease, respectively the distance "D" between the adjacent coating surfaces. The degree of compression can be selected, for example, by alignment of one of the calibration lines a-d located on the upper cap portion 12 with an arrow located on lower cap portion 13 as shown in Fig. 2.

Fig. 3 shows the preferred embodiment in which a flat spring 18A is used to provide the coating surfaces. In the preferred embodiment, the edge of the spring is flat although a tapered edge is also possible.

Fig. 4 is a partial sectional view through a tapered version of the flat spring 18A of Fig. 3. The preferred ratio of the height (H) to the width (W) of the flat spring is generally about 4, with the preferred range of the ratio generally being from 1 to 8.

Fig. 5 shows an embodiment in which a helical spring 18B with attached bristles 19 is used to provide the coating surfaces. The bristles can be either uniformly distributed around the entire spring periphery or attached at only certain predetermined points, such as on alternate turns of the coil or along one or more longitudinally positioned portions along the applicator axis. Bristles could, of course, be attached to any of the disclosed embodiments or equivalents thereof.

Fig. 6 is a partial cross-sectional view of the helical brush of Fig. 5. In the embodiment shown the bristles 19 are locked in place between two folded over

faces of the spring material. Other means of attaching the bristles will readily occur to one skilled in the art.

Fig. 7 shows an embodiment in which the helical spring applicator head 18C is tapered to facilitate application of mascara to the smaller lash hairs at either side of an eye. It is, of course, understood that any of the embodiments disclosed herein or equivalents thereof could be similarly tapered. Fig. 7 also shows an embodiment in which the adjusting rod 16 and applicator head 18C are integrally formed from a single section of spring material.

Fig. 8 shows a cross-sectional view of one of the turns of the applicator head of Fig. 7 in an oval or elliptical shape such as shown in U.S. Patent 3,896,823. It is, of course, understood that any of the embodiments disclosed herein could also be made into an oval or any other appropriate shape.

Fig. 9 shows an embodiment in which the helical spring applicator head 18D is serrated as at 23 and the sheath of shaft 8 is tapered from the base thereof to afford better visibility to the user.

Fig. 10 shows a section of the serrated spring applicator of Fig. 9. It would, of course, be possible to make the serrations in any shape or depth.

Fig. 11 shows an embodiment in which the applicator head has a plurality of circumferential grooves in a bellows configuration, with coating surfaces 18E being provided by the groove walls. In the embodiment shown, the adjusting rod 16 extends through the center of the bellows. This arrangement is most convenient when a helical coating surface is undesirable, although it could, of course, also be used for a helical surface.

Fig. 12 is an enlarged end view of a three tined applicator head 18F such as shown in U.S. Patent 3,892,248. The three tined embodiment is one of the variations of the serrated applicator as shown in Fig. 9, although it could also be easily incorporated into the bellows construction of Fig. 11. In an embodiment with two or more rows of tines, it would be possible to provide adjustability for some or all of the rows. For example, in a two or three tined applicator, it would be possible to provide adjustability between the coating surfaces of only one of the rows of tines.

Fig. 13 shows an alternative embodiment for a tension adjusting means in the cap 3. In this embodiment the adjusting rod 16A is movable axially along bead 24 by rotating the first cap portion 12A relative to the second cap portion 13A. Seal 25A prevents leakage of any mascara which may have worked its way between the rod and the sheath of shaft 8A. Although both Figs. 1 and 13 shows cap portions 12 and

13 rotationally mounted with respect to one another, other operative relationships will occur to one skilled in the art, such as cap portions which are slidably mounted in the axial direction.

Fig. 14 shows a cross-sectional view of the shaft 8A showing the sheath and rod 16A of Fig. 13. The inside diameter of the sheath and the outside diameter of the rod are shown to be rectangular to prevent rotational movement between them, although any out of round shape could be used.

It is apparent that a helical spring applicator is preferred since the spacing can be conveniently adjusted by a simple compression of the spring without the need for additional compression means between each coating surface. Many convenient spring materials will suggest themselves such as aluminum, steel or plastics.

It is also apparent that the applicator disclosed herein can be used in a variety of applications other than for mascara. For example, it could be used to apply coloring to an eyebrow, moustache, beard or hair upon the head, or to apply a metered amount of any pasty, liquid or semi-liquid product which is a cosmetic, medicament or otherwise.

In applications of certain liquid or semi-liquid products it might be desirable to treat or roughen the coating surface in order to improve product retention. For example, the surface could be textured by sand blasting, or the surface could be flocked by adhesively attaching fibers to it.

The range of possible distances between adjacent axially spaced coating surfaces would, of course, depend upon the purpose for which the applicator was being used. It has, however, been found that for mascara the distance can generally be up to 3.2 mm. A zero setting (i.e., full compression) could be used for touch-up, separating lashes or lower lash application. In a mascara applicator, it would generally be desirable to adjust the distances between all of the coating surfaces, although it would be possible to provide for adjustability between only selected surface portions of the applicator head.

In the preferred embodiment of a mascara applicator, the design parameters generally preferred are as follows. The applicator head has an overall diameter of 3-10 mm, and an overall length of 5-35 mm. The total number of tines or thread revolutions is generally from 5 to 15 with each individual tine or thread having an axial thickness of 0.3 to 1.0 mm, and a radial depth of 1.0 to 3.0 mm. The thickness can, however, be tapered down to about 0.1 mm. In the helical embodiment a left handed thread (opposite to that shown in Fig. 1) is preferred

since it is best suited for right handed users.

While several embodiments have been shown to illustrate the invention, it will be understood by those skilled in the art that various changes and modifications can be made without departing from the scope of the claims.

WHAT WE CLAIM IS:

1. An applicator for pasty, liquid or semi-liquid products comprising:

- a) a shaft,
- b) handle means at one end of said shaft,
- c) an applicator head having a plurality of surface portions forming coating surfaces axially spaced along said shaft, and
- d) means for adjusting the axial spacing between at least two adjacent coating surfaces.

2. Applicator as claimed in claim 1, wherein said applicator head is a helical spring.

3. Applicator as claimed in claim 2, wherein the external surface of said helical spring is serrated.

4. Applicator as claimed in claim 2, wherein the sides of said helical spring are flat.

5. Applicator as claimed in claim 4, wherein said sides are tapered radially outwardly.

6. Applicator as claimed in claim 2, wherein at least a portion of the external surface of said helical spring contains bristles.

7. Applicator as claimed in any one of claims 2 to 6, wherein said helical spring has a left handed thread.

8. Applicator as claimed in claim 1, wherein said applicator head comprises a plurality of axially aligned tines.

9. Applicator as claimed in claim 8, wherein said tines are in the form of a bellows.

10. Applicator as claimed in any one of claims 1 to 9, wherein the means for adjusting the axial spacing is provided by part of said handle means.

11. Applicator as claimed in any one of claims 1 to 10, wherein said handle means comprises a first and second portion, said first portion being operatively connected to said shaft and said second portion being operatively connected to said applicator head, whereby movement of said first portion relative to said second portion alters the axial spacing between adjacent coating surfaces.

12. Applicator as claimed in any one of claims 1 to 11, wherein said adjusting means sets a distance of up to 3.2 mm, between adjacent coating surfaces.

13. Applicator as claimed in any one

(14)



13 rotationally mounted with respect to one another, other operative relationships will occur to one skilled in the art, such as cap portions which are slidably mounted in the axial direction.

Fig. 14 shows a cross-sectional view of the shaft 8A showing the sheath and rod 16A of Fig. 13. The inside diameter of the sheath and the outside diameter of the rod are shown to be rectangular to prevent rotational movement between them, although any out of round shape could be used.

It is apparent that a helical spring applicator is preferred since the spacing can be conveniently adjusted by a simple compression of the spring without the need for additional compression means between each coating surface. Many convenient spring materials will suggest themselves such as aluminum, steel or plastics.

It is also apparent that the applicator disclosed herein can be used in a variety of applications other than for mascara. For example, it could be used to apply coloring to an eyebrow, moustache, beard or hair upon the head, or to apply a metered amount of any pasty, liquid or semi-liquid product which is a cosmetic, medicament or otherwise.

In applications of certain liquid or semi-liquid products it might be desirable to treat or roughen the coating surface in order to improve product retention. For example, the surface could be textured by sand blasting, or the surface could be flocked by adhesively attaching fibers to it.

The range of possible distances between adjacent axially spaced coating surfaces would, of course, depend upon the purpose for which the applicator was being used. It has, however, been found that for mascara the distance can generally be up to 3.2 mm. A zero setting (i.e., full compression) could be used for touch-up, separating lashes or lower lash application. In a mascara applicator, it would generally be desirable to adjust the distances between all of the coating surfaces, although it would be possible to provide for adjustability between only selected surface portions of the applicator head.

In the preferred embodiment of a mascara applicator, the design parameters generally preferred are as follows. The applicator head has an overall diameter of 3-10 mm, and an overall length of 5-35 mm. The total number of tines or thread revolutions is generally from 5 to 15 with each individual tine or thread having an axial thickness of 0.3 to 1.0 mm, and a radial depth of 1.0 to 3.0 mm. The thickness can, however, be tapered down to about 0.1 mm. In the helical embodiment a left handed thread (opposite to that shown in Fig. 1) is pre-

ferred since it is best suited for right handed users.

While several embodiments have been shown to illustrate the invention, it will be understood by those skilled in the art that various changes and modifications can be made without departing from the scope of the claims.

WHAT WE CLAIM IS:

1. An applicator for pasty, liquid or semi-liquid products comprising:

- a) a shaft,
- b) handle means at one end of said shaft,
- c) an applicator head having a plurality of surface portions forming coating surfaces axially spaced along said shaft, and
- d) means for adjusting the axial spacing between at least two adjacent coating surfaces.

2. Applicator as claimed in claim 1, wherein said applicator head is a helical spring.

3. Applicator as claimed in claim 2, wherein the external surface of said helical spring is serrated.

4. Applicator as claimed in claim 2, wherein the sides of said helical spring are flat.

5. Applicator as claimed in claim 4, wherein said sides are tapered radially outwardly.

6. Applicator as claimed in claim 2, wherein at least a portion of the external surface of said helical spring contains bristles.

7. Applicator as claimed in any one of claims 2 to 6, wherein said helical spring has a left handed thread.

8. Applicator as claimed in claim 1, wherein said applicator head comprises a plurality of axially aligned tines.

9. Applicator as claimed in claim 8, wherein said tines are in the form of a bellows.

10. Applicator as claimed in any one of claims 1 to 9, wherein the means for adjusting the axial spacing is provided by part of said handle means.

11. Applicator as claimed in any one of claims 1 to 10, wherein said handle means comprises a first and second portion, said first portion being operatively connected to said shaft and said second portion being operatively connected to said applicator head, whereby movement of said first portion relative to said second portion alters the axial spacing between adjacent coating surfaces.

12. Applicator as claimed in any one of claims 1 to 11, wherein said adjusting means sets a distance of up to 3.2 mm. between adjacent coating surfaces.

13. Applicator as claimed in any one



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of claims 1 to 12, wherein said surface portions are textured.

14. Applicator as claimed in any one of claims 1 to 12, wherein said surface portions are flocked with fibers.

15. An eyelash cosmetic package comprising:

- a) a bottle,
- b) a mascara composition partially filling said bottle,
- c) a bottle closure,
- d) an applicator as claimed in any one of claims 1 to 14 attached to said bottle closure and adapted to be immersed in said mascara composition when said bottle closure is attached to said bottle, and
- e) wiper means within said bottle and positioned intermediate said applicator head and said bottle closure when said closure is attached to said bottle, said wiper being adapted to clear excess mascara composition from said applicator head when the applicator head is removed from the bottle.

16. An eyelash cosmetic package as claimed in claim 15, wherein said handle

means and said means for adjusting the axial spacing form part of said bottle closure.

17. An eyelash cosmetic package as claimed in claim 15 or claim 16, wherein said bottle closure comprises a first and second portion, rotatably mounted with respect to one another, said first portion being operatively connected to said shaft and said second portion being operatively connected to said applicator head, whereby rotation of said first portion relative to said second portion alters the axial spacing between said adjacent coating surfaces.

18. An applicator as claimed in claim 1 and substantially as hereinbefore described with particular reference to the accompanying drawings.

19. An eyelash cosmetic package as claimed in claim 15 and substantially as hereinbefore defined with particular reference to the accompanying drawings.

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