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(54) Material dispenser with wiper retaining sleeve.

(57) A mascara dispenser including a container (10) having a neck (12), an applicator having a head such as a brush insertable through the neck (12) to pick up and remove mascara from the container (10), a tubular elastomeric wiper element (32) mounted in the neck (12) with an internal annular lip for engaging the applicator head to remove residual material therefrom as the head is withdrawn from the container (10), and a barbed metal sleeve (40) surrounding the wiper element (32) in an interference fit for anchoring the wiper (32) in the neck (12).

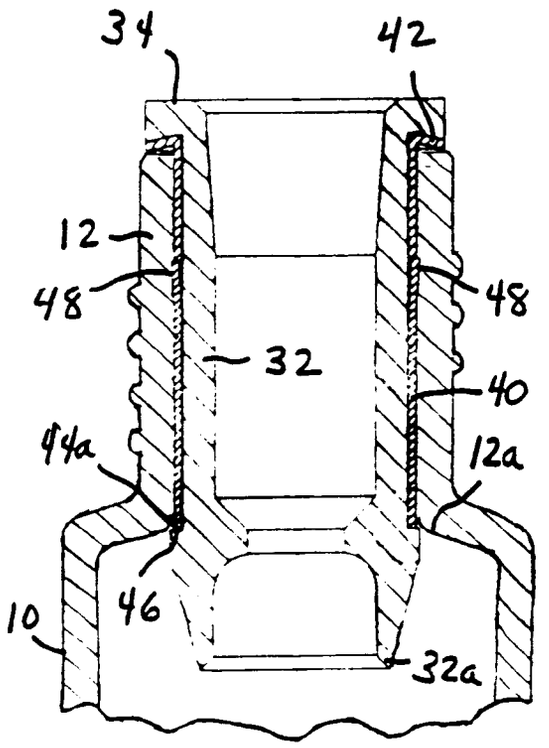

FIG. 6

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This invention relates to material dispensers of the type including a container having a mouth or neck, an elongated applicator that can be inserted and withdrawn through the container neck for picking up and transporting a quantity of material from the container, and a wiper associated with the neck for removing excess material from the applicator as the applicator is withdrawn through the neck. The invention is specifically directed to dispensers of such type having new and improved means for retaining the wiper in the neck.

The dispensers that are the subject of the invention are adapted to hold a small amount of material for direct end-use application. A typical applicator for such dispensers is a brush or similar material conveying/applying head carried on a stem or shaft projecting from a holder, which the user manipulates to apply the material.

The term "material" herein refers to materials that can be picked up by the applicator, as exemplified by substances which are themselves liquid or incorporate a liquid vehicle, e.g. liquid and pasty cosmetic substances such as mascara. In important embodiments, the invention is directed to dispensers for liquid or pasty cosmetic materials, especially mascara, to which detailed reference will be made herein for purposes of specific illustration.

A conventional mascara dispenser includes a container with an externally threaded neck for receiving an internally threaded container cap. The cap also serves as the applicator holder used to manipulate the brush or other applicator head. Typically, when the cap is seated on the neck, the applicator head is immersed in the mascara. As the cap is removed from the container, the applicator shaft and head are withdrawn through the neck, transporting a quantity of the mascara for immediate application to the user's eyelashes.

Customarily a flexible wiper is mounted in the dispenser neck to engage the applicator head as the applicator is withdrawn from the dispenser. This flexible wiper removes excess material from the head and/or the shaft allowing the excess material to fall back or flow back into the container. A typical or preferred form of wiper includes an elastic annular lip disposed in the container neck in surrounding relation to the path of the applicator through the neck. Such a wiper is shaped and dimensioned to engage the applicator snugly and conformingly as the applicator is withdrawn through the neck. The wiper may also include a sealing portion disposed at the upper end of the neck for cooperating with the cap to provide a fluid-tight closure of the container.

The wiper is commonly an open-ended tubular element insertable in the container neck and defining a central passage in which the lip is formed. At its upper end, this wiper element includes an outwardly projecting annular sealing flange for overlying the rim of the neck to constitute the aforementioned sealing portion engageable by the cap. The wiper element is advantageously a unitary body molded of a suitable elastomer, with an outer diameter dimensioned for a snug fit within the container neck, and may be assembled with the container by insertion into the neck.

Whenever the applicator brush or other head passes through a conventional wiper element of the type just described, its engagement with the wiper lip exerts a force on the wiper element, tending to move the latter (relative to the container neck) in the direction in which the applicator is moving. If the applicator is being inserted into the container, the positive engagement of the upper sealing flange of the wiper element with the rim of the neck keeps the wiper from being dislodged and pushed into the container. During withdrawal of the applicator, however, the sealing flange-rim engagement cannot act to hold the wiper in place, and owing to the inherent deformability of the elastomeric wiper element, even an interference fit between the wiper element and the neck may not prevent the wiper element from being pulled out of the container along with the applicator. Such accidental removal of the wiper is messy and inconvenient for the user.

In order to retain the wiper in the container, it has heretofore been proposed to provide an outwardly projecting, flexible annular flange or lip adjacent the lower end of the wiper element, so as to underlie the interior of the container at the shoulder formed at the lower extremity of the neck. This flexible retaining flange folds or deforms upwardly as the wiper element is forced into the neck during assembly, and resumes its unstressed, outwardly projecting configuration upon emerging into the container interior below the neck when the wiper element has been fully inserted. Thereafter the retaining flange is supposed to prevent outward movement of the wiper element (relative to the neck) by engaging the container around the neck shoulder.

The retaining flange arrangement is attended with various problems. It is difficult to assemble the wiper element with the container when the wiper element has an outwardly projecting flange adjacent its lower end. Moreover, in the production of containers by the usual injection molding techniques, the internal radius at the neck shoulder is not highly controllable, so that there may be considerable variation in this dimension from container to container; as a result, in at least some containers, the retaining flange may not have sufficient engagement with the container interior to prevent dislodgement of the wiper element. The inherent flexibility of this flange (necessary to enable initial insertion) also limits its effectiveness as a retainer.

It would therefore be desirable to provide a material dispenser, such as a mascara dispenser of the general type described above, that mitigates or over-

comes the aforementioned problems.

The invention provides a material dispenser comprising wiper-retaining means.

The present invention, in a first aspect, broadly contemplates the provision of a liquid material dispenser including a container for holding a liquid material, the container having a generally tubular neck; an applicator having a head insertable into and withdrawable from the container through the neck for carrying a quantity of the liquid material out of the container; and wiper means for removing excess liquid material from the head as the head is withdrawn from the container through the neck, the wiper means comprising a generally tubular element disposed in the neck and defining a central passage within which the applicator head is insertable and withdrawable through the neck as aforesaid, and having a lip disposed in said passage for engaging and wiping the applicator head; wherein the improvement comprises means, comprising a sleeve disposed in closely surrounding relation to the wiper element within the neck and having an interference fit with the wiper element and the neck, for retaining the wiper element within the neck against dislodgement by forces exerted by the applicator head on the wiper element when the applicator head is withdrawn as aforesaid.

Further in accordance with the invention, in currently preferred embodiments, the neck has an upper rim, and the wiper element has upper and lower extremities and an outwardly projecting annular flange at its upper extremity for overlying the rim, the sleeve being disposed below the flange. As another feature of advantage and preference, the wiper element has an outwardly projecting shoulder adjacent its lower extremity and the sleeve has upper and lower ends respectively engageable with the flange and the shoulder for preventing axial displacement of the sleeve relative to the wiper element. The wiper element is conveniently or preferably resiliently deformable such that its lower extremity and the shoulder are insertable into the sleeve through the upper end of the sleeve, and, upon passage of the shoulder entirely through the sleeve and beyond the lower end thereof, the shoulder resiles outwardly to engage the lower end of the sleeve.

As yet another preferred feature of the invention, the sleeve bears at least one outwardly projecting barb for engaging an internal wall portion of the container neck for preventing upward movement of the sleeve relative to the neck. Preferably, the sleeve is provided with at least two such barbs, spaced apart around the sleeve. Each barb can be made resiliently deformable to permit insertion of the sleeve into the neck through the rim of the neck; advantageously, each barb is formed by cutting and striking out a tab portion of the sleeve such that the tab portion has a free upper edge.

Still further in accordance with the invention, the upper end of said sleeve can be formed with an outwardly projecting flange extending between the flange of the wiper element and the rim of the neck. Preferably this sleeve flange slopes radially downwardly and outwardly.

Advantageously the sleeve is harder than the neck and the wiper. In exemplary or preferred embodiments, the container is a molded plastic body, the wiper element is a molded elastomeric body, and the sleeve is fabricated of metal.

The invention in a particularly important specific sense is embodied in dispensers for mascara.

In a second aspect, the invention contemplates the provision of a wiper device for use in a liquid material dispenser of the above-described type, including the foregoing retaining means comprising a sleeve disposed in closely surrounding relation to a wiper element and insertable therewith in the neck of the dispenser container, the sleeve having an interference fit with the wiper and the neck.

In another aspect the invention provides the use in a liquid material dispenser comprising a tubular wiper element disposed in the dispenser neck of retaining means between the wiper element and the dispenser neck and having an interference-fit therewith to retain the wiper element in the dispenser neck, the retaining means optionally comprising one barb, or two or more peripherally spaced barbs, to engage the dispenser neck whereby to resist removal of the retaining means from the dispenser neck, and the wiper element and the retaining means optionally comprising opposed abutment surfaces to resist relative axial movement of the wiper element and the retaining means.

The invention includes a wiper element retainer for use in a liquid material dispenser comprising a tubular sleeve adapted to be disposed between the wiper element and the dispenser neck in an interference fit therewith.

The present invention is further described by way of example only with reference to the accompanying drawings, in which:

FIG. 1 is an elevational view, largely in section, of a generally conventional mascara container of a type in which an embodiment of the present invention may be incorporated, also illustrating features of the prior art;

FIG. 2 is an enlarged elevational sectional view of a wiper device, for a dispenser of the general type shown in FIG. 1, embodying the present invention in a particular form;

FIG. 3 is a view, similar to Fig. 2, of the retaining sleeve of the device of FIG. 2;

FIG. 4 is a bottom plan view of the sleeve of FIG. 3;

FIG. 5 is a fragmentary elevational view of the sleeve of FIG. 3, rotated 90° about a vertical axis from the FIG. 3 position;

FIG. 6 is a view, similar to FIG. 2, showing the device of FIG. 2 inserted in the container of the mascara dispenser of FIG. 1; and

FIG. 7 is a further enlarged fragmentary sectional elevational view illustrating the engagement of a barb of the sleeve of the FIG. 2 device with the neck of the container of FIG. 6.

The invention will be described as embodied in a mascara dispenser of a type sold for personal use, with the contained mascara being applied directly to the user's eyelashes. It will be appreciated, however, that in its broader aspects the invention is also applicable to dispensers for other cosmetic materials, and indeed to dispensers for materials other than cosmetics, wherein the material container includes a wiping element mounted in its neck for removing excess material from a brush or other applicator head as the head is withdrawn from the container.

As shown in FIG. 1, a conventional mascara dispenser of a type in which an embodiment of the present invention may be incorporated includes a generally cylindrical container **10** for holding a body of mascara **11**. At the top of the container there is provided an opening or mouth in the form of a hollow cylindrical neck **12**, extending upwardly from an annular shoulder **12a** and having a rim **12b** at its upper extremity. The neck bears an external thread **14** for mating engagement with an internal thread (not shown) formed in a cap **16** which seats on the neck to close the container. Typically, the container **10** (including the neck) is a unitary, injection-molded plastic bottle, self-sustaining in shape and relatively rigid; the cap may also be a rigid molded plastic body, and may have an external metal sheath.

A rigid rod or stem **18** is secured to (or formed integrally with) and extends downwardly from the interior of the cap, coaxially therewith, so as to be inserted through the neck **12** into the interior of the container when the cap is seated on the neck. At its lower end, the stem **18** carries an applicator head comprising a brush **20** for picking up, transporting and applying mascara from the body **11**. The brush, as shown, is a conventional mascara brush constituted of an array of laterally projecting bristles gripped in a twisted wire core which is mounted in and extends downwardly from the distal extremity of the stem **18** so that the brush is located in the lower part of the container when the cap is seated on the neck **12**. The cap, stem and brush together constitute the applicator of the mascara dispenser.

The brush and stem can be withdrawn and inserted through the neck **12** with the cap **16** serving as a handle for the applicator. When the cap is in the closed position, the brush and at least the lower part of the stem are immersed in the mascara **11** at the bottom of the container. When the cap is unscrewed and the applicator is withdrawn from the container, a quantity of the mascara is picked up and carried out of the container by the brush for application as desired. Almost always, the amount of mascara in the container is sufficient for multiple applications, the applicator being reinserted in the container as needed to pick up additional mascara. After a particular applying operation is completed, the cap is retightened on the neck for storage until the next series of multiple successive applications.

In order to remove excess picked-up mascara from the brush **20** each time the brush is withdrawn from the container, the dispenser is provided with a wiper **22** defining a central through passage **23**. This wiper is a generally tubular, open-ended, unitary molded element fabricated of an elastomer and having at its upper extremity an outwardly projecting annular flange **24** overlying and seating on the upper rim **12b** of the neck while the lower extremity **22a** extends into the container below the shoulder **12**a. The flange **24** serves both to retain the wiper positively against downward movement through the neck beyond its intended position, and to constitute a sealing seat engageable by the cap **16**, i.e. when the cap is fully screwed onto the container neck, for assured liquid-tight closure of the container. As will be appreciated, the wiper element is initially assembled with the container **10** by simply inserting the wiper element into the neck **12** in the illustrated orientation.

Disposed in the passage **23**, and formed integrally with the wiper element, is an annular internal lip **26** dimensioned to engage and wipe the bristles of the brush **20** each time the brush is withdrawn from the container **10**. The lip is sufficiently flexible and elastic to permit the brush to pass in either an upward or a downward direction; as the brush, loaded with mascara from the body **11**, passes the lip in an upward direction, the lip removes excess mascara from the rod and brush, and this removed excess drips or falls from the lip back down into the interior of the container.

Each time the rod and brush pass the lip in either direction, they exert a force on the lip tending to displace the wiper element (relative to the container) in the same direction as that in which the rod and brush are moving. When the rod and brush are moving downwardly, the engagement of the wiper sealing flange **24** with the neck rim **12b** positively prevents downward movement of the wiper element into the bottle. The flange and rim, however, do not inhibit upward movement of the wiper relative to the neck; and although the wiper and neck may have such relative dimensions as to provide a snug or frictional fit, the deformability of the wiper limits the effectiveness of such fit in preventing dislodgement of the wiper in an upward direction. Consequently, the wiper is vulnerable to being pulled out of the container neck each time the applicator is withdrawn from the container past the wiper lip, unless some provision is made to retain the wiper in place.

One such retaining expedient of the prior art is illustrated in FIG. 1. This expedient comprises an outwardly projecting annular retaining flange **28** formed on the body of the wiper element **22** adjacent the lower extremity of the latter element, in such position as to underlie the shoulder **12a** and engage the inner top surface of the container **10** when the wiper element is fully inserted in the neck **12**, i.e., when the sealing flange **24** seats on the rim **12a** of the neck. When the retaining flange **28** functions properly, it and the flange **24** cooperatively lock the wiper element in the neck **12** against substantial vertical movement in either direction.

In order to enable initial insertion of the wiper element into the neck during assembly of the dispenser, the retaining flange **28** must be sufficiently flexible to deform or fold up so that it can pass downwardly through the neck before emerging below the shoulder **12a** and opening out into its illustrated unstressed configuration. Although the properties of the elastomer constituting the wiper element facilitate such deformation, the wiper-inserting operation is unavoidably hindered to some extent by the presence of this flange. Moreover, the requisite flexibility of the flange **28** detracts from its ability to resist upwardly-directed force acting on the wiper when the brush, while being withdrawn from the container, engages the lip **26**. The shortcomings of flange **28** as a retainer are exacerbated by variations, from container to container, in the radius of shoulder **12a**, inherent in the injection-molding operation by which the containers are produced; these variations affect the effective area of engagement of the flange **28** with the inner top surface of the container so that, in at least some containers, a flange **28** of given dimensions will not engage the container adequately to hold the wiper in place.

The present invention, in the embodiment now to be described, may be incorporated in a container of the type shown in FIG. 1 in place of the flange **28**. That is to say, the invention eliminates the provision of flange **28** together with its hindrance to assembly of the wiper and container. At the same time, the invention affords superior effectiveness of retention of the wiper element in the container neck, and does so in a way that is not dependent on the radius dimension of the shoulder **12a**, so that ordinary manufacturing variations in that radius are tolerable.

A wiping device **30** embodying the invention, and suitable for use in the dispenser of FIG. 1 in place of the above-described wiper **22**, is shown in FIG. 2. This device includes a wiper element **32** which is generally similar to the element **22** of FIG. 1 in being a unitary, tubular, open-ended, molded elastomeric element dimensioned to be insertable within the neck **12** coaxially therewith; in having a central through passage **33**, an outwardly projecting annular sealing flange **34** at its upper extremity for overlying the rim of the container neck, and an annular wiping lip **36** within the passage **33** for engaging the rod and brush **20** each time the rod and brush are withdrawn from or inserted in the container, and for wiping excess mascara from the brush and rod as the brush and rod are thus withdrawn; and in having a vertical extent such that, in its inserted position in the neck, its lower extremity **32a** projects below the neck shoulder **12a**. The functions and arrangement of all these features are generally as already described above with reference to element **20** in FIG. 1. The external configuration of the wiper element **33**, differs from that of the FIG. 1 element **20** in omitting the retaining flange **28** and in having, instead, other features hereinafter described.

In accordance with the invention, the device **30** of FIG. 2 further includes an open-ended and generally cylindrical retaining sleeve **40** which, in assembled condition, closely laterally surrounds the cylindrical exterior side wall of the wiper element **32** in coaxial relation thereto. The sleeve **40** is harder than either the elastomeric wiper element **32** or the plastic container neck **12**; in the described embodiment, sleeve **40** is fabricated of metal.

The relative dimensions and configurations of the wiper element **32** and sleeve **40** are such as to provide an interference fit between the sleeve and wiper element in the assembled condition represented in FIG. 2. In particular, at its upper end, the sleeve **40** is formed with an outwardly projecting annular flange **42** that preferably slopes radially outwardly and downwardly. When the sleeve **40** and wiper element **32** are in the assembled relation shown in FIG. 2, the undersurface of the wiper flange **34** seats on the sleeve flange **42**, and may be provided with a complementary radially outward and downward slope to ensure a suitably close fit.

The vertical dimension of the sleeve **40**, as seen in FIG. 2, is such that when the flanges **34** and **42** are in engagement, the sleeve surrounds the wiper element **32** for most of the vertical extent of that element, with the lower end **44** of the sleeve disposed at a level near but somewhat above the lower extremity **32a** of the wiper. At this level, a narrow upwardly-facing annular outward offset or shoulder **46** is formed on the outer surface of the wiper element, to abut and engage the lower end edge **44a** of the sleeve for positively preventing upward movement of the wiper element relative to the sleeve. The sleeve-edge-abutting surface of the shoulder **46** is preferably oriented horizontally, i.e. at 90° to the vertical cylindrical side surfaces of the sleeve and wiper element, so as to provide an assured positive stop against any such relative upward movement of the wiper element.

The flanges **34** and **42** at the upper end of the device **30**, and the shoulder **46** and sleeve lower edge **44a** in the lower portion of the device, cooperate to prevent any relative vertical movement between the sleeve **40** and wiper element **30** in either direction, once the sleeve and wiper element have been assem-

bled together as shown in FIG. 2.

The sleeve **40** is so formed that an interference fit is also achieved between the sleeve and the neck **12** when the sleeve is inserted into the neck. The flange **42**, of course, interferes with the rim of the neck to prevent downward movement of the sleeve into the neck beyond its intended position. The outer diameter of the sleeve is selected to provide a snug fit within the neck. In addition, one or more flexible barbs **48** are formed in the sleeve, intermediate the flange **42** and the sleeve lower end **44**, so as to project outwardly and upwardly from the external surface of the sleeve, for engaging and cutting or biting into the internal wall of the neck to prevent upward displacement of the sleeve (and hence of the wiper element) relative to the neck.

As best seen in FIGS. 3-5, each of the barbs **48** is an upwardly and outwardly opening tab cut in and struck slightly outwardly from the side wall of the sleeve at a level spaced below flange **42** and above lower end **44**. Each tab is thus an integral portion of the sleeve side wall, joined thereto at the lower end of the tab and separated from the wall along the sides and top of the tab, such that the tab has a free horizontal sharp upper edge **50**. In the unstressed condition of the sleeve illustrated in FIGS. 2-5, each tab is bent (struck out) so that the sharp tab edge **50** protrudes slightly radially outwardly beyond the vertical cylindrical outer surface of the sleeve. Where more than one tab is provided, they are positioned at spaced apart locations around the periphery of the sleeve; in the embodiment shown, there are two such tabs or barbs **48**, spaced 180° apart around the sleeve.

The device **30** is assembled by inserting the lower extremity of the elastomeric wiper element **32** into the upper end of the sleeve **40** and pushing the wiper element downwardly through the sleeve until the shoulder **46** of the wiper element emerges below the lower end edge **44a** of the sleeve. The outer diameter of shoulder **46** is greater than the internal diameter of the sleeve, but as this difference in diameters is small (typically corresponding to little more than twice the thickness of the sleeve wall) and the wiper is a hollow elastomeric element, the shoulder portion of the wiper element can readily be compressed sufficiently to pass downwardly through the sleeve with little difficulty. As the shoulder **46** emerges below the sleeve lower end, it immediately pops or snaps out into its uncompressed configuration, seating against the sleeve lower edge as shown in FIG. 3 to lock the wiper element in place against upward movement relative to the sleeve.

The device **30** is now ready to be inserted or mounted in the neck **12** of a container **10**, which may be identical to the container **10** of FIG. 1. For such assembly, the device **30** is inserted downwardly into the container neck until the sleeve flange **42** seats against the rim **12b** of the neck as shown in FIG. 2. This insertion, again, is performed without difficulty, as the wiper element shoulder **46** protrudes at most only slightly outwardly beyond the sleeve, and the tabs or barbs **48** are deformed or compressed into substantially flush relation with the cylindrical sleeve surface during downward movement of the sleeve into the neck.

After the wiper, sleeve and container have been assembled as described, and the container has been filled with mascara and supplied with a cap and applicator of the type shown in FIG. 1, the container is ready for use. Withdrawal of the brush 20 upwardly past the wiper lip exerts an upward force on the wiper element **30** and thus on the sleeve **40**, but since the tabs or barbs **48** are biased outwardly (against the inner wall of the neck), such upward force tends to cause the sharp upper edges **50** of the tabs to cut or bite into the wall of the neck, as best seen in FIG. 7. Thereby, the tabs or barbs positively restrain the sleeve and wiper element against any substantial displacement or upward movement relative to the neck, anchoring the wiper firmly in place.

That is to say, the interference fit between wiper and sleeve and between sleeve and neck effectively retains the sleeve against undesired withdrawal from the neck, but still allows simple insertion of the wiper into the sleeve and of the sleeve into the neck. The sleeve-neck interference fit is achieved by inserting the sleeve into the neck. As the sleeve is inserted, the barb or group of barbs is or are compressed by the inner surface of the neck, allowing the sleeve to slide along the neck. However, this sliding is only possible in the insertion direction because withdrawing motion of the sleeve (i.e. in the direction opposed to the insertion direction) will cause the sharp edge of each barb to cut into the interior surface of the neck and thereby prevent further withdrawal.

In use of the dispenser, the repeated insertions and withdrawals of the applicator are prevented from dislocating the wiper. As the applicator is inserted through the inner annular lip of the wiper, the applicator engages the lip, causing a downward force to be exerted on the wiper. The downward force presses the wiper flange **34** against the sleeve flange **42**, causing the latter in turn to press against the neck rim **12b**, maintaining the seating of the wiper in the neck.between the three elements. As the applicator is withdrawn, an upward force is exerted on the wiper when the applicator comes into contact with the wiper lip. This force is prevented from dislodging the wiper, owing to the abutment of the wiper shoulder **46** with the sleeve edge **44a** (which transmits the force to the sleeve) and the engagement of the barbs **48** with the neck wall.

In an illustrative specific example of the invention, as embodied in the device of FIG. 3, the sleeve **40** is fabricated of 0.010 inch gauge aluminum alloy

(using the alloy identified by the designation 3005 of the Aluminum Association), with an anodized finish. The cylindrical sleeve has an inner diameter of 0.242 inch, an outer diameter of 0.262 inch, and a diameter of 0.280 to 0.290 inch measured between the extreme outward protrusion of the opposed barbs **48**. Thus, the maximum extent of unstressed radial outward protrusion of each barb edge beyond the adjacent cylindrical outer sleeve wall is about 0.09 to 0.14 inch. Each tab or barb **48** has a top edge **50** that is 0.050 inch wide (measured horizontally) and side edges 0.050 inch high (measured vertically). The sleeve is 0.430 inch long, and the barb top edges 50 are spaced 0.136 inch below the upper end of the sleeve. The outer diameter of the top flange **42** is 0.301 inch; the flange slopes downwardly and outwardly at an angle of 12°. The overall length of the elastomeric wiper element **30** is 0.617 inch.

It is to be understood that the invention is not limited to the features and embodiments hereinabove specifically set forth, but may be carried out in other ways without departure from its spirit.

Claims

1. A liquid material dispenser comprising:

(a) a container for holding a liquid material, the container having a generally tubular neck;

(b) an applicator having a head insertable into and withdrawable from the container through the neck for carrying a quantity of the liquid material out of the container; and

(c) wiper means for removing excess liquid material from the head as the head is withdrawn from the container through the neck, said wiper means comprising a generally tubular element disposed in the neck and defining a central passage within which the applicator head is insertable and withdrawable through the neck as aforesaid, and having a lip disposed in said passage for engaging and wiping the applicator head;

characterized by:

(d) means, comprising a sleeve disposed in closely surrounding relation to the wiper element within the neck and having an interference fit with the wiper element and the neck, for retaining the wiper element within the neck against dislodgement by forces exerted by the applicator head on the wiper element when the applicator head is withdrawn as aforesaid.

2. A dispenser as defined in claim 1, wherein said applicator comprises a rod and a brush and said wiper means removes excess liquid material as aforesaid from the rod and the brush.

3. A dispenser as defined in claim 1 or claim 2, wherein:

(a) said neck has an upper rim, and said wiper element has upper and lower extremities and an outwardly projecting annular flange at its upper extremity for overlying said rim, said sleeve being disposed below said flange, or

(b) said neck has an upper rim, and said wiper element has upper and lower extremities and an outwardly projecting annular flange at its upper extremity for overlying said rim, said sleeve being disposed below said flange, and said wiper element has an outwardly projecting shoulder adjacent its lower extremity and said sleeve has upper and lower ends respectively engageable with said flange and said shoulder for preventing axial displacement of said sleeve relative to said wiper element, said wiper element optionally being resiliently deformable such that said lower extremity and said shoulder are insertable into said sleeve through the upper end of said sleeve and, upon passage of said shoulder entirely through said sleeve and beyond the lower end thereof, said shoulder resiles outwardly to engage said lower end of said sleeve.

4. A dispenser as defined in claim 3, wherein:

(a) the upper end of said sleeve is formed with an outwardly projecting flange extending between said flange of said wiper element and said rim of said neck, or

(b) the upper end of said sleeve is formed with an outwardly projecting flange extending between said flange of said wiper element and said rim of said neck, and said flange of said sleeve slopes radially downwardly and outwardly.

5. A dispenser as defined in any of claims 1 to 4, wherein said sleeve bears at least one outwardly projecting barb for engaging an internal wall portion of said neck for preventing upward movement of said sleeve relative to said neck.

6. A dispenser as defined in claim 5, wherein:

(a) said neck has an upper rim and said barb is resiliently deformable to permit insertion of said sleeve into said neck through said upper rim, or

(b) said neck has an upper rim and said barb is resiliently deformable to permit insertion of said sleeve into said neck through said upper rim, and said barb is formed by cutting and striking out a tab portion of said sleeve such that said tab portion has a free upper edge.

7. A dispenser as defined in claim 6, wherein said

sleeve has at least two said barbs, spaced apart around the sleeve.

8. A dispenser as defined in any of claims 1 to 7, wherein said container is a molded plastic body, said wiper element is a molded elastomeric body, and said sleeve is fabricated of metal.

9. A mascara dispenser comprising:

(a) a container for holding mascara, the container having a generally tubular neck with an upper rim;

(b) an applicator having a brush insertable into and withdrawable from the container through the neck for carrying a quantity of the mascara out of the container; and

(c) wiper means for removing excess liquid material from the brush as the brush is withdrawn from the container through the neck, said wiper means comprising a generally tubular elastomeric element dimensioned to be disposed in the neck and defining a central passage within which the brush is insertable and withdrawable through the neck as aforesaid, said element having a lip disposed in said passage for engaging and wiping the brush, said wiper element having upper and lower extremities and an outwardly projecting annular flange at its upper extremity for overlying said rim;

characterised by:

(d) means, comprising a metal sleeve disposed in closely surrounding relation to the wiper element and insertable therewith in the neck and having an interference fit with the wiper element and the neck, for retaining the wiper element within the neck against dislodgement by forces exerted by the applicator head on the wiper element when the applicator head is withdrawn as aforesaid;

(e) said sleeve having one barb, or two or more barbs spaced apart around the sleeve, for engaging an internal wall portion of said neck for preventing upward movement of said sleeve relative to said neck, each of said barbs being formed by cutting and striking out a tab portion of said sleeve such that said tab portion has a free upper edge;

(f) said wiper element having an outwardly projecting shoulder adjacent its lower extremity and said sleeve having upper and lower ends respectively engageable with said flange and said shoulder for preventing axial displacement of said sleeve relative to said wiper element, said wiper element being resiliently deformable such that said lower extremity and said shoulder are insertable into said sleeve through the upper end of said sleeve and, upon passage of said shoulder entirely through said sleeve and beyond the lower end thereof, said shoulder resiles outwardly to engage said lower end of said sleeve.

10. For use in a liquid material dispenser including a container for holding a liquid material, the container having a generally tubular neck with an upper rim, and an applicator having a head insertable into and withdrawable from the container through the neck for carrying a quantity of the liquid material out of the container, a wiper device for removing excess liquid material from the head as the head is withdrawn from the container through the neck, said wiper device comprising:

(a) a generally tubular elastomeric element dimensioned to be disposed in the neck and defining a central passage within which the applicator head is insertable and withdrawable through the neck as aforesaid, said element having a lip disposed in said passage for engaging and wiping the applicator head;

characterized by:

(b) means, comprising a metal sleeve disposed in closely surrounding and interference-fitting relation to the wiper element and insertable therewith in the neck for interference-fitting engagement with the neck, for retaining the wiper element within the neck against dislodgement by forces exerted by the applicator head on the wiper element when the applicator head is withdrawn as aforesaid.

11. A wiper device as defined in claim 10, wherein said sleeve has one barb, or two or more barbs spaced apart around the sleeve, for engaging an internal wall portion of said neck for preventing upward movement of said sleeve relative to said neck, each of said barbs being formed by cutting and striking out a tab portion of said sleeve such that said tab portion has a free upper edge; wherein said wiper element has upper and lower extremities and an outwardly projecting annular flange at its upper extremity for overlying said rim; wherein said wiper element has an outwardly projecting shoulder adjacent its lower extremity and said sleeve has upper and lower ends respectively engageable with said flange and said shoulder for preventing axial displacement of said sleeve relative to said wiper element, said wiper element being resiliently deformable such that said lower extremity and said shoulder are insertable into said sleeve through the upper end of said sleeve, and, upon passage of said shoulder entirely through said sleeve and beyond the lower end thereof, said shoulder resiles outwardlly to engage said lower end of said sleeve; and option-

ally wherein the upper end of said sleeve is formed with an outwardly projecting and radially downwardly and outwardly sloping flange extending between said flange of said wiper element and said rim of said neck.

12. The use in a liquid material dispenser comprising a tubular wiper element disposed in the dispenser neck of retaining means between the wiper element and the dispenser neck and having an interference-fit therewith to retain the wiper element in the dispenser neck, the retaining means optionally comprising one barb, or two or more peripherally spaced barbs, to engage the dispenser neck whereby to resist removal of the retaining means from the dispenser neck, and the wiper element and the retaining means optionally comprising opposed abutment surfaces to resist relative axial movement of the wiper element and the retaining means.

13. A wiper element retainer for use in a liquid material dispenser comprising a tubular sleeve, optionally of metal construction, adapted to be disposed between the wiper element and the dispenser neck and to have an interference fit therewith to retain the wiper element in the dispenser neck; the retainer optionally having one barb, or two or more barbs spaced apart around the sleeve, for engaging said neck for preventing upward movement of said sleeve relative to said neck, each of said barbs optionally being formed by cutting and striking out a tab portion of said sleeve such that said tab portion has a free upper edge.

PRIOR ART

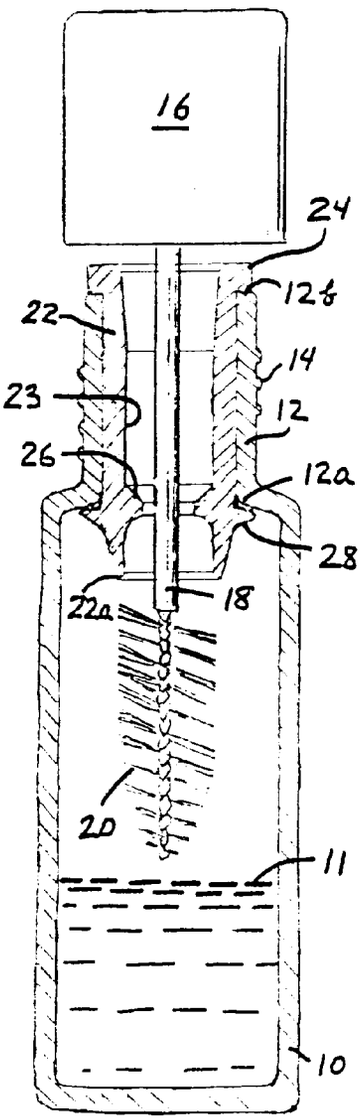


FIG. 1

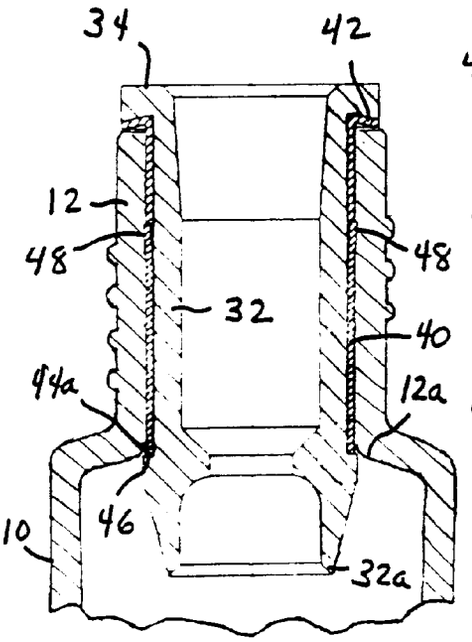


FIG. 6

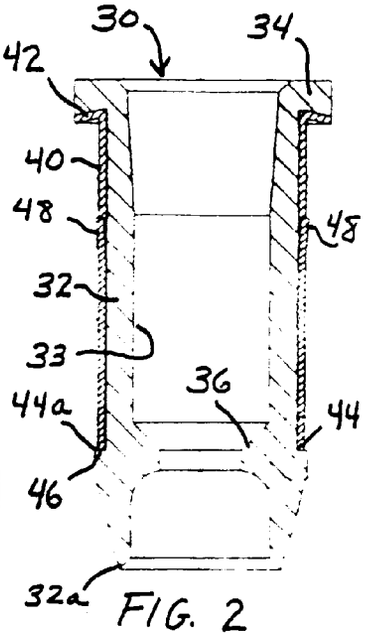


FIG. 2

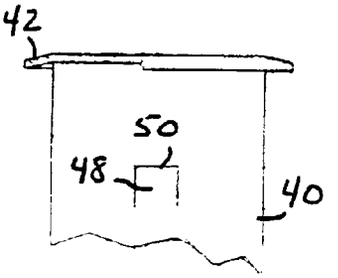


FIG. 5

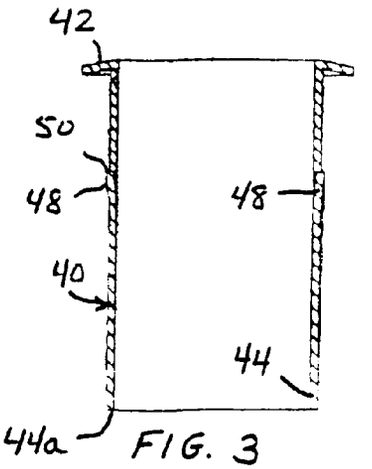


FIG. 3

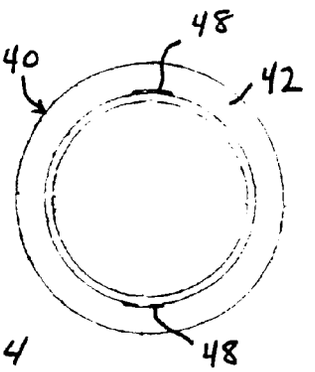
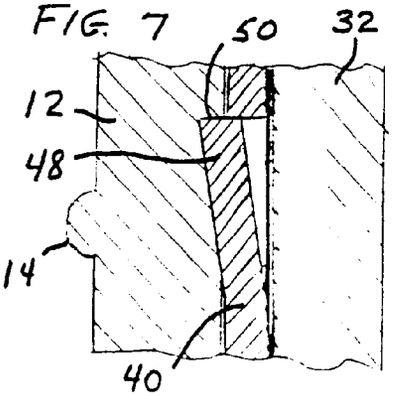


FIG. 4

FIG. 7



European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 30 4753

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	US-A-5 190 389 (VASAS) * the whole document *	1-3,10	A45D40/26
Y		5-9, 11-13	
A		4	

Y	US-A-5 137 387 (BYRD) * column 6, line 15 - line 54; figures 7,8 *	5-9, 11-13	

A	US-A-3 870 186 (REINHARD) * the whole document *	1,2	

A	FR-A-2 515 941 (L'OREAL) * figures 5-7 *	1,2	

A	GB-A-2 097 662 (L'OREAL)		

A	DE-U-92 01 883 (AURIPLAST)		

TECHNICAL FIELDS SEARCHED (Int.Cl.6)
A45D B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	4 April 1995	Sigwalt, C

CATEGORY OF CITED DOCUMENTS

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