United States Patent

[11] **3,565,294**

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[54] **APPLICATOR AND CONTAINER HAVING CAM-LOCKING MEANS**
1 Claim, 9 Drawing Figs.

[52] **U.S. Cl.** **222/107**
[51] **Int. Cl.** **B65d 35/54**
[50] **Field of Search** ..... 222/92, 107, 215, 501, 518, 498, (Inquired)

[56] **References Cited**

UNITED STATES PATENTS

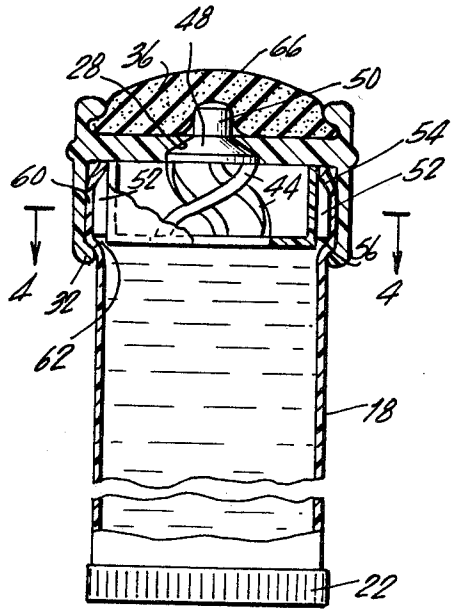
1,269,483	6/1918	Miller	222/107
1,960,393	5/1934	Otten	222/92
2,714,475	8/1955	Roehrich	222/501
2,984,393	5/1961	Magnenat	222/501
2,889,967	6/1959	Drennan	222/498

FOREIGN PATENTS

529,433	6/1955	Italy	222/107

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ABSTRACT: An applicator for use in combination with a squeezable tube and a retaining ring which carries a foamed plastic cover. An opening is formed in the ring defining a valve seat. Integrally formed with the retaining ring is a projecting portion so that a valve assembly can be force fitted into the container so that the projecting portion holds the tube and valve assembly in place. The valve assembly is integrally formed with annularly spaced cam members which are lockingly engaged by the projecting portion.



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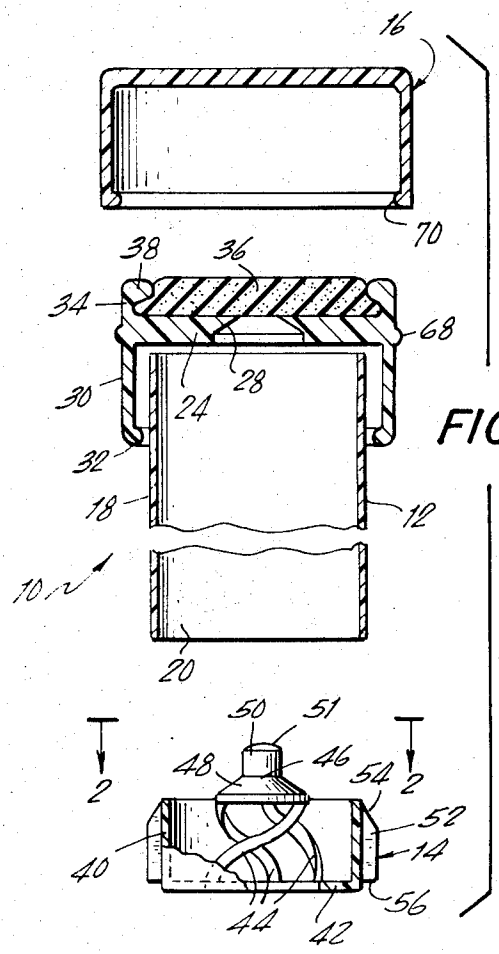


FIG. 1

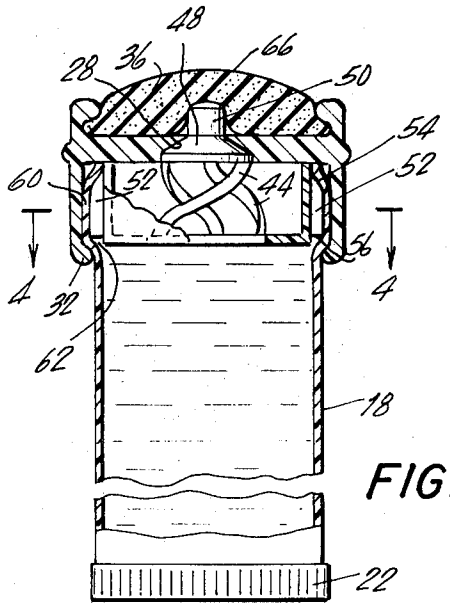


FIG. 3

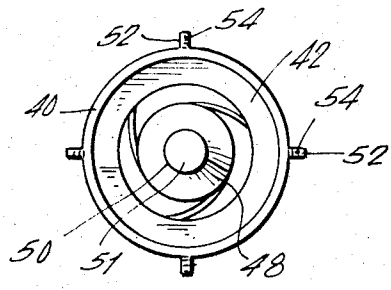


FIG. 2

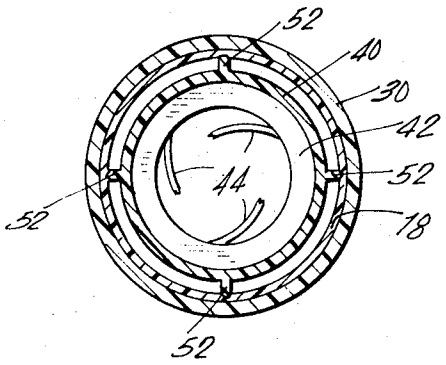


FIG. 4

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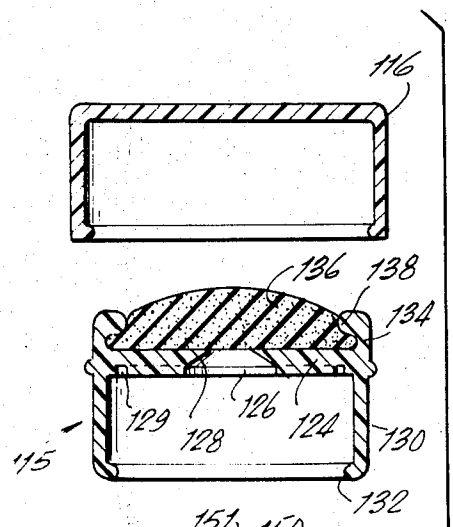


FIG. 5

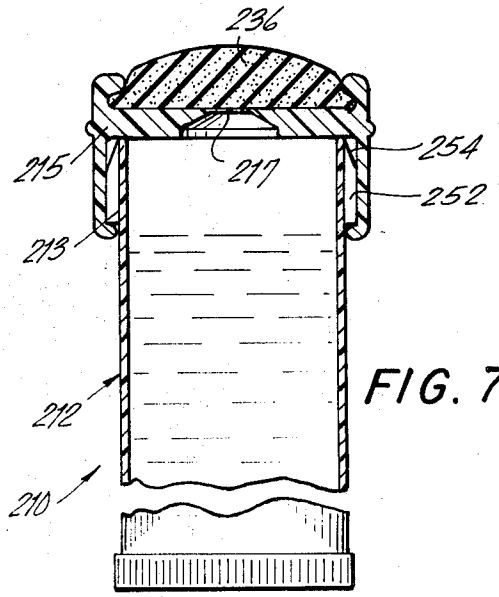
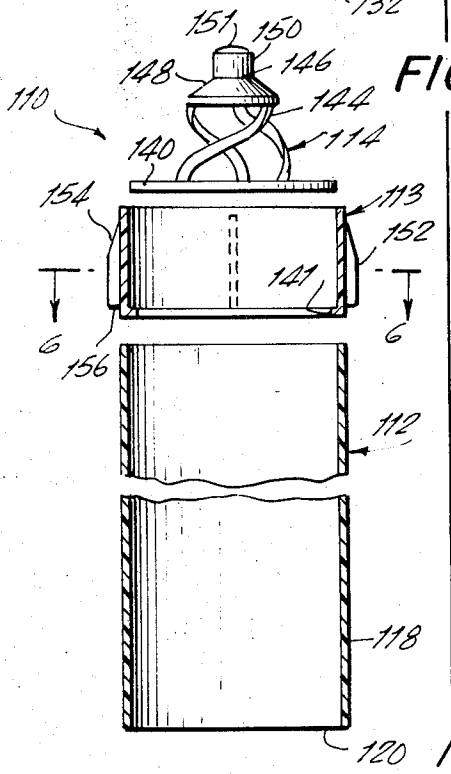


FIG. 7



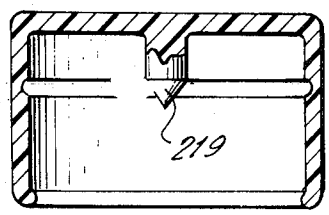


FIG. 8

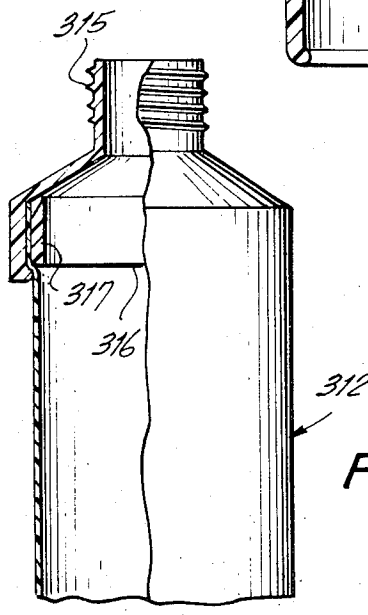


FIG. 9

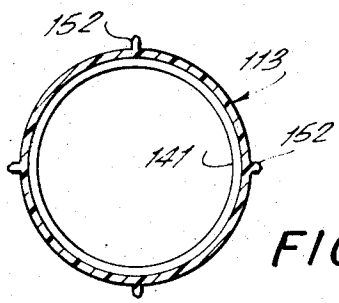


FIG. 6

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APPLICATOR AND CONTAINER HAVING CAM-LOCKING MEANS

This invention relates to an applicator for a squeezable container, and more particularly to a novel arrangement for assembling an applicator wherein a valve assembly is snapped in place in a convenient manner.

This invention is directed to a fluid applicator especially adapted for use in applying cosmetics, medications, shoe polish, or the like and may be adapted for repeated use or as a single use applicator.

An object of the present invention resides in the provision of an applicator for use in combination with a squeezable container such as a plastic tube or the like in which a mounting ring provided with cam members is snapped into position after being force fitted in the tube.

In the past, various types of mounting arrangements for valve assemblies had been provided. When it is desired to provide a cover for the valve opening to be used as an applicator surface, it had heretofore been necessary to secure the cover in place after the valve had been placed in its final assembled position, which sometimes served to destroy the efficiency of the valve. The present invention has the concept of providing a snap action seating arrangement for the valve assembly which can be accomplished after the cover has been positioned over the retaining ring and over the valve seat in a one step convenient operation which may be accomplished immediately prior to the filling of the tube. Alternatively, the filling of the tube can be accomplished at any time long after the valve assembly has been placed in position.

Still another object of the present invention resides in the provision of a novel valve assembly including a mounting ring provided with annularly spaced cam members integrally formed with the valve head and helical springs.

Still further objects and features of this invention reside in the provision of an application which is inexpensive to manufacture, simple to use, capable of metering fluids of various viscosities in an effective manner so that the applicator is capable of effective use in applying medications, cosmetics, polishes, oils, pigments and the like, and which is attractive in appearance.

These, together with the various ancillary objects and features of this invention, which will become apparent as the following description proceeds, are attained by this applicator and container having cam-locking means, a preferred embodiment of which is illustrated in the accompanying drawing, by way of example only, wherein:

FIG. 1 is an exploded longitudinal sectional view of an applicator constructed in accordance with the concepts of the present invention;

FIG. 2 is a top plan view of the valve assembly incorporated in the present invention looking in the direction of the plane of line 2–2 in FIG. 1;

FIG. 3 is a longitudinal sectional view of an applicator in an assembled position;

FIG. 4 is a transverse sectional detail view taken along the plane of line 4–4 in FIG. 3;

FIG. 5 is an exploded longitudinal sectional view of a modified form of the applicator;

FIG. 6 is a horizontal sectional view of the valve assembly incorporated in the present invention taken in the direction of the plane of line 6–6 in FIG. 5;

FIG. 7 is a longitudinal sectional view of a further modified form of applicator designed for a single use in an assembled position;

FIG. 8 is a sectional view of a cap used with the embodiment shown in FIG. 7; and

FIG. 9 is a sectional detail view of an embodiment used with a tube-type container.

With continuing reference to the accompanying drawing, wherein like reference numerals designate similar parts throughout the various views, reference numeral 10 is used to generally designate the applicator constructed in accordance with the concepts of the present invention. The applicator includes two main parts, a container generally indicated at 12 and a valve assembly generally indicated at 14. A cap 16 as desired may be provided.

The container 12 is in the form of an elongated cylindrical tube 18 molded out of any suitable plastic material as is generally used for such packages and is resilient, deformable, flexible, and squeezable, and prior to filling thereof has an open lower end 20 which may be crimped or otherwise sealed at 22 after filling, as shown in FIG. 3.

Integrally formed with the tube 18 is a retaining ring 24 having a tapered opening 26 therein defining a valve seat 28. Further integrally formed with the retaining ring 24 is a projecting portion 30 which extends exteriorally downwardly from the web portion of the retaining ring and surrounding and spaced from the tube 18 and terminates in a inwardly turned bead 32. Also integrally formed with the retaining ring 24 is a flange 34 which extends upwardly. A cover 36 formed of polyurethane foam or other suitable material, which may be covered with fabric, if desired, is positioned on the web portion in the retaining ring 24 overlying the opening 26 and is held in place by the flange being swaged thereover at 38.

The valve assembly 14 includes a mounting ring 40 of slightly less depth than the depth of the projecting portion 30 and has an inwardly extending flange integrally formed therewith. Integral with the flange 42 and rising therefrom are helical coil springs 44 which have formed integrally therewith a valve head 46 having a truncated conical portion 48 and a cylindrical portion 50 terminating in a rounded surface 51.

A plurality of cam members 52 having tapered leading edges 54 and shoulders 56 formed at the base thereof are integral with the mounting ring 40 and are spaced around the periphery thereof, there being four cam members 52 as can be best seen in FIG. 4. The valve assembly 14 is inserted in the container 12 through the open lower end 20 thereof and is force fitted upwardly along the tube 18 until it is snap fitted in position deforming the tube 18, as at 60, and is held in place by the bead 32 pressing the tube 18 and particularly the portion 62 thereof against the shoulder 56 as can be best seen in FIG. 3. In this position, the valve portion 48 closes the valve opening and abuts against the valve seat 28 with the cylindrical portion 50 extending through the opening 26 and the rounded portion 51 of the valve assembly causing the cover to assume an outwardly curved and substantially hemispherical surface 66.

The cap 16 is adapted to be snapped in place over the rib 68 integrally with the retaining ring with its rib 70 cooperating to hold the cover 16 in place. Of course, any suitable other type of rib can be used.

With reference to the embodiment of the invention shown in FIGS. 5 and 6, reference numeral 110 is used to generally designate the modified form of applicator. The applicator 110 includes four main parts, a container generally indicated at 112, a mounting ring 113, a retaining ring 115 and a valve assembly generally indicated at 114. A cap 116 as desired may be provided.

The container 112 is in the form of an elongated cylindrical tube 118 molded out of any suitable plastic material as is generally used for such packages and is resilient, deformable, flexible, and squeezable, and prior to filling thereof has an open lower end 20 which may be crimped or otherwise sealed at 22 after filling, as shown in FIG. 3.

The retaining ring 115 has a web 124 provided with a tapered opening 126 therein defining a valve seat 128. A groove 129 of circular shape optionally is formed in the web 124 for receiving the upper edge of the mounting ring 113. Further integrally formed with the web 124 is a projecting portion 130 which extends exteriorally downwardly from the web 124 and which terminates in an inwardly turned bead 132. Also integrally formed with the retaining ring 115 is a flange 134 which extends upwardly. A cover 136 formed of polyurethane foam or other suitable material, which may be covered with fabric, if desired, is positioned on the web 124 overlying the opening 126 and is held in place, the flange being swaged thereover at 138.

The valve assembly **114** includes a base ring **140** adapted to seat on flange **141** of mounting ring **113**. The mounting ring **113** is of slightly less depth than the depth of the projecting portion **30** and has the inwardly extending flange **141** integrally formed therewith. Integral with the base ring **140** and rising therefrom are helical coil springs **144** which have formed integrally therewith a valve head **146** having a truncated conical portion **148** and a cylindrical portion **150** terminating in a rounded surface **151**.

A plurality of cam members **152** having tapered leading edges **154** and shoulders **156** formed at the base thereof are integral with the mounting ring **113** and are spaced around the periphery thereof, there being four cam members **152** as can be best seen in FIG. **6**. The valve assembly **114** is inserted in the tube **112** through the open lower end **120** thereof and is force fitted upwardly along the tube **118** until it is snap fitted in position deforming the tube **118**, the tube **118** and the mounting ring **113** being held in place by the bead **132** pressing the tube **18** against the shoulder **156**. In this position, the valve portion **148** closes the valve opening and abuts against the valve seat **128** with the cylindrical portion **150** extending through the opening **126** and the rounded portion **151** of the valve assembly causing the cover to assume an outwardly curved and substantially hemispherical surface **166**. The cap **116** is adapted to be snapped in place over the rib **168** integrally with the retaining ring.

Referring now to FIG. **7**, herein is disclosed a further form of the invention wherein the parts are generally similar to those shown in FIG. **5**, however the valve assembly **114** is eliminated and the mounting ring is provided with a frangible seal. This form of applicator is generally designated by reference numeral **210** and includes three main parts, a container generally indicated at **212**, a mounting ring **213** and a retaining ring **215**.

The container **212** is substantially the same as container **112** and the mounting ring **213** is of the same general construction as mounting ring **113**. The retaining ring **215** is similar to retaining ring **115** with the exception that seal **217** is provided for the ring **113** as an initial closure and is in the form of a thin film integrally with or separately applied to the retaining ring **215**.

This seal is broken either by pressure applied on the tube **212** or by a depending prong **219** integrally formed in the cap **216**, shown in FIG. **8**, which is pushed through the cover **236** and the seal **217**. This form of the invention is therefore especially adapted for packaging and dispensing medications and the like as an inexpensive single dosage package.

In FIG. **9** there is shown an adaptation of the invention for use with a container such as a toothpaste tube or the like. Herein, the tube **312** is held in position relative to an upper part **315** by the mounting ring **316** and associated cam elements **317**.

A latitude of modification, substitution and change is intended in the foregoing disclosure, and in some instances, some features of the invention will be employed without a corresponding use of other features.

I claim:

1. An applicator comprising a flexible container, a retaining ring at the upper end of said container a cover secured to said retaining ring, said retaining ring having an opening therein, a cylindrical projecting portion integral with said retaining ring and concentric with and surrounding said container, said projecting portion having an inwardly beaded lower end, and a mounting ring concentric with said container having a plurality of spaced upwardly tapered cam members, said mounting ring having cylindrical sidewalls of less depth than said projecting portion and having a flange integral with the lower part thereof, a valve assembly integral with said flange and rising above said mounting ring and extending into said opening, said mounting ring being force fitted in said container and forming outwardly deformed portions in said container, said cam members seating in said deformed portions and being locked in said container by said beaded lower end engaging said deformed portion holding said retainer ring, said mounting ring, and said container assembled.