April 22, 1969 D. J. EVRAS 3,439,846

NONLEAK, NONSPILLABLE BOTTLE CAP

Filed June 26, 1967

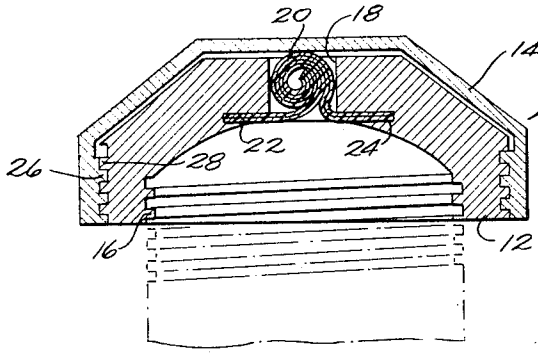


Fig. 1

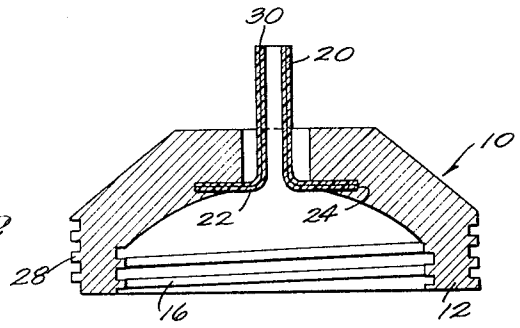


Fig. 2

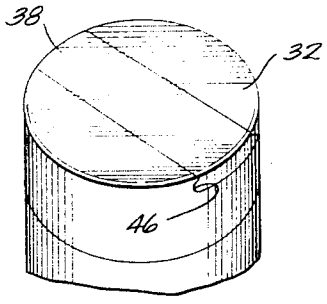


Fig. 3

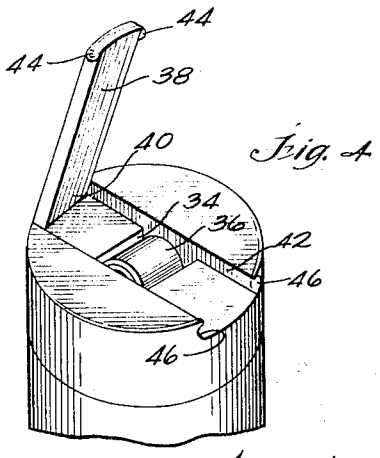


Fig. 4

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United States Patent Office 3,439,846 Patented Apr. 22, 1969

3,439,846

NONLEAK, NONSPILLABLE BOTTLE CAP

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Filed June 26, 1967, Ser. No. 648,569
Int. Cl. B65d 5/64, 25/40, 35/38
U.S. Cl. 222—494 4 Claims

ABSTRACT OF THE DISCLOSURE

Disclosed herein is a cap assembly for a flexible liquid container. A collapsible discharge nozzle is mounted in an opening in the assembly and collapses into the opening whenever it is not in use. A cover is used to hold the nozzle in the opening when not in use.

Background of the invention

This invention relates to cap assemblies for pressure discharged containers and is more specifically related to an improvement in a pressure actuated discharge type nozzle. The increased use of plastic or flexible containers for such products as liquid soap, oil, cleaning fluids, toothpaste and the like has presented some difficulties principally in the elimination of waste through spillage. Any time a cap is left off of a bottle or container there is the chance that it will be turned over allowing the liquid to run out of the container. The same is also true of tubes which are left on the counter with the caps removed.

Summary of the invention

In the present invention a cap assembly having a nonleak nozzle is secured to the spout of a container or bottle. The nonleak nozzle is a collapsible type tube that inherently returns to a collapsed condition whenever pressure is released from the nozzle. In the collapsed position the nozzle will be rolled up into a recess in the cap assembly. The discharge nozzle can be formed of plastic material and can contain a spring to increase the return bias on the nozzle. A cover may be used to close the recess so that the discharge nozzle will not unroll when pressure is applied to the container.

Other objects and advantages will become more readily apparent from the following detailed description when read in connection with the enclosed drawing in which:

FIG. 1 is a side view in section of an improved cap assembly.

FIG. 2 is a side view in section of the improved cap assembly with the top or cover removed and the discharge nozzle shown fully extended.

FIG. 3 is a view of a modified type cap assembly having a flip-up type cap.

FIG. 4 is a projection view of the modified cap showing the cap flipped up.

Referring more specifically to FIGS. 1 and 2 of the drawing, the improved cap assembly **10** includes a top **12** and a cover **14**. The top has an internal thread **16** which is formed to matingly engage a similar thread on a bottle or tube. Any other form of securing means such as a snap-on lip, can be provided in the top depending on the form of the spout in the container. An opening **18** is formed near the upper central portion of the top and a groove **24** is provided around the inner end of the opening. A flat flexible tube **20** is secured in the opening **18** by inserting lip **22** on the end of the tube into groove **24**. An adhesive may be used to secure the lip in the groove

or the groove squeezed tightly against the lip. Sufficient room is provided in the opening to allow the tube to roll up into the opening when not in use. The tube will be unrolled when sufficient pressure is applied to the tube to overcome its inherent bias causing the tube to unroll from the opening.

Cover **14** is also provided with an internal thread **26** which matingly engages the external thread **28** on the outside of the top. The cover is screwed tightly onto the top until it entraps the rolled up tube within opening **18**. When the cover is removed from the top as in FIG. 2 and pressure applied to the liquid to be dispensed, the liquid will cause the tube to unroll allowing for the discharge of the liquid through the tube.

The cap assembly can be used on any plastic type container that is to be squeezed to remove the liquid within the container. If a product to be dispensed has a high density, such as toothpaste, it may be necessary to mount a spring **30** within the collapsible tube to provide sufficient return bias to force any of the toothpaste in the tube back into the container. Since the tube is relatively flat, the spring will cause the tube to roll up forcing whatever material is in the tube back into the container.

In the modified arrangement shown in FIGS. 3 and 4, top **32** has a similar internal construction as in FIGS. 1 and 2 in that an internal thread is provided for mounting the top on a bottle or tube. An opening **34** is provided in the top and a roll-up type discharge tube **36** mounted in the opening. The opening is made large enough to allow the tube to roll up into the opening. The discharge tube is retained in the opening by a flip-up cover **38** that is mounted on a pivot pin **40** for pivotal motion into groove **42**. The discharge tube will roll up into the opening **34** due to its own inherent return bias and the flip-up cover pushed into the groove to prevent it from unrolling. A small detent button **44** is provided on each side of the flip-up cover to seat in recess **46** provided at the end of the groove. In the operation of this type of a cover it is only necessary to flip up the cover to release the tube and when pressure is applied to the liquid in the container the liquid will unroll the tube allowing the liquid to be discharged.

The cap assembly has been described as being screwed onto the container for the liquid to be dispensed. It is also possible to mold the cap assembly directly onto the container and to insert the roll-up nozzle after the cap is formed. In pressure actuated containers it also may be necessary to include a pressure relief port in the cap with a flapper type one way valve to allow the container to expand after the container has been squeezed to discharge the product.

Although only two embodiments of the present invention have been shown and described it should be apparent that various changes and modification can be made herein without departing from the scope of the appended claims.

I claim:

1. A removeable closure device which is adapted to be mounted on the threaded discharge opening of a resilient type liquid container, said device comprising:

a top having an inner threaded section and a centrally disposed opening,

a resilient discharge tube having one end sealingly secured to the opening,

said tube having an inherent return bias wherein said tube will roll up into said opening whenever the pressure imposed on the liquid in the container is less than the return bias of the tube.

2. A closure device according to claim 1 wherein said top has an outer threaded section and including:

cover means having a threaded section corresponding to said top for preventing the discharge tube from unrolling from the opening.

3. A closure device according to claim 1 wherein said top includes a recess and said cover means comprises a flat strip pivotally mounted for movement into and out of said recess in said top.

4. A closure device according to claim 1 including a cover means having a cup shape to matingly engage the top to prevent the discharge tube from unrolling from said opening.

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U.S. Cl. X.R.

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