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BOTTLE CLOSURE HAVING TEAR STRIP AND RECLOSURE FEATURES

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2 Sheets-Sheet 1

Fig. 1.

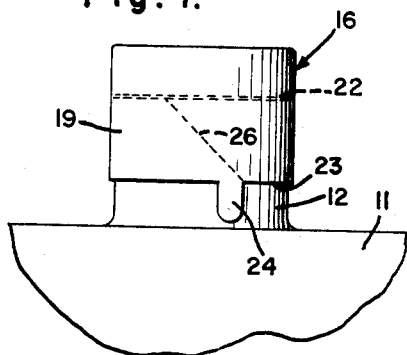


Fig. 2.

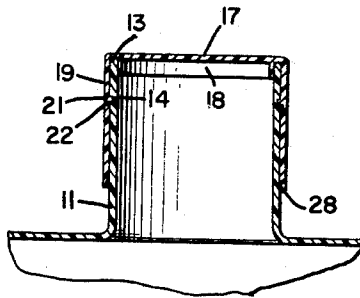


Fig. 3.

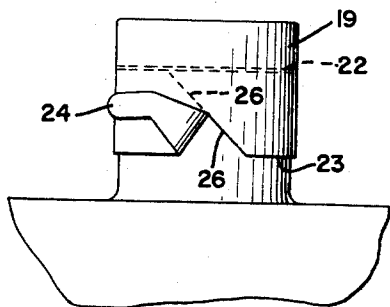


Fig. 4.

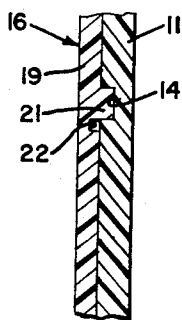
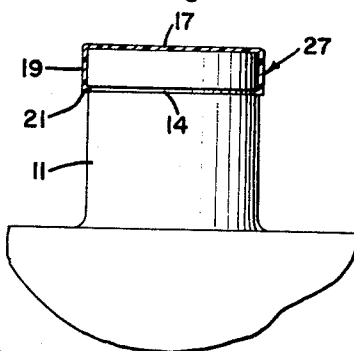


Fig. 5.

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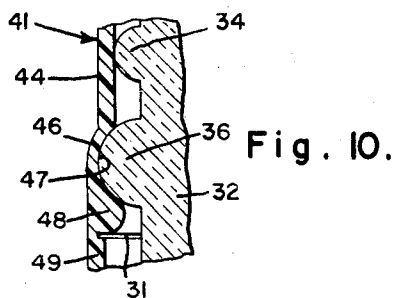
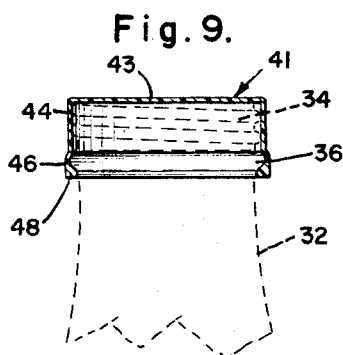
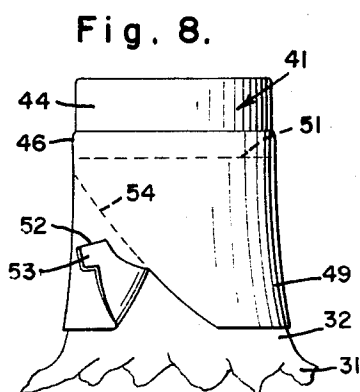
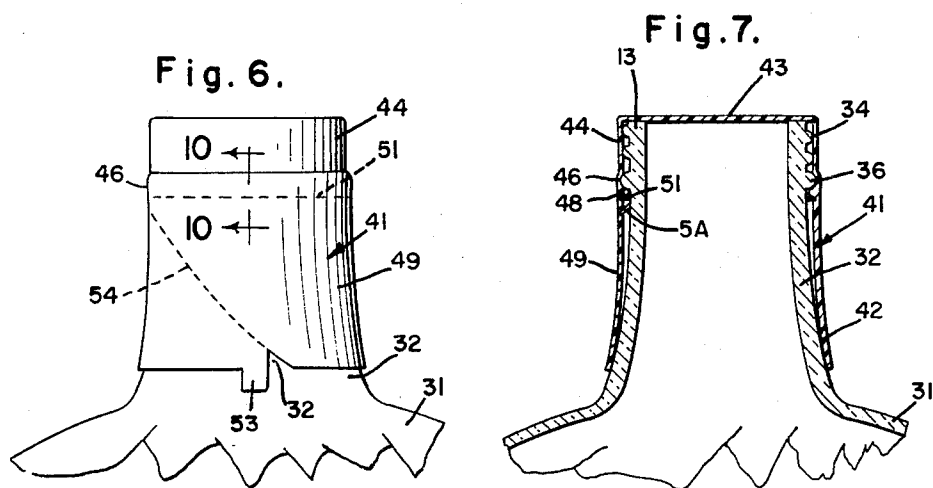
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2 Sheets-Sheet 2



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BOTTLE CLOSURE HAVING TEAR STRIP AND RECLOSURE FEATURES

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1 Claim. (Cl. 215-46)

This invention relates to a new and improved closure for bottles, the closure having a weakened score line or lines formed therein at the time of manufacture which facilitate tearing of a skirt portion of the closure to permit removal from the bottle neck but which is so located that a portion of the closure comprising a cap remains for reclosure purposes as required. Accordingly, the present invention provides a cap for a necked bottle which has an elongated skirt fitting down over the neck and frictionally and otherwise engaging the same so that the closure cannot be removed from the neck without destroying the same. Since the skirt must be torn before access to the contents is provided, it is impossible to remove or refill the contents of the bottle without detection. Nevertheless, when the elongated skirt is torn to provide access to the contents, the upper portion of the cap remains intact and serves to reclose the bottle as required.

The present invention provides a seal-like closure wherein the seal must be broken before access to the contents is afforded.

A further feature of the invention is the fact that a reclosure cap is provided which may be used for temporarily closing the bottle during storage at the point of consumption or on other occasions after a portion of the contents of the container has been removed.

A particular feature and advantage of the invention is the fact that the closure may be initially installed very easily. The skirt is elongated and of a moderately resilient plastic material and hence is fairly flexible. Thus the bottom edge of the skirt is fitted over the upper end of the neck of the bottle and pressed downwardly permitting the closure to flex so that it slips down over the neck and seats securely. Once it is seated the resiliency of the closure causes a frictional engagement between the closure and neck which prevents the closure from being pulled off of the neck.

It will be understood that at the present, bottles of the type with which this invention is concerned employ plastic sleeves or the like which fit over the cap and around the neck. Installation of such closures requires initial seating of the cap on the neck of the bottle and then the application of the plastic sleeve. The present invention reduces the amount of labor and simplifies the operation of sealing the bottles.

The foregoing type of closure requires that the plastic sleeve must be cut by a knife or other sharp instrument to provide access to the contents of the bottle. Locating and using such an instrument is a source of annoyance and hence the present invention enables the consumer to open the bottle much more easily than in conventional construction.

A still further feature of the invention is the fact that the closure is considerably less expensive to manufacture than conventional closures, requires less labor to install, and has additional advantages in simplicity of construction.

The present invention may be used with conventional glass bottles of the type used to merchandise bottled water or may be used also with thin walled plastic containers. When used with the plastic type container, which is becoming increasingly popular in vending liquid, the resilient nature of the plastic neck and closure cap enables the bottle to "breathe." Thus when such bottles are used to store chemical solutions, building up of pressure

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within the bottle enables gas to escape through the seal and prevents excessive pressure from building up. Further, although the seal will not leak during ordinary usage, unusual compressive force applied to the bottle will permit a part of the contents to leak out through the seal which is preferable in many instances to fracture of the bottle itself.

Another feature of the invention shown in one of the modifications hereof is the provision of a cap of the character described which slips over the screw neck of a conventional bottle.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings in which similar characters of reference represent corresponding parts in each of the several views.

In the drawings:

FIG. 1 is a side elevation of the closure of the present invention and the upper portion of a container of the plastic variety.

FIG. 2 is a vertical sectional view through the structure of FIG. 1.

FIG. 3 is a view similar to FIG. 1, showing the commencement of the tearing of the skirt of the closure to open the same.

FIG. 4 is a vertical sectional view showing the skirt torn and removed with the reclosure cap in place, the cap being in section.

FIG. 5 is an enlarged fragmentary sectional view through a portion of the neck and closure of the structure of FIG. 1.

FIG. 6 is a side elevation of a modified closure of the present invention and the upper portion of a screw neck glass container on which the closure is applied.

FIG. 7 is a vertical sectional view through the structure of FIG. 6.

FIG. 8 is a view similar to FIG. 6 showing the commencement of the tearing of the skirt of the closure.

FIG. 9 is a view similar to FIG. 8 showing completion of the tearing of the skirt of the closure and showing that the remaining portion of the closure may be used as a reclosure cap.

FIG. 10 is a fragmentary, enlarged sectional view taken substantially along the line 10-10 of FIG. 6.

In the form of the invention shown in FIGS. 1 to 5 the closure is used to close container 11, a thin-walled plastic type such as polyethylene or polystyrene, it being understood that a variety of plastic material is available for such purpose. Essentially, the container is relatively strong and light in weight and resistant to chemical action of most common liquids with which it is likely to be used. Although the walls are reasonably rigid, nevertheless there is sufficient resiliency in the plastic material so that they will flex somewhat under compression.

The shape of the container is not shown in detail in FIGS. 1 to 5, it being understood that such shape is subject to considerable variation. Preferably, however, the container has a thin-walled, relatively short, vertical neck 12 projecting upwardly from the body 11 of the container. The upper edge 13 of the neck is approximately square and lies in a common, horizontal plane. A groove 14 is formed in the exterior of neck 11, spaced downwardly from lip 13 a short distance such as approximately 1/4" and shaped rectangular, and preferably square, in cross-section.

It will be understood that considerable variation in the construction of the neck of the container may be practiced without departing from the spirit of the invention hereinafter described.

The closure 16 which is used with the container 11 is preferably formed of a plastic material which is sufficiently resilient so that it fits securely around neck 12

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and forms a tight seal against the same. The material of which the closure 16 is formed has the further characteristic that it may be torn with the fingers to obtain access to the container and has the additional feature that the plastic is of such characteristic that the upper portion snaps over the end of the neck 13 to form a reclosure as frequently as desired.

Closure 16 has a top circular disc 17 fitting over lip 13 and having an outside diameter slightly greater than that of neck 11. Disc 17 fits tightly against and seals against lip 13. Interiorly of lip 13 is a depending short inner skirt 18 which fits inside the upper end of neck 12 and assists in sealing the closure on the neck 11. Inner skirt 18 merges with and is integrally formed with disc 17. The outer peripheral skirt 19 is likewise integral with disc 17 and is elongated in the sense that it fits down the neck 12 for a substantial portion of the length thereof. Skirt 19 is substantially vertical. Outer skirt 19 is formed with an integral, internal, horizontal projecting bead 21 spaced downwardly from disc 17 such a distance that it fits into groove 14 and helps in locking the closure on the container. Bead 21 is complementary to the shape of groove 14 and has relatively sharp corners. Immediately below bead 21 a horizontal groove 22 is formed in the inner surface of skirt 19. The groove 22 is preferably of alternating greater and lesser depths, the maximum indentation being approximately of the length of $\frac{1}{32}$ inch and separated by portions of lesser depth and of approximately the same length. The weakening of the skirt at groove 22 facilitates in tearing the skirt to provide a reclosure cap as hereinafter appears.

At the bottom edge 23 of the skirt an integral, downwardly projecting tab 24 is formed to provide a finger grip. From a point immediately to the right of tab 24 as viewed in FIG. 1, there slants upwardly at an angle of approximately 45° an internal groove 26 which extends up until it intersects with groove 22. When the user grips tab 24 and pulls upwardly in the direction approximately that indicated by the displacement of tab 24 from the position shown in FIG. 1 to the position shown in FIG. 3, the skirt 19 tears along score line 26. The user continues to pull on the tab 24 until the skirt tears along line 26 and reaches groove 22. The user then continues to pull the lower portion of the skirt 19 around the circumference of the neck 12 until the portion below groove 22 is separated from the upper portion and is discarded. The container and closure then assume the position shown in FIG. 4. It will be seen that the disc 17, upper portion of skirt 19, and bead 21, provide a reclosure cap which may be snapped onto and off of neck 12 as required.

In use, at the point of filling of the container 11, the closure 16 is installed by fitting the lower edge 23 of skirt 19 over lip 13, the inner bottom edge of skirt 19 being formed with a bevel 28 as best shown in FIG. 2, the bevel 28 assists in seating of the closure on neck 12. Disc 17 is pressed downwardly and accordingly skirt 19 slides down over neck 12 and bead 21 snaps into groove 14. Inner skirt 18 seals inside lip 13 and outer skirt 19 seals outside neck 12. Therefore a substantially water and airtight seal is provided. The closure 16 cannot be pulled off the neck without fracturing the skirt 19. As has been mentioned, if the container 11 is sufficiently flexible, unusual compressive forces applied accidentally to the container will enable some of the contents to leak out by reason of relative deformation of the neck 12 and closure 16, thereby preventing the container itself from fracturing. Once the unusual force is removed, the seal is intact. Leakage of liquid in this manner is only outwardly and cannot enable harmful substances to enter from the outside. Further, certain chemical solutions which may be packed in container 11 sometimes emit gases under certain conditions. Such gases may escape through the seal between the neck 12 and closure 16 but, on the other hand, gases cannot enter the container. So

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long as skirt 19 remains intact as shown in FIGS. 1 and 2, the contents of the container cannot be removed.

At the point of consumption, the user grasps tab 24 and pulls upwardly with a twisting motion along the direction of groove 26. Tearing is continued until the skirt is torn along the full length of groove 22. Upon completion of the tearing, the upper portion 27 remains seated on neck 12 as shown in FIG. 4. The consumer can remove the upper cap 27 merely by prying the bead 21 out of the groove 14. Upper cap 27 may be used to reclose the container by merely pressing it down into its initial position. Cap 27 may be removed and replaced as many times as required.

The form of the invention shown in FIGS. 6-10 is used to close containers such as glass bottles formed with necks. As illustrated herein, the bottle 31 has a neck 32 terminating at its upper end in a lip 13 and having on its exterior screw threads 34. The threads 34 are conventionally used in connection with a metal cap having mating threads. Immediately below the threads 34 is a circumferential bead 36. Although the foregoing construction is particularly suited to the present invention, nevertheless it will be understood that considerable variation in the construction of the neck of the container may be practiced without departing from the spirit of the invention hereinafter described.

The closure 41, which is the subject of this invention, is preferably formed of a plastic material which is sufficiently resilient so that it fits securely around the neck 32 and forms a tight seal thereagainst in the zone indicated by reference numeral 42 in FIG. 7. The material of which the closure 41 is formed is similar to that of FIGS. 1-5.

Closure 41 has a top circular disc 43, fitting over lip 13 and having an outside diameter slightly greater than that of the threads 34. Disc 43 fits tightly against and seals against lip 13. An upper peripheral skirt 44 depends from disc 43 and fits over the threads 34. Upper skirt 44 flares outwardly as indicated by reference numeral 46 at the level of bead 36, and is formed with an internal groove 47 at zone 46 which fits around bead 36. Below groove 47 is an inwardly projecting circumferential bead 48 which fits under the bead 36 of the neck 32. Below bead 48 is a lower skirt 49, preferably formed somewhat thinner than the portion above bead 48 so that it may be torn as hereinafter appears. Lower skirt 49 seals around neck 32 with a fairly tight fit.

A circumferential internal score line 51 is formed immediately below internal bead 48 on the interior of the skirt of the closure. On the lower edge of the skirt is a slit 52 and immediately adjacent thereto is a downwardly projecting tab 53. By gripping the tab 53 and pulling upwardly, the slit 52 commences the tearing of the skirt. Preferably a spiral or helical internal score line 54 winds upwardly from slit 52 to a juncture with score line 51.

Installation and use of the closure shown in FIGS. 6-10 inclusive is essentially the same as in the preceding modification.

What is claimed is:

A cap of plastic material for a substantially vertical container neck, said neck having a circumferential groove of square cross section, comprising a flat top disk closing off the open end of said neck and a substantially vertical, thin wall, cylindrical skirt depending from said top disk and tightly engaging the exterior of said neck, said skirt being scored and weakened in a circumferential first line spaced downwardly from the top of said skirt and also in a spiral configuration second line joining said first line and extending down to the bottom edge of said skirt, said skirt formed with a slit at the lower extremity of said second line, an integral tab extending substantially vertically from the lower edge of said skirt adjacent the lower end of said second line,

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an internal circumferential bead on the inside of said skirt spaced downwardly from said top and immediately above said first line, said bead being square in cross section with sharp corners to fit snugly in said groove, said skirt being of substantially uniform thickness both above and below said bead, and a second short skirt concentric with and of lesser diameter than said first mentioned skirt depending from said top disk to fit inside said neck, said cap formed of relatively flexible, thin plastic material which may be torn along said second and first lines when said tab is pulled with the fingers, said cap being outwardly deformable upon application of internal pressure in the container to which it is applied partially to unseat said bead from said groove to

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permit leakage of air from said container in an outward direction only upon application of severe compressive force to said container, whereby said container leaks but does not fracture upon application of said force.

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