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TEARABLE BOTTLE CAP

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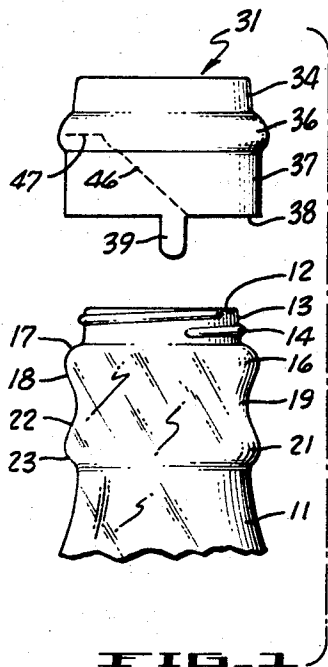
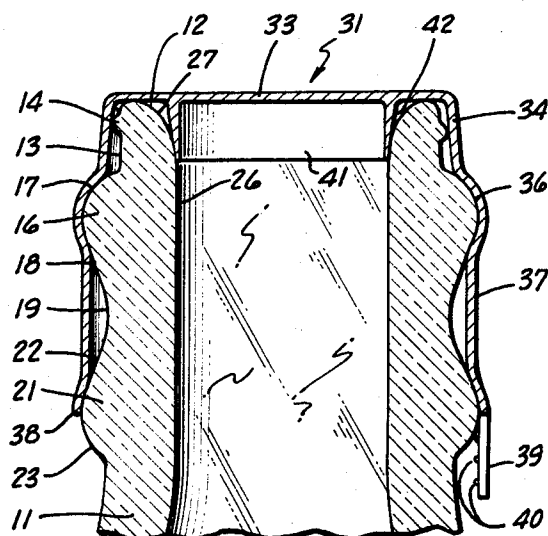


FIG. 2

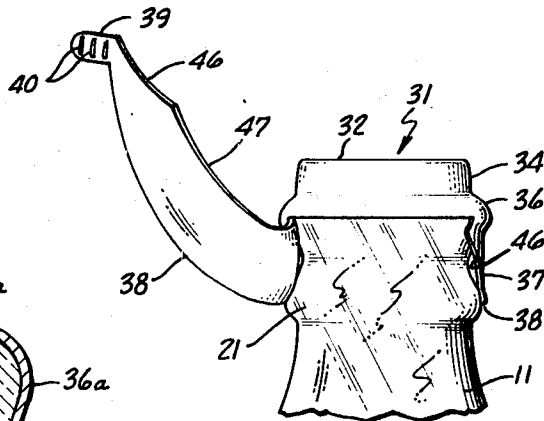


FIG. 3

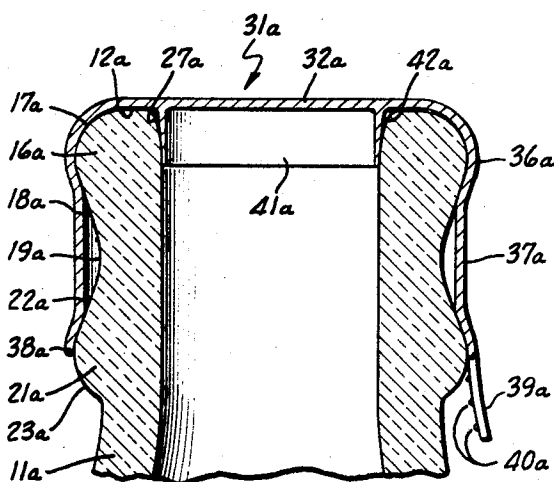


FIG. 4

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1

3,392,860

TEARABLE BOTTLE CAP

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ABSTRACT OF THE DISCLOSURE

A plastic bottle cap for 5-gallon water bottles, and the like, has a central disc with a depending skirt which fits snugly around the exterior of the bottle neck and, so long as it remains intact, prevents tampering with the contents. The lower part of the skirt is scored and provided with a tab so that it may be partially torn off, thereby facilitating easy removal of the cap to dispense the contents. The cap may also have a hollow plug sealing in the inside of the neck. The score lines are so constructed that when the installer of the bottle tears the cap skirt he can readily remove the cap from the neck without his hands coming in contact with the bottle lip and thus contaminating the contents.

This invention relates to a new and improved plastic water bottle cap of the type used on five gallon water bottles either of the type having a screw neck or a crowned neck. The cap has a hollow plug sealing in the inside of the neck and also a depending skirt which fits snugly around the exterior of the neck of the bottle and, so long as it remains intact, prevents tampering with the contents. Thus when the skirt is intact, liquid cannot be added to or removed from the bottle. However, the lower part of the skirt is scored and provided with a tab so that it may be partially torn off, thereby facilitating easy removal of the cap to dispense the contents.

A particular feature and advantage of the present invention is the fact that prior to tearing of the skirt the upper part of the neck of the bottle, as well as the lip and interior of the neck, are sealed against contamination from dirt. Another important feature of the invention is the fact that when the skirt is torn and the cap removed, the likelihood of the hands of the user coming in contact with the upper end of the neck is practically eliminated. This feature is of extreme importance in sanitation. In prior caps, when the driver who delivers and installs the bottle in a water cooler removes the cap, his hand is in such close proximity to the lip of the neck that contact therewith is not easily avoided and hence contamination may occur. The present invention has for its principal object, therefore, provision of a cap which promotes sanitation.

A still further feature of the construction of the cap is the fact that after the cap has been removed, it may be reinstalled on an empty bottle and used to protect the lip of the bottle against damage during transportation of the bottle back to the point of refilling. In conventional delivery trucks, five gallon bottles are racked on top of each other and this may result in the bottom of the upper bottle chipping or cracking the lip of the neck of the lower bottle and thus reducing the effectiveness of the subsequent seal after the bottle has been used and eventually resulting in discard of the bottle. Accordingly, a still further feature of the present invention is the reduction in damage to the bottles both when the seal is intact and when it is being used to protect a bottle during transportation back to the bottling works.

The torn bottle cap may also be used as a temporary reclosure cap where all of the contents of the bottle are not dispensed at a single time. There is sufficient imperforate area on the cap which interfits with the neck of

2

the bottle to permit the cap to be reinstalled and keep dust out of the bottle.

Five gallon water bottles are conventionally produced by manufacturers in two types. A first type is designed for screw cap closure and has adjacent the upper end two external beads surmounted by a small diameter upper terminal portion exteriorly screw threaded. Such caps may be closed with a cork which fits inside the neck but are primarily designed for closure with screw thread caps. Use either of screw caps or corks is unsatisfactory for reasons which are obviated by the present invention. Corks are intended to be partially driven into the neck of the bottle and for sanitation reasons are customarily covered by a piece of paper which is held in place by a rubber band. Use of such corks is unsanitary for the reason that they are porous and hence extremely difficult to sterilize satisfactorily. Further, the method of installation is labor consuming in that the corks must be driven in place and the paper covers installed. Another disadvantage is the fact that corks and covers tend to become dislodged during transportation of the bottles to the consumer or in some instances the corks are driven inside the bottle by reason of the impact of one bottle against the other. Such corks have a short life and are relatively expensive. None of these undesirable features applies to plastic caps in accordance with this invention.

Screw caps are expensive and they cannot be reused because they cannot be sterilized readily and still comply with sanitary codes in many localities. They tend to leak or unscrew because of vibration during transportation. They sometimes stick so that they cannot readily be unscrewed and generally are time-consuming in installation and removal. None of these disadvantages applies to the present invention.

A still further construction of conventional five gallon water bottles eliminates the screw threaded terminal at the upper end of the neck and such bottles are referred to herein as "crowned." Such bottles are conventionally closed by a cork and the disadvantages of cork closure heretofore mentioned apply equally to this type of cap.

A further disadvantage of all prior caps for bottles of this type is the fact that it is relatively easy to replace the high quality pure water which is intended to be vended therein with ordinary tap water because there is no way that removal and replacement of cap or cork can be readily detected. Such caps encourage dishonesty in that empty bottles can be filled with tap water instead of the high quality water intended to be sold. The present invention provides a cap having a skirt which while intact prevents the contents of the bottle from being substituted. The patron is assured by the appearance of the skirt at the time the bottle is delivered that there has been no tampering with the contents.

A still further advantage of the invention is the fact that the cap seals on the neck of the bottle in a plurality of different locations. Thus, an internal corking skirt is provided which seals against the inside of the neck. In addition, the underside of the top of the cap seals against the top edge or finish of the lip of the neck. In the screw threaded type of bottles, the cap also seals against the exterior of the screw threads. Finally, the skirt seals around the topmost external bead as well as against the upper edge of the lower bead. Sealing in a plurality of locations reduces the tendency of the contents to leak or for contaminants to enter the bottle.

A principal feature of the invention is its low cost of manufacture and the facility with which the cap may be installed at the bottling works and removed at the premises of the patron.

Other objects of the present invention will become apparent upon reading the following specification and re-

ferring 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 an exploded side elevational view of a cap in accordance with one form of the invention and the upper portion of a bottle neck with which the cap is used.

FIG. 2 is an enlarged vertical midsectional view showing the cap and bottleneck in assembled position.

FIG. 3 is a partially schematic side elevational view showing the skirt in the act of being torn preliminary to removal of the cap.

FIG. 4 is a view similar to FIG. 2 of a modification.

One conventional type of five gallon water bottle used for spring water, distilled water and the like is shown in FIGS. 1-3 and has a neck 11 terminating in an upper edge or finish 12 which is annular. Immediately below finish 12 the neck has a small diameter cylindrical upper terminal portion 13 provided with an external screw thread 14 of slightly more than one turn. Such thread 14 is intended for use with a screw cap but such screw cap is not used in accordance with this invention. Below terminal portion 13 is an external upper bead 16 having a substantially circular arcuate upper corner 17 and a downwardly-inwardly tapering lower curvature 18 which terminates in a minimum diameter portion 19 which is substantially the same as the diameter of terminus 13. Below minimum diameter portion 19 is a second bead 21 having an upper curvature 22 which extends upwardly-outwardly in a parabolic curve 22 and then curves inwardly-downwardly in a circular arc 23 merging with the upper end of neck 11. Customarily, the bottle is made of glass although the present invention contemplates rigid plastic substitutes for glass. The interior of the bottleneck 11 has a generally cylindrical inner diameter 26 terminating adjacent the finish 12 in an outwardly flaring bevel 27.

Cap 31 is initially unitary and is a thin-walled plastic such as polyethylene or polystyrene, it being understood that a variety of plastic materials is available for such purpose. The quality of the plastic is such that it is sufficiently resilient so as to slip over the external beads and yet to snap back to form tight seals as heretofore described. The material is further characterized by the fact that it may be torn with the fingers along a score line as hereinafter explained to obtain access to the container.

Cap 31 has a top circular disc 32 having an external diameter about equal to the inside diameter of top finish 12 of neck 11. Depending from the underside of disc 32 is an internal or corking skirt 41 having a downwardly-inwardly external surface 42 which fits tightly inside the neck portion 26 with a seal. The bevel or flare 27 of the neck facilitates proper seating of skirt 41. Around the perimeter of disc 32 is an upper skirt portion 34 which is approximately cylindrical but in practical construction tapers downwardly-outwardly and which has an inside diameter equal to the outside diameter of thread 14 and a length such that its lower end abuts surface 17 of bead 16. The thread 14 seals against the interior of portion 34. Below portion 34 is an external bead 36 which is complementary to bead 16 and terminates in a vertical skirt 37 having a lower edge 38 which fits over and seals against the surface 22 of bead 21. Depending from bottom edge 38 is a tab 39 having horizontal ribs 40 on its inside surface to facilitate gripping with the fingers of the user. Slanting upwardly at approximately a 45° angle as best shown in FIG. 1 is an internal score line which commences at bottom edge 38 immediately to the right of tab 39 and slants up to the midpoint of bead 36 where it merges with a horizontal internal score line 47. The arcuate length of score line 47 is less than 180°, being preferably approximately 150°. Score

lines 46, 47 are sufficiently deep so that when the user grips the tab 39 and pulls upwardly and outwardly as best illustrated in FIG. 3, the skirt tears along said lines to permit removal of cap 31 as hereinafter explained.

In use, cap 31 is installed by pressing downward, corking skirt 41 being guided by curved surface 27 into the assembled position. The diameter of skirt 37 is greater than that of cylindrical portion 13 and hence fits easily over that portion. By reason of the fact that surfaces 17 and 22 are rounded, when downward pressure is applied on cap 31, the cap stretches so that it slips over beads 17 and 21 and then contracts to its initial condition with tight sealing engagement against bead 16 and the upper surface 22 of bead 21 as well as with thread 14, lip 12 and the interior of neck 26. In such position the contents of the bottle are not subject to tampering since the cap cannot be removed without tearing the skirt. Water cannot leak out of the bottle nor can dirt or other contaminants enter. Of equal importance is the fact that the exterior of the bottle around the neck is also protected from contaminants.

When the bottle reaches its destination, it is customarily unloaded from a truck by the driver and installed in a water cooler, although such end use is not essential to practice of the present invention. The user grasps tab 39 and pulls upwardly and outwardly with a twisting motion as best illustrated in FIG. 3, tearing along lines 46 and 47. Continued pulling of tab 39 upwardly and outwardly unseats cap 31 from the neck of the bottle, the plastic stretching sufficiently after the skirt has been perforated as indicated to permit removal of the cap. The hands of the user are far removed from the upper end of the neck and hence the danger of contamination of the surface or of the contents by contact of the hands is eliminated.

When desired, the cap in the condition shown in FIG. 3 may be used for reclosure purposes. The cap fits on the bottleneck sufficiently tightly to prevent dirt from contaminating the water, and in fact the cap is partially water-tight under normal storage conditions. A principal purpose of the perforated cap, however, is the fact that it may be reapplied to an empty bottle and when thus used protects the bottle from chipping or cracking during transportation back to the bottling works.

The shape of the bottleneck 11 shown in FIGS. 1-3 is only one of two common types of bottlenecks commercially available. FIG. 4 illustrates a common alternate construction wherein the terminus 13 is eliminated. The neck 11a illustrated is in other respects similar and similar characters of reference are used followed by the subscript *a*. Cap 31a is similar to that of the preceding modification in construction and use except for the fact that the portion 34 is eliminated. The same reference numerals are used in the cap followed by the subscript *a*.

Although the foregoing invention has been described in some detail, by way of illustration and example for purposes of clarity and understanding, it is understood that certain changes and modifications may be practiced within the spirit of the invention and scope of the appended claims.

What is claimed is:

1. In combination, a container having; a container neck having an annular finish at the end of said neck, an upper external first bead having a substantially circular arcuate upper corner and a downward tapering lower curvature ending in a minimum diameter portion and a second bead below said minimum diameter portion; and a cap of a flexible plastic material, said cap deformable to accommodate minor variations in bottle dimensions and also to permit said cap to stretch over said first bead, said cap preformed and having substantially uniform wall thickness throughout, said cap comprising a flat top disc having a diameter about equal to that of said finish, an external third bead below said disc complementary to and tightly engaging said first bead down to

5

the upper end of said lower curvature, and a vertical skirt below said external third bead having a diameter less than said first and second beads of said neck, said external third bead being weakened in a first score line approximately midway of said external third bead and also in a spiral configuration second score line joining said first line and extending down to the bottom edge of said skirt, said skirt being tearable along said second and first lines, said cap in intact condition on said neck sealing said neck against either input or output of liquid, said cap when torn along said second and first lines permitting removal of said cap from said neck.

2. The combination of claim 1 which further comprises a pull tab depending from the lower edge of said skirt to one side of the lower end of said second line.

3. A combination according to claim 2 in which said tab is formed with ribs facilitating gripping with the fingers.

4. A combination according to claim 1 in which the arcuate length of said first score line is less than 180°.

5. A combination according to claim 1 which further comprises a corking skirt depending from said top disc and dimensioned to seal inside said neck.

6

6. A combination according to claim 1; said container having a short cylindrical terminus below said finish formed with external screw threads, said cap further comprising a short depending upper skirt around the periphery of said top disc above said external third bead and having an inside diameter slightly greater than said terminus and slightly less than said threads.

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