United States Patent [19]

Faulstich

[11] **3,840,137**

[45] **Oct. 8, 1974**

[54] **TEARABLE PLASTIC CAP FOR THREADED AND UNTHREADED WATER BOTTLES**

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[22] Filed: **June 4, 1973**

[21] Appl. No.: **366,607**

[52] **U.S. Cl.** **215/256,** 215/321

[51] **Int. Cl.** **B65d 41/48**

[58] **Field of Search** ..... 215/40, 41, 46 A

[56] **References Cited**

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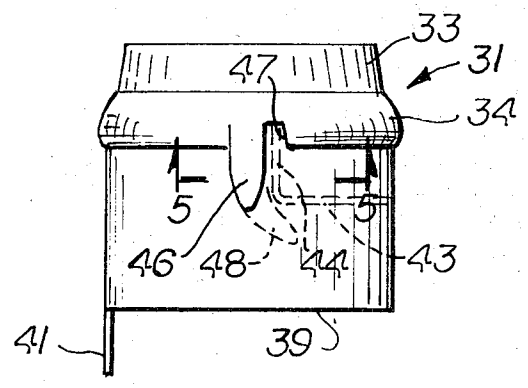
Primary Examiner—Donald F. Norton

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[57] **ABSTRACT**

A plastic cap seals the necks of both threaded type and nonthreaded type conventional water bottles, such as commonly used 5-gallon bottles used in water coolers. The cap has an upper skirt which fits outside the threads of threaded bottles and an external bead which fits over the bottle neck bead immediately below the threaded terminal portion of the bottle neck. The lower end of the upper skirt seats on the top of the bottle neck bead. Internal circumferential beads on the external cap bead grip the undersurface of the bottle neck bead to prevent removal of the cap unless its skirt is torn along pre-formed score lines. When used with unthreaded bottles, the lower end of the upper skirt seats directly on the lip of the bottle neck and the external cap bead fits over the bottle neck bead and the internal circumferential beads grip the bottle neck bead as in the case of threaded bottles. The tear features of the cap permit convenient tearing of the cap skirt which continues up into the external cap bead to allow removal of the cap but to also allow limited reclosure.

5 Claims, 6 Drawing Figures



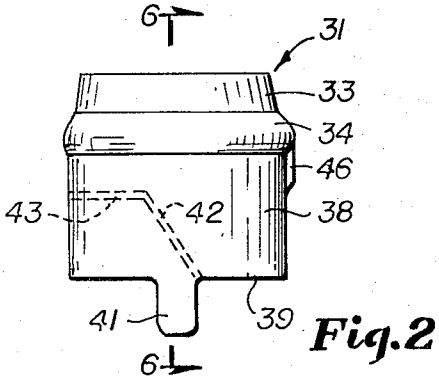


Fig.2

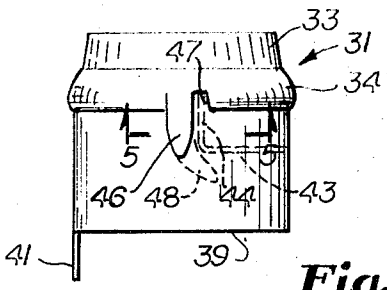


Fig.3

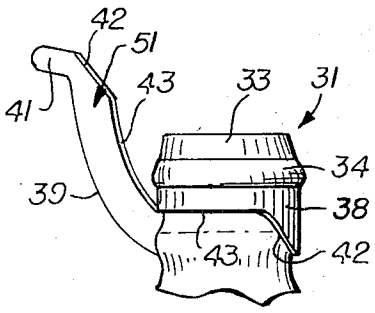


Fig.4

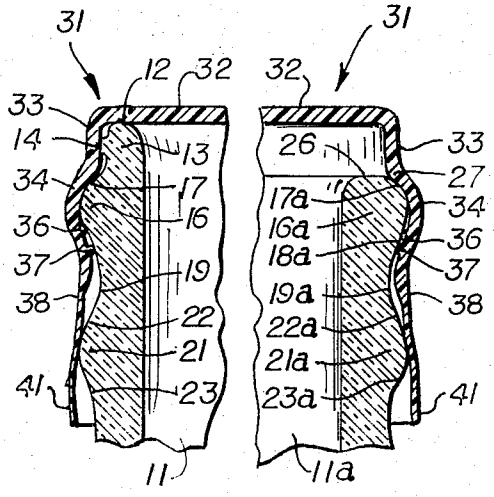


Fig.1A Fig.1B

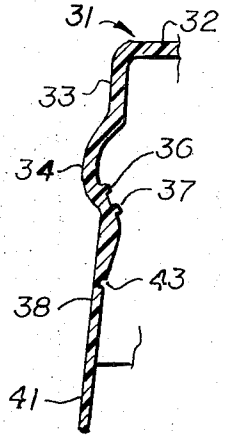


Fig.6

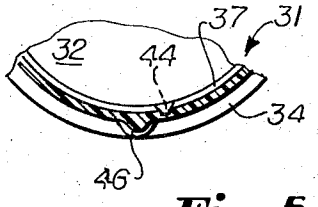


Fig.5

TEARABLE PLASTIC CAP FOR THREADED AND UNTHREADED WATER BOTTLES

This invention relates to a new and improved tearable plastic cap for threaded and unthreaded water bottles.

At present, bottled water for water coolers and other purposes is frequently transported in 5-gallon glass containers. There are two common types of such containers, one having at the upper end of the neck a reduced external diameter terminal portion with external screw threads, and the other being unthreaded and omitting the terminal portion. The threaded necks are intended initially for closure with threaded screw caps, but frequently, as is shown in U.S. Pat. No. 3,392,860, FIGS. 1–3, the screw cap is discarded and a plastic cap substituted. The unthreaded necks are initially originally intended for closure with a cork, but, as is shown in FIG. 4 of said patent, specially constructed plastic caps have been used. Prior to the present invention, different caps have been required for each of the two types of bottles because a single cap has not previously fitted both types of bottle necks in a satisfactory manner. Caps of the type of FIG. 4 in said patent have not been usable on screw threaded necks and caps of the type of FIG. 1–3 have not seated on the unthreaded necks in a manner which prevents leakage of the contents.

It is a principal purpose of the present invention to provide a cap which fits both types of bottle necks.

Quite frequently, bottled water companies have in stock both screw threaded and unthreaded neck bottles and this creates considerable difficulty in operation of the bottling plant because it is necessary prior to applying the caps to segregate the bottles according to style and to make sure that the proper type caps are on hand at the time they are applied. Accordingly, the present invention reduces the labor required in preparing bottles for capping.

Another advantage of the present invention is the fact that a bottler need install only one type of cap, thereby considerably reducing inventory requirements. From a manufacturing standpoint, the cost of manufacture is reduced because of the fact that an increased volume of caps of a single type are necessary.

Another feature of the invention is the fact that the interior of the cap skirt is provided with circumferential rings which grip the underside of the bead of the bottle neck of both styles of bottles and prevents prying the cap off the bottle until it has been torn in a readily identifiable manner. Substitution of tap water in place of the more expensive spring water, de-ionized water and the like is a practice in the bottled water industry. To discourage such practice, caps of the type shown in U.S. Pat. No. 3,392,860 have been provided which fit on to the bottle necks so tightly that they cannot be removed except by tearing the cap along preformed score lines. When the cap has been torn in such manner, it is readily identifiable to the consumer. As has been stated, heretofore in order to make such plastic caps seal on unthreaded bottles, a different shape has been required than for threaded bottles. The present invention has a construction which adequately seats in a manner to prevent leakage on either style bottle and which cannot be removed from either style bottle without tearing the cap.

Another feature of the invention is the provision of score lines which guide the tearing of the cap to enable the cap to be removed.

Another feature of the invention is the provision of reinforcing gussets and reduced dimensioned notches formed in the cap which control the extent of the tearing of the cap and permit enough of the cap to remain so that the bottle may be covered and danger of injury to the finish of the lip of the neck during transportation back to the bottling works is reduced.

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. 1A is a vertical sectional view through a portion of a threaded bottle neck showing the plastic cap of the present invention applied thereto.

FIG. 1B is a view similar to FIG. 1A showing an unthreaded cap.

FIG. 2 is a side elevational view of a cap in accordance with the present invention.

FIG. 3 is a view similar to FIG. 2 showing the cap turned 90°.

FIG. 4 is a view showing the cap installed on a bottle neck with the skirt torn to permit removal of the cap.

FIG. 5 is an enlarged fragmentary sectional view taken substantially along the line 5—5 of FIG. 3.

FIG. 6 is a sectional view taken substantially along the line 6—6 of FIG. 2.

FIG. 1A shows a threaded glass bottle neck 11 having at its upper end a smooth finish 12 with a reduced diameter terminal portion 13 immediately below the finish 12, the exterior of terminal portion 13 being provided with screw threads 14. Below terminal portion 13 is an external upper bead 16 having an upper curved portion 17 which merges into the exterior of terminal portion 13. Bead 16 also has a lower curved portion 18 which merges into the minimum external diameter portion 19. Below portion 19 is a second external bead 21 of a shape similar to bead 16 having an upper curved portion 22 which merges into portion 19 and a lower curved portion 23 which merges into the remainder of the neck 11. Such a glass bottle neck 11 is still commonly used. However, it has to a considerable extent been replaced by the unthreaded neck of FIG. 1B. The neck of FIG. 1A is intended to be used with an internally screw threaded cap in a manner well understood in the art, whereas the neck of FIG. 1B was originally intended to be used with a cork. The modification of FIG. 1B is similar to that of FIG. 1A except that the terminal portion 13 and screw threads 14 are eliminated and the top lip 26 immediately above bead 16a is substantially horizontal. In other respects, the structure of FIG. 1B is similar to that of FIG. 1A and the same reference numerals followed by the subscript *a* are used to designate corresponding elements.

In accordance with the present invention, a plastic cap 31 is substituted for the screw threaded metal cap and cork which were original means of sealing the modificiations of FIG. 1A and FIG. 1B respectively. As is best shown in FIGS. 1A and 1B, the cap 31 adequately seals either neck, a feature which has not been possible in prior plastic cap structures.

Cap 31 has a top disc 32 having around its periphery a depending upper skirt 33 which tapers somewhat outwardly-downwardly. The side diameter of skirt portion 33 is sufficient to clear the threads 14 when the cap is used with a threaded neck. The length of skirt 33 is equal to the length of terminal portion 13. Below skirt 33 is an external bead 34 which is complementary to neck bead 16. However, the portion of bead 34 which engages curved portion 18 is provided with upper and lower circumferential internal rings 36, 37. These rings are thin and shallow and flexible enough so that if an attempt were made to pull the cap of FIG. 1A upwardly with the skirt of the cap untorn, the friction of the rings 36, 37 against the upwardly-outwardly curved surface 18 would prevent removal.

Below bead 34 is lower skirt 38 which is essentially cylindrical and fits fairly tightly over the lower bead 21 of the neck. The bottom edge 39 of skirt 38 is at a level below the maximum diameter portion of second bead 21.

Extending below lower edge 39 is a tab 41 of a shape which can be gripped by the fingers. As is shown in FIGS. 1A and 1B, the tab 41 extends outward of neck 11 below bead 21 so that it can be conveniently gripped with the fingers. To one side of tab 41 extending from lower edge 39 in an upwardly slanted direction is an internal score line 42 formed on the inside of shirt 38 and weakening the strength of the material of the skirt. Slanted score line 42 merges with a similar horizontal score line 43 which is at about the elevation of minimum diameter portion 19. Displaced approximately 180° from the origin of score line 42 is a vertical score line 44 extending upwardly and into the lower portion of bead 34 and cutting across rings 36,37. Formed on the exterior of cap 31 extending downwardly from bead 34 and into the upper end of skirt 38 is an external gusset 46 which, as best shown in FIG. 5, is an increased thickness section of the wall of the cap. To the right of gusset 46, as viewed in FIG. 3, is an external notch 47 formed in the wall of bead 34. Gusset 48 is formed on the inside of cap 31 and bends to the right of, and below, the lower end of gusset 46. The purpose of elements 46, 47 and 48 is hereinafter explained.

Cap 31 is installed on neck 11 or 11a either manually or by capping machinery. The cap 31 is pressed vertically-downwardly. Its internal diameter is sufficient so that the curved portion 17, 17a of beads 16, 16a cause the cap to stretch to clear beads 16 and 21. The plastic material of which the cap 31 is formed is polyethylene, or similar plastic, which permits such stretching. When cap 31 is fully in place, bead 34 is tight against bead 16 or 16*a* and this prevents leakage. The rings 36, 37, as has heretofore been explained, prevents removal of cap 31 prior to tearing of the same.

When cap 31 is installed on a threaded neck bottle, as is shown in FIG. 1A, the underside of top disc 32 seats upon finish 12 and the external bead 34 tightly grips the bead 16 and the rings 36, 37 grip the underside of curved portion 18 of bead 16. Thus there is no leakage from the interior of the bottle. On the other hand, when the cap 31 is installed on neck 11*a*, such as is shown in FIG. 1B, the junction 27 where upper skirt 33 merges into bead 34 seats against upper curved portion 17*a* of bead 16*a* in a water-tight manner which prevents leakage out of the bottle. At the same time, to reinforce the seal, the bead 34 grips the bead 16*a* and rings 36, 37 grip curved surface 18*a*. Thus, in either style neck a single cap 31 adequately seals the bottle. In the form shown in FIG. 1B, the area of cap 31 within upper skirt portion 33 is empty but this is of an advantage in that it forms a cushion which prevents damage to finish 26 in the event of impact, an event which is quite common when water bottles are transported in trucks in racks.

So long as the skirt 38 is not torn, it is impossible to remove and replace cap 31. This prevents refilling an empty bottle with tap water and reusing a cap 31 without detection.

When it is necessary to remove the cap 31, the user grips tab 41 with the thumb and forefinger and pulls upwardly along the direction of slanted score line 42 and thence along line 43. When the corner where lines 43 and 44 intersect is reached, the gussets 46 and 48 insure that the skirt 38 will be torn upwardly along line 44. The notch 47 weakens the bead 34 sufficiently so that the tear will continue up into the bead 34 and across the rings 37, 36. Completion of this operation is shown in FIG. 4 wherein a pull portion 51 is provided which consists essentially of tab 41 and the portion of skirt 38 below line 43. By pulling upwardly on portion 51, the cap 31 may be pulled off the bottle neck without the hands of the user coming near the top of the neck and thus preventing the possibility of contamination of the neck and the contents of the bottle.

When the bottles are returned to the bottling works, it is desirable that the finish 12 or top lip 26 be protected against chipping or scratching. The partially torn cap shown in FIG. 4 can be replaced; and when replaced, the bottle is protected. However, the fact that the pull portion 51 has been torn and is exposed prevents the cap 31 from being used a second time and further insures that a dishonest employee cannot fill an empty bottle with tap water and replace the cap without danger of detection by the consumer.

The cap is preferably molded of polyethylene or other suitable plastic material having the properties of being flexible and stretchable to accommodate minor variations in the dimensions of the necks to the container and also to permit the cap to stretch over the upper bead 16 of the neck. The flat top disc 32 and upper skirt 33 are of substantially the same wall thickness while the external bead 34 dimenishes in thickness proceeding downwardly. The inner wall of the lower skirt 38 above the horizontal score line 43 tapers downwardly and the lower skirt 38 below said line 43 is quite thin to facilitate tearing. Gusset 46 is both external and internal of the skirt 38 and terminates at a point substantially below score line 43.

What is claimed is:

1. A cap for use with either of two types of rigid container necks, said first type of neck having an annular finish at the upper end of said first type neck, an upper external first bead below said finish having a substantially circular arcuate upper corner curving downwardly-outwardly below said finish and a downward tapering lower curvature ending in a first minimum diameter portion below said first bead, and a second bead below said first minimum diameter portion; said second type of neck having a short, cylindrical upper terminal portion formed with external screw threads, an upper external third bead below said terminal portion having a maximum diameter greater than that of said threads and shaped congruent to said first bead, a second minimum diameter portion of the same diameter as said

first minimum diameter portion below said third bead and a fourth bead below said second minimum diameter portion; said cap being formed of a flexible plastic material which is deformable to accommodate minor variations in container neck dimensions and also to permit said cap to stretch over said first or third beads, said cap comprising a flat top disc having a diameter about equal to that of said threads, an upper cylindrical skirt depending from the periphery of said disc having an inside diameter to fit tightly over said screw threads, having a length equal to that of said terminal portion and having an outwardly-downwardly curved juncture shaped to fit tightly against said upper corner of first bead or of said third bead, an external fifth bead below said upper skirt complementary to and tightly engaging either said first or third bead down to the upper end of said lower curvature thereof, a plurality of thin, shallow, flexible internal rings on said lower curvature of said fifth bead positioned and shaped to grip said lower curvature of either said first or third beads, said fifth bead shaped and positioned to fit tightly around said first or third beads, and an imperforate vertical second skirt below said fifth bead having a diameter less than said first and second beads of said neck, said skirt being weakened in a first score line slanting upwardly from the bottom edge of said skirt and merging into a second score line horizontal and below said external fifth bead, said second score line having an arcuate length less than 180°, a thickened gusset below said fifth bead, said second score line terminating at said gusset, a third score line extending upward from said second score line alongside said gusset up into the middle of said fifth bead, said second skirt being tearable along said first, second and third score lines, said cap in intact condition on said necks sealing said necks against either input or output of liquid, said cap when torn along said first, second and third score lines permitting removal of said cap from either of said necks.

2. The combination of claim **1** which further comprises a pull tab depending from the lower edge of said second skirt alongside the lower terminus of said first score line.

3. The combination of claim **1** in which said score lines are internal.

4. The combination according to claim **1** in which said gusset is external.

5. A cap according to claim **1** in which said disc and said upper skirt are of substantially the same thickness, said fifth bead at its upper arcuate portion is of substantially the same thickness as said upper skirt and at its lower portion is substantially less thickness than said skirt, said lower skirt tapering in thickness proceeding downwardly and being substantially less in thickness below said second score line than above said second score line.

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