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PLASTIC WATER BOTTLE CAP

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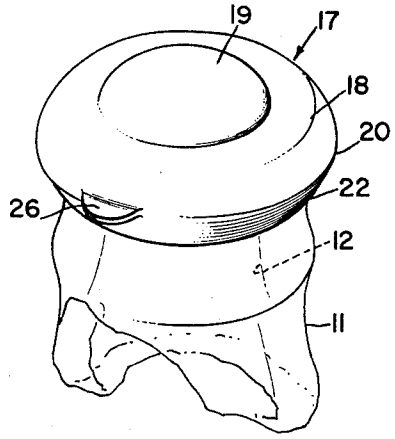


Fig. 1

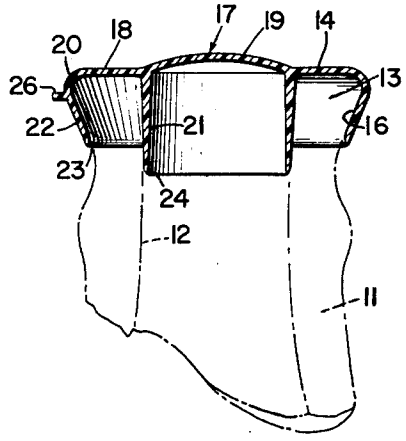
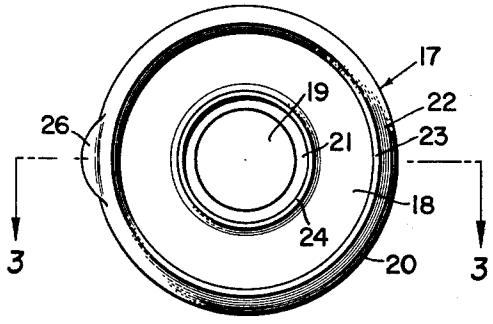


Fig. 3

Fig. 2



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PLASTIC WATER BOTTLE CAP

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1 Claim. (Cl. 215—41)

This invention relates to a new and improved plastic water bottle cap of the type used on five-gallon water bottles and the like.

Heretofore, water bottles of this general type have been closed by means of a cork driven into the neck of the bottle, and for the purpose of sanitation the neck and cork are customarily covered by a piece of paper which is usually held in place by a rubber band. Such a method of closing bottles has a number of disadvantages. The use of corks is unsanitary for the reason that they are porous and hence extremely difficult to sterilize satisfactorily. Further, the prior method is labor-consuming, in that the corks must be driven in place and the paper covers installed. Another disadvantage is the fact that the 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. Another disadvantage of the prior method is the short life of the cork and its resulting relatively high cost.

The instant invention provides a plastic cap which is readily sterilized and hence does not have the disadvantage of unsanitary corks. When installed, the cap seals inside the neck of the bottle and also seals over and around the outer edge of the lip of the neck with a water- and dirt-tight seal.

Another advantage of the present invention is the fact that the cap is rapidly installed and easily removed and hence saves labor. Inasmuch as no paper cover is required, the labor involved in installing covers is eliminated.

Another advantage of the present invention is the fact that it cannot be readily dislodged during transportation and it is impossible to drive the cover inside the bottle. By reason of the durable nature of the plastic, it may be reused repeatedly.

Another feature of the present invention is the fact that the cap is fabricated with a resilient dome which is centrally disposed and projects upwardly, thereby providing a cushion which protects the end of the neck of the bottle from chipping due to the impact which occurs during transportation when the bottles are racked end to end.

Another feature of the present invention is the fact that seals are formed in three zones, one being at the interior of the neck of the bottle, the second being at the finished end of the neck, and the other being the external rim of the lip. Thus, leakage of water is prevented and ingress of foreign matter is prevented.

Another feature of the invention is the fact that a flexible cap is provided, which accommodates variations in bottle dimensions which inherently occur. Thus, different manufacturers have different tolerances and manufacturing standards, and shrinkage of the bottles as they are removed from the molds causes other variations in the dimensions. The cap which is the subject of this invention will provide a proper seal despite such variations in the dimensions. Further, minor chips and similar imperfections in the neck area do not prevent proper sealing action.

Another important advantage of the invention is the reduction in the expense involved in providing caps for water bottles and, further, the reduction in replacement costs for the bottles themselves by reason of the fact that the bottlenecks are not so readily chipped.

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 present corresponding parts in each of the several views.

In the drawings:

FIG. 1 is a perspective view of the cap installed on the neck of the bottle;

FIG. 2 is a top plan view;

FIG. 3 is a vertical sectional view taken substantially along the line 3—3 of FIG. 2.

A conventional five-gallon water bottle of the type used for water coolers and the like for drinking purposes is formed with a neck 11 having an inside diameter 12 which tapers slightly inwardly from the end of the neck. The exterior of neck 11 is formed with a terminal bead 13 having a finished end 14 and an inwardly tapered outside diameter 16.

The present invention employs a plastic cap 17 which is preferably formed from a polyethylene material such as that manufactured by the Union Carbide Corporation, Bakelite Division, under the name DYNH-3 Polyethylene Molding Resin. Such plastic material has a specific gravity of 0.92 and a bulk factor of 1.85. It has sufficient flexibility for the purpose of the invention but also sufficient toughness for repeated usage.

The cap has a substantially uniform wall thickness of about 1/16 inch and is formed with a top having an annular portion 18 which has an inner and outer diameter substantially equal to those of the finished end 14 of the bead 13, and which seats on and seals against end 14 when in place. Inwardly of the annular portion 18 is a domed central portion 19, the dome being elevated approximately 1/8 inch above the level of the annular portion 18 and having a radius of curvature of about 1 5/8 inches. It will thus be seen that the dome 19 provides a resilient cushion which protects the bead 13 from chipping or impact. Inasmuch as an air-tight seal is effected when the cap is in place, the dome 19 acts as a pneumatic cushion. Projecting downwardly on the inside of the cap at the juncture of the annular portion 18 and dome 19 is an elongated inner seal hollow cylinder 21. The outside diameter of cylinder 21 is about 1.150 which is slightly greater than the conventional inner diameter of the opening 12 in the neck 11. The inner surface of cylinder 21 tapers and is thicker at the top than at the bottom. The length of cylinder 21 is about .820 inch. The function of cylinder 21 is to seal against the inside 12 of the neck 11 and prevent seepage of water. The elongated taper of cylinder 21 insures a seal despite neck variations.

On the periphery of the annular portion 18 is a rounded corner 20 curved with an external radius of 3/16 inch and an internal radius of 1/8 inch, which is substantially the same as conventional rounded bead 13. An inwardly-downwardly tapered skirt 22 is formed below the corner 20, the angle between the skirt 22 and the vertical being approximately 22°. The outer diameter at the top of skirt 22 is about 2.400 inches and at the bottom of its approximately .600 inch length is about 2.190 inches. The skirt 22 thus fits around and under the bead 13 and provides an external seal which prevents the ingress of dirt so that, when the bead 13 is exposed after the cap is removed, it is in a sanitary condition and protects the neck from chipping. The formation of skirt 22 insures a seal despite bottle dimension variations.

To facilitate installation of the cap, the skirt 22 is formed with a rounded nose 23 and the inner seal cylinder 21 is similarly formed with a rounded nose 24. For the same purpose the cylinder 21 is substantially longer than skirt 22 so that the former has already fitted inside the neck interior before the latter engages the neck exterior.

A finger tab 26, which is arcuate in configuration, is

joined to the skirt 22 at its maximum diameter portion. The purpose of the tab 26 is to assist the user in prying the cap off the bottle with his fingers.

It will thus be seen that there is provided a cap formed of a resilient material which can be deformed sufficiently to fit inside and outside the neck of a conventional water bottle and seal both the interior and the exterior thereof as well as the end thereof. Further, the deformable nature of the material compensates for minor variations in the dimensions of the bottle without interfering with the seals.

It will be understood that bottles containing materials other than water may be closed by the cap hereinabove described.

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

What is claimed is:

A bottle cap for the neck of a water bottle formed of a relatively stiff polyethylene-like material which is deformable to the extent of accommodating minor variations in standard bottle dimensions, said cap being preformed and having a substantially uniform wall thickness throughout and having a top shaped with a central dome, which has a raised dome shape both when the cap is in place on a bottle and when removed from the bottle, a flat annular zone outside said dome having a flat underside to seal against the finished end of the neck of the bottle, an elongated, hollow plug tapering slightly outwardly-downwardly substantially uniformly throughout its entire length depending from the underside of said top at the juncture of said dome and said annular zone of said top and having an external diameter to seal inside the neck of said bottle, a rounded corner around the periphery of said annular portion, and a skirt of substantially shorter length than said plug around the periphery of said annular zone, the bottom edge of said skirt being of substantially uniform elevation, said skirt being turned inwardly in a thin-walled frusto-conical shape having substantially the same wall thickness throughout, said skirt terminating in a thin, sharp, outwardly-curved edge, said skirt being imperforate and having a circumference to seal around the exterior of the neck bead of a conventional bottle, said central dome protruding upwardly above the level of said annular zone when said cap is subject to substantially atmospheric pressure both interiorly and exteriorly.

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