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CONTAINER CLOSURE

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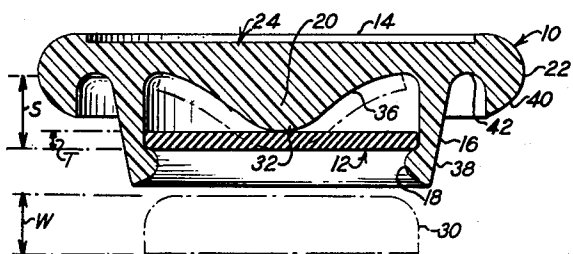


Fig. 1

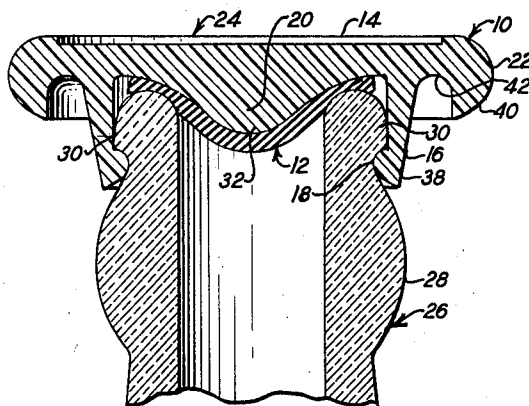


Fig. 3

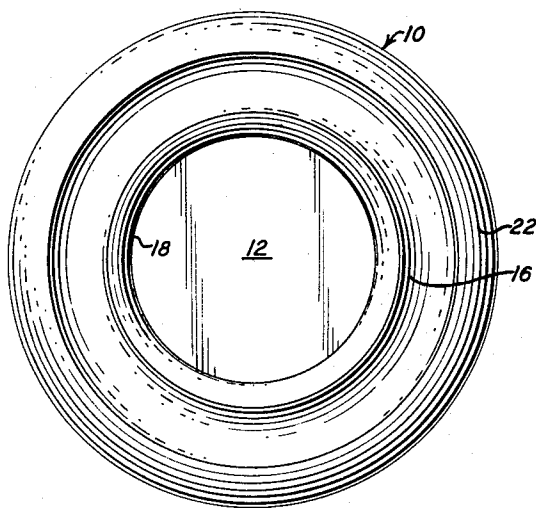


Fig. 2

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2 Claims. (Cl. 215—40)

This invention relates to container closures, and more particularly to caps which function to seal open-mouth containers tightly while being readily displaceable therefrom.

There are numerous instances in which it is desirable to provide a container with a closure which is removable so as to permit access to the interior of the container or the removal of its contents and which is, at the same time, adapted to repeated use.

A typical example of a container having these requirements is the carbonated beverage bottle from which the beverage may not be completely emptied at one time so that it is especially important that the bottle be maintained tightly sealed to retain the quality of the bottled fluid.

It is an object of the invention to provide a container closure capable of tightly sealing a container opening and of being easily removed while being further capable of withstanding repeated usage without a loss of efficiency in the performance of its function.

A further object of the invention is to provide a closure structure which is adapted to mass production techniques at low costs.

In accordance with one embodiment of the invention, a bottle cap is provided which is adapted for use as a cover for soda bottles of standard dimensions. As is known, such bottles are normally provided with beaded necks for engagement by deformable metal caps.

To provide a cap for such containers, the invention contemplates the use of a cover portion from which depends an annular ring adapted to slide readily over the bead on the neck of a bottle and supporting an inwardly directed abutment capable of engaging the bead. For operation in conjunction with the abutment, there is provided a resilient pad such as a rubber disc whose thickness is such that it defines with the abutment a space which is less than the thickness of the bead. Consequently, the bead is tightly engaged intermediate the pad and the abutment and an efficient closure of the bottle opening is assured. Further, the invention provides for a protrusion to force the resilient pad into the bottle neck to achieve a seal therein. The invention also provides leverage means to enable the cap to be removed from the bottle with ease.

Advantageously, the cover portion, the annular ring, and the abutment can be included in an integral structure which can be molded, cast or otherwise formed in a simple operation. The design of this structure in accordance with the invention incorporates, as inferred above, a spacing intermediate the abutment and the cover portion which is dependent upon the thickness of the resilient pad (which is subsequently inserted) as well as upon the size of the bead of the bottle with which the closure is to be employed.

Other objects and advantages of the invention will be shown in the following detailed description of a pre-

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ferred embodiment thereof as illustrated in the accompanying drawing in which:

Figure 1 is a sectional view of a bottle cap provided in accordance with the invention, the beaded neck of a bottle for which the cap is intended being shown in dotted lines;

Figure 2 is a bottom view of the cap illustrating a circular form which can be generally employed in accordance with the invention; and

Figure 3 is a sectional view of the cap in engagement with a bottle neck illustrating the engagement of the resilient pad with the inside of the neck of the bottle.

The cap shown in the drawing includes an integral structure 10 and a separable resilient pad 12. The structure 10 can be made of plastic, hard rubber, metal or any other material having the necessary structural strength and resiliency as will become hereinafter apparent. The resilient pad 12 can be a rubber disc.

More particularly, the structure 10 includes a cover portion 14, a depending annular ring 16, an inwardly directed annular abutment 18, a protruding portion 20, and a leverage member 22. The cover portion 14 may be provided with a recess 24 which accommodates an identification disc or label.

Beneath the structure 10 in Fig. 1 is shown a bottle 26 having a neck 28 of standard dimensions and a toroidal bead 30 which is likewise of standard dimensions. The dimensions of the neck and bead do not in any manner determine the scope of the invention, but do affect the design of a cap for a particular bottle.

Thus, for example, the inside diameter of the annular ring 16 exceeds the outside diameter of the bead 30 so that the cap can be readily placed over the bead. On the other hand, however, the inside diameter defined by the abutment 18 is smaller than the outside diameter of the bead 30 to enable the locking of the cap on this bead.

To enable the abutment 18 to slide over the bead 30 during a covering operation, the resiliency of the material from which the structure 10 is made enables the ring 16 itself to be resilient. The ring 16 is therefore temporarily deformed during the engaging process due to the pressure of the abutment 18 sliding over the bead 30 and the abutment snaps into position engaging the bead.

As previously noted, a protrusion 20 depends from the cover portion 14. The protrusion 20, which is generally cone-like in shape, actually is provided with a central convex portion 32 and peripheral base sections 34 and 36 which are concave in shape. This construction gives to the protrusion 20 a cross-section which can be generally considered as having the shape of a sine wave. The protrusion 20 cooperates with the cover portion 14 to urge the resilient pad 12 against the top of the bottle as well as partly into the opening of the bottle so as to insure an efficient seal. Moreover, protrusion 20 (as seen particularly in Fig. 3) enables a seal to be established by the pad 12 with the inner top portion of the neck of the bottle.

The convex portion 32 of the protrusion 20 enables pressure to be applied against the pad 12 without exposing the same to sharp points or irregularities which might penetrate this pad, and the concave portions 34 and 36 facilitate the sliding of the pad 12 across the top of the bottle 26 as may occur during the sealing of the same.

The thickness of the pad 12, the size of the bead 30 and the spacing of the abutment 18 from the cover portion 14 are all interrelated in accordance with the invention, the purpose being to provide that the sum of the width of the bead 30 and the thickness of the pad

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12 exceeds the spacing intermediate the abutment 18 and the cover portion 14. In this manner, the invention assures an extremely tight fit of the cap on the bottle.

This relationship can be controlled by adjusting any of the three dimensions involved, but for purposes of illustration it will be assumed that the thickness T of the pad 12 is fixed and that the width W of the bead 30 is fixed. Accordingly, the spacing S intermediate the abutment 18 and the cover portion 14 should be made less than the sum of T plus W and, if so planned, the design will cause the compacting of the pad 12 in order to provide for the accommodation of the bead 30 and, thus, a very tight fit is achieved.

Further, and in order that the pad 12 can be maintained within the cap without undue looseness while the cap is not in use, the distance between parallel planes passing respectively through the apex of the protrusion 20 and the nearest edge of the abutment 18 can be made equal to T, the thickness of the pad 12. As a consequence thereof, the undeformed pad 12 will rest securely in the position illustrated by solid lines in Fig. 1 until caused to assume the position shown by dotted lines by the insertion of the bottle neck.

With the cap firmly in position, the leverage member 22 provides for readily removing the cap from the bottle. The member 22 extends substantially from the cover portion 14 outwardly away from the ring 16. Thus, pressure applied to the underside of the member 22 will be fulcrumed about a point diametrically opposite the point of force application and the additional length provided by the member 22 will add materially to the mechanical advantage. In practice, the additional leverage has proven to be very beneficial.

Moreover, it will be noted that the ring 16 is constructed with an inclined side 38. The depending flange 40 cooperates with the inclined side 38 to define an annular groove 42 for accommodating a second bottle having a diameter different from that of bottle 26. The resiliency of the ring 16 along with the inclination of the wall 38 is found to serve admirably for forcing the cap into the opening of a large container whose upper rim is firmly received in the groove 42. Thus, for example, a cap can be provided in accordance with the invention for sealing both soda and milk bottles of standard dimensions.

The invention which has been described in terms of a preferred embodiment thereof can be further illustrated by many variations within its scope. For example, the cover portion need not have a circular periphery but may be polygonal in shape or the cap itself may be shaped to accommodate an elliptical neck of a bottle.

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In fact, there will now be obvious to those skilled in the art, many modifications of the structure set forth which do not depart essentially from the spirit of the invention as defined in the following claims.

What is claimed is:

1. A closure, for a container having an opening defined by a beaded neck, comprising a cover portion, a resilient closed wall extending from said cover portion and adapted to encircle the neck, an inwardly directed abutment supported on said closed wall and adapted to engage the bead of the beaded neck, a resilient pad accommodated within said closed wall, and a protruding portion on said cover portion in correspondence with the container opening, said protruding portion comprising a central convex portion for urging the resilient pad into the opening of the container and a peripheral concave portion for urging the resilient pad against the top and against the inner top portion of the neck of the container, a leverage portion on said cover portion extending outwardly from said closed wall for facilitating removal of the closure from the container, said leverage and cover portion defining a groove for accommodating the neck of a second container.

2. A closure, for a container having an opening defined by a beaded neck, comprising a cover portion, a resilient closed wall extending from said cover portion and adapted to encircle the neck, an inwardly directed abutment supported on said closed wall and adapted to engage the bead of the beaded neck, a resilient pad accommodated within said closed wall, and a protruding portion on said cover portion in correspondence with the container opening, said protruding portion comprising a central convex portion for urging the resilient pad into the opening of the container and a peripheral portion for urging the resilient pad against the top and against the inner top portion of the neck of the container, a leverage portion on said cover portion extending outwardly from said closed wall for facilitating removal of the closure from the container, said leverage and cover portion including a peripheral depending flange at its periphery in outwardly spaced relation to said closed wall.

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