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2,726,001

CONTAINER CLOSURES

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Fig. 1.

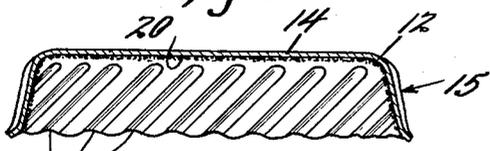


Fig. 2.

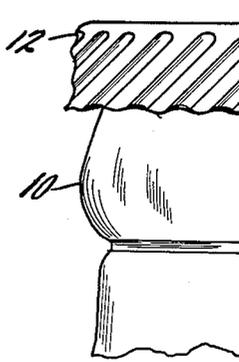


Fig. 5.

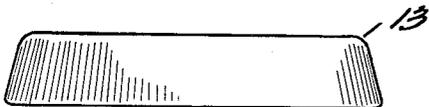


Fig. 3.

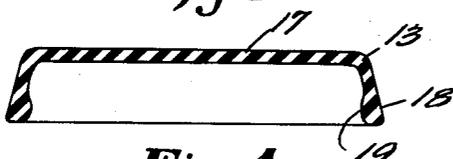


Fig. 4.

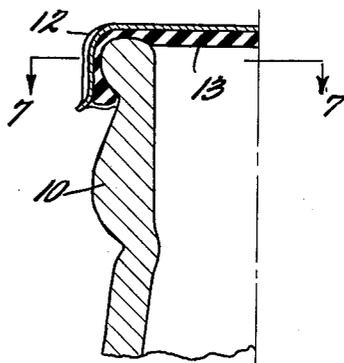


Fig. 6.

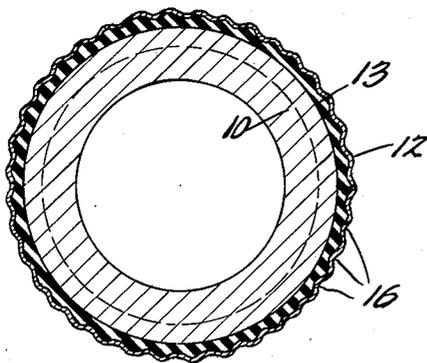


Fig. 7.

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CONTAINER CLOSURES

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3 Claims. (Cl. 215—39)

This invention relates to closures for containers and in particular to closures of the crown type.

The crown cap which is in general use in the bottling industry today usually comprises a metal cap having a generally flat disc-like top and a flared skirt, a thin liner of material such as cork immediately underlying the top disc, the skirt of the cap being crimped or corrugated so as to be slightly expansible. Such a cap, when forced onto a bottle neck, grips the neck very tightly. Because of this tight grip, it is virtually impossible to remove the cap by hand and, to dislodge the cap, one must resort to mechanical means, for example, the common bottle opener. Such mechanical means is not always available and, when attempts are made to remove the caps with the aid of other devices, the results are not always happy.

Usually, the beverages which are bottled in the containers with which crown caps are used are of the carbonated kind and, of course, the cap must closely encompass the bottle mouth in order to maintain the proper carbonation and thus keep the beverages from going "flat." So far as is known, no one has been able to produce a common crown cap which is sufficiently secure and gas tight to maintain carbonation and yet loose enough to enable one to easily remove it by hand.

A major problem among the local distributors is breakage, particularly chipping in the region of the mouth of the bottle, which not only ends the further usefulness of the bottle, but also may endanger the lives of unwary drinkers, especially where the chipping occurs on the inside edge of the bottle mouth. Since the bottles are usually transported and stored in stacks, i. e., one case on top of another, the rate of incidence of chipping is fairly high. While one of the functions of the conventional cork liner is to cushion the mouth of the bottle against shocks and jars, it is usually made from such a thin sheet of material that it affords an inadequate amount of protection. Also since the liner is equal in diameter to the top of the cap and does not extend down to the skirt of the cap, it provides protection against only thrusts or shocks impressed upon the cap in directions generally parallel to the longitudinal axis of the bottle.

It is an object of the invention to provide a crown cap which is easily removable by hand but which does not necessitate any deformation or structural change in the conventional beverage container. Another object of this invention is to provide a crown cap with means whereby the mouth of the container is protected against shocks coming from a lateral as well as vertical direction. A further object of this invention is to provide an improved crown cap which will be substantially compatible with present-day methods of manufacture, assembly, storage, and transportation.

More specifically stated, it is a purpose of this invention to provide a crown cap having a liner of resilient material and in which the liner includes a top portion and a flared skirt portion, the skirt portion having adjacent its lower edge an inwardly directed bead which, when the cap is crimped over the mouth of the bottle, will be forced under

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the peripheral bead provided on the conventional beverage bottle adjacent its mouth. In order that the cap may be removed by hand, the skirt instead of being crimped in the usual fashion, is provided with a series of inclined parallel ribs or screw-like threads so that the cap may be removed by a twisting, or unscrewing movement. To prevent the cap from sticking to the liner, a suitable lubricant is deposited between the mutually engaging surfaces of cap and liner.

Other and further objects, features and advantages will be apparent from the description which follows, taken in connection with the accompanying drawings in which one embodiment of the invention is set forth by way of example;

Figure 1 is a front elevation of the improved crown cap;

Figure 2 is a section through the cap, taken on its longitudinal axis;

Figure 3 is a front elevation of the liner;

Figure 4 is a section through the liner, taken on its longitudinal axis;

Figure 5 is a front elevation showing the cap affixed to a bottle neck;

Figure 6 is a section of the cap and bottle assembly taken on the longitudinal axis of the bottle neck, and

Figure 7 is a transverse section through the cap and bottle assembly, taken along line 7—7 of Figure 6.

Referring to the drawings, Figure 5 shows the crown cap, liner, and bottle assembled together according to this invention. Numeral 10 indicates a conventional beverage bottle or container, over the mouth of which the crown cap 12 and liner 13 are applied.

Crown cap 12, made of sheet metal or other suitable material in the same manner as are conventional crown caps, has two integral portions, a flat disc-like top 14 and a flared skirt or marginal portion 15 depending from the top. Spaced around the circumference of the skirt 15 are a plurality of parallel grooves or inwardly directed ribs 16 which are inclined or biased in such a way as to serve as screw-like threads or wedge surfaces. The grooves begin at the lower edge of the skirt 15 and extend obliquely up the skirt to approximately where it joins the top of the cap.

The liner or sealing gasket 13 is moulded of resilient material such as medium hard rubber, plastic or the like in substantially dishlike shape, having a flat top portion 17 and flared skirt portion 18. An internal rib or bead 19 is formed around the periphery adjacent the lower edge of the skirt 18. The size of the liner is such that it will nestle snugly within the cap 12, the angle of flare of the liner skirt 18 being substantially the same as that of the cap skirt 15.

It is contemplated by this invention that a film 20 of a lubricant shall be applied to the entire undersurface of the cap 12. The lubricant must be such as to withstand heat as would be present during sterilization, cold as would be present during storage, or other elements to which containers are subjected. Any lubricant meeting these requirements would be suitable, for example, paraffin or such plastics as are peculiarly adapted for use here. The lubricant may be applied to the cap either by spraying or dipping.

In the capping operation, the downward vertical thrust of the capping machine compresses the top of the liner 13, holding it firm against the mouth of the bottle while the skirt portion 15 of the cap is folded down to the vertical position shown in Figure 5. As the skirt is thus being crimped in, the liner material flows into the grooves, the excess material being forced downwardly toward bead 19 which is pressed down and under the peripheral bead of the bottle until the shape and position shown in Figure 6 is assumed.

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This produces a sufficiently tight fit that carbonation is maintained and accidental removal of the closure is prevented since the grooves in the cap engage the liner which, because of the bead provided thereon, closely embraces the underside of the bead on the mouth of the bottle. Thus the cap cannot be pulled off or inadvertently jarred off except by forces of such magnitude as to release a conventional crown cap.

In order to remove the cap manually, all that is required is a twisting or unscrewing movement in the direction of the grooves. The lubricant will prevent sticking or binding and allow the cap to come off independently of the liner. As the cap is being unscrewed the liner will remain stationary until the lower edge of the cap skirt reaches the apex of the bead on the mouth of the bottle, at which moment the liner springs back to its original shape so that it can be easily removed by hand.

The design of the metal cap and the moulded liner lends itself very easily to the simplest methods of manufacture and use. Since neither the size nor method of application has been changed, this cap is perfectly compatible with the costly handling and capping machines in use today and no change in them will be necessary.

It will be appreciated that due to the provision of the liner with a skirt similar to that of the cap and a bead on said skirt, the mouth of a bottle having applied thereon a crown cap as herein described will be protected from thrusts coming at right angles to the longitudinal axis of the bottle as well as parallel thereto. Hence the amount of chippage will be substantially reduced.

While it is contemplated by this invention that the cap may be removed by hand, it will be understood that should it be desired to dispense large numbers of bottles in a short time, a conventional bottle opener may be utilized.

Although my invention is peculiarly adapted for use with glass containers for carbonated beverages, I do not intend that it cannot be advantageously used in connection with other types of containers or beverages.

The above description and drawings are given by way of example only and not by way of limitation since it is apparent that various changes and modifications may be made in the embodiments illustrated and described herein without departing from the scope of the invention as defined by the following claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

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1. In combination, a container having an outwardly directed bead around the periphery thereof adjacent its mouth, a dish-shaped cap having a generally cylindrical skirt fitting over said container mouth and extending below the bead on said container, a dish-shaped resilient liner residing between said cap and the bead on said container, said cap being rotatable relative to said liner, said liner being deformable by said skirt and forming an inwardly directed bead thereon adjacent the under side of the bead on said container, the inner side of said skirt having ribs thereon, each said rib being concentric to the cylindrical axis of said skirt and axially co-extensive with the skirt, and being inclined at an acute angle relative to the free edge of said skirt to form a screw thread for cooperation with the liner, and said skirt being crimped around said liner and bottle neck into substantially cylindrical shape whereby said ribs are embedded in said liner and the bead formed by said liner is held in contact with the under side of said container bead.

2. The combination claimed in claim 1 in which a lubricant is interposed between said cap and said liner.

3. Container closure means applicable by pressure axially and radially inwardly thereof to an open container, comprising a dish-shaped cap having a flared skirt portion with a series of internal ribs constituting short screw threads, a dish-shaped resilient liner nestled in said cap, the surface of said liner directly facing said ribs being substantially smooth and being indentable by the ribs on said cap skirt, a lubricant being interposed between said cap and said liner.

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