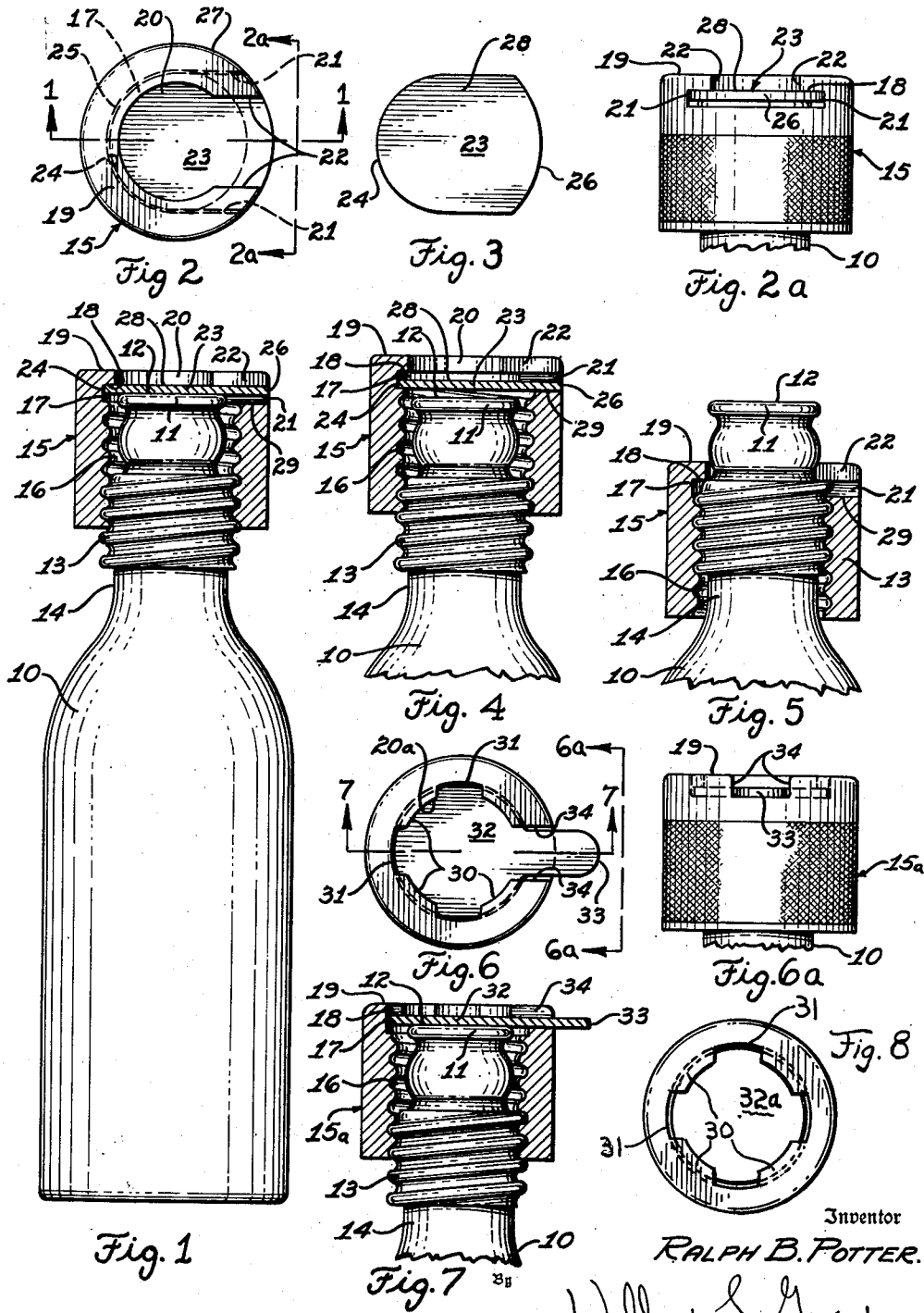


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R. B. POTTER
BOTTLE CLOSURE CAP
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BOTTLE CLOSURE CAP

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This invention pertains to improvements in closures for containers and is particularly directed to improvements in a bottle closure cap.

One of the objects of this invention is to provide a closure cap for a container requiring no supplemental aids such as cap pullers, can openers and the like for opening the bottle or container to release the contents therefrom.

Another object of this invention is to provide an improved closure cap for a container having a releasable diaphragm and a threaded member rotatable to release the diaphragm and further rotatable to position the closure for access to the discharge mouth of the container, but without removing the closure from the container itself.

Still another object of this invention is to provide an improved bottle closure cap having a threaded member adapted to be rotated for vertical displacement on the bottle neck in conjunction with a disposable diaphragm forming the closure seal for the bottle.

Still another object of this invention is to provide an improved closure cap for a bottle which secures a diaphragm seal to the lip of the bottle and is arranged to be rotated in one direction to release the diaphragm from contact with the bottle mouth lip and so arranged that the sealed diaphragm may be removed and discarded and then the closure cap rotated in the opposite direction to a position downwardly on the bottle neck so as to provide full access to the mouth and lip of the bottle.

Further features and advantages of this invention will appear from a detailed description of the drawings in which:

Fig. 1 is an exemplary showing of a typical bottle including a closure cap having the features of this invention, partly in section on the line 1-1 of Fig. 2.

Fig. 2 is a plan view of the closure cap shown in Fig. 1.

Fig. 2a is a side elevation of the closure cap indicated by the line 2a-2a in Fig. 2.

Fig. 3 is a plan view of the disposable seal diaphragm associated with the closure cap.

Fig. 4 is a fragmentary sectional view similar to that in Fig. 1 showing the closure cap rotated to a point to release the disposable diaphragm seal from the bottle mouth.

Fig. 5 is another view similar to Figs. 1 and 4 but showing the closure cap rotated to a position downwardly below the lip and mouth of the container after the diaphragm seal has been disposed of.

Fig. 6 is a plan view of an alternative form of closure cap and seal.

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Fig. 6a is a side elevation of the closure cap indicated by the line 6a-6a in Fig. 6.

Fig. 7 is a sectional view on the line 7-7 of Fig. 6.

Fig. 8 is a plan view of still another form of the device shown in Figs. 6, 6a and 7.

As illustrative of one embodiment of this invention there is shown a bottle 10 having the usual cap holding lip 11 and seal contacting surface 12, such as commonly used with soda pop bottles and the like. Below the mouth of the bottle there is provided an enlarged threaded portion 13 integral with the neck portion 14 of the bottle.

A rotatable closure cap 15 is provided with an internal thread 16 nicely fitting the thread 13 formed on the bottle 10. The upper portion of the threaded bore 16 of the closure cap 15 has a counterbore 17 formed therein which terminates in the seal contacting surface 18, formed on the underside of the top portion 19 of the closure cap. An opening 20 is provided in the top 19 of the cap of sufficiently large size to pass down over the lip 11 and top 12 of the bottle 10 and of the same size as the root diameter of the thread 13 on the bottle as shown in Figs. 1, 4, 5 and 7. A radially disposed slot 21 is also formed in one side of the upper portion 19 of the closure cap 15. Above the slot 21 there is also a cut away portion extending radially as determined by the surfaces 22 in the top 19 of the closure cap.

Through the slot 21 the disposable diaphragm seal 23, Fig. 3, is positioned in the slot and its arcuate portion 24 nicely fitting in the arcuate portion 25 of the counterbore 17 and its outer larger arcuate edge 26 coinciding with the outside diameter 27 of the closure cap 15. The upper portion or face 28 of the seal diaphragm 23 is exposed through the opening 20 and the slot 22 by which the finger may be used to insert the seal or to draw the seal out from the cap when released from contact with the lip surface 12 of the bottle 10.

Having thus placed the seal disc or diaphragm 23 in the closure cap as described, the cap is then screwed tightly downwardly on the threads 13 as shown in Fig. 1 to cause the surface 18 of the closure cap 15 to engage the top surface 28 of the diaphragm 23 to force the diaphragm tightly in sealing contact with the lip 12 of the bottle. In this manner the contents of the bottle or container are securely maintained at all times for transshipment and storage.

When it is desired to release the contents from the bottle the closure cap is merely rotated to raise it upwardly as shown in Fig. 4 whereupon

the surface 18 of the closure cap is released from the surface 28 of the diaphragm 23 so that ordinarily the pressure in the bottle will immediately pop up the diaphragm 23 so that the finger may be placed on the surface 28 and the disc readily slid outwardly radially and discarded. Further, in the event the disc 23 should stick to the lip 12 continued rotation of the closure cap 15 will cause the surface 28 in the bottom of the counterbore 17 to engage under the outwardly projecting edges of the disc 23 and positively raise the disc up off of the lip 12 of the bottle so that it can then again be slid radially outwardly by placing the finger through the opening 20 in the closure cap as described.

As soon as the disc has thus been disposed of the operator then quickly spins the closure cap in the opposite direction, downwardly on the threads 13 to the position shown in Fig. 5 so that the lip 11 and mouth 12 are fully exposed for disgorging the contents from the container. In order to again seal the bottle it is merely necessary to again spin the closure cap 15 to the position shown in Fig. 4, insert the seal diaphragm 23 and then screw it back down to the position shown in Fig. 1.

As an alternative method of securing the diaphragm in the novel closure cap described, there is shown in Fig. 6 an arrangement where there is provided an opening 20a formed by a plurality of upwardly extending prongs 30 so that the closure cap takes the form of a castellated nut or the like with clearance spaces 31 formed between the projections 30. In this case a circular disc 32 is provided having an integral lip or tang 33 which extends outwardly through a slot formed by the surfaces 34 extending radially through one side of the closure cap 15a. In Fig. 7 is shown the closure cap 32 secured to the lip 12 of the bottle as in Fig. 1. In this construction it is only necessary to partially rotate the cap to upward releasing position as shown in Fig. 4. The operator then merely takes hold of the tang 33 and draws it upwardly so as to withdraw the circular disc 32 from between the prongs 30, without removing the cap from the bottle, and discards the same so that the closure cap may again be rotated downwardly to pouring position shown in Fig. 5. In this way the diaphragm 33 is the only element of the closure definitely mutilated and folded so that a fresh diaphragm seal must be obtained before the bottle can again be closed, this condition being obtainable only upon return of the receptacle to the manufacturer or supplier of the contents for the bottle.

Still another arrangement is that shown in Fig. 8 wherein the disc 32a is of circular form and the cap is also continuous throughout its periphery, no slot such as 34 in Fig. 6 being required. In this arrangement the cap is screwed upwardly as in Fig. 4 sufficiently to allow the diaphragm 32a to be pried up with a knife point or the like and lifted out through a pair of diametrically opposite clearance spaces 31.

While the apparatus herein disclosed and described constitutes a preferred form of the invention, it is to be understood that the apparatus is capable of mechanical alteration without departing from the spirit of the invention and that such mechanical arrangement and commercial adaptation as fall within the scope of the appendant claims are intended to be included herein.

Having thus fully set forth and described this invention what is claimed is:

1. In a container closure apparatus including a bottle or the like receptacle, a threaded portion on the neck of said receptacle, a sealing lip edge on the upper portion of said receptacle, a closure cap threadedly mounted on the threaded portion of said receptacle, a reduced bore in the top surface of said closure cap having a diameter slightly larger than the lip of said receptacle and equal to the root diameter of the thread on said bottle so that said closure cap may be screwed downwardly on said receptacle to expose said lip above the top of said closure cap, a radially disposed slot in said cap terminating in a counterbore in the threaded bore of said cap located immediately below the top surface of said cap, and a diaphragm seal adapted to be inserted radially into said slot and counterbore and to be forced down against the top sealing edge of the lip of said receptacle by the downward rotation of said closure cap on the threaded portion of said receptacle.

2. In a bottle closure arrangement for a bottle having a neck, a pouring lip on the top of said bottle, a threaded portion formed integral with the neck located below said pouring lip, a cylindrical closure cap having a threaded bore fitting on the threaded portion of the neck of said bottle, a top for said cap having an opening and equal to the root diameter of the thread on said bottle adapted to pass down over the pouring lip of said bottle when said closure cap is screwed downwardly on the neck thereof, a counterbore in the upper threaded portion of said nut, a radially disposed slot in the upper portion of said cap opening into said counterbore, and a closure disc diaphragm insertable and removable from said counterbore adapted to engage the upper pouring lip of said bottle when said closure cap is screwed downwardly on the threaded portion of the neck of said bottle.

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