

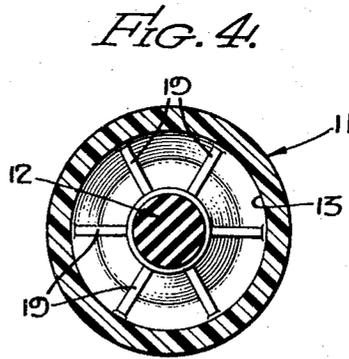
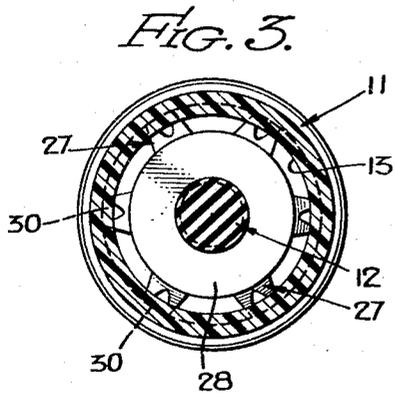
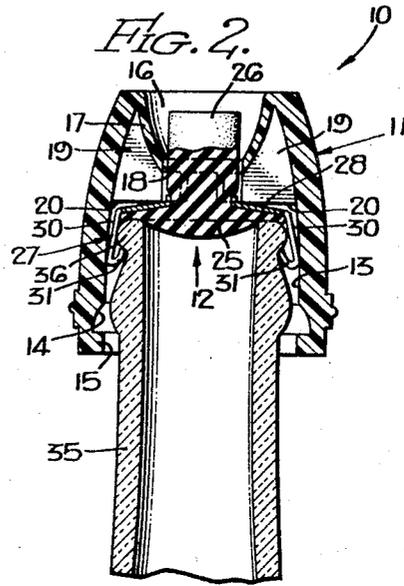
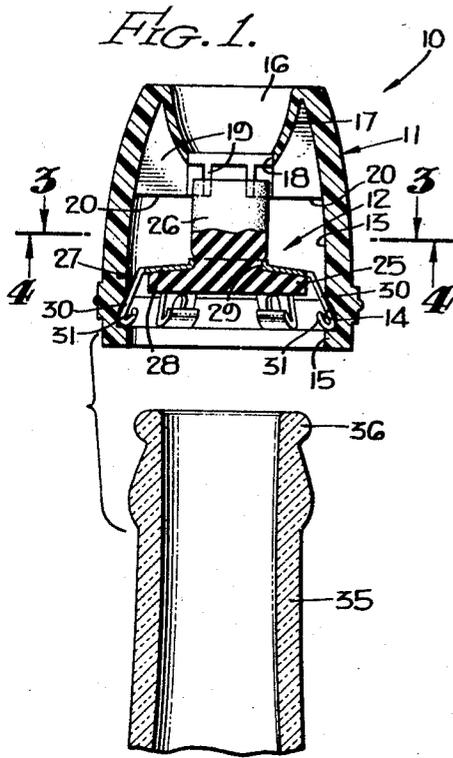
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BOTTLE CLOSURE

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## BOTTLE CLOSURE

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1 Claim. (Cl. 215—45)

This invention relates to closures for bottles which have an external bead on the end of the bottle neck serving to hold a cap swedged thereon when the bottle is filled at the bottling works.

The present invention is particularly useful in manually capping a bottle, to retain therein a portion of its contents under pressure, after the swedged cap has been removed.

The invention represents an improvement on the bottle closure shown in U. S. Letters Patent No. 2,586,440 issued February 19, 1952 to William Satz. The patented closure included a plastic shell enclosing in the mouth thereof an expanded neck sealing and bead gripping device which is installed in operative relation with the bottle neck by merely pressing the shell axially on to the bottle neck. The closure is removable from the bottle neck by merely pulling axially on the shell.

It was possible for the sealing device of the patented Satz bottle closure to be pressed up into the shell thereof when not being applied to a bottle neck. Some difficulty was then experienced in returning said sealing device into the mouth of the shell where it must be for the closure to be applicable to a bottle neck.

An object of the present invention is the provision of a bottle cap of the general type of the Satz patented closure, in which the sealing device may be returned into the mouth of the shell with relative ease while the cap is disassociated with a bottle.

Another object of the invention is to provide such a bottle cap in which the sealing device is provided with a guide stem which functions not only as an aid in keeping the sealing device aligned with the shell but also as a button responsive to pressure from a finger to return said device to its starting position in the mouth of the shell.

The manner of accomplishing the foregoing objects as well as further objects and advantages will be made manifest in the following description taken in connection with the accompanying drawings in which

Fig. 1 is a longitudinal sectional view of a preferred embodiment of the invention positioned in alignment with a bottle neck as in readiness for applying the cap of the invention to said neck, or as the cap appears immediately after removal from said neck.

Fig. 2 is a view like Fig. 1 showing the cap applied to the bottle neck.

Fig. 3 is a cross sectional view taken on the plane 3—3 of Fig. 1 and looking down.

Fig. 4 is a cross sectional view on the same plane looking upward as indicated by arrows 4—4.

Referring specifically to the drawings, the invention is there shown as embodied in a bottle cap 10 including a rigid shell 11, which is preferably molded of plastic, and a sealing device 12.

The shell 11 is of a generally tubular shape, tapering towards the upper end, is open at both top and bottom ends, and has a substantially cylindrical main bore 13 which communicates downwardly with a flaring mouth 14, the

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latter terminating at its lower edge in an internal flange 15.

The top end of shell 11 has a deep hollow 16 formed therein by a thin, cup-shaped wall 17 terminating at its lower end in a central hole 18. A series of six radial guide walls 19 extend downwardly from and reinforce wall 17 and have their inner edges flush with hole 18. Lower edges 20 of walls 19 lie in a common radial plane to function as a stop in a manner to be made clear later.

The sealing device 12 is mounted in the bore 13 and flaring mouth 14 when in its starting position as shown in Fig. 1. This device comprises a closure disc 25 and guide stem 26 which are preferably molded integrally of soft rubber. It also includes a flexible means 27 which extends radially downwardly and outwardly from the outer edge of said closure disc into expanding engagement with flaring mouth 14 and internal flange 15.

Flexible means 27 may be variously formed but preferably is a unitary stamping from spring metal including a central washer 28 slightly tapering upwardly to a central rimmed hole 29. Formed integral with washer 28, extending radially outwardly and downwardly from its outer edge, is a series of springing fingers 30. Each of these has an intumed end portion 31, which is bent back on itself to form a bead engaging element.

When the sealing device 12 is in its starting position, as shown in Fig. 1, the spring fingers 30 engage the flaring mouth 14 and internal flange 15 in expanding relation so as to support the closure disc 25 and stem 26 as positioned in this view. This is accomplished by making stem 26 with a slightly larger diameter than the inside diameter of hole 29 and then drawing the stem through this hole to bring the closure disc 25 flush against the concave tapered bottom surface of washer 28.

The stem 26 is made of a length to cause this to now extend upwardly into concentric guided relation with inner edges of radial walls 19 (Fig. 1).

A bottle neck 35 is shown in Fig. 1 which is of the standard type universally used for bottling carbonated drinks. This bottle neck has an external bead 36 at its extremity to which cap 10 automatically locks itself in sealing relation when applied as follows:

Cap 10 is moved axially downward onto bottle neck 35 from its position shown in Fig. 1. The closure disc 25 first engages the end of bottle neck 35 and closes this by the pressure with which the yieldable means 27 resists its being constricted to the point where it will be received in the lower end of bore 13 of shell 11, as the latter is pressed downward. The inward constriction of yieldable means 27 brings the bottle-neck-bead-engaging elements 31 inwardly to engage bead 36 from beneath thus locking the closure disc 25 in tight sealing relation with the bottle neck.

When the shell 11 has been pushed onto the bottle neck until lower stop edges 20 of walls 19 engage washer 28 (Fig. 2), the fingers 30 are completely confined in bore 13 and they are thus retained in their locking relation with bead 36 until shell 11 is deliberately pulled upwardly to release fingers 30, allowing these to expand into engagement with flaring mouth 14 and internal flange 15 as shown in Fig. 1.

It is to be noted that when the sealing device 12 is pushed into shell 11 as shown in Fig. 2, when sealing a bottle, the stem 26 extends a substantial distance upwardly into the hollow 16 formed in the upper end of shell 11.

It is ordinarily unnecessary to touch this stem to aid in returning the sealing device 12 to its starting position shown in Fig. 1, after the cap 10 has been used as shown in Fig. 2 to cap a bottle. Just pulling the cap off ordinarily accomplishes this.

It is possible however to break the bead 36 off a bottle,

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as by dropping the same, and now and then the sealing device 12 is inadvertently pressed fully into the shell 11 while the cap 10 is not on a bottle. When this happens with the present invention, pressure from a finger applied to the stem 26 is sufficient to return sealing device 12 to its starting position shown in Fig. 1.

While only a single embodiment of the invention is shown herein, it is to be understood that various modifications may be made in this without departing from the spirit of the invention or the scope of the appended claim.

I claim:

In a cap for manually closing an externally beaded bottle neck, the combination of: a generally tubular shaped rigid shell provided with an open top, said shell having a main bore with a lower flaring mouth terminating at its lower edge in an internal flange; a slidable sealing device within said bore comprising a closure disc; flexible means extending radially outwardly and downwardly from said disc into expanding engagement with said mouth and said flange, lower portions of said flexible

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means extending inwardly to engage the external bead of said bottle neck from beneath when said disc is placed against said neck and said shell slid downwardly over said device, thereby locking said disc in closing relation with said neck, said open top of said shell having a deep finger-fitting hollow formed downwardly therein, there being a central hole in the bottom of said hollow which is substantially smaller than the outer opening of said hollow; and a guide stem provided on said closure disc, which stem extends axially upwardly from said disc into said hole so as to be guided by said hole whereby said stem extends upwardly through said hole and a substantial distance into said hollow when said cap is applied to a bottle neck.

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