

June 30, 1970

P. GUALA

3,517,847

FRANGIBLE BOTTLE CLOSURE

Filed Nov. 25, 1968

3 Sheets-Sheet 1

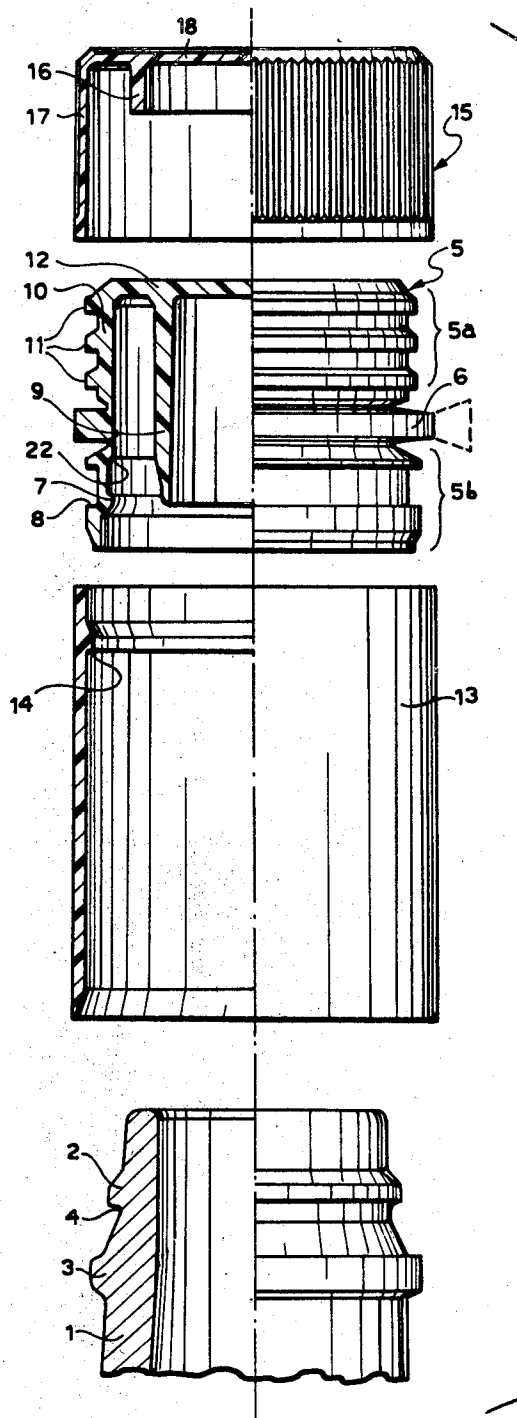


Fig-1

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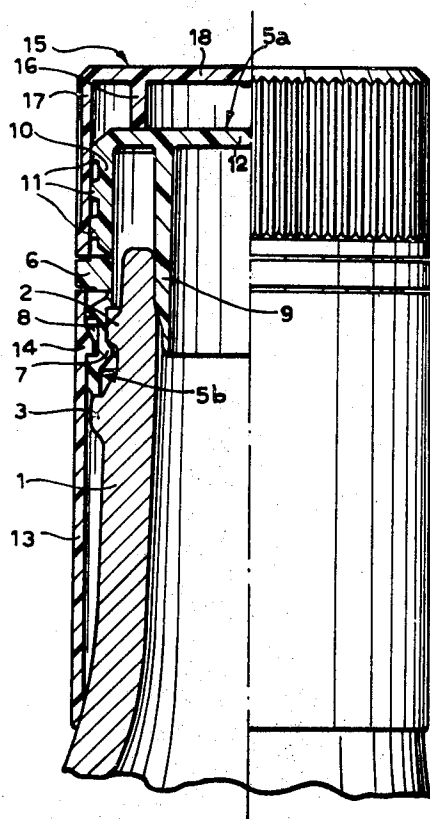


Fig. 2

Fig. 6

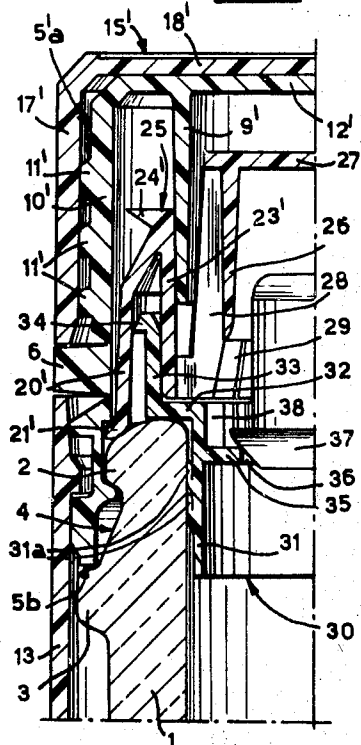
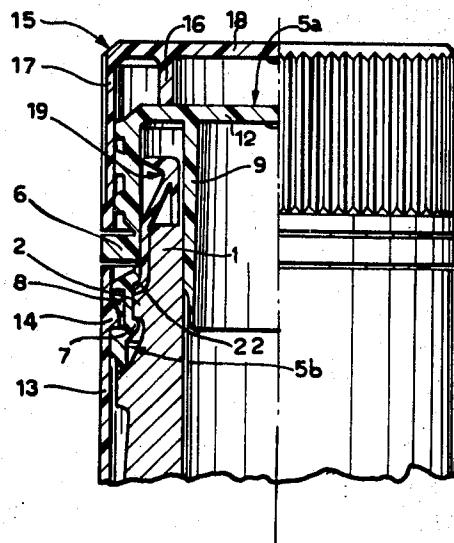


Fig. 5



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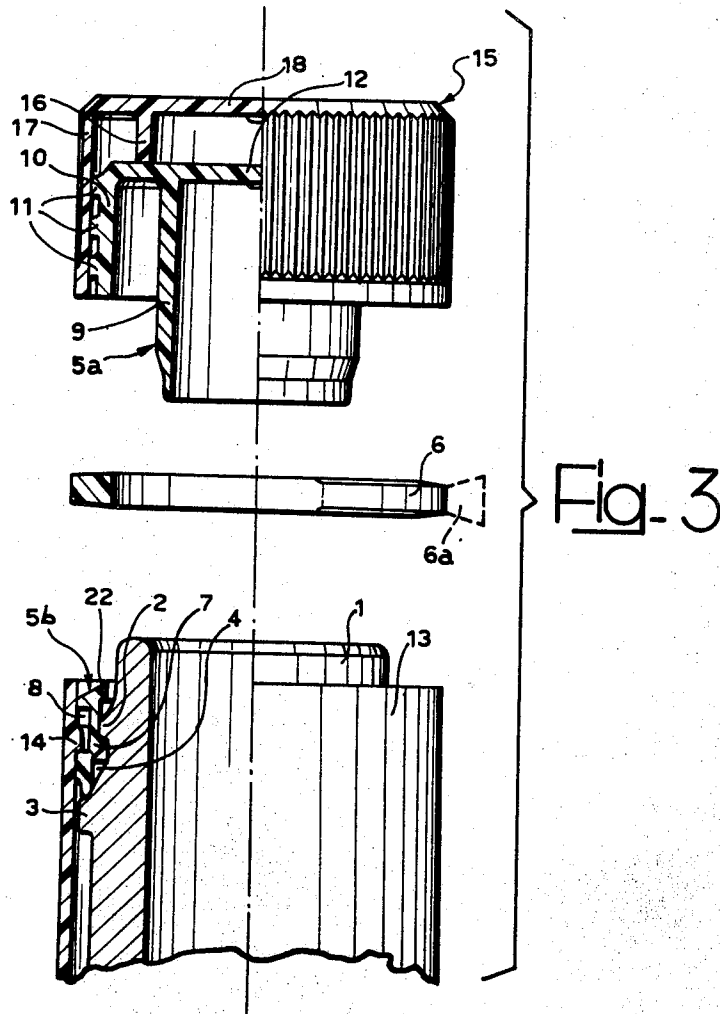
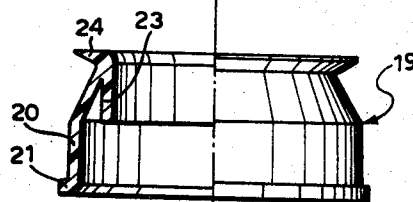


Fig. 4



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Filed Nov. 25, 1968, Ser. No. 778,493
Claims priority, application Italy, Dec. 6, 1967, 54,011/67

Int. Cl. B65d 41/20

U.S. Cl. 215—42

14 Claims

ABSTRACT OF THE DISCLOSURE

A bottle closure device has a flexible plastics stopper for closing the bottle neck. A flexible plastics ring is retained on the bottle neck by a rigid plastics sleeve and is connected to the bottle neck by a tear-off sealing strip. Removal of the strip permits removal of the stopper, a cap preferably fitting over the stopper to facilitate its removal.

This invention relates to bottle closure devices.

More particularly, the invention concerns bottle closure devices which are openable by breaking or tearing a seal. An object of the invention is to provide such a closure device which is simple, inexpensive and tough in construction and which comprises a small number of component parts which can be pre-assembled before fitting to the bottle.

The bottle closure device according to the present invention comprises a stiff plastics retaining sleeve adapted to fit over the neck of a bottle and a body member of flexible plastics having an annular locking portion which is adapted to be retained on the bottle neck by the sleeve, and a stopper portion connected to the annular portion by a breakable seal element and adapted to fit into and sealingly close the neck of the bottle.

The closure device according to the invention is proof against illicit tampering, since breakage of the seal element is readily detectable. Moreover, the device cannot be removed intact from the bottle and replaced intact. It thus prevents clandestine interference with the bottle contents and overcomes a common drawback of prior art devices made entirely of flexible material.

The device preferably includes a cap of stiff plastics adapted to fit over the stopper portion to facilitate removal of the stopper portion and assembly of the device on a bottle.

The invention will be more clearly understood from the following description, given by way of example, with reference to the accompanying drawings, in which:

FIG. 1 is a part-sectional exploded side view of a bottle closure device according to a preferred embodiment of the invention;

FIG. 2 is a partial axial sectional view of the device of FIG. 1 in its assembled and closed condition;

FIG. 3 is a part-sectional side view of the device of FIG. 1, assembled on a bottle and in its open condition;

FIG. 4 is a part-sectional side view of an auxiliary anti-drip member for use optionally with the device of FIGS. 1 to 3;

FIG. 5 is a partial axial sectional view of an assembled

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closure device incorporating the auxiliary anti-drip member of FIG. 4; and

FIG. 6 is an axial sectional view of a modification of FIG. 5.

Referring to FIGS. 1 to 3, a bottle neck 1 is provided with two external annular ridges 2, 3 between which an undercut groove 4 is defined.

The closure device according to the invention includes a body member 5 moulded from flexible plastics and comprising two distinct superposed portions, namely a stopper portion 5a and an annular portion 5b, interconnected by an intermediate annular breakable seal element in the form of a circumferentially extending strip 6. The strip 6 is provided with an outwardly projecting tongue 6a (broken lines) which is pulled when it is desired to remove the strip 6. Upon removal of the strip 6 tearing occurs at respective regions of reduced thickness connecting the strip 6 to the respective portions 5a, 5b.

The annular portion 5b serves to retain the device on the bottle neck 1 and is provided for this purpose with an internal annular projection 7 adapted to snap-engage the lower surface of the ridge 2 in the groove 4 formed in the bottle neck 1. An external annular groove 8 is provided on the portion 5b opposite the projection 7.

The stopper portion 5a includes an inner tubular part 9 which is adapted to fit sealingly into the bottle neck 1 to close the latter. In addition the portion 5a includes an outer tubular part 10 provided with annular projections 11, the parts 9 and 10 being interconnected by a planar top wall 12.

The two-part body member 5 cooperates with a tubular retaining sleeve 13 of stiff plastics adapted to fit over the bottle neck 1 and having a smooth cylindrical outer wall adapted to receive inscriptions, engravings or the like. The sleeve 13 is formed with an internal annular projection 14 adapted to snap-engage in the external annular groove 8 in the annular portion 5b of the two-part member 5 upon assembly of the device (FIG. 2). This snap-engagement causes the sleeve 13, by virtue of its stiffness, to oppose any attempt at removing at least the annular portion 5b of the stopper device from the bottle. Short of breaking the sleeve 13, the device cannot be removed from the bottle without breaking the seal element 6 and thus leaving obvious traces that the bottle has been opened.

A cap 15 molded from stiff plastics is fitted over the two-part member 5 and comprises an inner tubular portion 16, of relatively small depth compared with the overall depth of the cap 15, abutting the top wall 12 of the stopper portion 5a upon assembly of the device. The cap 15 has an outer tubular skirt portion 17 which is externally milled for easy grip by the fingers, the portions 16 and 17 being interconnected by a planar top wall 18.

The skirt portion 17 of the cap 15 is a force-fit over the annular projections 11 on the stopper portion 5a in order to facilitate opening of the bottle and assembly of the closure device on the bottle.

For assembly of the device on the bottle the three components 5, 13, 15 are pre-assembled to form the closure device, and the assembled device then forced on to the bottle neck. The cap 15, being of stiff plastics facilitates the fitting of the closure device to the bottle neck 1, the

strip 6 being interposed between the lower edge of the skirt portion 17 and the upper edge of the sleeve 13.

In order to open the bottle the strip 6 interconnecting the portions 5a, 5b is peeled off, tearing occurring at the reduced-thickness regions on each side of the strip 6. The stopper portion 5a can then be removed by gripping and pulling the cap 15, the annular portion 5b and sleeve 13 remaining fast with the bottle (FIG. 3).

In the embodiment shown in FIGS. 4 and 5 the closure device, which is essentially the same as that of FIGS. 1 to 3, includes additionally an auxiliary anti-drip member 19 of plastics comprising an outer tubular wall 20 tapering at its upper end and formed at its lower end with an external bead 21 engageable behind an undercut shoulder 22 provided on the internal surface of the annular portion 5b. The member 19 also has a smooth internal cylindrical wall 23 merging at its upper end with the external tapered wall 20 in a shaped circumferential pouring lip 24.

The anti-drip member 19 is interposed, as shown in FIG. 5, between the annular portion 5b and the strip 6 on one side and the upper end of the bottle neck 1 on the other side. In this position the internal wall 23 of the member 19 abuts the upper edge of the neck 1 and forms an effective continuation of the neck 1.

On successively opening and reclosing the bottle the anti-drip member 19 remains in its assembled (FIG. 5) position, being held by the shoulder 22. The member 19 facilitates the pouring of liquids from the bottle.

In the modified embodiment shown in FIG. 6 the closure, which is substantially the same as that of FIG. 5, includes an auxiliary anti-drip member 25 provided with known protective means adapted to prevent filling of the bottle after it has been opened.

The stiff outer cap 15' merely comprises a skirt portion 17' and a planar top portion 18' and cooperates with a top portion 5'a of the stopper which is of greater height than in the embodiments shown in FIGS. 1 to 5, the outer tubular wall 10' formed with projections 11' and the inner tubular wall 9' of the top portion 5'a of the stopper being of increased height and merging into the top wall 12' which contacts the wall 18' of the cap 15'.

The auxiliary member 25 comprises an outer tubular wall 20' formed with a bottom bead 21', an intermediate tubular wall 23' merging into the formed by a pouring lip 24' extending to the outside and an internal cylindrical wall 26 which is closed at the top by a planar wall 27 and is connected to the intermediate wall 23' by radial ribs 28 defining a plurality of openings 29 between the two walls 23', 26.

A further auxiliary member 30 fits over the bottle neck 1, the member 30 being a moulding of plastics comprising a bottom tubular portion 31 formed with flexible ribs 31a fitting into the hollow in the neck 1, and a top tubular portion 33 larger in diameter, merging into the former by an intermediate wall 32 in the form of a circular rim.

For assembly the top portion 33 of the member 30 is coaxially interposed between the outer wall 20' and intermediate wall 23' of the member 25 and is secured to the said walls by a top edge 34 of tooth-shaped cross section.

The bottom portion 31 of the member 30 is provided with an intermediate diaphragm 35 formed with a valve seat 36 controlled by a valve member 37 guided by radial ribs 38 on the diaphragm and by the internal parts 26, 27 of the member 25.

When the bottle is inclined to pour its contents, the valve member 37 is removed from its seat permitting flow of the liquid. In the upright or nearly upright position of the bottle the valve member again closes the opening in the diaphragm and prevents further flow of liquid to the bottle.

What I claim is:

1. A bottle closure device for a bottle having at least one ridge externally of its neck, the device comprising, in combination, a stiff plastics retaining sleeve adapted to fit over the bottle neck, the sleeve having an internal circumferential projection; and a body member of flexible plastics comprising an annular locking portion formed with circumferential formations that are adapted to cooperate with the ridge on the bottle neck and the projection on the sleeve to lock the device on the bottle neck against upward movement, a stopper portion adapted to fit into and sealingly close the neck of the bottle, and a breakable seal element connecting the stopper portion to the annular locking portion.

2. A device as claimed in claim 1, and further including a cap of stiff plastics adapted to fit over the stopper portion to facilitate removal of the stopper portion and assembly of the device on a bottle.

3. A device as claimed in claim 1, wherein the breakable seal element comprises a circumferentially-extending strip of said flexible plastics and respective regions of reduced thickness interconnecting the strip with the annular locking and stopper portions of the body member, tearing occurring at said regions upon removal of the strip to separate the annular locking and stopper portions.

4. A device as claimed in claim 2, wherein the stopper portion is provided with external annular projections over which the cap is a force-fit to permit effective interconnection of the cap and the stopper portion.

5. A device as claimed in claim 2, wherein the cap has a depending cylindrical skirt portion and wherein the seal element is upon assembly of the device, interposed directly between the lower edge of said skirt portion and the upper edge of the retaining sleeve.

6. A device as claimed in claim 1 and further including an anti-drip member which is locatable around the neck of the bottle and retainable thereon by interposition between the annular locking portion of the body member and the neck of the bottle.

7. A device as claimed in claim 6, wherein the anti-drip member is formed with a smooth internal wall which upon assembly of the device on a bottle forms an effective continuation of the neck of the bottle, said member being provided with a shaped pouring lip at the upper end of said wall.

8. Device as claimed in claim 6, wherein the anti-drip member is provided with an internal cylindrical wall which is partially closed by a top protective wall that is connected by spaced radial ribs to the internal cylindrical wall of the anti-drip member.

9. Device as claimed in claim 6, wherein the anti-drip member includes a valve adapted to prevent filling of liquids into the bottle after fitting of the device on the bottle.

10. A device as claimed in claim 1, wherein the circumferential formations on the annular locking portion of the body member comprise an external groove adapted to engage with the circumferential projection on the sleeve, and an internal projection adapted, on fitting of the device, to deform resiliently to snap-engage on the lower surface of the ridge on the bottle neck.

11. Device as claimed in claim 9, in which the anti-drip member has an outer and an inner wall, and including an auxiliary member interposed between the anti-drip member and the bottle neck and comprising a bottom tubular portion fitting into the bottle neck, a top tubular portion interposed between the outer and inner walls of the anti-drip member, and a diaphragm intermediate between the bottom and top tubular portions and being formed with a valve seat, a valve member being arranged on the valve seat and being movable off it to permit pouring of liquid from the bottle; and including means to guide the valve member for limited movement relative to the valve seat.

12. Device as claimed in claim 2, wherein the cap has a substantially flat internal top wall, the top surface of the

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stopper portion of the body member being shaped to abut this surface of the cap.

13. A device as claimed in claim 10, in which the internal projection is located opposite the external groove.

14. A bottle having a neck formed externally with at least one annular ridge and a closure device fitted to said neck and closing the bottle, said closure device comprising, in combination, a stiff plastics retaining sleeve fitting over the neck of the bottle, and a body member of flexible plastics having an annular locking portion which is snap-engaged over a said external ridge of the bottle neck and retained on said neck by the sleeve, the sleeve and annular locking portion having interengaging formations which lock the sleeve and annular locking portion together, the

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body member also having a stopper portion which fits into and closes the neck of the bottle, and a breakable seal element interconnecting the annular portion and the stopper portion.

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