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STOPPERS FOR BOTTLES AND THE LIKE

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FIG. 1

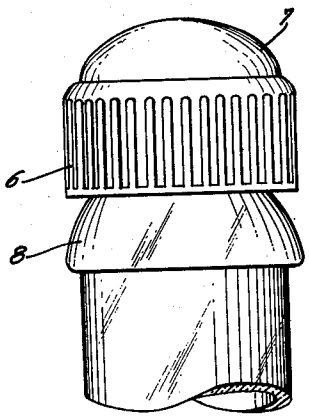
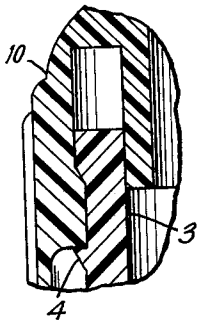



FIG. 3



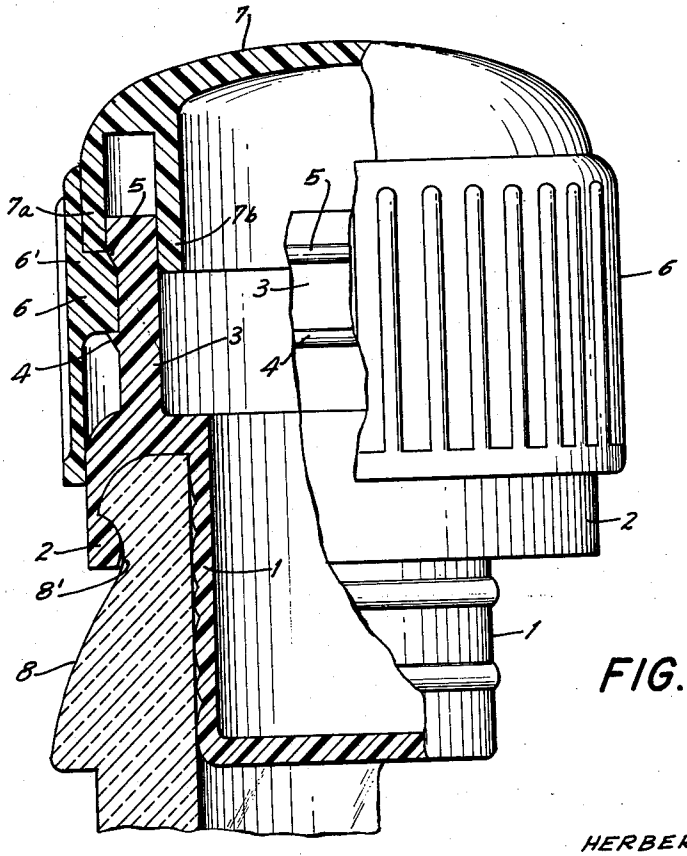




FIG. 2

INVENTOR:
HERBERT BRÜNE

BY Frederick Breitenfeld

ATTORNEY

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# STOPPERS FOR BOTTLES AND THE LIKE

Herbert Brüne, Kolnerstrasse 9, Porz, near Cologne, Germany, assignor, by direct and mesne assignments, of one-third to Plaswin Corporation, a corporation of New York

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This invention relates to a stopper for bottles, containers and the like, with a safety device against excess internal pressure.

It is known that there are stoppers provided with a snap closure or a similar slotted closure, over which a safety ring is slid to effect the locking action of the closure, and, by the same token, of the stopper in the neck of the container against excess internal pressure.

A disadvantage of these known stoppers is that they cannot be inserted into the neck of the container in one single operation. Rather, the stopper must first be inserted into the neck of the container deep enough for the snap closure to engage, or for the slotted closure to reach its engagement setting. Thereafter, the safety ring is slid over such closure in a second operation. Similarly, the removal of the stopper requires two successive operations in reverse order.

Another disadvantage of these known stoppers consists in the fact that not only before the insertion of the stopper into the neck of the container, but also after the removal of the stopper from the neck, two separate parts are present, namely the stopper and the safety ring.

The purpose of the invention is to obviate the mentioned drawbacks and construct the stopper in such a way that it can be inserted in the neck of the container by one single thrust from above, in one operation, being simultaneously secured therein by the safety ring and, vice versa, that the safety ring and the stopper can again be removed together in one single operation.

According to the invention, the stopper is provided in known fashion with a snap bulge or a slotted bulge traversing the neck of the container and, in addition, with a jacket, for example of cylindrical shape, surmounting said bulge, whereby the safety ring, appropriately secured against twisting in relation to the jacket, or alternatively running between end stops, slides thereon in such a way that, when the closure is pressed against the neck of the container, the safety ring, initially in its topmost position, engages the stopper by means of the bottom end stop, until the snap bulge has snapped in or until the slotted bulge has reached its engagement setting, whereupon by increasing the pressure, the safety ring slides past the bottom end stop and secures the bulge in its bottom position. In the area of the bottom end stop, the safety ring may so engage as to prevent any undesirable upward sliding of the safety ring.

The stopper and the safety ring constitute two inseparably connected parts, which remain connected before as well as after the utilization of the stopper.

In the insertion of the stopper, the pressure may be exerted directly against the safety ring, but it is also possible to surmount the stopper with a compression cap, which presses against the safety ring, which in turn pushes down the stopper, and vice versa.

The safety ring and the compression cap may also consist of a single piece of material.

The compression cap is preferably equipped with two concentrically running jackets, whereby the outer jacket projects between the stopper jacket and the pressure ring, while the inner jacket slides as a bearing surface against the inside surface of the stopper jacket, thereby securing the latter against buckling.

The upper end stop on the stopper jacket is so constructed as to prevent upward escape of the safety ring, once it is drawn over the stopper and particularly after the cap is set in place. Conversely, the bottom end stop on the stopper jacket is so constructed as to permit lifting the safety ring from the outside as far as the upper end stop, when the stopper is being removed.



In lieu of the bottom end stop or stops on the stopper jacket, it is also possible to make provision for appropriate friction resistances which permit depressing the safety ring only when increased pressure is applied on this safety ring from the outside.

An illustrative embodiment of the invention is shown in the drawings.

FIG. 1 shows a container neck with the stopper applied thereto in closing position;

FIG. 2 is an enlarged view of the stopper partly in section, wherein the stopper is already located in its lowest setting, but the safety ring is still in its upper location; and

FIG. 3 is a view similar to the upper left-hand corner of FIG. 2, showing an alternative embodiment of the stopper.

1 is a stopper made of elastic material, for example thermoplastic materials. It is designed as a hollow stopper, provided with a snap bulge 2 which can be pushed past the neck of the container 8 deep enough to accommodate the bulge 2 in a groove or recess 8' in the container neck.

According to the invention, this stopper is provided with a cylindrical jacket 3 surmounting the snap bulge 2. This cylindrical jacket 3 features a lower end stop 4 and an upper end stop 5, of circular shape. Provision may also be made for a greater number of end stops.

6 is the safety ring made of less elastic material (plastic or metal), which must slide down past the bulge 2, so as to secure bulge 2 in its setting within the neck of the container (FIG. 1). This safety ring 6 is provided with a projection 6' by which the safety ring spans the gap between the end stops 4 and 5. This safety ring 6 is mounted on the stopper 1 in advance, and even after the stopper 1 is removed, the safety ring 6 remains on the jacket 3 and, by the same token, on stopper 1, in the position shown in FIG. 2.

7 is a compression cap of any desired material, equipped with two concentric jackets 7*a* and 7*b*. Otherwise, the compression cap 7 may be of any desired construction. It may also constitute a single piece of material with the pressure ring 6 as shown at 10 in FIG. 3. As mentioned, in lieu of the snap bulge 2, provision may be made for a slotted bulge.

The mode of operation of the stopper according to the invention is as follows: The stopper 1 together with the safety ring 6 mounted thereon, is inserted into the container neck 8 in one operation, by exerting pressure on the safety ring 6 from above. In the process, this safety ring 6 with its circular projection 6' engages the stopper 1, by bearing down on the end stop 4. The stopper 1 reaches the position shown in FIG. 2, whereby the bulge 2 penetrates the recess 8' in the container neck 8. Once this setting is reached, increased pressure is exerted on the safety ring 6. The safety ring 6 with its projection 6' skips past the end stop 4, thereby passing below the end stop 4, so that the lower jacket on the safety ring 6 slides past the bulge 2, thereby securing bulge 2 in the recess 8'. The upper edge of projection 6' engages the end stop 4 in such a way as to prevent any undesirable upward slipping of safety ring 6.

In order to remove the stopper 1 from the neck of the container, pressure is exerted on safety ring 6 from bottom up, as in the removal of conventional stoppers or corks. Safety ring 6 slides once more upward in the setting shown in FIG. 2, thereby releasing the bulge 2.

As soon as the safety ring 6 rises to the end stop 5 on jacket 3, the stopper 1 is extracted from the neck of the bottle.

Instead of exerting pressure on the safety ring 6 when inserting the stopper into the neck of the container, pressure may be exerted on cap 7, when such a cap is used. This cap bears on the safety ring 6 with its external cylindrical jacket 7*a*. The inner cylindrical jacket 7*b* prevents, particularly in the removal of the stopper, any radial inward shifting of jacket 3 on stopper 1, thereby securing the end stop 5.

Hence, jacket 7*b* serves as a supporting element. Cap 7 simultaneously provides a closure for the open upper end of stopper 1. It may also constitute a single piece of material with safety ring 6. Upward slippage is prevented by the fact that jackets 7*a* and 7*b* are held at least by the force of friction provided by the elastic material of jacket 3.

In lieu of the end stop or stops 4, provision may be made for friction elements or friction resistances which permit compression of safety ring 6 only in the presence of increased pressure, while enabling the safety ring 6 to slide upward, for the purpose of removing the stopper 1 from the neck of the container.

What is claimed is:

1. A stopper for a bottle having an opening in its neck and a bead surrounding the opening, comprising means for sealing the opening, a wall surrounding said sealing means and having an inwardly projecting bulge adapted to cooperate with said bead when said sealing means is in bottle-sealing condition, a cylindrical jacket projecting above said wall, an outwardly projecting deformable stop element formed on said jacket and spaced above said wall, a ring surrounding said wall and jacket and having an upper position and a lower position, said ring serving to lock said bulge beneath said bead when in its lower position to prevent removal of said sealing means from the bottle and to release said bulge when in its upper position, and a detent formed on said ring adapted to rest upon said stop element when said ring



is in its upper position and capable of being forced past said stop element to permit said ring to reach its lower position, whereby when said ring is in its upper position a continuous downward force on it is initially transmitted to said wall via said detent and stop element to move said bulge past said bead on the bottle and thereafter serves to move said ring to its lower position by forcing said detent past said stop element.

2. A stopper according to claim 1 including a cap located above said jacket and movable with respect thereto, and including an element engaging the top of said detent whereby a downward force applied to said cap is transmitted to said ring.

3. A stopper according to claim 2 wherein said jacket is hollow, and including a sleeve depending from said cap and adapted to fit snugly but slidably within said jacket and thereby guide the movement of said cap and ring with respect to said jacket.

4. A stopper according to claim 2 wherein said cap and ring are integral.

5. A stopper according to claim 1 including a second stop element formed on said jacket and spaced above said aforementioned stop element, said second stop element serving to prevent removal of said ring from around said jacket.

6. A stopper according to claim 1 wherein the upper edge of said detent and the lower edge of said stop element are beveled upwardly and outwardly to aid said detent in moving past said stop element when said ring is moved from its lower position to its upper position.

7. A stopper according to claim 1 wherein the spacing between said stop element and the upper end of said wall equals the length of said detent whereby when said ring is in its lower position the upper edge of said detent engages the lower edge of said stop element to thereby positively maintain said ring in its lower position.

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