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CONTAINER WITH CLOSURE PLUG AND SEVERABLE OUTLET ELEMENT

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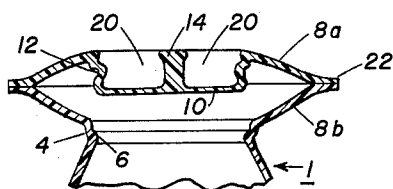
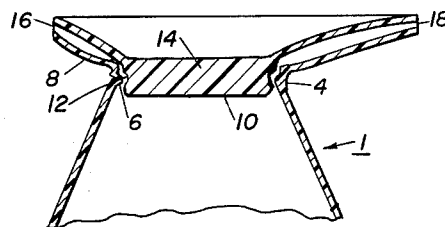
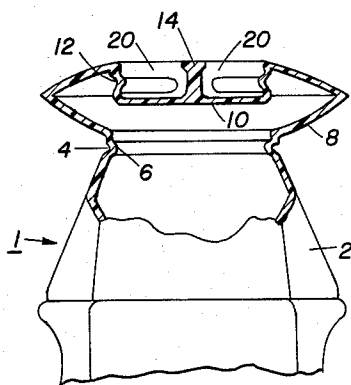
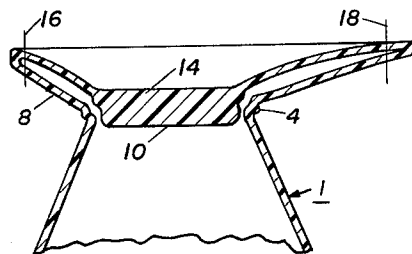
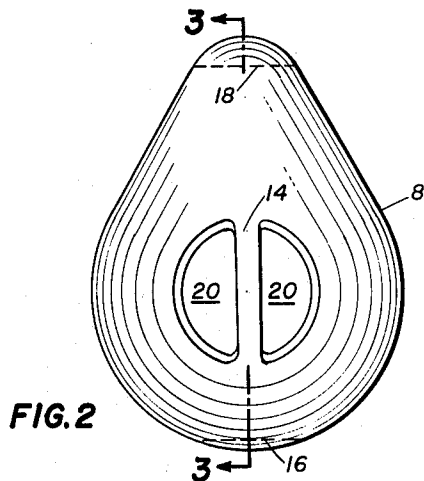


FIG. 1

FIG. 3

FIG. 3a

FIG. 4

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This invention relates to a unique closure for containers, being particularly directed to a novel type of closure wherein the closure forms an integral part of the container and wherein displacement of the closure in one direction permits the discharge of material from the container and a reversal of directional displacement of the closure, originally displaced, causes the closing or sealing of the container.

More specifically, this invention relates to a container of unitary construction wherein the top of the container is so fashioned that an aperture can be made in one portion thereof and the container subsequently reclosed without the use of external means. It is the purpose of this invention to provide a one-piece sealed container that once opened can be reclosed and reopened repeatedly.

The type of container with which this invention is concerned is one having sufficient flexibility to permit partial collapse of the top of the container within itself and to permit the top to remain in collapsed position until an opposite force is applied to disengage the deformed portion of the container top from the remainder of the container. Such containers are commonly made of plastic material such as polyethylene and are adapted to dispense liquids from an opening at the top by applying pressure to the sides of the container or by providing an air vent through which air may enter the container.

It is an object of this invention to provide a one-piece container having a self-contained stopper which will prevent flow of the liquid contents from the container through an aperture made in the container top once the sealing portion of the container top has been flexed into a closed position.

It is another object of this invention to provide a container in which an aperture can be made whereby the top portion of the container top will engage a restricted neck portion of the container thereby sealing the aperture.

It is another object of this invention to provide a container top which forms a portion of the container, as well as a built-in pour spout and self-contained sealing element.

It is still a further object of this invention to provide a novel container in which a reusable stopper forms a part of the unitarily constructed type of container made in conventional plastic blow-molding machines.

These and other objects and advantages will more fully appear from the following description made in connection with the accompanying drawings wherein like reference characters throughout the several views designate like elements in which;

FIGURE 1 is a fragmentary side view in cross-section showing the upper portion of the unitary container in open position;

FIGURE 2 is a top view of the container depicted in FIGURE 1;

FIGURE 3 is a fragmentary cross-sectional view of FIGURE 2 taken along the line 3-3 showing the container top in the closed position;

FIGURE 3a is similar to FIGURE 3 but showing portions of the peripheral edge of the container removed thereby forming a pour spout and an air vent;

FIGURE 4 is an alternate embodiment of this invention showing the novel container closure in other than a unitarily constructed container.

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Broadly, the container of this invention is of unitary construction of the flexible type having a hollow body and a restricted neck portion wherein the neck portion of the container has an annular circumferential interior flange at its most constricted point. The walls of the container at the constriction flare out to form a top which is of single bellows-shaped construction having resilient walls capable of deformation within itself and is made of a material which is easily severed. The uppermost portion of the bellows-shaped top comprises an inverted plug or cylinder cap wherein the cylinder is inverted with respect to the upper surface of the bellows and the cylinder body of the cap is spaced apart from and positioned above the interior opening of the container formed by the restricted neck portion. The walls of the inverted cylinder or plug are adapted to frictionally engage the annular flange at the restricted neck portion of the container when a compressive force is applied to the upper surface of the bellows-shaped top. This engagement is maintained until an opposite force is applied whereby the cylindrical body of the inverted cap or plug disengages the restricted neck portion of the container thereby breaking fluid-tight relationship and permitting the contents of the container to flow through the body of the container into the hollow bellows-shaped top upon placement of the container in an inclined position. The upper exposed surface of the recessed cap or plug is provided with means secured thereto which can normally be grasped by the thumb and forefinger of the human hand and upon which tensional and compressive force can be exerted.

In the drawings, referring specifically to FIGURE 1, there is shown a plastic liquid container 1 having a hollow body 2 and a restricted neck portion 4 which has disposed circumferentially, in the interior surface, flange 6. The bellows-shaped top 8 is of elliptical cross-section and has the top surface thereof inverted in the form of a cap 10, the walls of the cylindrical body of the cap having an annular interior groove 12 adapted to receive flange 6. The diameter of inverted cap 10 is equal to the diameter of the container at the restricted neck portion 4 such that upon the application of a compressive force to projection 14, the body of inverted cap 10, being disposed over the aperture of the hollow container at the restricted neck portion 4, will be depressed and internal annular groove 12 will engage flange 6 whereby the walls of inverted cap 10 will frictionally engage the walls of the container 1 in fluid-tight relationship. Projection 14 provides means by which tensional force can be applied to inverted cap 10 to disengage cap 10 from the restricted neck portion 4. The bellows portion 8 of the container 1 has walls constructed of a flexible yet resilient material such as polyethylene. The thickness of the wall structure is selected so that the bellows-shaped top 8 will be easily compressible yet rigid enough to engage interior annular flange 6.

Referring now to FIGURE 2 wherein a top view of the bellows 8 is shown, the teardrop configuration of the bellows is readily apparent. The bellows 8 may be severed at points 16 and 18, removing a portion of the peripheral edge to provide an aperture for dispensing the fluid retained in container 1 and to provide an air vent to permit air to come into the vent and displace the product as it is dispensed from the container during normal usage. While the apertures have been shown at points 16 and 18, it is to be understood that any number of apertures may be placed at any point on the peripheral edge of the bellows-shaped member 8. While a teardrop shape has been shown for simplicity it is to be understood that any other type of configuration is possible depending upon the circumstance. As can be seen the teardrop configuration ideally forms an elongated spout at one end of the top of the container which

facilitates emptying the contents of the container into another receptacle. Bellows member 8 may be in the shape of any polygon or similar figure. Projection 14 is an extension or projection of the inverted cap portion of the top of the container and ideally is of sufficient thickness to allow grasping by the thumb and forefinger of the human hand. Similarly, the dimensions of projection 14 are of sufficient size to permit the application of compressive forces upon the upper surface of projection 14. Disposed on either side of the projection 14 are two recesses or cavities semi-circular in shape. The recesses 20 are actually formed by the inverted cap 10.

Referring now to FIGURES 3 and 3a wherein the top of the container is shown in the closed position, annular bellows 8 in the collapsed position closes aperture 16 and aperture 18. Aperture 16 in this instance is the air vent, and aperture 18 the orifice from which the contents of container 1 are dispensed when container 1 is tipped. It can now be seen that when a compressive force is applied to projection 14 the walls of cap 10 are depressed to meet the walls of container 1 at the restricted neck portion 4 of the container 1. As the compressive force is applied to projection 14, annular flange 6 engages interior annular groove 12, thereby creating a tight snap fit with the walls of container 1. It is readily apparent that in this position the contents of container 1 are isolated from apertures 16 and 18 by inverted cap 10 in closed position and in fluid-tight relationship with the restricted neck portion of the container 1 at 4.

Another form of the novel container top is shown in FIGURE 4 wherein bellows 8 comprises two separate sections 8a and 8b which have been joined together at seam 22 by conventional heat seal. In this embodiment, the container 1 is molded with a configuration comprising semi-bellows section 8b. Semi-bellows section 8a is separately fashioned and joined to semi-bellows section 8b along the periphery of the two sections designated at seam 22. The mode of operation is identical to that when the top of the container is fashioned in one piece.

It may thus be seen that I have devised a simple and novel container which can be repeatedly re-sealed and opened without the use of external means. Various modifications may be made of the foregoing structures including various combinations of features disclosed without departing from the scope of this invention. For example, the bottom portion of the container can be of any configuration, as can be the top bellows portion, it being only necessary that the inverted top portion of the bellows, which is disposed at the restriction of the container, be of the same configuration as the restriction so that the walls of the inverted cap portion engage the walls of the container in fluid tight relationship. While the invention has been described in terms of one mechanism, it is to be clearly understood other locking mechanism can also be utilized to satisfactorily re-seal the container once the container has been opened.

The embodiments of this invention in which an exclu-

sive property or privilege is claimed are defined as follows:

1. A reclosable container having a hollow body, a constricted neck forming an opening communicating the interior of said hollow body to a hollow bellows-shaped top having resilient walls capable of deformation within itself and capable of being severed along its peripheral edge, said top having an inverted upper surface forming a plug spaced apart from and positioned above said opening and adapted to form a fluid-tight closure with said neck when a compressive force sufficient to deform said top into engagement with said neck is applied to said top and means on said top to enable tensional and compressive force to be applied thereto.

2. A container in accordance with claim 1 including means to retain said plug in fluid-tight relationship comprising an internal circumferential flange formed by the walls of said container at said neck and an internal circumferential groove on said plug whereby a snap interengagement of said flange and said groove occurs when said plug is depressed into the neck of said container.

3. A container in accordance with claim 2 wherein said peripheral edge of said bellows-shaped top is of teardrop configuration and said top is of elliptical cross-section.

4. A container in accordance with claim 2 wherein said neck of said container forms a conical section and said plug is of congruent configuration.

5. A container in accordance with claim 4 wherein said means on said plug to apply tensional and compressive forces thereto is a tab-like projection capable of being grasped by the thumb and forefinger of the human hand.

6. A unitary reclosable container of the flexible type having a hollow body; a constricted neck having an inwardly extending annular flange; and a hollow bellows-shaped top having resilient walls capable of deformation within itself and capable of being severed along its peripheral edge, said top having an inverted upper surface forming a cylindrical plug, said plug being spaced apart from and positioned above said neck when the top is in normal position, said plug having an annular groove adapted to frictionally engage said annular flange in fluid-tight relationship and maintain said engagement when a compressive force sufficient to engage said plug with said annular flange is applied to said plug, and said top having a tab-like projection on the upper exposed surface of said top upon which compressive and tensional forces can be applied by the human hand to engage and disengage said plug from said annular flange.

References Cited by the Examiner

FOREIGN PATENTS

975,034 2/1951 France.
1,220,045 5/1960 France.

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