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CLOSURE FOR PRESSURIZED PACKAGE

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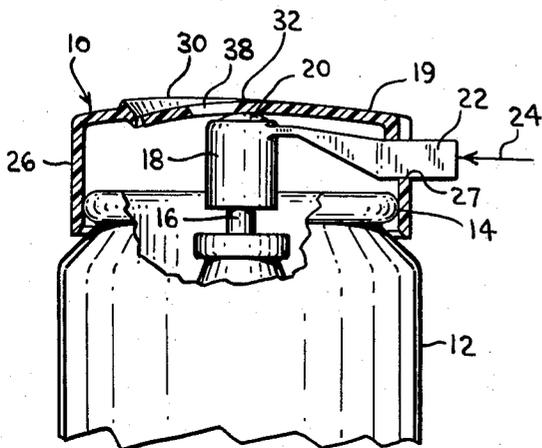


Fig. 1

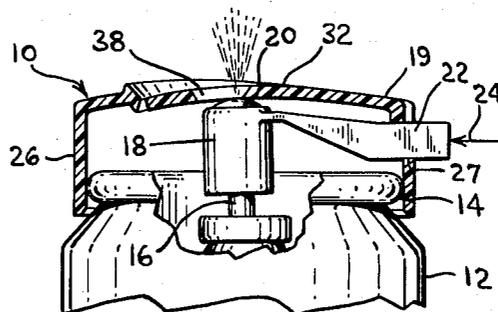


Fig. 2

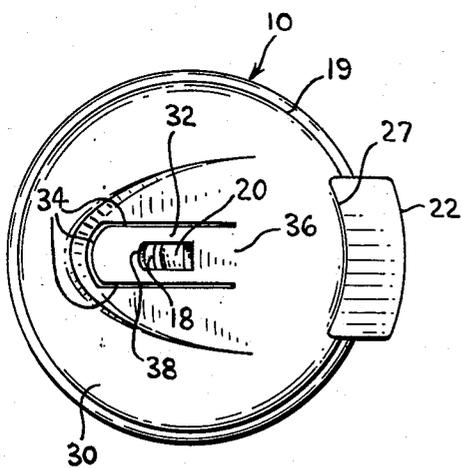


Fig. 3

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CLOSURE FOR PRESSURIZED PACKAGE

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The invention relates to a closure for pressurized packages and more specifically to a closure that will serve to hermetically seal the pressurized package between successive uses thereof.

A large number of products are now sold in pressurized packages wherein the product, usually in liquid form but in other forms as well, is confined within a container under the superatmospheric pressure of a gaseous propellant. Discharge of the product from the container is effected by the manual actuation of a valve that is ordinarily mounted at the mouth of the container. When the valve is open, the interior of the container is communicated with the atmosphere and the superatmospheric pressure of the gaseous propellant forces the product out through the open valve. Actuation of the valve is had by the user of the package applying pressure to a valve actuator which serves as a convenient device for operating the valve and which normally contains the discharge orifice through which the product is dispensed.

Despite the continually increasing number of products being marketed in pressurized packages, there have been, heretofore, certain types of products which could not be satisfactorily marketed in this manner. These products include those, which for one reason or another, would either clog the discharge orifice and passageways in the valve actuator as a result of being exposed to the atmosphere or which are of such a nature that prolonged exposure to the atmosphere would adversely affect their quality.

The difficulty arises from the fact that in the usual pressurized package there is a substantial distance between the cut-off point in the valve and the discharge orifice in the valve actuator. As a result, the passageways connecting these points are exposed to the atmosphere for long periods of time between successive uses of the package. Inasmuch as there is always some residue of product left within these passageways after each actuation of the valve, any product containing a nonvolatile ingredient that will dry out in the presence of air will clog these passageways and prevent any subsequent dispensing of the product. If the product is one which is adversely affected by prolonged exposure to the air, the residue of product left in the passageways will become contaminated due to its exposure to the atmosphere and will be dispensed on the next subsequent use of the package.

The present invention, accordingly, has for its object the development of a closure for pressurized packages that will hermetically seal off from the atmosphere the discharge orifice and passageways in the valve actuator during those periods when the package is not in use without in any way interfering with the normal actuation of the valve. It is a further object of the invention to accomplish this sealing off of the orifice and passageways in an automatic manner so as not to require any action on the part of the user of the package for this purpose.

A presently preferred form of the invention is shown in the accompanying drawings and will be described in detail hereinafter for the purpose of illustrating one way in which the invention may be made and used. It will be apparent to those skilled in the art, however, that the principles and advantages of the invention can be obtained in other forms of the invention not shown herein. The accompanying drawings and the description to follow are, accordingly, by way of example only and are not intended

to define or restrict the scope of the invention. The claims appended hereto, together with their lawful equivalents, are relied upon for that purpose.

Of the drawings:

5 FIG. 1 is a side elevation of a pressurized package equipped with a closure embodying the principles of the present invention, the closure being shown in transverse section;

10 FIG. 2 is a view similar to that of FIG. 1 showing the parts of the package in their operating positions; and

FIG. 3 is a top view of the package shown in FIG. 1.

15 In FIG. 1 there is shown a pressurized package having a closure 10 made in accordance with the teachings of the invention. For the sake of clarity the closure 10 is shown in section while the rest of the package is shown in side elevation.

20 The package comprises a container 12 in which are confined the product to be dispensed and a gaseous propellant therefor. The propellant is at a superatmospheric pressure and serves to force the product from the container. Dispensing of the product from the container 12 is controlled by a valve fixed in a cap assembly 14 that is secured to the mouth of the container. A valve stem 16 for the valve extends upwardly through an opening (not shown) in the cap assembly 14 and an actuator 18 for the valve is mounted on the upper end of the valve stem 16. The closure 10 takes the form of a cap 19 that encloses the valve actuator 18, valve stem 16 and the top of the container 12. The container 12 for the particular 30 pressurized package shown in the drawings is a metal can, however, the invention is not limited to this type of container but is equally well suited for glass or plastic bottles or for any other type of container.

35 As is customary, the valve stem 16 is hollow and is communicated with the discharge port of the valve so as to provide an internal passageway for the flow of product whenever the valve is opened. The internal passageway (not shown) in the stem 16 also communicates with a similar internal passageway (also not shown) formed in the valve actuator 18 in the customary manner. A discharge nozzle 20 is provided in the upper end of the valve actuator 18 at the terminus of the internal passageway therein. In this way a continuous escape route is provided for the product after it has passed through the 45 open valve.

40 In the particular package shown in the drawing a "toggle" action type of valve is employed. Opening of this type of valve is effected by a lateral displacement of the valve stem 16 from the normal substantially vertically disposed position shown in FIG. 1. Displacement of the actuator 18 occurs whenever the user of the package applies a lateral force on the extension piece 22 which is secured to the actuator 18 and which extends beyond the side of the container 12 (see FIG. 2). Such a force is 55 indicated by the arrow 24.

50 The closure cap 19 is cup shaped and has a side wall 26 which extends downwardly in frictional engagement over the rolled-over edge portion of the valve assembly 14. An access opening 27 is provided in the side wall 26 to permit the extension piece 22 to extend beyond the side of the container 12. In preferred form the side wall 26 of the cap is substantially continuous as shown but the side wall can also be discontinuous if desired. The top portion 30 of the cap 19 extends laterally across the actuator 18 and the top of the container 12 and has a deflectable segment 32 formed centrally thereof. The segment 32 is formed so that three of its sides 34, 34 are not 65 joined to the rest of the top portion while the fourth side is. (See FIG. 3). This fourth side 36 thus serves as a hinge for the segment 32 which is free to deflect upwardly relative to the top portion 30 by reason of the other three sides 34, 34 not being joined to the top. 70

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The segment 32 is so located in the top portion 30 of the cap 19 that it lies directly above the valve actuator 18 and engages the upper end thereof. By reason of this arrangement a sealing engagement is effected between the discharge nozzle 20 in the valve actuator 18 and the deflectable segment 32 which acts to close off the discharge orifice (not shown) in the nozzle 20 from the atmosphere. During the engagement of the segment 32 with the nozzle 20 the segment is deflected slightly upward and this upward deflection produces a compensating force constantly acting to maintain the seal between the segment and the nozzle.

An opening 38 is formed in the segment 32 to one side of the discharge orifice in the nozzle 20. The opening 38 is formed on a side opposite to that of the extension piece 22 so as to lie above the path of movement of the valve actuator 18 when moved by a lateral force on the extension piece 22. When the valve actuator 18 is so moved to bring the orifice in the discharge nozzle 20 into register with the opening 38, the orifice is no longer sealed from the atmosphere. Care is taken to position the opening 38 so that the discharge orifice is in register with the opening when the actuator 18 has been tilted far enough to open the valve.

To use the package the container 12 is grasped in the hand and a finger is placed against the end of the extension piece 22. A lateral force inwardly of the package is then exerted by the user as is indicated by the arrow 24. The lateral force tilts the actuator 18 and valve stem 16 from their normal substantially vertically disposed positions thereby moving the discharge orifice in the nozzle 20 into register with the opening 38 in the segment 32 and actuating the valve. The product in the container 12 then issues from the discharge nozzle 20 and passes out through the opening 38 in the segment 32.

After the desired amount of product has been dispensed, the user removes his finger from the extension piece 22. The valve stem 16 and valve actuator 18 then automatically return to their original positions under the urging of a resilient part (not shown) within the valve. In returning to its normal upright position the valve actuator 18 slides the discharge orifice back under the unapertured portion of the segment 32 thereby again sealing off the orifice from the atmosphere.

While the invention has been described for purposes of illustration with reference to a package employing a "toggle" type of valve, it will be readily understood by those skilled in the art that the invention is not so limited and may also be applied to a vertically actuated valve.

What is claimed is:

1. In a pressurized package wherein a product is confined within a container under the superatmospheric pressure of a gaseous propellant and discharge of the product from the container is controlled by a valve mounted thereon, the discharge of the product issuing from a discharge orifice in an actuator for the valve, the combination of

(a) a cap portion affixed to the container for the package extending from opposite sides laterally across the actuator for the valve,

(b) said cap portion having a wall thereof in overlying engagement with the valve actuator to seal off from

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the atmosphere the discharge orifice located in the actuator when the latter is disposed in its normal position.

(c) said cap portion having an opening therethrough positioned to one side of the discharge orifice in the valve actuator when the latter is disposed in its normal position, and

(d) an extension on the valve actuator projecting outwardly of the cap portion to be accessible for the application of a force to move the valve actuator to effect register of the discharge orifice therein with said opening in said cap portion concomitantly with the opening of the valve for dispensing the product from the package.

2. In a pressurized package wherein a product is confined within a container under the superatmospheric pressure of a gaseous propellant, the combination of

(a) a valve on the container for controlling the discharge of the product therefrom,

(b) an actuator for the valve on the container normally disposed in an upright position and movable laterally in any direction from said upright position to open the valve,

(c) said actuator having a discharge orifice in the upper end thereof in communication with the valve,

(d) a cap portion affixed to the container for the package extending from opposite sides laterally across the upper end of the valve actuator,

(e) said cap portion having a deflectable segment therein in engagement with the actuator to seal off from the atmosphere the discharge orifice located therein,

(f) said cap portion having an opening in the deflectable segment positioned to one side of the discharge orifice in the valve actuator, and

(g) an extension on the valve actuator extending laterally beyond the cap portion so as to be accessible for the application of a laterally directed force thereto to move the discharge orifice in the valve actuator into register with the opening in the segment and to move the valve actuator laterally from its normal upright position to open the valve.

3. The combination as set forth in claim 2 wherein said container has an opening therein and said cap portion engages the container substantially entirely around the periphery of the opening therein.

4. The combination as set forth in claim 3 wherein said cap portion has a generally cylindrical side wall and a substantially planar top portion joining the upper edge of the side wall, said deflectable segment being provided in the top portion and said side wall having an access opening through which extends the extension on the valve actuator.

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