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Vos et al.

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[54] **PRESSURIZED PACKAGE**

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[51] Int. Cl.**B65d 83/14**

[58] Field of Search.....222/402.1, 402.11, 402.12, 222/402.13, 402.18, 54, 145, 402.15, 136, 402.24

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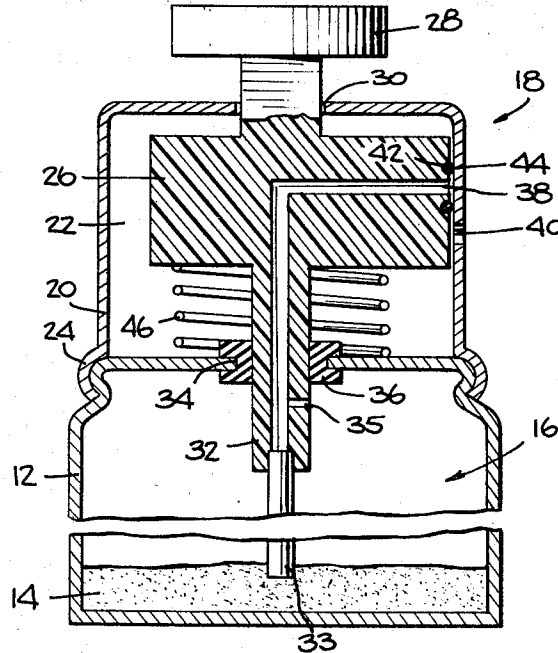
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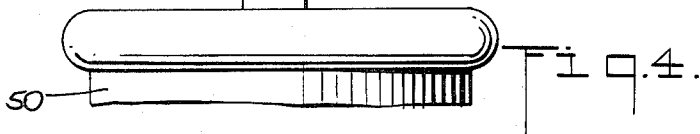
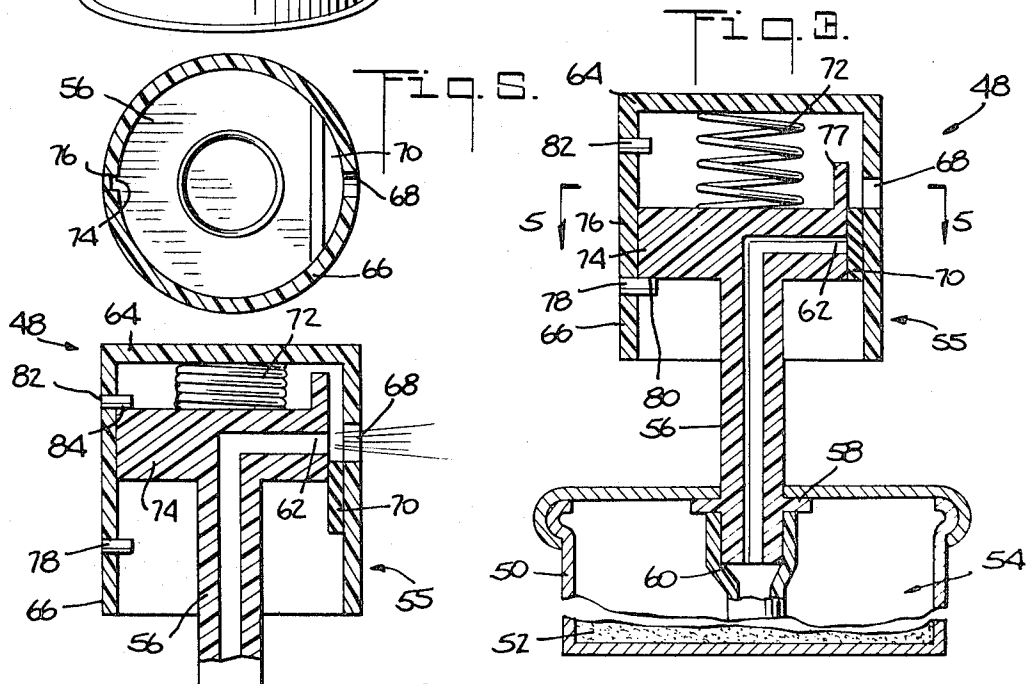
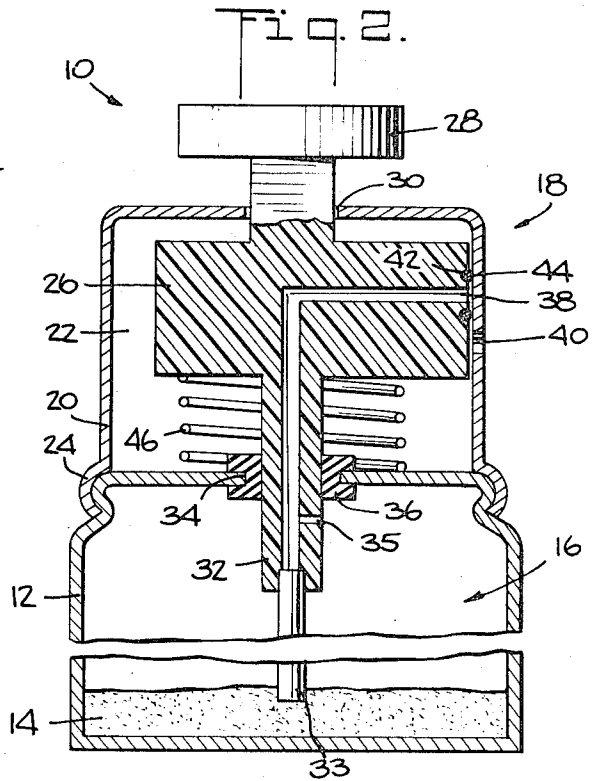
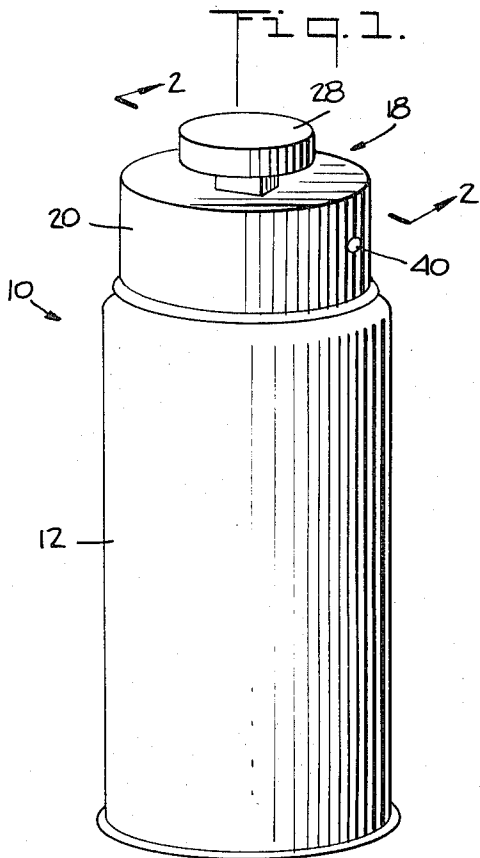
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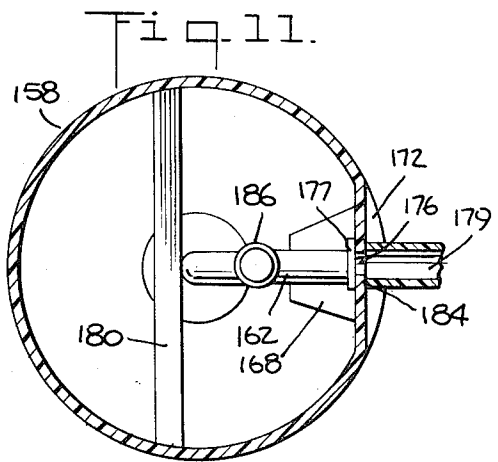
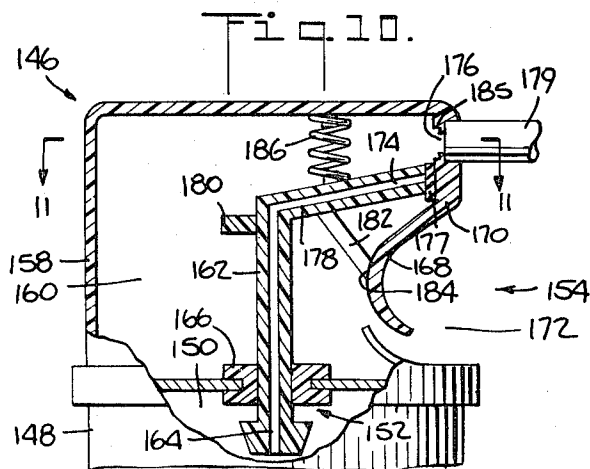
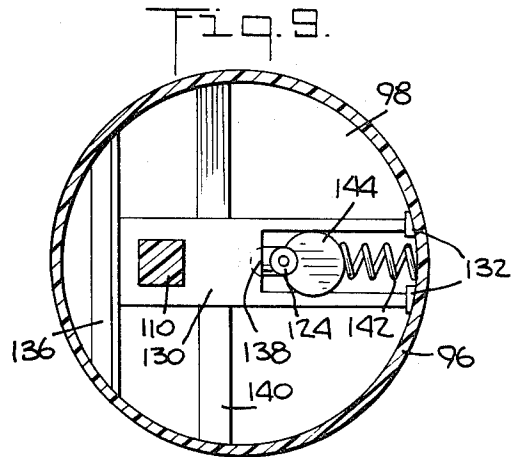
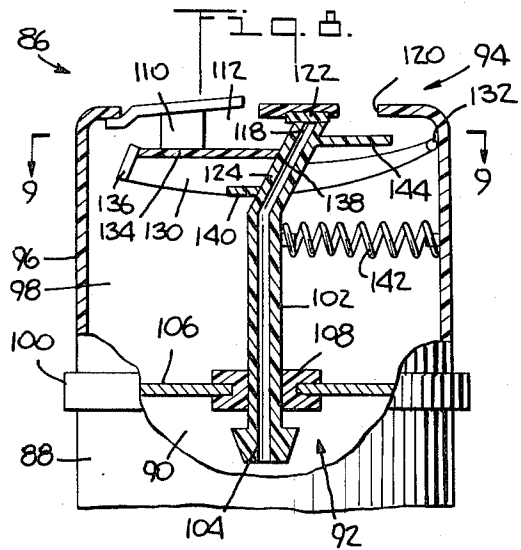
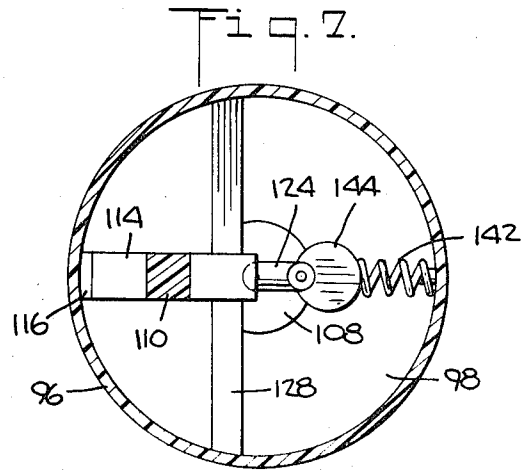
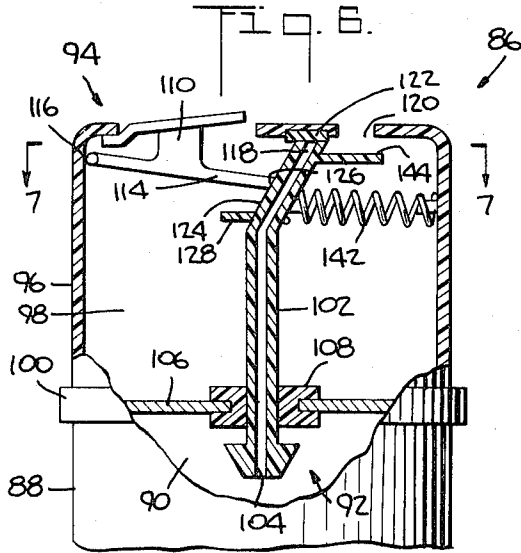
[57] **ABSTRACT**

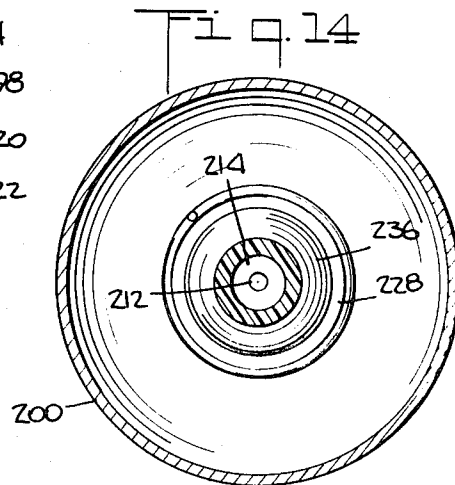
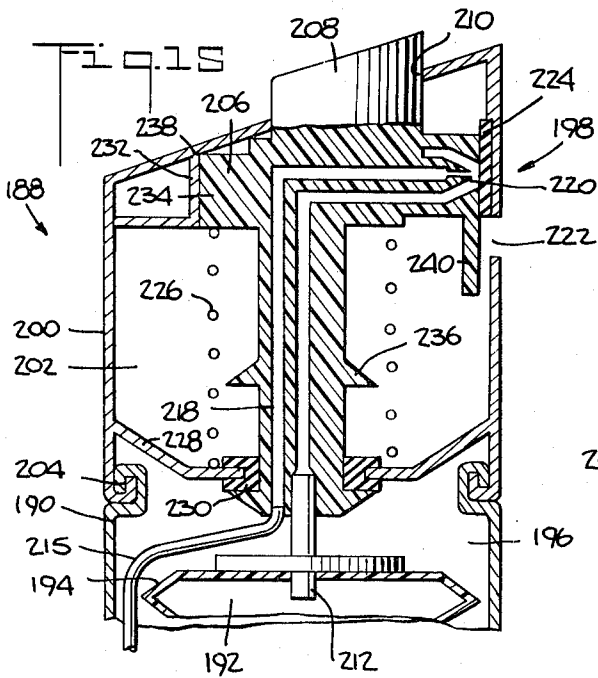
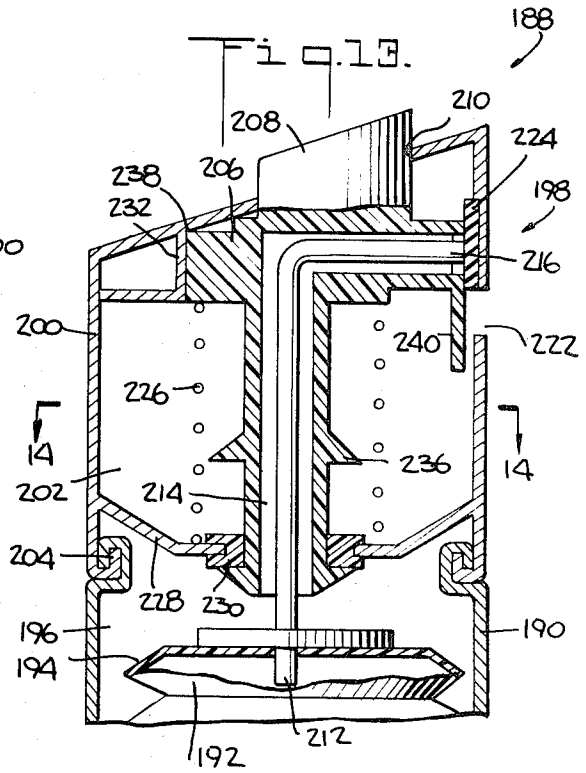
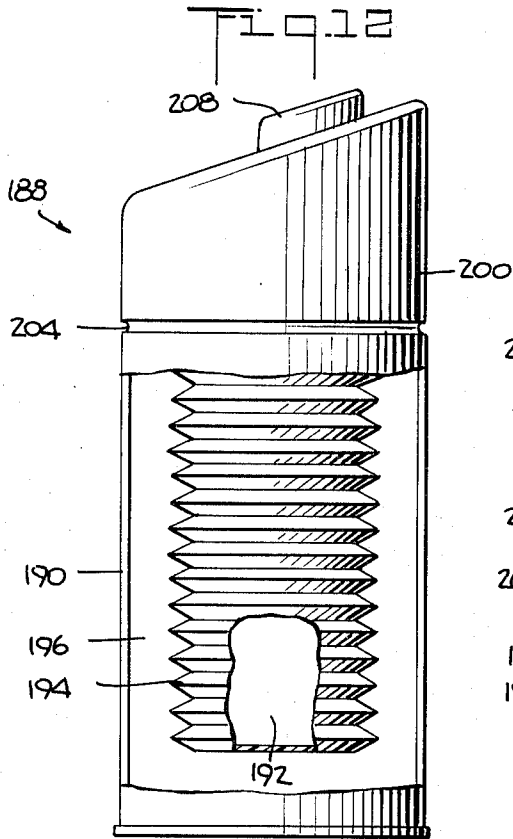
This invention relates to a pressurized package of the class including a container for receiving a product, propellant means also in the container for discharging the product from the container, and a dispensing assembly mounted on the container and characterized by positioning the shutoff which holds the pressure of the container at the dispensing exit, combined with other novel features.

27 Claims, 15 Drawing Figures









PRESSURIZED PACKAGE

This invention has to do with pressurized packaging, and more particularly to such packaging characterized by a container for a product and a pressurized propellant for effecting discharge of the product from the container.

It is known to utilize a propellant for dispensing a product from a container in the form of an aerosol, for example. Such containers are generally equipped with a dispensing assembly operated by manual push-down buttons which actuate a conventional shutoff valve in the container located at a substantial distance from the exit orifice for venting the container contents for so long as the button is held in its depressed position against a resilient force. Upon release of the button, the resilient force serves to close the shutoff valve and prevent further release of the product from the container.

Heretofore, difficulty was experienced with certain products such as paint, shaving cream, etc., because frequently some of the product was left in the discharge tube downstream of the valve after the valve was closed and this product tended to dry and plug the tube, thereby inhibiting proper flow of the product from the container in future applications. In addition, microorganisms attacked the product residue causing unpleasant odors.

A further problem often noted in connection with such constructions is the occurrence of drooling at the exit opening after valve closure. Such drooling is caused by the slow expansion of product left in the discharge tube after the valve is closed.

The present invention involves a novel combination of elements arranged in such a way as to afford a very effectual solution to the difficulties encountered with the prior art, as will become apparent as the description proceeds. Essentially, we have conceived dispensing assemblies for use in connection with packages of the class described and according to which sealing takes place at the outlet end of the discharge tube. That is, the shutoff valve which holds the pressure of the container is located at the outlet end of the container. Related patents in this art include U.S. Pat. No. 3,211,346 issued Oct. 12, 1965, and U.S. Pat. No. 3,378,205 issued Apr. 16, 1968. It will be appreciated that these patents located a conventional shutoff valve a substantial distance inside the container and the external sealing was merely secondary. These patents do not relate to the idea of a seal at the exit, which holds the pressure of the container, but rather describe techniques for eliminating solvent evaporation if the solvent has a low vapor pressure.

In order to accomplish the desired results, according to one aspect of the invention, we contemplate the provision of a new and improved pressurized package of the class including a container for receiving a product, propellant means also in the container for discharging the product from the container, and a dispensing assembly mounted on the container and characterized by a container cap having an internal cavity secured to the top of said container. A button is mounted in the cavity, and has a passageway extending outwardly, and means are provided for placing the button passageway in fluid flow communication with the inside of said container. The container cap has an exit

opening and sealing means are interposed between the button and the container cap. Means are also provided for moving the button to align the button opening with the exit opening for dispensing the product from the container, and means such as a spring return the button to its original position.

According to another aspect of our invention, there is provided a pressurized package including a container for receiving a product, propellant means also in the container for discharging the product from the container, and a dispensing assembly mounted on the container and characterized by a valve member mounted on the top of the container, and a dip tube extending downwardly from the bottom of the valve member into the top of the container. A valve opening extends radially outwardly in the valve member, and it is in fluid flow communication with the dip tube. A cap is provided which has depending side walls with a radially extending exit opening. A seal pad is fixedly mounted on the inside of the side walls adjacent and below the exit opening for sealing the valve member with respect to said side wall. The cap is manually depressible to align the exit opening with the valve opening for dispensing the product from the container. Means are provided for returning the cap to its upper position upon release of the valve member.

In conformity with another aspect of the invention, there is provided a pressurized package characterized by a container for receiving a product, propellant means also in the container for discharging the product from the container, and a dispensing assembly mounted on the container and comprising a container cap having an internal cavity secured to the top of said container. A button is mounted in the cavity with a portion thereof protruding through an aperture in the top of the container cap for manually operating the button. A dip tube extends downwardly from the bottom of the button into the top of the container, and a second downwardly extending tube is in fluid flow communication with the top of the container. A button passageway extends radially outwardly and is in fluid flow communication with both tubes. The container cap has a radial exit opening, and sealing means are fixedly mounted on the container cap adjacent and above the exit opening for sealing the button with respect to the container cap. The button is depressible to align the button passageway with the exit opening for dispensing the product from the container. Means are provided for returning the button to its proper position upon release.

According to still another aspect of the invention, there is provided a pressurized package of the class including a container for receiving a product, propellant means also in the container for discharging the product from the container, and a dispensing assembly mounted on the container comprising a container cap having an internal cavity and secured to the top of the container. A valve member is mounted in the cavity, and it has a tube portion extending downwardly into the container. A button is pivotally mounted in an opening on the container cap for manual movement, and a lever arm is pivotally mounted on the container cover. The pivot arm is movable responsive to movement of the button and the valve member has a valve opening in fluid flow communication with the tube portion, and the container cap has an exit opening. A sealing pad is

mounted on the container cap adjacent the exit opening and is engageable with the valve opening for sealing the valve member with respect to the container cap. The valve member has a contact surface, and the lever arm engages this surface to align the valve opening with the exit opening for dispensing the product from the container when the button is depressed. Means are provided for returning the valve opening to the sealing pad upon release of the button.

As still another aspect of our invention, we provide a new and improved pressurized package which includes a container for receiving a product, propellant means also in the container for discharging the product from the container, and a dispensing assembly mounted on the container. The dispensing assembly is characterized by a container cap having an internal cavity secured to the top thereof. A valve member is mounted in the cavity, and it has a tube portion which extends downwardly into the top of the container. A trigger is pivotally mounted in an opening on the side of the container cap for manual horizontal movement. The valve member has a radially extending valve opening which is in fluid flow communication with the tube portion. The container cap has a horizontally extending exit opening, and a sealing pad is mounted thereon adjacent said exit opening and engageable with the valve opening for sealing the valve member with respect to the container cap. The valve member has a contact surface, a lever arm has one end fixedly mounted on the trigger and has the other end engageable with the contact surface on the valve member to align the valve opening with the exit opening for dispensing the product from the container when the trigger is depressed. Means are provided for returning the valve member to the sealing pad upon manually releasing said trigger.

Those persons concerned with this art, while appreciating the importance of giving adequate consideration to customer safety in the design and assembly of all products to be offered to the public, will be particularly aware of the need to consider customer safety where pressurized products such as aerosols are involved. Thus, we have taken into account the danger inherent in charged aerosol containers when they become over-pressurized as by exposure to heat, for example, and provide for the venting of the containers if such conditions evolve. We have therefore contributed, as a further important aspect of our invention, a combination according to which the components are fabricated from two different plastics having different coefficients of thermal expansion. That is, the container cap is fabricated from a material having a higher coefficient of thermal expansion than the material from which the button itself is fabricated, thereby expanding at a different rate than the button in the event of exposure to excessive heat and permitting slow venting of the contents of the container to prevent bursting or exploding of the container.

There has thus been outlined rather broadly the more important features of the invention in order that the detailed description thereof that follows may be better understood, and in order that the present contribution to the art may be better appreciated. There are, of course, additional features of the invention that will be described hereinafter which will form the subject of the claims appended hereto. Those skilled in the

art will appreciate that the conception on which this disclosure is based may readily be utilized as the basis for the designing of other structures for carrying out the several purposes of the invention. It is important, therefore, that this disclosure be regarded as including such equivalent constructions as do not depart from the spirit and scope of the invention.

Several embodiments of the invention have been chosen for purposes of illustration and description, and are shown in the accompanying drawings, forming a part of the specification, wherein:

FIG. 1 is a perspective view of a pressurized package constructed in accordance with the concept of the present invention;

FIG. 2 is an enlarged vertical sectional view of the dispensing assembly taken along the line indicated at 2—2 in FIG. 1;

FIG. 3 is an enlarged vertical sectional view of another dispensing assembly according to the present invention;

FIG. 4 is an enlarged vertical sectional view similar to FIG. 3, but showing the dispensing assembly in its dispensing position;

FIG. 5 is a horizontal sectional view taken along the line indicated at 5—5 in FIG. 3;

FIG. 6 is a vertical sectional view of another embodiment of the dispensing assembly constructed according to our invention;

FIG. 7 is a horizontal sectional view taken along the line indicated at 7—7 in FIG. 6;

FIG. 8 is a vertical sectional view of a modification of the dispensing assembly of FIGS. 6 and 7;

FIG. 9 is a horizontal sectional view taken along the line indicated at 9—9 in FIG. 8;

FIG. 10 is a vertical sectional view of still another embodiment of a dispensing assembly according to the present concept;

FIG. 11 is a horizontal sectional view taken along the line indicated at 11—11 in FIG. 10;

FIG. 12 is a side elevation, partially broken away, of a pressurized package constructed according to the concept of this invention;

FIG. 13 is an enlarged vertical sectional view showing details of the dispensing assembly of the pressurized package of FIG. 12;

FIG. 14 is a horizontal sectional view taken along the line indicated at 14—14 in FIG. 13; and

FIG. 15 is an enlarged vertical sectional view similar to FIG. 13, but showing a modification of the dispensing assembly.

Referring now to the drawings, and more particularly to FIG. 1 thereof, there is shown a pressurized package, indicated generally at 10, constructed according to the present concept and comprising a container 12 for receiving a product 14, FIG. 2, which may be in the form of a liquid or a gel. Propellant means indicated generally at 16, is also disposed in the container for discharging the product from the container, and a dispensing assembly, indicated generally at 18, is mounted on the container. As best seen in FIG. 2, the dispensing assembly comprises a container cap 20 having an internal cavity 22 secured to the top of the container 12 as at 24. A button 26 is mounted in the cavity and a portion 28 of the button protrudes through an aperture 30 in the top of the container cap 20 for manually operating the button.

Still referring to FIG. 2, a stem 32 extends downwardly from the bottom of the button 26 through an aperture 34 in the top of the container and carries a dip tube 33. A conventional vapor tap 35 may be provided in the stem 32. Sealing means, such as a rubber gasket 36, serves to provide a seal between the stem 32 and the container 12. A button passageway 38 extends radially outwardly in the button 26 and is in fluid flow communication with the dip tube, while the container cap 20 has a radial exit opening 40. We also form a recess 42 in the button 26 to surround the opening 38 and a rubber gasket 44 is positioned in the recess to engage the container cap 20 normally to seal the button passageway with respect thereto. The button 26 is manually depressible to align the button opening 38 with the exit opening 40 to unseal the passageway 38 and dispense the product from the container. The portion 28 of the button 26 serves as a limit stop by engaging the upper surface of the cap 20, thereby preventing further depression of the button; and a spring 46 is interposed between the button 26 and the top of the container 12 for returning the button to its upper position upon release thereof.

In a modification of the invention illustrated in FIGS. 3-5, we utilize a pressurized package, indicated generally at 48, including a container 50 for receiving a product 52. Propellant means, indicated generally at 54, are also in the container 50 for dispensing the product 52 therefrom. A dispensing assembly, indicated generally at 55, is mounted on the container 50 and comprises a valve member 56 secured in sealed relationship to the top of the container 50 as at 58. A dip tube 60 extends downwardly from the valve member 56 into the container 50, and a passageway 62 extends upwardly from the dip tube and then radially outwardly in the valve member 56.

As is seen in FIGS. 3 and 4, a cap 64, having a cylindrical depending side wall 66, is mounted over the valve member 56 and a radially extending exit opening 68 is formed in the wall 66. A sealing pad 70 is fixedly mounted on the inside of the side wall 66 adjacent and below the exit opening 68 for sealing the valve member 56 with respect to the side walls 66. The cap 64 is manually depressible to align the exit opening and the valve opening for dispensing the product from the container 50, as shown in FIG. 4. A spring 72 is interposed between the top of the valve member 56 and the bottom of the cap 64 to return the cap to its upper position upon manual release, as seen in FIG. 3.

The valve member 56 is formed with a radially extending projection 74 disposed diametrically opposite the valve opening 62, and the side wall of the cap 64 has a vertically extending cut 76 (FIG. 5) for receiving the projection 74 to maintain proper alignment of the cap with respect to the valve member during relative movement of same. As shown in FIGS. 3 and 4, a shield 77, carried by the valve member, is disposed in front of the exit opening 68 when the valve is shut off. A stop member 78 depends radially inwardly from the side wall 66 of the cap 64 for engaging the underside of the valve member, as at 80, FIG. 3, to limit the upward movement of the cap; and a second stop member 82 depends radially from the side wall of the cap 64 for engaging the upper side of the valve member, as at 84, FIG. 4, to limit the downward movement of the cap.

Referring next to the embodiment of FIGS. 6-9, a pressurized package, indicated generally at 86, includes a container 88 for receiving a product 90. Propellant, indicated generally at 92, is disposed in the container for discharging the product from the container, and a dispensing assembly, indicated generally at 94, is mounted on the container 88. The dispensing assembly includes a container cap 96 secured to the top of the container 88, as at 100, and has an internal cavity 98 which we mount a valve member 102 provided with a tube 104 extending downwardly through an aperture in the top 106 of the container 88 and to which a dip tube may be connected. Sealing means such as a grommet 108 is provided for sealing the tube portion with respect to the top of the container. The valve member 102, FIGS. 6 and 8, has an upwardly directed valve opening 118 in fluid flow communication with the tube 104; and the container cap 96 has a vertically extending exit opening 120 and a sealing pad 122 is mounted on the container cap adjacent the exit opening and engageable with the valve opening 118 for sealing the valve 102 with respect to the container cap 96.

A button 110 is mounted in an opening 112 in the top of the container cap 96 for manual vertical movement and in the form of the invention illustrated in FIGS. 6 and 7, a lever arm 114 is pivotally mounted on the container, as at 116. The lever arm is movable responsive to movement of the button 110. The other end 126 of the lever arm engages a contact surface 124 on the valve member to align the valve opening 118 with the exit opening 120 for dispensing the product from the container when the button 110 is depressed. In this case, we have chosen to bend the valve member 102 so that a portion of it is angulated relatively to the longitudinal axis of the container; and this angulated portion provides the contact surface 124 against which end 126 of the lever arm 114 bears. Also, because of this bend, the valve opening 118, which is normally sealed against pad 122 and out of alignment with opening 120, will discharge through opening 120 when the valve member 102 is vertically depressed. A stop element 128 serves to limit the downward travel of the lever arm 114.

In the form of the invention illustrated in FIGS. 8 and 9, a lever arm 130 is pivotally mounted on the container at a position diametrically opposite the button, as at 132, the button being engageable with the lever arm as at 134, FIG. 8, and the free end of the lever arm being engageable with a stop member 136. The lever arm has a medial surface portion 138 engageable with the contact surface 124 of the valve member to align the valve opening 118 with the exit opening 120 for dispensing the product from the container when the button 110 is depressed. A stop element 140 serves to limit the downward travel of the lower arm 130.

Still referring to the embodiment of FIGS. 6-9, a spring 142 is interposed between the container cap 96 and the valve member 102 for returning the valve opening 118 to the sealing pad 122 upon manual release of the button 110. A shield 144 is mounted on the valve member 102, and it projects adjacent the exit opening when the valve opening 118 is in engagement with the sealing pad 122.

Turning now to the embodiments of FIGS. 10 and 11, we illustrate a pressurized package 146 which comprises a container 148 for receiving a product 150 and propellant, indicated generally at 152, for discharging the product from the container. A dispensing assembly 154 is mounted on the container 148 and comprises a container cap 158 mounted on the container and having an internal cavity 160. A valve member 162 is mounted in the cavity, and has tube 164 extending downwardly through an aperture in the top of the container to which it is sealed by a grommet 166. A trigger 168 is pivotally mounted, as at 170, in an opening 172 on the side of the container cap 158 for manual horizontal movement. The valve member 162 has a radially directed part having an opening 174 in fluid flow communication with the tube 164. The container cap 158 has a horizontal exit opening 176, and a sealing pad 177 is mounted on the container cap adjacent the exit opening 176 and engageable with the valve opening normally to seal the valve member with respect to the container cap 158. It will be appreciated that a disposable tube 179 may be placed in the opening 176. The valve member has a contact surface 178, and a back rest 180 is mounted adjacent the valve member. A lever arm 182 is mounted on the trigger 168, as at 184, and the other end thereof is engageable with the contact surface 178 to align the valve opening 174 with the exit opening 176 for dispensing the product from the container when the trigger is depressed. The exit opening 176 is provided with a notch 185 for receiving the valve opening 174 when dispensing the product and a spring 186 is interposed between the container cap 158 and the valve member 162 for returning the valve opening 174 to the sealing pad 177 upon manual release of the trigger.

Referring next to the embodiment of the invention shown in FIGS. 12-15, a pressurized package indicated generally at 188 includes a container 190 for receiving a product 192 inside a bellows-like bag 194 and a propellant 196 surrounding the bellows-like bag 194 for discharging the product from the container 190. A dispensing assembly 198 is mounted on the container 190 and comprises a container cap 200, having an internal cavity 202, secured in sealed relationship to the top of the container, as at 204. A button 206 is mounted in the cavity 202 and a portion 208 thereof protrudes through an aperture 210 in the top of the container cap 200 for manually operating the button. A tube 212 extends downwardly from the bottom of the button through an aperture in the top of the container. In the form of the invention shown in FIG. 13, there is a second downwardly extending tube 214 formed as a bore in the button 206 and which is concentrically disposed with respect to the tube 212 and in fluid flow communication with the top of the container. A segment 216 of the tube 212 and a similar segment of the outer tube 214, extend radially outwardly, and the portions of both tubes adjacent to the button opening are concentrically disposed one with respect to the other so that the product is discharged through the first tube and propellant is simultaneously discharged through the concentric second tube thus to obtain certain desired spray characteristics requiring discharge of both product and propellant. Discharge from each tube can be controlled by shaping the respective nozzles for the desired results.

In the form of the invention shown in FIG. 15, there is a second downwardly extending tube 218 which is disposed in spaced, parallel relationship with respect to the tube 212 which in this case is shown as an extension of a bore in the button, and in fluid flow communication with the top of the container. The outlet end of tube 218 is necked down as at 220 to form a restricted exit or button opening in order to create a pressure drop as fluid from the dip tube 215 flows therethrough. It will be appreciated that the area 196 in FIGS. 12 and 15 may contain a product in addition to propellant. If the area 196 contains a product, a dip tube 215 would be attached to the tube 218.

The button opening 220 opens radially outwardly and in this the the portions of both tubes adjacent the button opening merge with the opening for discharge.

As shown in FIGS. 13 and 15, the container cap 200 has a radial exit opening 222 and a sealing pad 224 is fixedly mounted on the container cap adjacent and above the exit opening 222 for sealing the button with respect to the container cap. The button 206 is manually depressible, as at 208, to align the tube 216 in FIG. 13 and 220 in FIG. 15 with the exit opening 222 for dispensing the product from the container 190; and a spring 226 is interposed between the button 206 and an inwardly projecting portion or bottom wall 228 of the container cap 200 for returning the button to its upper position upon manually releasing the button. A grommet 230 serves to seal the tubes with respect to the bottom wall 228, and thereby with respect to the top of the container. The container cap 200 has an internal downwardly projecting portion 232 and the button has a radially projecting portion 234 for engaging the downwardly projecting portion to align the button with respect to the container cap. A stop element 236 serves to limit the lower travel of the button with respect to the container cap, and the button engages the container cap, as at 238, for limiting the upward travel of the button with respect to the container cap. A shield 240 is mounted on the button 206 and projects adjacent the exit opening 222 when the valve opening is in engagement with the sealing pad 224, for purposes of preventing outside foreign matter from entering the cap through the exit opening 222.

It will be appreciated that in each embodiment of our invention thus described, the discharge tube is valved at its outlet end so that when the valve is closed, any content in the tube is sealed from atmosphere and will not dry or thicken so as to inhibit subsequent discharge; nor can the product drool from the discharge passageways after the valve is closed.

As already stated, in each of the embodiments illustrated, the container cap may be fabricated from a plastic material having a higher coefficient of thermal expansion than the material from which the button itself is fabricated for purposes of providing slow venting of the contents in the container in the event that the container should become heated. Thus, the container cap may be fabricated from polyethylene and the button may be fabricated from polycarbonate, for example. Preferably the container cap is fabricated from high density polyethylene so that it returns to its shape subsequent to heating, thereby rendering the container usable even after being temporarily heated and distorted.

It will also be seen that the present invention does indeed provide an improved pressurized package in which solvent evaporation does not occur, which eliminates drooling at the exit opening, and in which microorganisms do not attack the product residue; and which is superior in simplicity, economy and efficiency as compared to prior art such devices.

Although certain particular embodiments of the invention are herein disclosed for purposes of explanation, various modifications thereof, after study of this specification, will be apparent to those skilled in the art to which the invention pertains.

What is claimed and desired to be secured by letters patent is:

1. A pressurized package of the class including a container for receiving a product, propellant means also in the container for discharging the product from the container, and a dispensing assembly mounted on the container and comprising a container cap having an internal cavity secured to the top of said container, a member mounted in said cavity, passageway means in said member extending outwardly of same, means for connecting said passageway means in fluid flow communication and under full dispensing pressure at all times directly with the inside of said container, said container cap having an exit opening, main and only sealing means for said passageway means interposed between said member and said container cap normally to seal said exit opening at a location directly adjacent said exit opening, means for moving said member to align said passageway means with said exit opening for dispensing said product from the container, and means for returning said member to its original position.

2. A pressurized package according to claim 1 further comprising a shield element mounted on said member and projecting adjacent said exit opening when said passageway means is in engagement with said sealing means.

3. A pressurized package of the class including a container for receiving a product, propellant means also in the container for discharging the product from the container, and a dispensing assembly mounted on the container and comprising a container cap having an internal cavity secured to the top of said container, a member mounted in said cavity, passageway means in said member extending outwardly of same, means for connecting said passageway means in fluid flow communication and under full dispensing pressure at all times directly with the inside of said container, said container cap having an exit opening, main and only sealing means for said passageway means interposed between said member and said container cap normally to seal said exit opening at a location directly adjacent said exit opening, means for moving said member to align said passageway means with said exit opening for dispensing said product from the container, and means for returning said member to its original position, a stem carrying a dip tube extending downwardly from said passageway means through an aperture in the top of said container, said dip tube being in direct fluid flow communication with the product in said container, sealing means for sealing said stem with respect to the top of said container, said dip tube extending towards the bottom of said container and having a vapor tap therein disposed towards the top of said container.

4. A pressurized package of the class including a container for receiving a product, propellant means also in the container for discharging the product from the container, and a dispensing assembly mounted on the container and comprising a container cap having an internal cavity secured to the top of said container, a member mounted in said cavity, passageway means in said member extending outwardly of same, means for connecting said passageway means in fluid flow communication directly with the inside of said container, said container cap having an exit opening, main sealing means interposed between said member and said container cap normally to seal said exit opening, means for moving said member to align said passageway means with said exit opening for dispensing said product from the container, and means for returning said member to its original position, said container cap being fabricated from a material having a higher coefficient of thermal expansion than the material from which the button itself is fabricated.

5. A pressurized package according to claim 4 wherein said container cap is fabricated from polyethylene and said button is fabricated from polycarbonate.

6. A pressurized package according to claim 5 wherein said container cap is fabricated from high density polyethylene.

7. A pressurized package of the class including a container for receiving a product, propellant means also in the container for discharging the product from the container, and a dispensing assembly mounted on the container comprising a container cap having an internal cavity secured in sealed relationship to the top of said container, a member mounted in said cavity, a portion of said member protruding through an aperture in the top of said container cap, a dip tube extending downwardly from the bottom of said member through an aperture in the top of said container, sealing means for sealing said tube with respect to the top of said container, passageway means in said member extending outwardly thereof, said passageway means being in direct fluid flow communication and under full dispensing pressure at all times with said dip tube, said container cap having an exit opening, a recess in said member surrounding the outer end of said passageway means and being disposed directly adjacent thereto, gasket means mounted in said recess and engageable with the container cap for encompassing the end of said passageway means and normally sealing said passageway means with respect to said container cap, said member being manually depressible through said aperture in said cap to align said passageway means with said exit opening for dispensing said product from the container, and means for returning said member to its original position upon manual release thereof.

8. A pressurized package of the class including a container for receiving a product, propellant means also in the container for discharging the product from the container and a dispensing assembly mounted on the container and comprising a container cap having an internal cavity secured to the top of said container, a member mounted in said cavity, a portion of said member protruding through an aperture in the top of said container cap for manually operating said member, a first tube extending downwardly from the

bottom of said member into the top of said container, a second downwardly extending tube in fluid flow communication with the top of said container, a member opening extending outwardly of said member, said member opening being in direct fluid flow communication with said first tube and with said second tube and under full dispensing pressure at all times, said container cap having a radially extending exit opening, main sealing means fixedly mounted on said container cap adjacent and above said exit opening for sealing said member with respect to said container cap, means mounting said member and said cap for manually actuated relative movement to align said member opening with said exit opening for dispensing said product from the container, and means for returning said member and said cap to their original respective positions upon termination of the manual actuation.

9. A pressurized package according to claim 8 wherein the downwardly extending portion of said second tube is in a parallel spaced relationship with respect to said first tube.

10. A pressurized package according to claim 8 further comprising means for engaging the top of the container to limit the relative movement between said member and said cap.

11. A pressurized package of the class including a container for receiving a product, propellant means also in the container for discharging the product from the container and a dispensing assembly mounted on the container and comprising a container cap having an internal cavity secured to the top of said container, a member mounted in said cavity, a portion of said member protruding through an aperture in the top of said container cap for manually operating said member, a first tube extending downwardly from the bottom of said member into the top of said container, a second downwardly extending tube in fluid flow communication with the top of said container, the downwardly extending portion of said second tube being larger and concentrically disposed with respect to said first tube, a member opening extending outwardly of said member, said member opening being in direct fluid flow communication with said first tube and with said second tube, said container cap having a radially extending exit opening, main sealing means fixedly mounted on said container cap adjacent and above said exit opening for sealing said member with respect to said container cap, means mounting said member and said cap for manually actuated relative movement to align said member opening with said exit opening for dispensing said product from the container, and means for returning said member and said cap to their original respective positions upon termination of the manual actuation.

12. A pressurized package of the class including a container for receiving a product, propellant means also in the container for discharging the product from the container and a dispensing assembly mounted on the container and comprising a container cap having an internal cavity secured to the top of said container, a member mounted in said cavity, a portion of said member protruding through an aperture in the top of said container cap for manually operating said member, a first tube extending downwardly from the bottom of said member into the top of said container, a

second downwardly extending tube in fluid flow communication with the top of said container, a member opening extending outwardly of said member, said member opening being in direct fluid flow communication with said first tube and with said second tube, the portions of said second tube and said said first tube adjacent said member opening being concentrically disposed one with respect to the other, said container cap having a radially extending exit opening, main sealing means fixedly mounted on said container cap adjacent and above said exit opening for sealing said member with respect to said container cap, means mounting said member and said cap for manually actuated relative movement to align said member opening with said exit opening for dispensing said product from the container, and means for returning said member and said cap to their original respective positions upon termination of the manual actuation.

13. A pressurized package of the class including a container for receiving a product, propellant means also in the container for discharging the product from the container, and a dispensing assembly mounted on the container and comprising a container cap having an internal cavity secured in sealed relationship to the top of said container, a button mounted in said cavity, a portion of said button protruding through an aperture in the top of said container cap for manually operating said button, said container cap having a bottom wall, a first tube extending downwardly from the bottom of said button through an aperture in the bottom wall, a downwardly extending concentric tube with respect to said first tube in fluid flow communication with the top of said container, sealing means for sealing said concentric tube with respect to the bottom wall, a button opening extending radially outwardly in said button, said button opening being in fluid flow communication with said first tube and with said concentric tube, the portions of said concentric tube and first tube adjacent said opening being concentrically disposed one with respect to the other, said container cap having a radial exit opening, sealing means fixedly mounted on said container cap adjacent and above said exit opening for sealing said button with respect to said container cap, said button being manually depressible to align said button opening with said exit opening for dispensing said product from the container, said container cap having an internal downwardly projecting portion, said button having a radially projecting portion for engaging said downwardly projecting portion to align said button with respect to said container cap, stop means for limiting the upper and lower travel of said button with respect to said container cap, and resilient means for returning said button to its upper position upon manually releasing said button.

14. A pressurized package of the class including a container for receiving a product, propellant means also in the container for discharging the product from the container, and a dispensing assembly mounted on the container and comprising a container cap having an internal cavity secured in sealed relationship to the top of said container, a button mounted in said cavity, a portion of said button protruding through an aperture in the top of said container cap for manually operating said button, said container cap having a bottom wall, first tube extending downwardly from the bottom of

said button through an aperture in the bottom wall, a second downwardly extending tube disposed in spaced parallel relationship with respect to said first tube and in fluid-flow communication with the top of said container, sealing means for sealing said first and second tubes with respect to said bottom wall, a radial outward button opening in said button, said button opening being in fluid flow communication with said first tube and with said second tube, the portions of said tube and first tube adjacent said button opening are concentrically disposed one with respect to the other, said container cap having a radially extending exit opening, sealing means fixedly mounted on said container cap adjacent and above said exit opening for sealing said button with respect to said container cap, said button being manually depressible to align said button opening with said exit opening for dispensing said product from the container, said container cap having an internal downwardly projecting portion, said button having a radially projecting portion for engaging said downwardly projecting portion to align said button with respect to said container cap, stop means for limiting the upper and lower travel of said button with respect to said container cap, and resilient means for returning said button to its upper position upon manually releasing said button.

15. A pressurized package of the class including a container for receiving a product, propellant means also in the container for discharging the product from the container, and a dispensing assembly mounted on the container comprising a container cap having an internal cavity and secured to the top of said container, a valve member mounted in said cavity, said valve member having a tube portion extending downwardly into the container, a button pivotally mounted in an opening on said container cap for manual movement, a lever arm pivotally mounted on said container cover, said lever arm being movable responsive to movement of said button, said valve member having a valve opening in fluid flow communication with said tube portion, said container cap having an exit opening, a sealing pad mounted on said container cap adjacent said exit opening and engageable with said valve opening for sealing said valve member with respect to said container cap, said valve member having a contact surface, said lever arm engaging said contact surface to align said valve opening with said exit opening for dispensing said product from the container when said button is depressed, and means for returning said valve opening to said sealing pad upon releasing said button.

16. A pressurized package according to claim 15, wherein one end of said lever arm is pivotally attached to said container cover adjacent said button and the other end thereof engages said contact surface on the valve member to align said valve opening with said exit opening for dispensing said product from the container when said button is depressed.

17. A pressurized package according to claim 15 wherein one end of said lever arm is pivotally attached to said container cover at a position diametrically opposite said button, said button being engageable with the other end of said lever arm, said lever arm having a medial surface portion engageable with said contact surface of said valve opening with said exit opening for dispensing said product from the container when said button is depressed.

18. A pressurized package according to claim 17 wherein said container cap has a projecting stop element adjacent the other end of said lever arm to limit the travel of said lever arm when said button is released.

19. A pressurized package according to claim 15 wherein said valve member has a projecting stop portion adjacent said contact surface to limit the travel of said lever arm with respect to said valve member when said button is depressed.

20. A pressurized package according to claim 15 further comprising a shield member mounted on said valve member and projecting adjacent said exit opening when said valve opening is in engagement with said sealing pad.

21. A pressurized package according to claim 15 wherein said means for returning said valve opening to said sealing pad upon releasing said button comprises a horizontally disposed spring acting between said valve member and the side of said container cap.

22. A pressurized package of the class including a container for receiving a product, propellant means also in the container for discharging the product from the container, and a dispensing assembly mounted on the container comprising a container cap having an internal cavity secured to the top of said container, a valve member mounted in said cavity, said valve member having a tube portion extending downwardly through an aperture in the top of said container, sealing means for sealing said tube portion with respect to the top of said container, a button pivotally mounted in an opening on the top of said container cap for manual vertical movement, a lever arm pivotally mounted on cavity container cover and having a portion adjacent said button, said pivot arm being movable responsive to movement of said button, said valve member having an upwardly directed valve opening in fluid flow communication with said tube portion, said container cap having a vertical exit opening, a sealing pad mounted on said container cap adjacent said exit opening and engageable with said valve opening for sealing said valve member with respect to said container cap, and said valve member having a contact surface, said lever arm engaging said contact surface to align said valve opening with said exit opening for dispensing said product from the container when said button is depressed, and resilient means for returning said valve opening to said sealing pad upon manually releasing said button, said valve member having a mechanical stop to prevent overtravel of said lever arm with respect to said contact surface when said button is depressed, shield means mounted on said valve member projecting adjacent said exit opening when said valve opening is in engagement with said sealing pad.

23. A pressurized package of the class including a container for receiving a product, propellant means also in the container for discharging the product from the container, and a dispensing assembly mounted on the container comprising a container cap having an internal cavity secured to the top of said container, a valve member mounted in said cavity, said valve member having a tube portion extending downwardly into the top of said container, a trigger pivotally mounted in an opening on the side of said container cap for manual horizontal movement, said valve member having a radially directed valve opening in

fluid flow communication with said tube portion, said container cap having a horizontal directed exit opening, a sealing pad mounted on said container cap adjacent said exit opening and engageable with said valve opening for sealing said valve member with respect to said container cap, said valve member having a contact surface, a lever arm having one end fixedly mounted on said trigger and having the other end engageable with the contact surface on said valve member to align said valve opening with said exit opening for dispensing said product from the container when said trigger is depressed, means for returning said valve member to said sealing pad upon manually releasing said trigger.

24. A pressurized package according to claim 23 wherein said contact surface on said valve member is substantially horizontally disposed, and further comprises a back rest mounted on said container cap for restricting horizontal movement so that movement of said lever arm causes the valve opening to pivot upwardly into alignment with said exit opening.

25. A pressurized package according to claim 23 wherein said exit opening has a notch for receiving said valve opening when dispensing said product.

26. A pressurized package according to claim 23 wherein said means for returning said valve member to said sealing pad upon manually releasing said trigger comprises a spring interposed between the top of said valve member and the top of said container cap.

27. A pressurized package of the class including a container for receiving a product, propellant means

also in the container for discharging the product from the container, and a dispensing assembly mounted on the container comprising a container cap having an internal cavity secured to the top of said container, a valve member mounted in said cavity, said valve member having a tube portion extending downwardly through an aperture in the top of said container, sealing means for sealing said tube portion with respect the the top of said container, a trigger pivotally mounted in an opening on the side of said container cap for manual horizontal movement, said valve member having a radially directed valve opening in fluid flow communication with said tube portion, said container cap having a horizontal directed exit opening, a sealing pad mounted on said container cap adjacent said exit opening and engageable with said valve opening for sealing said valve member with respect to said container cap, said valve member having a contact surface, a lever arm having one end fixedly mounted on said trigger and having the other end engageable with the contact surface on said valve member to align said valve opening with said exit opening for dispensing said product from the container when said trigger is depressed, resilient means for returning said valve member to said sealing pad upon manually releasing said trigger, a back rest mounted on said container cap for guiding said valve member, said exit opening having a notch for receiving said valve opening when dispensing said product.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,680,738 Dated August 1, 1972

Inventor(s) Kenneth Dean Vos, et. al.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 2, line 51, "proper" should read -- upper -- .
Column 8, line 16, "the" should read -- embodiment -- .
Column 14, line 35, "cavity" should read -- said -- ; line
43, cancel "and". Column 16, line 8, "the" should read -- to -- .

Signed and sealed this 8th day of May 1973.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents