May 24, 1960 L. A. MICALLEF 2,937,791

PRESSURE DISCHARGE CAN

Filed Dec. 31, 1954 2 Sheets-Sheet 1

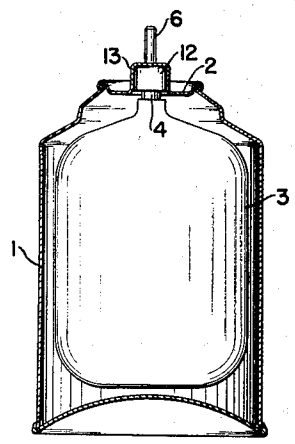


FIG. 1

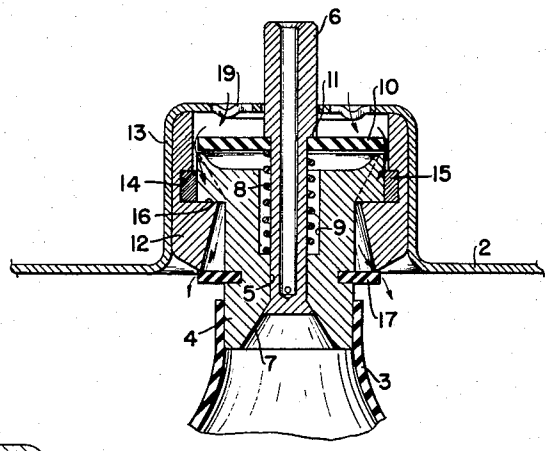


FIG. 2

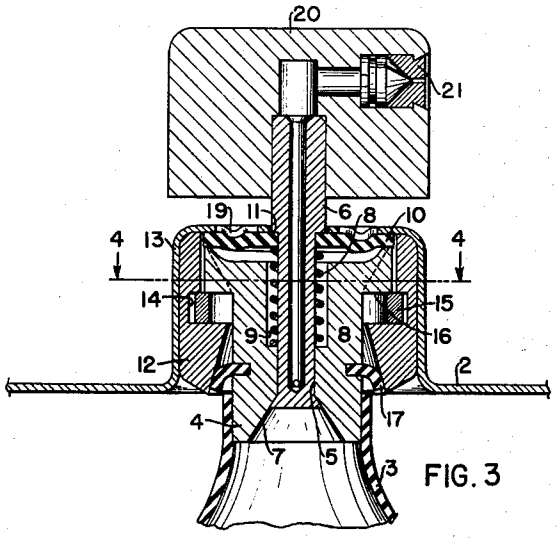


FIG. 3

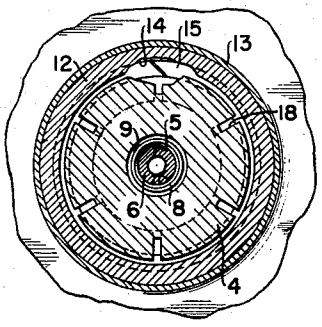


FIG. 4

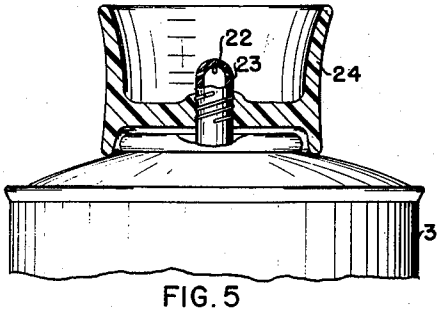


FIG. 5

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PRESSURE DISCHARGE CAN

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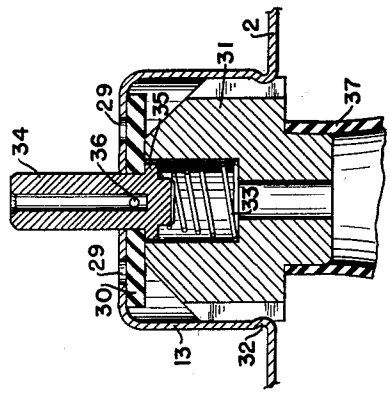


FIG. 6

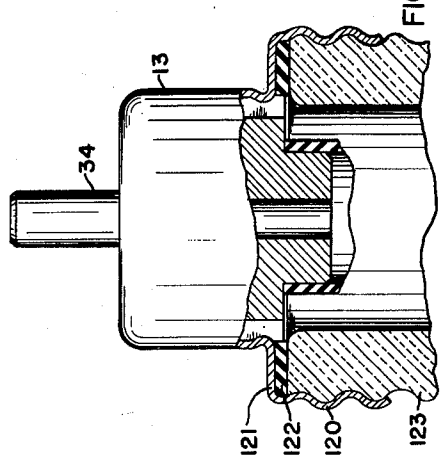


FIG. 8

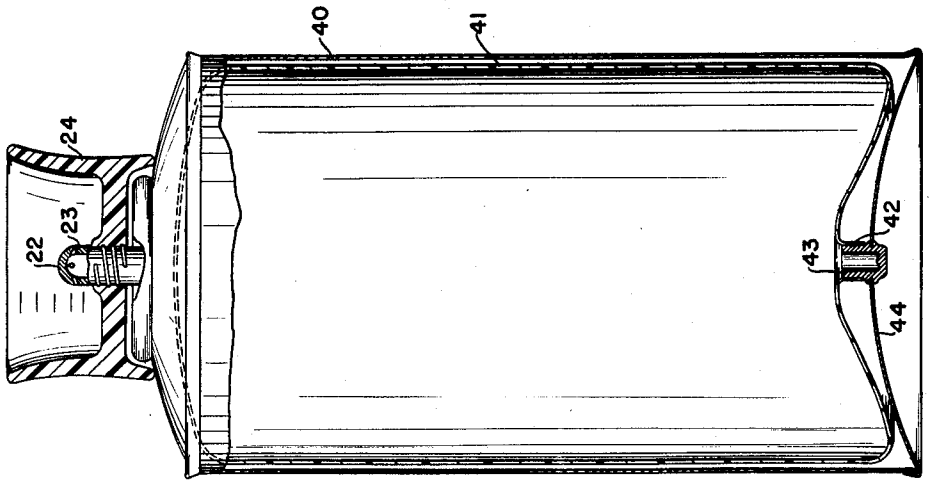


FIG. 7

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PRESSURE DISCHARGE CAN

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2 Claims. (Cl. 222—95)

This invention relates to containers for commodities of the so-called pressure package type, wherein the liquid contents of the container are under pressure by reason of a contained gas or highly volatile liquid which discharges the contents through a valve egress opening.

Such packages have become popular in recent years for commodities of such characteristics that they are not adversely affected by the contained gas or volatile liquid. There are many commodities which could be advantageously dispensed from a container of the pressure package type but they are of a nature to be adversely affected by contact with a propelling fluid.

The object of my invention is to provide a container of the pressure package type for such commodities.

A further object of my invention is to provide a pressure package of this type whose cost of manufacture is no greater than containers not embodying my invention.

A further object of my invention is to provide a container of this type wherein the liquid commodity and the propelling fluid may be separately charged into the container through the same valve.

A further object of the invention is to provide a measuring attachment whereby the quantity of the liquid commodity discharged may be accurately measured.

Further objects of the invention will appear from the following specification and accompanying drawings wherein

Fig. 1 is a sectional view on a reduced scale of an entire container embodying my invention but not disclosing the details of construction;

Fig. 2 is a vertical sectional view through the valve of the container shown in Fig. 1 with the parts in the position occupied while the container is being charged with the propelling fluid;

Fig. 3 is a view similar to Fig. 2 with the parts in closed position and with the release button applied to the top of the discharge spout;

Fig. 4 is a sectional view on line 4—4 of Fig. 3;

Fig. 5 is a sectional view of my improved measuring attachment;

Fig. 6 is a view similar to Fig. 2 but showing a modified structure;

Fig. 7 is a view similar to Fig. 1 of a further modification;

Fig. 8 is a view similar to Fig. 6 showing a further modification.

Referring to the drawings, particularly to Fig. 1, my improved container consists of an outer can 1 of conventional form except for the top cap portion 2. In the customary pressure package the commodity to be dispensed is contained in a can but by my improved construction the commodity is contained in a flexible bag 3 of suitable material such as polyethylene, pliofilm or the like, the neck of which is permanently attached to the depending end of a plug 4 which serves as the valve body for the discharge valve. The neck of the bag is heat-sealed or otherwise attached in a fluid tight manner to

the plug 4. The plug 4 has a central bore 5 in which is mounted the discharge valve 6. The lower end of the valve stem is flared outwardly to co-operate with the tapering countersunk cavity 7 in the bottom of the plug 4 to provide a fluid tight cutoff when the valve stem is held in its "up" position by the spring 8 which surrounds the valve stem within a recess 9 formed by enlarging the bore 5.

The upper end of the spring 8 abuts against a washer 10 of rubber or other suitable material which in turn abuts against a shoulder 11 formed on the valve stem. The purpose of the washer 10 will be later described.

The plug 4 is mounted in a collar 12 which in turn is permanently fitted in the central upstanding portion 13 of the cap 2 of the can. The collar 12 has an upper portion of an inside diameter slightly greater than the diameter of the washer, and beneath this portion is formed with a circumferential recess 14 in which is mounted a split ring 15 which is normally contracted to a diameter slightly less than the inside diameter of the upper portion of the collar 12 as shown in Fig. 3.

The plug has an integral collar at its upper end around which the split ring 15 is fitted when the parts are first assembled, as shown in Fig. 2. When so assembled the split ring 15 is pushed outwardly into the circumferential groove 14 and the bottom face of the collar 16 rests on a shoulder formed by the reduced diameter of the bore of the collar 12 at its lower end. This portion of the bore of the collar 12 is outwardly tapered as shown, and when the parts are in charge-receiving position as shown in Fig. 2 the bottom edge of the collar 12 is in contact with the outer edge of a flexible washer 17 mounted on the lower portion of the plug 4. Longitudinal slots 18 are provided at spaced intervals around the collar 16 of the plug 4 to permit the passage of the propelling fluid into the can 1 through openings 19 in the upper end of the portion 13 of the can top 2 when the parts are in charging position as shown in Fig. 2.

As shown in Fig. 1 the plastic bag 3 is of a diameter slightly less than the inside diameter of the can and is shaped to leave at the top and bottom additional spaces of sufficient capacity to contain a sufficient volume of a propelling gas to completely collapse the flexible bag while still retaining sufficient pressure to properly expel the contents of the bag. The space provided for the expelling fluid of course depends on the pressure which the can will withstand. Cans as presently fabricated for pressure packages will withstand an internal pressure of over 50 pounds per square inch and for an initial pressure of this order the space left for the propelling gas should be approximately 10% of the total interior space of the can.

In fabricating my improved container the parts are assembled in the manner shown in Fig. 2 with the split ring surrounding the collar of the plug 4 and seated in the recess 14 in the collar 12. The assembly is then placed in the neck 13 of the end member 2 of the can 1 and the member 2 attached to the can in the usual manner. The commodity to be dispensed is then charged into the bag 3 through the valve stem 6 by a conventional filling machine which presses down the valve stem to allow the liquid to pass through the bore of the valve stem into the bag. After the bag is filled the can is moved onto the next station of the filling machine where a supply of air under pressure is delivered through the openings 19 in the part 13 of the can top. The air under pressure follows the direction of the arrows in Fig. 2 and passes into the can surrounding the bag 3, to thereby fill the space within the can surrounding the bag to the desired pressure. When the charging pressure is cut off the internal pressure in the can coming on the under side

of the washer 17 lifts the plug 4 out of the split ring 14, allowing the latter to contract beneath the collar of the plug 4, thereby locking the plug in its uppermost position against the edge of the washer 10 carried by the valve stem 6. In this position the washer 17 securely closes the passage through the collar 12 against the escape of the compressed air, while the washer 10 prevents any leakage of air which might otherwise occur through imperfect fitting of the collar 12 within the part 13. After the can is filled the plastic button 20 with the spray nozzle 21 is fitted over the top of the valve stem 6 as shown.

In Fig. 5 I have shown a feature of my invention which may be employed with my improved pressure package or with the conventional pressure package. As here shown, the valve stem 22 is closed at the outer end and has downwardly inclined discharge openings 23 through which the liquid passes into a measuring cup 24 threaded on the valve stem as shown. I have not shown the valve structure as any conventional type of valve may be employed wherein the valve is opened by either depressing or tilting the stem.

In operation the measuring cup 24 is unscrewed about half a turn and is then depressed or tilted, opening the valve to permit the discharge of the contents through the downwardly inclined openings 23. When the desired quantity is discharged into the cup as indicated by the scale marks on the inner wall of the cup, the cup is released so that the valve will close. The cup can then be screwed down to lock the valve against accidental opening.

This measuring cup attachment is particularly useful in connection with my improved can wherein only the commodity to be distributed is discharged through the outlet valve so that the can may be held with the cup uppermost and level to accurately measure the quantity drawn off.

In Fig. 6 I have shown a simplified valve structure wherein the cost of manufacture is greatly reduced. As here shown the same can top member 2 is employed as in the above described construction. The upper surface of the part 13 of the can top 2 is provided with openings 29 for the ingress of the discharge fluid. A rubber or plastic washer 30 is permanently pressed against the under side of the openings by means of a molded plastic neck 31 of the shape shown which is held in place by crimping the vertical wall of the part 13 at its base under a shoulder 32 formed on the neck 31. The bore of the neck 31 is enlarged at its upper end to receive a spring 33 which holds the discharge tube 34 against the rubber washer in the manner shown. The discharge tube 34 is provided with a collar 35 which forms an effective shut-off valve for the can contents. The upper end of the discharge tube 34 is provided with a push button 20 similar to that shown in Fig. 3 and when the stem is depressed the holes 36 leading into the discharge tube will be uncovered, allowing the contents of the bag 37 which is fastened to the lower end of the part 21 to be discharged by the pressure of the fluid in the can surrounding the bag.

The can is charged with the discharge fluid in the same manner as above described, the rubber washer serving as an effective cutoff valve which is held closed by the pressure inside the can after the charging pressure is removed. In the modified structure shown in Fig. 6 the air inlet valve is not locked in closed position after charging the can with the compressed air, but this is not essential to the operation of the container as the likelihood that the ingress valve will be accidentally opened and the compressed air allowed to escape before the contents of the can are used up is remote. A further advantage of the construction shown in Fig. 6 is that the container may be refilled repeatedly.

In Fig. 7 I have shown a further modification of my invention wherein the commodity to be dispensed is contained in the can 40 and the fluid under pressure is in the bag 41. As here shown the can is of conventional design with a valved discharge opening which may advantageously be provided with a measuring cup such as shown in Fig. 5.

The bag 41 is supported in the can in inverted position with its neck 42 hermetically sealed around a plastic stem 43 which in turn is permanently mounted in the center of the bottom piece 44 of the can. The neck 43 is closed at its bottom end and may if desired be formed of a so-called self-sealing plastic.

The can with the collapsed bag 41 is filled in the usual manner with the appropriate amount of the commodity to be dispensed. Cans of the conventional construction used today may be filled with four-fifths of their total cubic capacity without requiring excess initial pressure to effect the discharge of the fluid. After the can is filled, air under pressure is charged into the bag through the neck 43. If the neck is formed of a self-sealing plastic this may be accomplished by delivering air through a hollow needle which is punched through the closed bottom end of the plug. The plug may of course be formed of other material and sealed in any suitable manner after the bag receives its charge of compressed air. When the contacts occupy four-fifths of the capacity of the can, compressed air under about 50 pounds per square inch will be sufficient to discharge the entire contents of the can.

In Fig. 8 I have shown my invention embodied in a bottle or other container of which it is not a permanent part. As here shown, the metal part 13, instead of being formed as an integral part of the flat member 2 of the can has at its lower end a threaded extension 120 of slightly larger diameter than the part 18 to provide a shoulder 121. Beneath the shoulder is a washer 122 which fits against the end surface of the bottle neck 123, against which it is tightly clamped when the extension 120 is screwed onto the bottle or other container. Also if desired a plastic cap may be screwed onto the outside of the threaded extension.

In the accompanying drawings and foregoing specification I have shown and described my invention in its preferred form with certain modifications, but it will be understood that my invention is not limited to the structure shown except insofar as recited in the appended claims.

I claim:

1. A dispensing container comprising a metal can adapted to contain a gas under pressure, said can having an opening in one end, a closure for said opening having a portion of reduced diameter extending into the can, a bag of flexible material of a size when extended to substantially fill said can, said bag having a neck portion of reduced diameter surrounding the inwardly projecting extension from said closure and attached thereto, said inwardly extending portion having a bore leading from the interior of the bag to the exterior of the can, a valve in said bore, said valve including a valve operating member extending from the valve within the bore to a position above the surrounding portions of said end closure, said closure having a passage through the portions surrounding the inwardly projecting extension, and means for closing said passage after said can is charged with gas under pressure.

2. The container of claim 1 wherein said last named means comprises a flexible member which is held in position to close said passage by the pressure in said container.

References Cited in the file of this patent

UNITED STATES PATENTS

398,528 Molin ---------- Feb. 26, 1889

(Other references on following page)

5

UNITED STATES PATENTS

1,715,335	Cocks	May 28, 1929
1,913,811	Laufe	June 13, 1933
2,177,032	Baumgardner	Oct. 24, 1939
2,608,320	Harrison	Aug. 26, 1952
2,632,585	Tomasek	Mar. 24, 1953
2,671,578	McBean	Mar. 9, 1954

6

2,689,065	Schroeder et al.	Sept. 14, 1954
2,704,621	Soffer	Mar. 22, 1955
2,707,968	Efford	May 10, 1955

FOREIGN PATENTS

486,654	Italy	Nov. 13, 1953