

May 14, 1963

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3,089,624

PRESSURE DISCHARGE CONTAINER

Filed June 28, 1956

2 Sheets-Sheet 1

FIG. 1

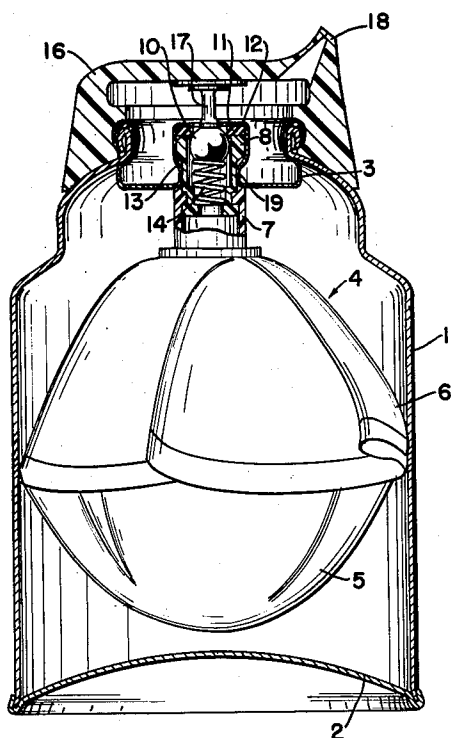
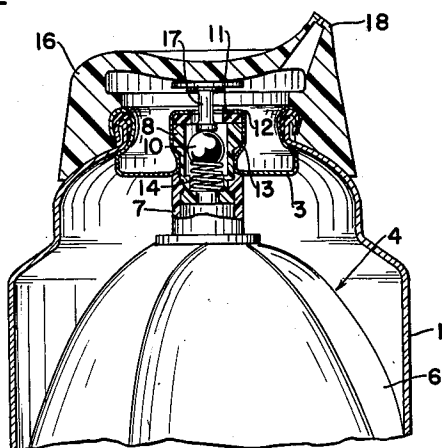


FIG. 2



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FIG. 3

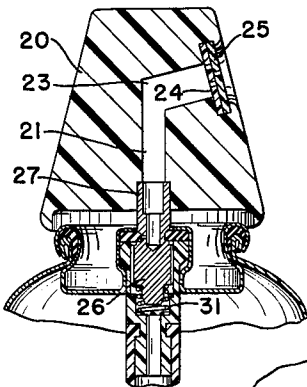


FIG. 4

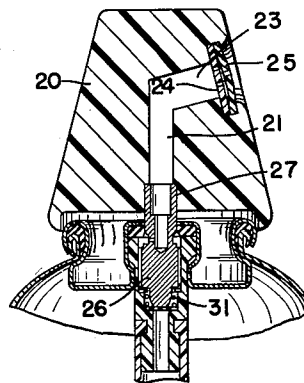


FIG. 7

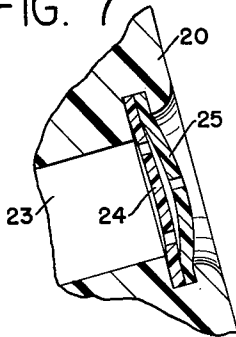


FIG. 6

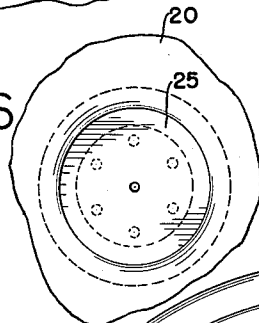


FIG. 10

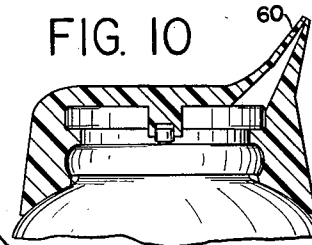


FIG. 5

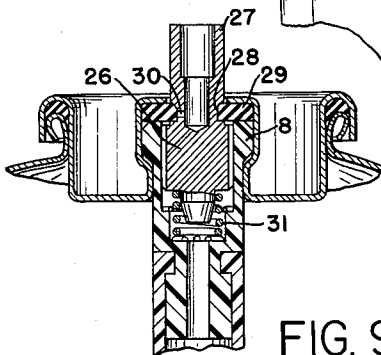


FIG. 9

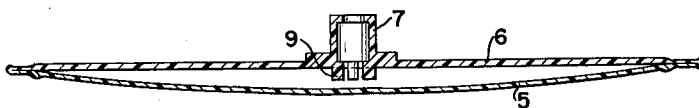
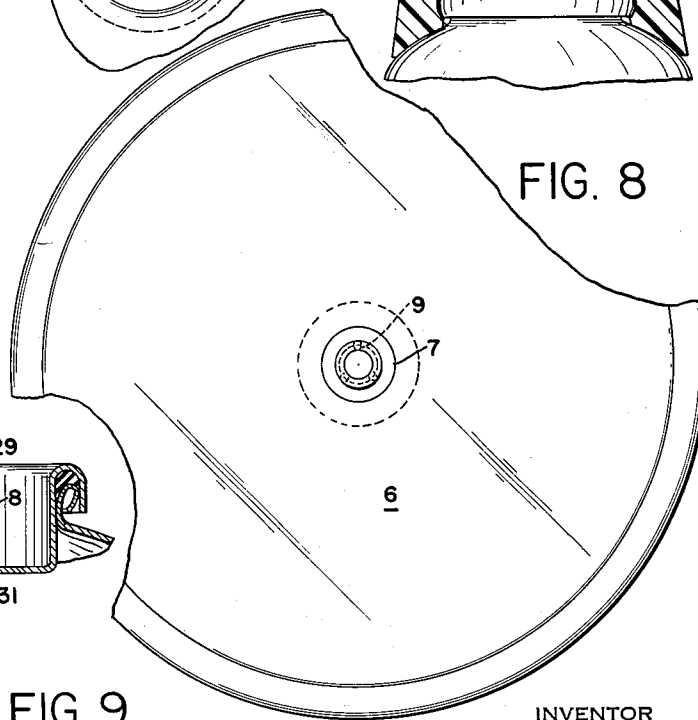


FIG. 8



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PRESSURE DISCHARGE CONTAINER

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4 Claims. (Cl. 222-386.5)

This invention relates to improvements in pressure discharge containers wherein the commodity to be dispensed by the container is contained in a flexible bag of suitable plastic or like sheet material and is expelled by a gas under pressure in the outer container which may be a metal can, in which the bag is enclosed.

One object of the present invention is to provide a container which can be filled and closed by the machines now in use for filling and closing containers wherein the internal pressure is supplied by Freon or other suitable gas mixed with or dissolved in the commodity to be expelled, and

A further object of the invention is to provide an improved container wherein the cans now employed for pressurized contents can be used with certain changes in a container of the class described wherein various and sundry commodities of different consistency, from liquids as fluent as water to pastes, syrups and the like of high viscosity can be satisfactorily dispensed in accurately controlled increments without modification of the container structure.

Further objects of the invention will appear from the following specification taken in conjunction with the accompanying drawings wherein we have illustrated certain forms of our container as now being produced.

In the said drawings,

FIGURE 1 is a vertical section of a container for dispensing viscous liquids;

FIG. 2 is a similar view showing the discharge valve open;

FIG. 3 is a vertical section of a portion of a container for dispensing liquids in the form of a spray;

FIG. 4 is a similar view with the discharge valve open;

FIG. 5 is a detail sectional view on an enlarged scale showing the valve of FIG. 3 before the can top is attached to the can body;

FIGS. 6 and 7 are detail views of the spray nozzle;

FIGS. 8 and 9 are detail views of the flexible bag for the liquid to be dispensed.

FIG. 10 is a detail view of a modified form of the discharge nozzle; and

FIG. 11 is a sectional view similar to FIG. 1 showing a modified form of valve and discharge tube.

Referring to the drawings, particularly FIGS. 1 and 2, 1 indicates the can body which, as stated above, is of the same construction as the conventional "pressurized" container. 2 is the can bottom and 3 the can top, which are also of conventional construction.

The can top 3 is crimped over the neck of the can body after the can is filled by the machines now employed for the so-called pressure filling of pressurized containers. In such machines the crimping mechanism is contained within a sleeve having a rubber gasket at its lower end which fits over the top of the can so that the commodity containing the Freon can be charged under pressure into the can. Such machines can be used with slight changes for the final filling step of the container of this application.

As shown in FIG. 1, the bag 4 of flexible sheet material, e.g. polyethylene, consists of upper and lower disks 5 and 6, respectively, heat sealed together around their outer edges. The bottom disk 5 is preferably made of somewhat thinner and more flexible material than the upper disk 6, and in the center of the disk 6 is a neck 7 (see FIGS. 8 and 9) which, in turn, is fitted over the

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plastic stem 8 containing the valve through which the packaged commodity is dispensed. The lower end of the neck 7 is formed with a plurality of projections 9 the purpose of which is to prevent the bag, when collapsed by the pressure in the can as the contents are discharged, closing off the end of the stem as might otherwise happen after the major portion of the contents has been discharged.

Any suitable valve may be employed for regulating the discharge of the contents. The valve shown consists of a ball 10 which seats against a washer 11 fitted against the inturned flange 12 at the end of the central stem 13 of the can top 3. The ball is held against the washer by a spring 14 which is partially compressed between the ball and a shoulder at the lower end of the bore of the stem 8.

The upper end of the can is covered with a cap 16 of plastic such as polyethylene, or vinyl or of rubber. The lower edge of the cap is shaped to fit the top of the can body around the base of the neck. The cap is attached by suitable cement or otherwise to the can top to provide a fluid tight joint capable of remaining tight under pressure equal to the charging pressure within the can. The walls of the cap 16 are thick enough to be substantially rigid, whereas the top is sufficiently flexible to be readily depressed with the finger to thereby open the valve and permit the discharge of the contents of the can into the space within the cap. To open the valve there is attached to the under side of the cap 16 a stem 17 which is formed of metal or plastic or may consist of a pin set in a seat molded on the under side of the cap. When the cap is applied to the can, the stem 17 overlies the ball 10 so that pressure on the top of the cap will open the valve.

The cap 16 is provided with a discharge nozzle 18 of the shape shown. That is to say, the opening of the nozzle is in the form of a horizontal slit which is normally closed, as shown in FIG. 1, when the top of the can is not depressed to open the valve, but which is opened when the top of the cap is pressed down to open the valve, as shown in FIG. 2, to thereby facilitate the discharge of the contents of the bag.

In filling the container the bag 4 with the attached stem 8 is attached to the top 3 of the can by crimping the neck of the can at several places, as shown at 19, FIG. 1, into the groove around the outside wall of the stem 8. The empty bag 4 is then bent downwardly away from the neck and thrust into the open end of the can with the can top resting on the neck of the can body, but without crimping the margin of the can top over the neck. With the parts so assembled but with the can top unattached as shown in FIG. 5, the can is placed in the filling machine whose first operation is to fill the bag with the desired quantity of the commodity to be dispensed. During such filling operation the air in the can surrounding the bag is expelled through the loose connection between the can top and the neck of the can body. As the commodity is forced into the bag the bottom half of the bag which is more flexible than the upper half will be forced downwardly until its folds are distended and the upper half of the bag will be expanded outwardly so that the bag above and below the middle seam will be fully distended.

In practice it has been found that the charge in the bag can equal in bulk four-fifths the capacity of the can. For example, a so-called six ounce can which when charged with six ounces of water will be 95% full, can be used for dispensing 5.15 ounces of a commodity having the same specific gravity as water.

A pressure of a few pounds per square inch is all that is required to fill the cans with the commodity to be dispensed and to expand the bag into contact with the wall

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of the cans, as described. When the filling is complete the valve will hold the bag closed against discharge of the contents. After being charged with the commodity to be expelled the can is closed in the same manner and by the same machines now being used for closing cans containing a pressure charged liquid. The pressure chamber of the closing machine, instead of being connected to a source of the pressure charged commodity, is charged with air under whatever pressure is desired for expelling the contents of the cans. Air under pressure passes into the can around the open seam between the can top and the neck of the can body and while the interior of the tubular head of the closing machine is maintained under the desired air pressure the flange of the can top is crimped on the neck of the can body.

After the closing operation the can passes on to a cap applying head which places the cap 16 with the attached valve opening stem over the can top and connects its lower edge to the metal of the can body around the margin of the can top.

Instead of filling the bag with the commodity to be dispensed before the can top is crimped to the can body as above described, the can crimping operation with the pressure head may be carried out at the factory, thereby charging the can with air under the desired pressure for the particular commodity to be packaged in the can.

The cans so charged are then delivered to the purchaser of the commodity to be dispensed and are there filled by a conventional filling machine equipped with appropriate means for filling the cans through the valve opening. In charging the cans with air at the canning factory allowance is made for the reduction in volume which will be effected by the distension of the bags within the can when the bags are filled and the charging pressure of the filling machine will have to be sufficient to overcome the increasing pressure which builds up during the filling operation.

The can is now ready for use, but in order to protect the can against being accidentally opened during shipment a cap of celluloid or like material of sufficient rigidity to prevent accidental opening of the valve may be pressed over the top of the can.

In FIGS. 3, 4 and 5 I have shown a dispensing container designed for discharging the contents in the form of a spray. As here shown the can and enclosed bag are the same as employed in the previously described container, but instead of employing a hollow cap overlying the end of the can as in the previous construction, the cap consists of a molded plastic member 20 which has a central bore 21 leading in from its bottom end, which bore fits over the hollow stem 27 of the valve member 26 which controls the discharge of the commodity to be dispensed. The plastic member 20 has a laterally extending bore 23 which joins with the central bore 21 and whose outer end is closed by two disks 24 and 25, respectively, of resilient material which may be either metal or plastic. The outer disk 25 has a central perforation while the underlying disk 24 has a series of perforations surrounding the central perforation of the outer disk 25. When the valve member is pressed the contents of the bag pass through the valve member into the bore 21 and pass through the annular perforations in the disk 24 to the space between the disks, the pressure bowing the outer disk 25 outwardly as shown in FIGS. 6 and 7 and causing the discharge through the perforations of bore 25 to be in the form of a fine spray.

The valve shown in FIGS. 3, 4 and 5 consists of a plastic valve member 26 having an upstanding tubular stem 27 to which is fitted the bore 21 in the lower end of the plug 20. The stem 27 has a groove 28 at its base and fitted in the groove is a flexible rubber washer

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29 which is clamped at its outer edge between the top of the stem 8 and the inturned flange of the central neck 13 of the can top when the valve is assembled with the can top. Radial bores 30 connect the groove 28 with the bore of the stem 27, see FIG. 5.

The body of the valve member 26 below the stem 27 fits loosely within the stem 8 and is grooved to permit the liquid in the bag to flow freely into the space surrounding the member 26 below the washer.

Also enclosed within the stem 8 between the internal shoulder of the stem and the valve member 26 is a spring 31 which assists in holding the valve body 26 and attached member 20 in elevated position.

The valve is opened by pressing on the member 20 to thereby move the inner portion of the washer 29 downwardly, thereby uncovering the radial bores 30 so that the liquid in the stem 8 can pass into the bore 21 and thence to the spray nozzle formed by the disks 24 and 25.

In FIG. 10 we have shown a modified form of discharge spout for use where it is desired to dispense the contents of the bag drop-wise or in a fine stream. As here shown the discharge spout 60 is in the form of an elongated flexible tube of the shape commonly employed for ear syringes. By virtue of the pressure reducing chamber and the fact that the discharge pressure in the outer container may be just sufficient to expel the contents of the bag, the fluid in the bag may readily be delivered in drops or in a fine stream of whatever force is desired.

I claim:

1. A dispensing container comprising a fluid-tight outer vessel containing an expansible fluid under pressure, an inner fluid-tight container for the commodity to be dispensed, said inner container comprising two wall portions of flexible material joined at their perimeter, the perimeter of the wall portions being substantially greater than the perimeter of the adjacent portion of the outer vessel, unattached thereto and convoluted in contact therewith, a discharge passage mounted in one wall of the outer container, an opening in the mid portion of one of said wall portions and the material around the opening having a fluid-tight connection with said discharge passage.

2. The container of claim 1 wherein the material of the inner container forming the perimeter is less flexible than in other areas.

3. The container of claim 1 wherein the inner container is formed of two plastic sheets of substantially equal area joined together face to face at their perimeters to form a flat portion of greater thickness.

4. The container of claim 2 wherein the outer vessel is a cylindrical vessel of stiff sheet material and the marginal portion of the inner container is in loose folds in contact with the wall of the outer vessel.

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