United States Patent [19]

Low et al.

[11] **3,926,347**

[45] **Dec. 16, 1975**

[54] **FLOWABLE MATERIAL DISPENSER WITH RESILIENT CONTAINER**

[75] Inventors: **Jack B. Low**, Brooklyn, N.Y.; **Buckley Crist**, Plainfield; **Thomas J. Zoltner**, Morris Plains, both of N.J.

[73] Assignee: **Jaclo, Inc.**, Brooklyn, N.Y.

[22] Filed: **July 10, 1974**

[21] Appl. No.: **487,257**

[52] **U.S. Cl.** **222/185**; 222/214; 222/528

[51] **Int. Cl.**[2] **B65D 37/00**

[58] **Field of Search** 222/96, 103, 162, 181, 222/183, 185, 213, 214, 528, 209, 282

[56] **References Cited**

UNITED STATES PATENTS

2,357,544	9/1944	Prance	222/96
2,681,169	6/1954	Watson	222/181 X
2,721,675	10/1955	Buras	222/103
2,927,717	3/1960	McDermott	222/96 X
3,278,095	10/1966	Johns	222/528 X

FOREIGN PATENTS OR APPLICATIONS

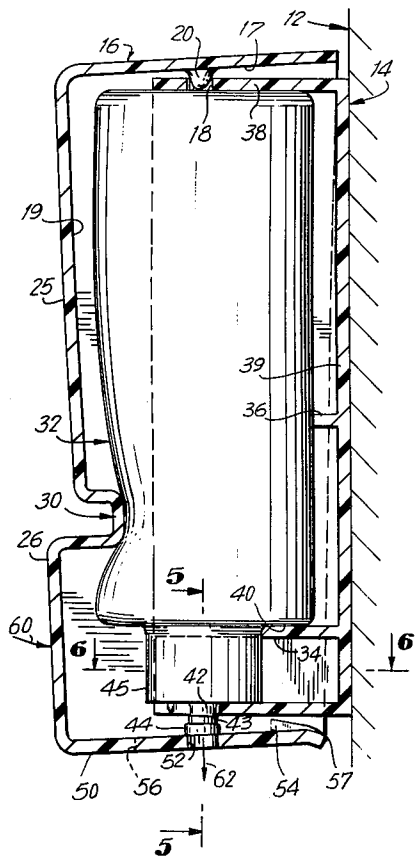
693,126	7/1940	Germany	222/162
1,190,344	10/1959	France	222/96

Primary Examiner—Robert B. Reeves
Assistant Examiner—Francis J. Bartuska
Attorney, Agent, or Firm—Gottlieb, Rackman, Reisman & Kirsch

[57] **ABSTRACT**

There is disclosed a mechanism for dispensing powder or liquid from a plastic container. In one form, a mounting bracket is attached to a wall and a swingable front cover is hinged to it. The floor of the cover serves as a removable seal for the spout of an inverted plastic container placed within the mounting bracket. A dispensing hole in the floor of the front cover becomes aligned with the container's spout when the front cover is pushed inwardly; powder or liquid flows out of the container spout and through the hole as the front cover is pushed in. The front cover includes a bumper which bears against the plastic container, to force the powder or liquid out of the container. The natural expansion of the container serves to return the front cover to its initial position. In another form, the plastic container is swingably mounted on the bracket, and the dispensing hole is formed in a floor extending from the bracket.

3 Claims, 13 Drawing Figures



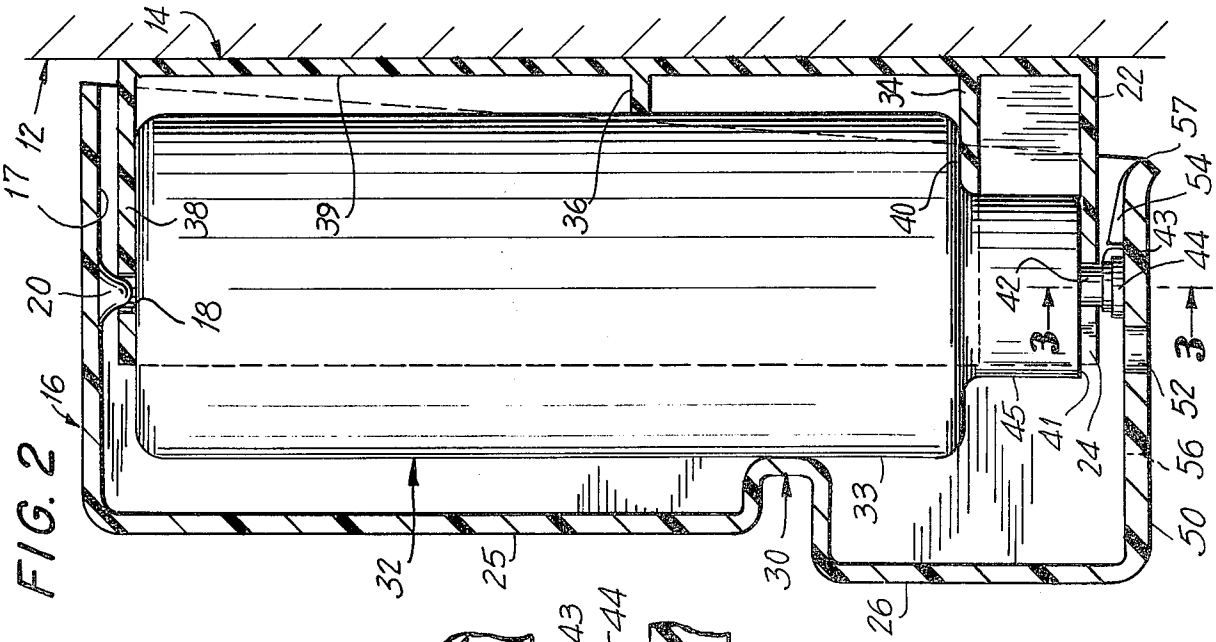


FIG. 2

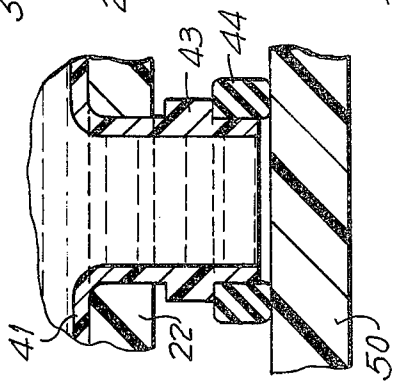


FIG. 3

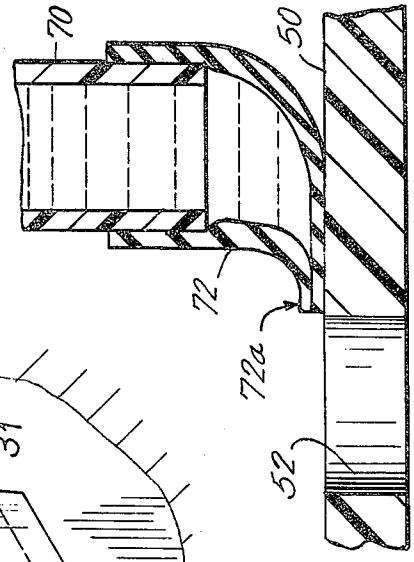


FIG. 7

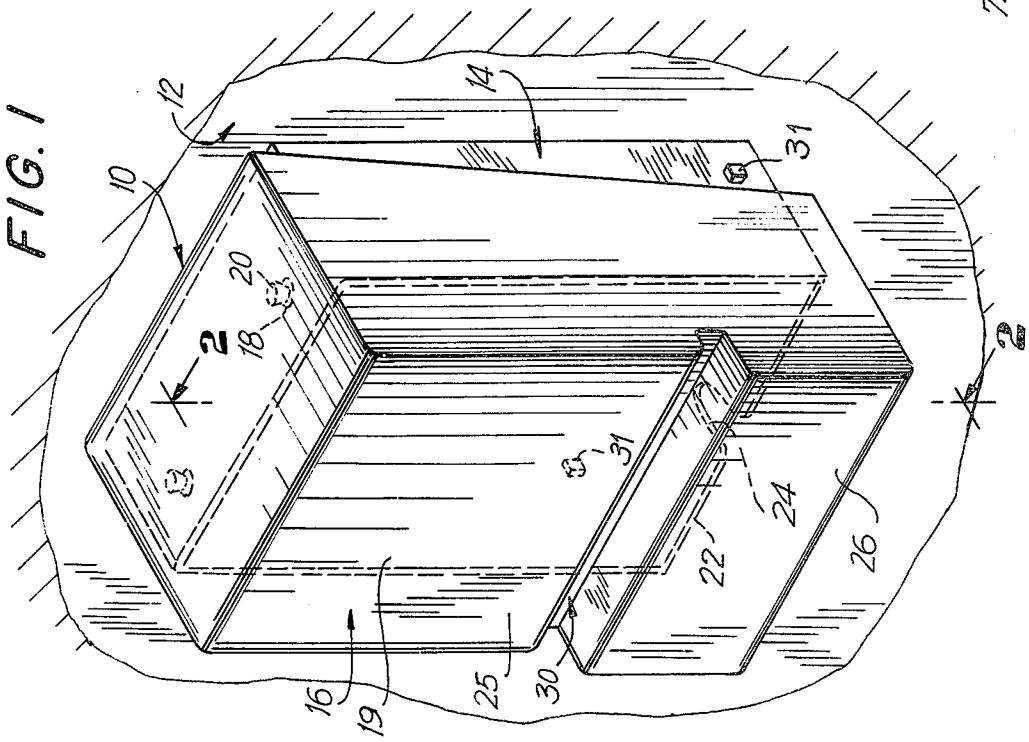


FIG. 1

FIG. 4

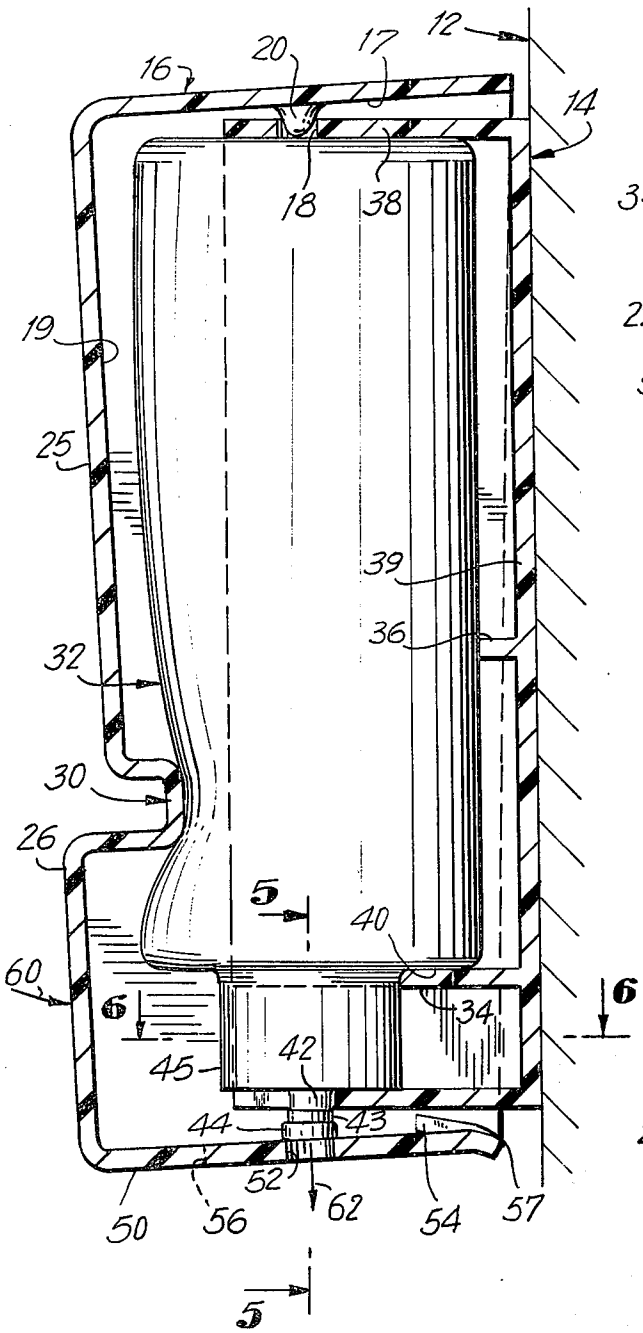


FIG. 5

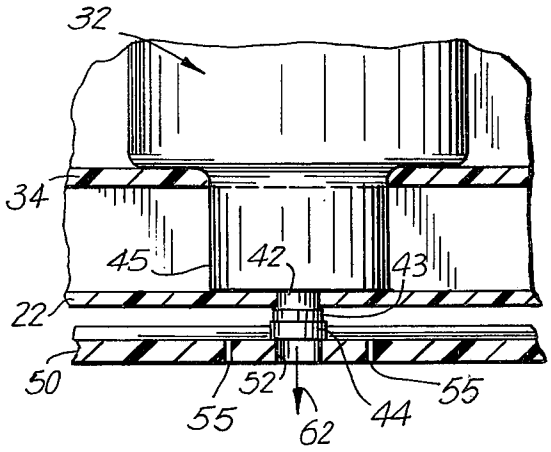


FIG. 6

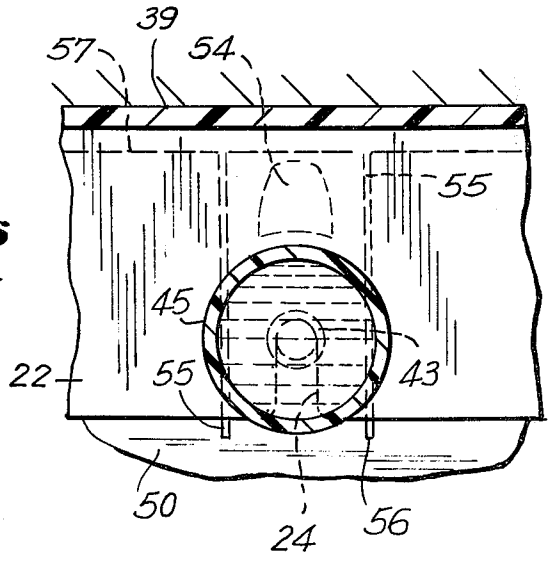


FIG. 8

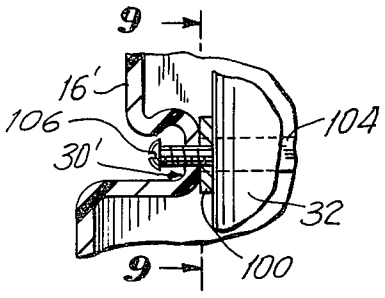


FIG. 9

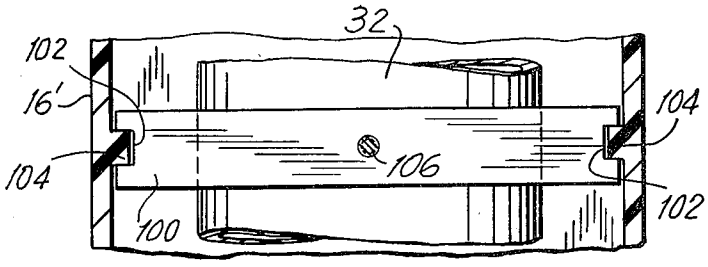


FIG. 10

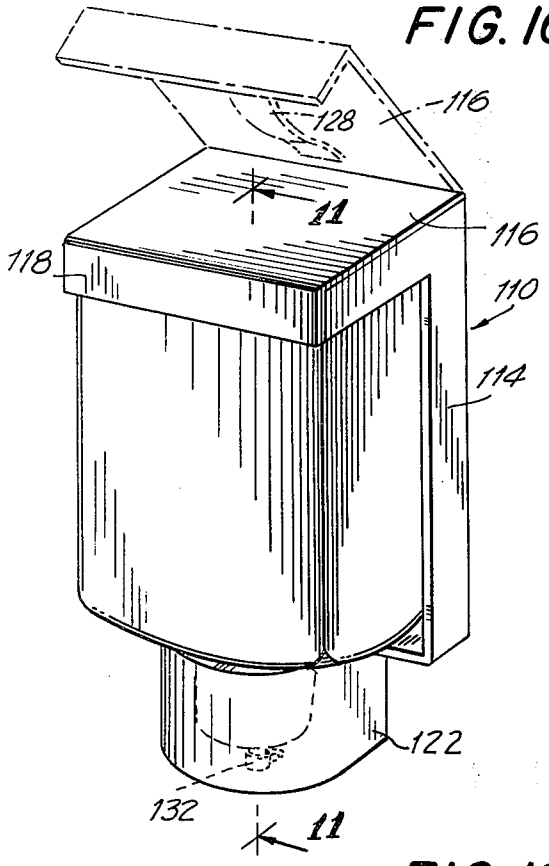


FIG. 11

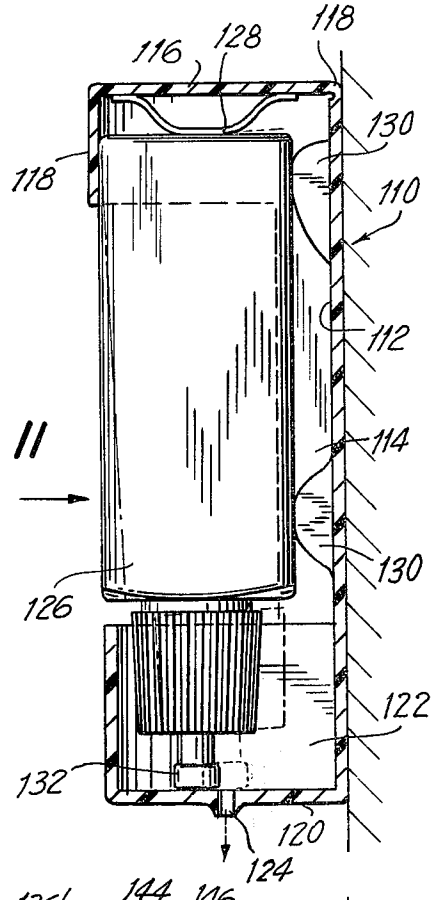


FIG. 12

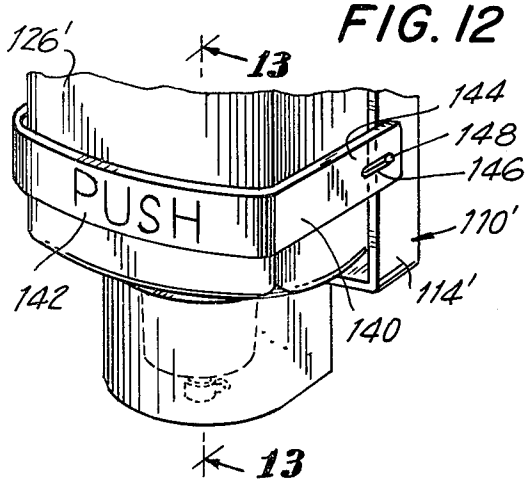
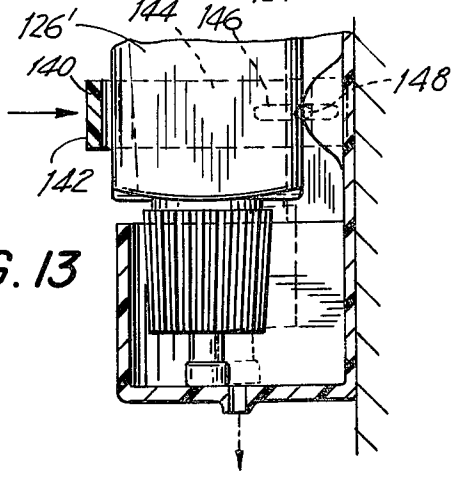


FIG. 13



FLOWABLE MATERIAL DISPENSER WITH RESILIENT CONTAINER

This invention relates to liquid and powder dispensers, and more particularly to such dispensers which are reliable, inexpensive, easy to operate and easy to clean.

There are many mechanisms on the market for dispensing metered amounts of liquids, creams or powders. Such mechanisms, however, are relatively expensive and difficult to clean when that is necessary; generally, they find only institutional use.

The availability of a reliable, inexpensive and easily cleaned dispenser could lead to widespread residential use. Such a dispenser, for example, could be placed in a kitchen near a sink for dispensing liquid detergent. Such a dispenser could also be placed in a bathroom for dispensing a cosmetic cream, hair shampoo or powders. It is envisioned that banks of dispensers would find widespread home use if they could be made inexpensive, reliable, and easy to load, clean and operate.

It is a general object of our invention to provide a dispenser which meets the foregoing criteria.

In accordance with the principles of our invention, we provide a dispenser which in one form consists of two parts: a rear mounting bracket which is attached to a wall and a front cover, both of which cooperate with a squeeze container. The front cover is desirably removable, but when placed on the rear mounting bracket is adapted for swinging movement. As the front cover pivots about a hinge at the top of the mounting bracket, a generally horizontal floor of the cover moves back and forth underneath the bracket in a substantially horizontal direction.

Inside the mounting bracket there is placed a squeeze container, typically made of plastic, which contains the liquid or powder to be dispensed. Although a properly configured container may be provided for each dispenser, into which container the desired liquid or powder is poured from the original bottle, it is contemplated that original containers properly configured for respective dispensers will be marketed, which are prefilled with a liquid or powder, and which are discarded when empty.

The container is placed inside the bracket in an inverted position, with the spout bearing against the bottom floor of the front cover. The floor serves as a seal so that in the normal position of the front cover, no liquid or powder escapes from the container.

Specifically, the floor contains a dispensing hole disposed to move into alignment with the container spout. When the front cover is pushed inwardly and rotates on its hinges, the hole comes into line with the spout and liquid or powder flows out through it. The flow stops when the front cover returns to its normal initial position. The return is controlled by the natural expansion of the container itself. The front cover includes a bumper which bears against the container in the normal initial position of the cover. When the front cover is pushed inwardly, the bumper squeezes the container, causing flow of the powder or the liquid from it. The dispensing mechanism dispenses a substantially constant quantity of powder or liquid, each time it is operated by a user. In one form of the invention, the amount dispensed may be varied.

When the user releases the front cover, the natural expansion of the container against the bumper forces the front cover to return to its normal position.

Rather than to provide a completely removable front cover, the front cover can be permanently hinged to the rear bracket. In such a case, however, the hinge permits the front cover to open sufficiently to enable the container to be replaced and to permit cleaning of the interior. Whether the front cover is completely removable or not, it is very easy to clean the interior because there are no complex mechanical parts.

The replacement of containers is simple. With the front cover open, the user need only remove the cap from a new bottle, to invert it while covering the spout with a finger, to place the bottle on supporting ledges in the mounting bracket, and then to swing the front cover shut so that the floor seals the spout while the user removes his finger. The mechanism is inexpensive because it consists of two parts which may of plastic. It is exceedingly simple to operate since all that is required is to hold one hand under the dispenser while the same or other hand is used to give the front cover a slight push.

Further objects, features and advantages of the invention will become apparent upon consideration of the following detailed description in conjunction with the drawing in which:

FIG. **1** is a perspective view of the illustrative dispenser of our invention mounted on a wall;

FIG. **2** is a sectional view taken through the line **2—2** of FIG. **1**;

FIG. **3** is a sectional view taken through the line **3—3** of FIG. **2**;

FIG. **4** is a sectional view similar to that of FIG. **2**, but showing the front cover pushed in for controlling the dispensing of fluid or powder; FIG. **5** is a sectional view taken through the line **5—5** of FIG. **4**;

FIG. **6** is a sectional view taken through the line **6—6** of FIG. **4**;

FIG. **7** is a partial sectional view of an alternative seal arrangement;

FIG. **8** is a fragment cross-sectional view showing a bumper whose horizontal dimension may be varied;

FIG. **9** is a sectional view taken through the line **9—9** of FIG. **8**;

FIG. **10** is a perspective view of another form of the invention, wherein the squeeze container is directly acted upon by the user's hand;

FIG. **11** is a sectional view taken through the line **11—11** of FIG. **10**;

FIG. **12** is a fragmentary perspective view of another form of the invention, wherein a horizontally-elongated push-bar is used to apply pressure to the squeeze container; and

FIG. **13** is a sectional view taken through the line **13—13** of FIG. **12**.

The dispenser **10**, attached to a wall **12**, is shown in a first form most clearly in FIGS. **1** and **2**. The dispenser consists of two parts, rear mounting bracket **14** and front cover **16**.

The mounting bracket is an open box-like structure and is provided with a number of vertical sections including a rearward vertical section **39** which can be secured by any conventional means (not shown) to wall **12**. The mounting bracket, in addition to vertical side sections, includes four horizontal ledges **22, 34, 36** and **38**. Ledge **36** serves as a stop to position a squeeze container **32** therein and to prevent container **32** from moving too far inwardly. Ledge **34** serves a similar function by bearing against neck **45** of the container, and it partially surrounds and thus serves to support

shoulder 40 of the container. Ledge 22 partially surrounds and functions to support the neck of the container, and ledge 38 bears against the top of the container. The inner edges of ledges 34 and 36 are curved and contoured to match the contours of respective portions of the container.

Ledge 22 includes a slot 24 (see FIGS. 1 and 6) into which the spout 42 of the container slides. The container is placed in the rear mounting bracket, after the front cover is opened as will be described below, by sliding spout 42 of the container in slot 24 and properly positioning the container within the rear mounting bracket. The spout includes a shoulder 43, shown most clearly in FIG. 3, for properly positioning the container in the vertical direction within the rear mounting bracket, this shoulder 43 and shoulder 41 being disposed on opposite sides of ledge 22 in the vicinity of slot 24. Also, a rubber sleeve 44 is provided for placement around the lower extremity of the container spout adjacent to shoulder 43 for the purpose of effecting a seal with floor 50 of the front cover, shoulder 43 serving to determine the proper position of the sleeve on the spout. It will be seen in FIGS. 2 and 3 that the rubber sleeve bears against the floor 50 when the cover is in its normal open position. The rubber sleeve is capable of deforming slightly as shown in FIG. 4, when the front cover is pushed in to release some liquid or powder.

Front cover 16 is generally configured to fit around the rear mounting bracket, as shown most clearly in FIG. 1. Two holes 18 are provided at opposite sides of ledge 38 of the rear mounting bracket. Two internal, downwardly depending projections 20 are provided at the bottom of the roof 17 of the front cover. Each of the projections 20 is to be placed into one of the respective holes 18, as shown most clearly in FIGS. 2 and 4. The projections and holes serve as hinges for permitting the front cover to pivot between the two positions shown in FIGS. 2 and 4. Preferably, the hinges are disposed directly above the vertically-oriented axis of the container spout.

The front 19 of the cover includes two vertical sections, upper section 25 and lower section 26, and an internal bumper 30. The bumper functions to bear against the container when the cover is in its normal position shown in FIG. 2. Although any form of internal bumper could be used, separating the front of the cover into two sections, in different planes, with a connecting wall serving as a bumper, not only fulfills the functional requirements of the cover but also provides a pleasing appearance and constitutes an elongated indent which may be "pushed" by the fingers of a user.

A dispensing hole 52 is provided in the floor. In the normal position of FIG. 2, the hole is in front of the spout and the seal effected by rubber sleeve 44 bearing against floor 50 prevents any of the liquid or powder from flowing out of the container. When the cover is pushed in, as shown by arrow 60 in FIG. 4, it rotates about the upper hinges, and floor 50 swings until hole 52 is disposed directly beneath the container spout. At this time, a portion of the contents of the container flow out through the dispensing hole 52 in the floor as depicted by arrow 62 in FIG. 4.

As shown in FIG. 4, when the cover is pushed inwardly, bumper 30 squeezes the container. A pair of stops 31 on the exterior sides of the side walls of the mounting bracket limit inward movement of the cover. When the cover is released, the natural expansion of the container applies a force to the bumper which causes the cover to return to its normal position of FIG. 2. The container itself thus functions as the return spring for the cover. A stop 54 is provided on the floor 50 of the cover, and serves to prevent excessive outward movement of the cover, by striking against the container spout, in case there is any over-travel as a result of the force applied to it by the expanding container.

Since the bottom spout 42 is the only opening in the container, the amount of liquid or powder dispensed is governed by the displacement or reduction of internal volume caused by the collapse of the container wall when pushed by bumper 30. Flow will continue until substantially atmospheric pressure is reached inside the container, by virture of the contents of the container being lessened in volume, by such outflow.

The amount dispensed is not governed by the time the hole 52 is in line with the spout, but by the volume displaced which in turn is controlled by the configuration of the various parts of the dispenser. Normally the dispensing is rapid. For liquids of low viscosity, the dispensing of about a teaspoon in quantity takes less than a second.

As the finger pressure is released from the cover, the natural resiliency of the container 32 expands, creating an interior suction which draws air up spout 42 to replace the dispensed liquid. Because of the low viscosity of air, this action can take place in a few hundreths of a second.

The dispenser is ordinarily used by pushing the cover inwardly and then releasing it immediately. For any given repetitive series of pushes, approximately the same amount of powder or liquid is dispensed for each stroke, no matter how much remains in the container.

It is desirable that the compressive force between floor 50 and the spout exit (rubber sleeve 44) be fairly closely controlled, to insure good operation and to prevent dripping. If the compressive force is too great, the resulting friction may prevent the cover from returning to its normal position, that is, the natural expansion force of the container may be insufficient to return the cover to its normal position; in such a case the container would simply remain in a slightly squeezed condition and the dispenser would leak. Similarly, if a separate return spring is provided to return the front cover to its original position after it is released, or even if the return is controlled by the weight of the front cover itself, excessive friction might prevent the return. on the other hand, too little compressive force may result in leakage. For this reason, two slits 55 are provided in the floor as shown in FIGS. 5 and 6. The slits extend from the rear edge 57 of the floor to a point indicated by numeral 56 in FIGS. 2, 4 and 6. By providing the slits, the central section of the floor (the section containing stop 54 and hole 52) flexes in the manner of a flat spring to maintain gentle contact against rubber sleeve 44. This compensates for production variations in the relationships of the other key parts of the dispenser.

This feature also permits simple removal and replacement of the cover. To remove the cover, the user bears down on the middle section of the floor between the slits 55 and causes it to flex. With the middle section moved down sufficiently so that stop 54 can clear rubber sleeve 44, the bottom of the cover can be rotated in the clockwise direction so that it clears the mounting bracket, after which the cover can be raised and pro-

jections **20** removed from holes **18.** In replacing the cover after a new container is placed within the mounting bracket, projections **20** are first placed in holes **18.** Thereafter, the bottom of the cover is pushed inwardly. As the sloping edge of stop **54** engages the container spout (or, more accurately, rubber sleeve **44**), the middle section of floor **50** is forced downward, the spout riding over the stop. Thereafter, the middle section springs upwardly to effect the seal.

An alternative sealing arrangement is shown in FIG. **7.** A container spout **70** is provided with a rubber sleeve **72** which functions as a dispensing nozzle. The rubber sleeve is made of very flexible material so that when floor **50** is disposed beneath the sleeve, the sleeve is pinched as shown by the numeral **72***a* to effect a seal. When the cover is pushed inwardly and floor **50** moves to the right in FIG. **7,** hole **52** moves to a position beneath the spout. At this time, the rubber sleeve extends down into the hole and is no longer pinched so that liquid or powder can be dispensed. When the cover is released and the floor moves to the left in FIG. **7,** the seal is effected once again.

FIG. **8** shows in cross sectional view, and FIG. **9** shows in front sectional view, another form of the present invention wherein the bumper is variable in its horizontal dimension, whereby the amount of liquid or powder dispensed on each inward stroke of the cover is variable. More specifically, the cover **16'**, at its bumper **30'** carries a horizontally-elongated bumper bar **100.** The bumper bar has in indent **102** at each of its ends, which mate with horizontally-oriented ribs **104,** these ribs being carried on the facing walls of the cover **16'**. The position of the bumper bar **100** is varied through the use of a threaded bolt **106,** the head of which extends through the cover **16'** at the bumper **30'**, so that it is open to access from the front, and the body of which is matingly attached to both the bumper **30'** and the bumper bar **100.** Thus, rotation of the bolt **106** in one direction will move the bumper bar **100** inwardly with respect to the interior wall of the bumper **30'**, while rotation of the bolt **106** in the opposite direction will have the opposite effect. It will be apparent that the more the bumper bar **100** is moved inwardly, the greater will be the amount of liquid or powder dispensed from the squeeze container **32,** on each inward push of the cover **16'**.

Another embodiment of the present invention is shown in perspective in FIG. **10,** and in cross section in FIG. **11.** The primary difference between this form, and the forms previously discussed, is that the cover member is eliminated, and the container itself is pivoted between a sealed and a dispensing position, and is also squeezed directly by the hands of a user. More specifically, the form shown in FIGS. **10** and **11** includes a mounting bracket **110** adapted to be attached to a vertical surface in any conventional manner. The mounting bracket **110** includes a back wall **112** and a pair of opposed side wall **114,** each such side wall being of an inverted L-shape. The mounting bracket **110** further includes a roof **116** with a front lip **118.** As can be seen by comparing the dot and dash lines with the solid lines in FIG. **10,** the roof **116** is swingable between an open or upward position, wherein the interior of the mounting bracket **110** is fully exposed, and a closed position which is substantially horizontal and wherein the roof **116** joins the upper legs of the side walls **114.** The roof **116** is pivotally joined to the back wall **112** by a "living" hinge **118.**

The mounting bracket further includes a floor **120,** surrounded by side walls **122.** The floor **120** has a dispensing hole **124** formed centrally within it. A squeeze container **126** is positioned within the mounting bracket, being held under moderate pressure by a spring **128** attached to the interior surface of the roof **116,** and positioning ribs **130** formed on the interior surface of the back wall **112.** It will be clear that the squeeze container **126** can be put into the mounting bracket, by simply opening the roof **116,** inserting the squeeze container so that its spout is within the walls of the floor **120,** and then closing the roof so that the spring **128** bears on the end of the squeeze container, while the lip **108** bears against the forward periphery of the squeeze container. The invention in this form, is operated by the user taking the fingers of his hand and pushing against the squeeze container, until the spout **132** comes into alignment with the dispensing hole **124.** After the amount of liquid has been dispensed, normal expansion of the squeeze container **126** expands the same away from bracket **110** so that the spout **132** overlies the floor **120,** thereby sealing the same. In this connection, the various sealing means, shown specifically in FIGS. **3** and **7,** may be advantageously utilized for this purpose.

FIGS. **12** and **13** show still another form of the present invention, wherein a push bar is substituted for the cover member previously shown. More specifically, a push bar **140** of U-shaped configuration is engaged to the mounting bracket **110'**, the mounting bracket **110'** being substantially similar to the mounting bracket **110** shown in FIGS. **10** and **11.** The push bar **140** includes a central leg **142,** which may optionally be marked with the word "push", and two opposed side legs **144.** Each such side leg has an elongated slot **146** therein, which engages a stud **148** projecting outwardly from each of the side walls **114'** of the mounting bracket **110'**. By virtue of the foregoing slot and stud arrangement, the push bar **140** is oriented to slide substantially horizontally inwardly when pressed inwardly by the fingers of a hand of a user, and will move outwardly, due to the natural expansion of the container **126'** therein. Again, the mounting bracket and the sealing arrangement therein, in the form shown in FIGS. **12** and **13,** are substantially the same as that shown in connection with FIGS. **10** and **11.**

Although the invention has been described with reference to particular embodiments, it is to be understood that these embodiments are merely illustrative of the application of the principles of the invention. Numerous modifications may be made therein and other arrangements may be derived without departing from the spirit and scope of the invention.

What we claim is:

1. A hand operated dispenser for controlling the flow of flowable material from a flexible, shape retaining container having a spout, comprising supporting means for retaining the container in an inverted position with the spout of the container maintained substantially stationary relative to said supporting means, a hand actuated outer cover having an outwardly exposed hand-receiving portion, a floor fixed to the cover and located at the bottom of the dispenser, said floor including a separated portion adapted to flex toward and away from spout of the container, means for providing a seal between the flexible floor portion and the spout of the container, a hole defined within the flexible floor portion and communicating with the outside of the

dispenser at the bottom thereof, means for mounting the cover for movement of the floor beneath the spout of the container in a substantially horizontal plane from a first position where the flexible floor portion and the sealing means prevent flow of flowable material from said container to a second position where the hole of the floor is positioned beneath the spout of the container to permit flowable material in the container to flow through the hole into the hand of a user placed below the dispenser, said cover further including a bumper bearing against a portion of the side wall of the container for squeezing the container upon hand actuation of the cover and for moving the floor from said first position to said second position, the natural expansion of the container moving the side wall of the container to return the floor from said second position back to said first position, and means for adjusting the pressure applied by the bumper to said side wall by varying the position of the bumper relative to said cover.

2. A hand-operated dispenser as set forth in claim **1** wherein the sealing means includes a separate portion of said floor adapted to flex independently from the remainder of said floor, said portion containing said hole.

3. A hand-operated dispenser as set forth in claim **2** wherein said separate portion of the floor is defined by a pair of slits in the floor.

* * * * *