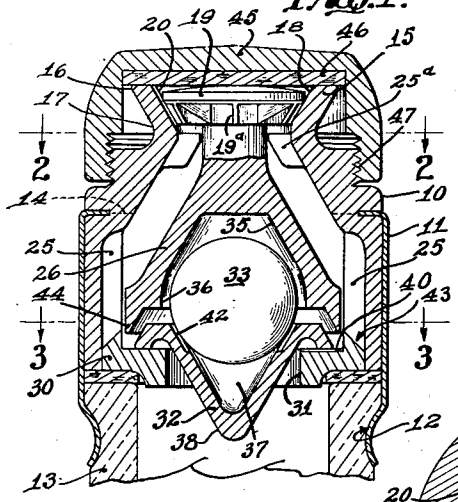
Oct. 13, 1942. D. H. SEGERLUND 2,298,655

DISPENSING CLOSURE

Filed May 21, 1941

Fig. 1.



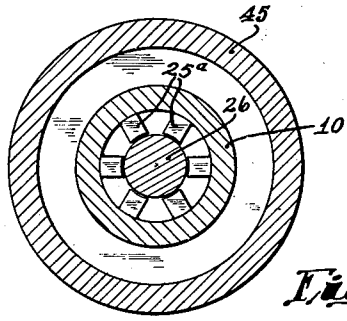


Fig. 2.

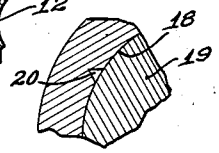


Fig. 4.

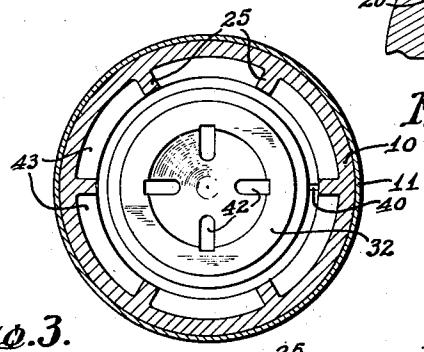


Fig. 3.

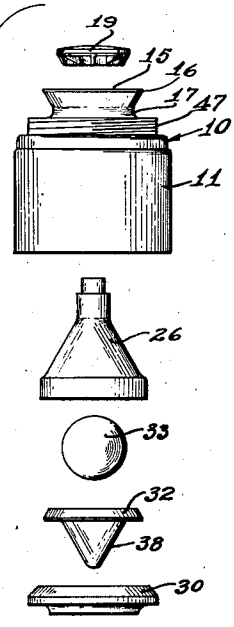


Fig. 7.

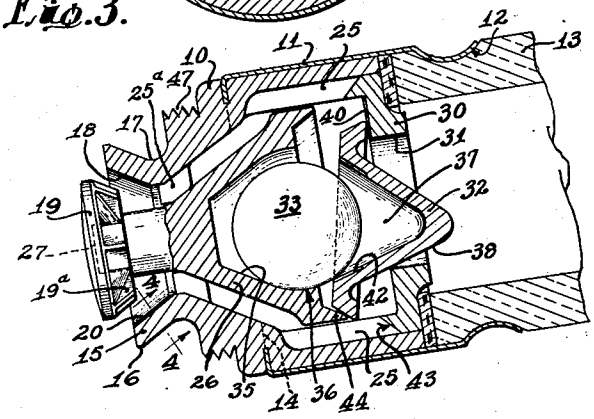


Fig. 5.

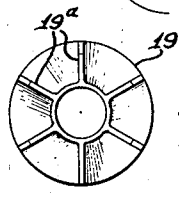


Fig. 6.

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Patented Oct. 13, 1942

2,298,655

UNITED STATES PATENT OFFICE

2,298,655

DISPENSING CLOSURE

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Application May 21, 1941, Serial No. 394,429

6 Claims. (Cl. 215—22)

This invention relates to improvements in dispensing closures for containers and has for an object the provision of a new and improved device of this character.

Among the objects is the provision of an automatic resealing device that is arranged for positive opening upon the dispensing of liquid from a container embodying the device.

A further object is the provision of a secondary or internal seal for the prevention of liquid evaporation in the container and one that is positively moved into closing position incident to terminating the liquid dispensing operation.

Another object is the provision of means whereby these sealing members or devices above mentioned will not become automatically locked closed upon the container being subjected to wide temperature variations such as in refrigeration which creates a vacuum in the container.

A still further object is the constructing of the device in such a manner as to preclude tampering with the internal mechanism, or the removal of the entire device without the destruction of one or more of its parts.

Other objects will be in part apparent and in part pointed out hereinafter.

In the drawing:

Fig. 1 is a sectional elevational view of my invention, showing the various parts in closed or non-pouring position.

Fig. 2 is a sectional view taken along the line 2—2 of Fig. 1, showing the inner rib structure for guiding and centering the stem of the upper valve or resealing device.

Fig. 3 is a sectional view taken along the line 3—3 of Fig. 1 showing the lower valve or secondary seal and the body guide members.

Fig. 4 is a sectional view showing the location of the relief groove as at the line 4—4 on Fig. 5 or as at 40 on Figs. 1 and 5.

Fig. 5 is a cross-sectional view of the complete closure in pouring position with both valves open.

Fig. 6 is a bottom view of the upper valve member illustrating the rib structure of same.

Fig. 7 is a side elevational view of the closure with the parts slightly separated.

Referring particularly to Fig. 1, the invention comprises a hollow body 10 or housing, preferably cylindrical in form, having integrally molded therein a metal ferrule 11 or shell, said ferrule depending from the body 10 and adapted to be spun into an external groove 12 formed in the neck of a container 13. Attention is directed to the fact that the metal ferrule 11 is embedded or molded into the body 10 to such an extent that a comparatively weakened portion 14 is formed. Consequently any attempt to remove the fitment by tampering with the ferrule at points 12 or 14 will result in a strain at 14 to the extent that said portion in all probability will break entirely, or at least crack sufficiently to leak and thereby prevent reuse of the container fitment.

A pouring spout 15 at the upper end of the body 10 is formed externally in the usual manner, i. e., a shear lip 16 and a retracted or undercut portion 17 to provide for proper pouring and shearing of the stream. Internally the pouring spout includes a tapered valve seat 18 and a valve 19 normally seated thereon. The valve seat 18 is provided with a venting groove 20 (Fig. 4) of such dimension that liquid will not pass when the valve is seated except under extreme pressure and yet will permit entrance or exit of air. This arrangement prevents the locking of said valve due to any creation of a differential pressure within and between the body 10 of the device and the inside of the container 13 when under refrigeration, or other temperature varying means.

An annular series of vertical ribs 25 are formed on the lower portion of the interior wall of the body 10 and these provide channels through which the liquid being dispensed may flow from the container 13. These ribs are of such shape and dimensions as to form guide means for the guard member 26. An annular series of ribs 25a above the first named series, guides the reduced neck portion of the guard. Said guard 26 and the valve 19 are connected together by a press fit connection as at 27 (Fig. 5) so as to move as a unit during opening and closing of the pouring spout 18.

Inserted in the lower opening of the body 10 (Fig. 1) is a valve seat 30 or ring, having a central opening 31 upon which is positioned a valve 32. This valve 32 is free to move relative the valve seat 30, but in non-pouring position is retained on said seat by means of a free weight 33 in the form of a ball.

The guard 26 is hollow as at 35 to provide clearance for the ball 33 and at the same time furnish a guide for controlling the path of movement of said ball. In pouring position, the ball will normally rest upon the surface 36 of the guard 26 allowing the valve 32 to be free and capable of floating into sealing position on the seat 30 upon any attempt being made to direct liquid into the container.

Movement of the container from pouring po-

sition to vertical or normal upright position immediately results in movement of the ball **33** by gravity into the recess **37** of the valve **32**, thereby closing same against the seat **30**. A cone formation **38** on the valve **32** prevents the valve from ever moving beyond the confines of the opening **31**, and functions as a guide which insures proper positioning of the valve for closing the opening **31**.

A venting groove **40** is provided in the valve seat **30**, said groove being of such a size as to preclude gravity flow of liquid therethrough when the valve is seated, but to permit a comparatively small flow under extreme pressure. This groove **40** provides a means of equalizing pressures within and without the container under temperature differentials and thus prevents air or vacuum locking of the valve **32** upon the seat **30**. This groove **40** is of the same shape and dimensions as groove **20** (Fig. 4). The two venting grooves herein described may of course be formed in the face of each valve rather than the seat, and still perform the desired function. Moreover, the groove **20** may in some instances be omitted.

In order to prevent the float valve **32** from becoming attached to the ball **33**, an annular series of grooves **42** are provided in the inner face **37** of said valve, thus insuring that said valve will always remain free to float when the container is in pouring position or any position opposed to a vertical closed position.

To provide means to make it difficult to "wire lock" the valve **32**, in an open position for unauthorized refilling of the container, an angular annular recess **43** is formed between the inner wall of the body **10** and the outer upper wall of the valve seat **30**. This recess **43**, together with the extension **44** of guard **26**, will in most instances force a wire or similar object into the recess **43** upon any such instrument being inserted into the body **10**.

A closure cap **45** with a cork or foil liner **46** is adapted to be screwed in place at **47** on the body **10** to provide a means for sealing and resealing the complete package as desired.

In operation of the device the parts are normally in the position shown in Fig. 1 with the valves **19** and **32** seated upon their respective valve seats **18** and **31**. In this position the valve **19** is seated only by its own weight, while valve **32** is retained in its seated position by means of the free weight ball **33**. This arrangement of parts provides a double valve which prevents evaporation of the liquid in either the container **13** or the body **10**.

To remove the contents from the container **13**, it is tilted to horizontal position or slightly therebeyond (as in Fig. 5) whereupon the ball **33** positively forces the guard **26** and its attached valve **19** to open position, while at the same time releasing valve **32** from the weight **33**, allowing the liquid contents to emerge from the container **13** and float the valve **32** into open position. The valve **32** is made of such material and of such dimensions that it is buoyant and will float in liquor. Consequently if any attempt is made to flow liquor into the bottle while said valve is free of the weight **33**, the valve will float into sealing position on the seat **30**.

From the preceding description it will be apparent that in one direction of motion the ball **33** positively actuates the valve **19** to open the same, while in its opposite direction of travel it positively closes valve **32**. In order that the pouring qualities of this device will be at a maximum of efficiency, the valve **19** has formed on its under side, a series of ribs **19a** which function as air breathers or a vent during the pouring operation. This provides smooth pouring as well as acceleration of the rate of pouring. As shown in Fig. 2, the ribs **25** hold the valve **19** centered with respect to its seat **18**, thus preventing splitting of the stream of liquid as it is poured.

It should also be apparent that this device provides both a built-in pouring spout and a tamper-proof fitment which functions to prevent evaporation of the container contents; prohibits entrance of gnats or other insects into the container; prevents either the container or the fitment from becoming vacuum locked; provides resealing of the container; prevents removal and reuse of the pour spout; and makes it difficult, if not impossible, to either adulterate the contents of the container or refill same.

Modifications may be resorted to within the spirit and scope of the appended claims.

I claim:

1. In a dispensing closure of the character described, a generally cylindrical housing initially open at both ends, a valve seat at each end, one seat formed internally of the housing and the other seat externally thereof, a valve body within the housing normally resting upon the internal seat, a second valve normally resting upon the external seat, means limiting relative movement of said valves, a ball weight for opening the external valve and closing the internal valve alternatively and a vent for each valve affording communication between the interior and exterior of said housing.

2. In a dispensing closure for a receptacle having a neck, a generally cylindrical housng attached to and extending outwardly from the neck, a valve seat at the inner end of said housing, a valve normally resting upon said seat, said housing having its outer end reduced in diameter and provided with a continuous outwardly flared valve seat coaxial with the first named valve seat, a valve normally resting upon the flared seat, a hollow guard depending axially from the last named valve and terminating in close proximity to the first named valve, a ball weight positioned within the guard and normally resting upon the first valve and out of actual contact with said guard, said weight operating to seat the first named valve and open the second valve in alternation in response to predetermined changes in the position of the receptacle and means providing vents across at least one of said valve seats.

3. In a dispensing closure for a receptacle having a neck, a generally cylindrical housing attached to and extending outwardly from the neck, a valve seat at the inner end of said housing, a valve normally resting upon said seat, said housing having its outer end reduced in diameter and provided with a continuous outwardly flared valve seat coaxial with the first named valve seat, a valve normally resting upon the flared seat, a hollow guard depending axially from the last named valve and terminating in close proximity to the first named valve, a ball weight positioned within the guard and normally resting upon the first valve and out of actual contact with said guard, said weight operating to seat the first named valve and open the second valve in alternation in response to predetermined changes in the position of the receptacle and means providing vents across at least one of said valve seats, said vents each comprising a

shallow groove extending entirely across the corresponding valve seat.

4. In a dispensing closure for a receptacle having a neck, a generally cylindrical housing attached to and extending outwardly from the neck, a valve seat at the inner end of said housing, a valve normally resting upon said seat, said housing having its outer end reduced in diameter and provided with a continuous outwardly flared valve seat coaxial with the first named valve seat, a valve normally resting upon the flared seat, a hollow guard depending axially from the last named valve and terminating in close proximity to the first named valve, a ball weight positioned within the guard and normally resting upon the first valve and out of actual contact with said guard, said weight operating to seat the first named valve and open the second valve in alternation in response to predetermined changes in the position of the receptacle and means providing vents across both of said valve seats.

5. In a dispensing closure for a receptacle having a neck, a generally cylindrical housing attached to and extending outwardly from the neck, a valve seat at the inner end of said housing, a valve normally resting upon said seat, said housing having its outer end reduced in diameter and provided with a continuous outwardly flared valve seat coaxial with the first named valve seat, a valve normally resting upon the flared seat, a hollow guard depending axially from the last named valve and terminating in close proximity to the first named valve, a ball weight positioned within the guard and normally resting upon the first valve and out of actual contact with said guard, said weight operating to seat the first named valve and open the second valve in alternation in response to predetermined changes in the position of the receptacle and means providing vents across both of said valve seats, said vents each comprising a shallow groove extending entirely across the corresponding valve seat.

6. In a dispensing closure for a receptacle having a neck, a generally cylindrical housing attached to and extending outwardly from the neck, a valve seat at the inner end of said housing, a valve normally resting upon said seat and including a hollow frusto-conical body and an annular radial flange, the latter engaging the valve seat while the body depends through it and into the receptacle neck, said housing having its outer end reduced in diameter and provided with a pouring lip and a flared internal valve seat, a valve normally resting upon the flared valve seat, an inverted hollow frusto-conical guard attached to the last named valve in axial alignment with the first valve, the open end of said guard in part telescoping over the flange of the first valve and a ball weight interposed for free limited movement between the guard and first valve and for the greater part housed within said frusto-conical guard and operating to seat the first named valve and open the second valve in alternation in response to predetermined changes in the position of the receptacle, and means providing vents across at least one of the valve seats.

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