

1

2,880,914

DISPENSER

Louis L. Lerner and Albert Safianoff, Chicago, Ill., assignors to The Gillette Company, Chicago, Ill., a corporation of Delaware

Application February 28, 1958, Serial No. 718,190

9 Claims. (Cl. 222—321)

This invention relates to a dispenser adapted to be mounted on a container for dispensing fluent materials such as liquids or flowable pulverulent solids contained therein.

One object of the invention is to provide a dispenser of simple compact construction readily adapted to be manufactured on a mass scale at low cost.

A second object is to provide a dispenser of the type described which includes a spring-loaded pump, the spring being shielded from contact with the fluent material.

Other and further objects will be apparent from the drawings and from the description which follows.

In the drawings:

Fig. 1 is an isometric view showing one embodiment of the present invention mounted on a container;

Fig. 2 is a view in vertical section through the embodiment of Fig. 1 with the outlet spout in closed position and with the pump in extended position;

Fig. 3 is a view in vertical section showing a modified construction with the outlet spout extended to delivery position and with the pump in compressed position;

Fig. 4 is a view in cross-section taken along line 4—4 of Fig. 3;

Fig. 5 is a view in cross-section taken along line 5—5 of Fig. 2; and

Fig. 6 is a view in cross-section taken along line 6—6 of Fig. 3.

As appears from Figs. 1 and 2 of the drawing, the dispenser of the present invention comprises a piston member 10 provided with a generally cylindrical depending portion 12 carrying threads 14 on its inner face by means of which the piston member 10 may be secured to the mouth of a container 16 carrying corresponding threads adjacent its upper end. Piston member 10 is provided with an encircling sealing gasket 18 of flexible, resilient, rubbery material which is seated in a groove in the wall of piston member 10 and provides a sliding seal between member 10 and the inner face of a generally cylindrical chamber 20 embracing member 10. In addition, piston member 10 is provided with an aperture 22 near its center permitting communication between the interior of chamber 20 and a conduit 24 depending from member 10 and extending to a point adjacent the bottom of container 16. The mouth of aperture 22 serves as a valve seat for a spherical valve 26. A generally cylindrical valve retainer 28 extends upwardly from piston 10 within chamber 20 around aperture 22 and is provided with an inwardly extending lip or flange 30 adjacent its upper end serving as a keeper for valve 26. Conduit 24 may be of either rigid or flexible construction and is secured to piston member 10 in any suitable manner, as by an adhesive, a simple press fit, soldering, etc.

Extending laterally outwardly from adjacent the upper end of chamber 20 is a flange 32 from which depends a skirt 34. A second laterally outwardly extending flange 36 is secured to piston member 10 in a position opposing flange 32. Disposed between flange 32 and flange 36 and embracing chamber 20 is a compression coil spring 38

2

which urges chamber 20 away from piston member 10 to the open position shown in Fig. 2. A limit stop is provided to limit the extent of relative movement of chamber 20 away from piston member 10, the limit stop in the embodiment shown in Fig. 2 taking the form of hooked extensions 40, 40 secured to the lower margin of skirt 34 and extending through mating apertures 42, 42 in flange 36 with the hooks engaging the bottom face of the flange. In order to limit the extent of relative movement of chamber 20 toward piston member 10, a supplemental annular stop 44 is secured to the wall of skirt 34 in position to abut against the upper face of flange 36 when the chamber 20 and piston member 10 are in closed position. A generally cylindrical guard member 46 is secured to the outer margin of flange 36 to prevent accidental pinching of the fingers during operation of the device and to provide a smooth external contour for the device.

An outlet 50 is provided in the upper face of chamber 20 with an inwardly extending tapered nipple 52 embracing outlet 50 and having slots 53, 53 in its wall. A spout 54 is mounted on top of chamber 20 and is provided with a downwardly extending tubular member 56 having a flanged shoulder 58 adjacent its closed lower end and having a slot 59 in its wall. Tapered nipple 52 is of resilient flexible material so that tubular member 56 may be forced into the position shown in Fig. 2 with flanged shoulder 58 snapping over the lower end of nipple 52. The wall of tubular member 56 mates with the inner face of nipple 52 and serves as a bearing permitting rotation of spout 54 about member 56 as an axis. An annular rubber sealing ring 62 is disposed between tubular member 56 and nipple 52. Within outlet spout 54 is a generally spherical valve 70 mounted on a conical valve seat 72. Slot 59 in the wall of tubular member 56 registers with slots 53, 53 in the wall of nipple 52 only when the outlet end of spout 54 extends laterally outwardly beyond the periphery of chamber 20.

In operation of the embodiment shown in Figs. 1 and 2, the spout 54 is swung from the closed position in which slot 59 is sealed, as shown in Fig. 5, to a discharge position as shown in dotted lines in Fig. 1 or as shown in Fig. 3 in which the nozzle overhangs the lateral margin of chamber 20 and slot 59 registers with one of slots 53, 53. Chamber 20 is then manually urged downwardly on piston member 10, compressing the fluent material or air within chamber 20 and causing valve 26 to seat and valve 70 to open, discharging a portion of the contents of chamber 20 through spout 54. Chamber 20 is then released, whereupon spring 38 returns the chamber to its original position, as shown in Fig. 2, in which limit stops 40 engage the bottom of flange 36. The return of chamber 20 to this position, of course, causes valve 70 to close and valve 26 to open, drawing additional fluent material from the container into chamber 20. The operation is repeated until the desired quantity of the fluent material has been dispensed through spout 54. It will be appreciated that stop 44 abuts against the upper face of flange 36 upon downward compressive movement of chamber 20, thereby limiting the extent of compression.

In the modified construction shown in Figs. 3 and 4, the limit stops consisting of a plurality of hooked extensions 140, 140 are secured to the wall of chamber 20 and extend downwardly through flange 136 provided with suitable apertures 142, 142. In this embodiment skirt 134 is arranged so that its lower margin abuts against the upper face of flange 136 upon compression, thereby limiting the extent of compression. A guard member 146 having an axially curved cross-sectional configuration is mounted on an upwardly projecting extension 147 of flange 136 and performs the same function as guard 46 in the embodiment shown in Fig. 2. The operation of

3

the embodiment of Figs. 3 and 4 is analogous to that of the embodiment of Fig. 2.

While a variety of materials may be employed in fabricating the dispenser of the present invention, a relatively hard and rigid synthetic plastic material such as polystyrene, polymethyl methacrylate, or the like is preferred for piston member 10 and chamber 20 as well as for spout 54, while a soft elastic rubbery material is preferred for sealing gaskets 18 and 62. Conduit 24 may be of the same hard and rigid synthetic plastic material as piston member 10, but normally a relatively flexible material such as polyethylene or a plasticized vinyl resin is preferred for this member in order to reduce the hazard of breakage when the dispenser is changed from one container to another. Although stainless steel is preferred for valve members 26 and 70 in order to eliminate any danger of corrosion, it will be appreciated that since spring 38 is sealed from any possible contact with the fluent material, it may be constructed of any conventional spring steel. This is highly advantageous since the best spring steels are not made from stainless steel; the present construction, therefore, makes it possible to use the best quality spring steel even when the fluent material to be dispensed is corrosive in nature.

When piston member 10 and chamber 20 are constructed of synthetic plastic materials, it will be appreciated that the design lends itself to rapid and inexpensive manufacture by injection or other molding techniques with a minimum number of separate parts being required.

Although specific embodiments of the invention have been described herein, it is not intended to limit the invention solely thereto, but to include all of the obvious variations and modifications within the spirit and scope of the appended claims.

What is claimed is:

1. A dispenser adapted to dispense fluent materials comprising a piston adapted to be rigidly secured to the mouth of a container, a chamber slidably mounted on said piston with its wall in sealing engagement with said piston, a spring mounted outside said chamber urging said piston and chamber away from each other, a limit stop limiting the relative movement of said chamber and said piston away from each other in response to said spring, a conduit extending from said piston to a position adjacent the bottom of said container and communicating with the interior of said chamber through an aperture in said piston, a check valve for preventing back flow through said conduit from said chamber to said container, an outlet from said chamber including a spout pivotally mounted for swinging movement to and from a first position in which the exit end of the spout overhangs the side of said chamber to dispense said fluent material, and a second position in which the exit end of the spout overlies said chamber.

2. A dispenser as defined in claim 1 including means for sealing the outlet when said spout is in said second

4

position and for opening said outlet when said spout is in said first position.

3. A dispenser adapted to dispense fluent materials comprising a piston adapted to be rigidly secured to the mouth of a container, a chamber slidably mounted on said piston with its wall in sealing engagement with said piston, a first flange secured to and extending radially outwardly from said piston, a second flange secured to and extending radially outwardly from said chamber in a position opposing said first flange, a compression spring encircling said chamber disposed between said flanges to urge said piston and chamber apart, a skirt spaced from and embracing said chamber and spring secured to one of said flanges and extending toward the other of said flanges, a limit stop limiting the relative movement of said chamber and piston away from each other in response to said spring, a conduit extending from said piston to a position adjacent the bottom of said container and communicating with the interior of said chamber through an aperture in said piston, a check valve for preventing back flow through said conduit from said chamber to said container, and an outlet from said chamber.

4. A dispenser as defined in claim 2 in which said limit stop comprises a hooked extension secured to said skirt adapted to engage said other flange.

5. A dispenser as defined in claim 2 in which said limit stop comprises a hooked extension secured to the wall of said chamber adapted to engage the flange secured to said piston.

6. A dispenser as defined in claim 2 in which said skirt is secured to said second flange.

7. A dispenser as defined in claim 5 in which said limit stop comprises a plurality of hooked extensions secured to said skirt and passing through apertures in said first flange to engage therewith.

8. A dispenser as defined in claim 6 in which an annular stop member is mounted on said skirt in position to limit the extent of movement of said chamber and piston toward each other.

9. A dispenser as defined in claim 2 in which said limit stop comprises a plurality of hooked extensions secured to the wall of said chamber and passing through apertures in the flange secured to the piston to engage therewith, and said skirt abuts against the flange attached to the piston to limit the relative movement of said chamber and piston toward each other.

References Cited in the file of this patent

UNITED STATES PATENTS

330,483	Heston	Nov. 17, 1885
1,929,564	Rolph	Oct. 10, 1933
2,083,776	Ferguson	June 15, 1937
2,136,263	Holmes	Nov. 8, 1938
2,774,517	Teegardin et al.	Dec. 18, 1956