June 26, 1951 C. L. DUMONT 2,557,952

DISPENSING CONTAINER WITH RATCHET TYPE FOLLOWER AND SPRING BIASED CLOSURE

Filed Jan. 20, 1948 2 Sheets-Sheet 1

Fig. 1.

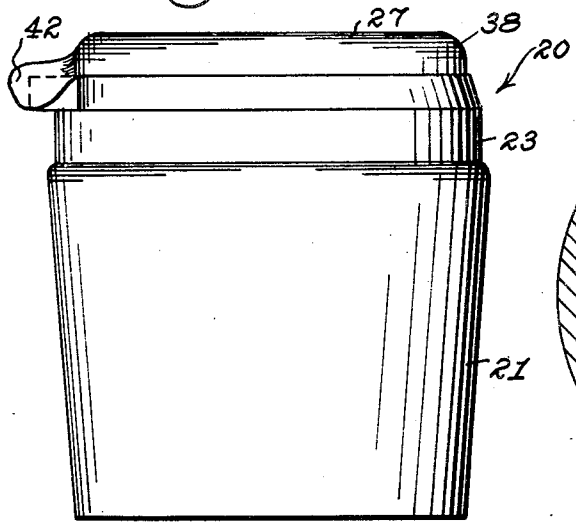


Fig. 4.

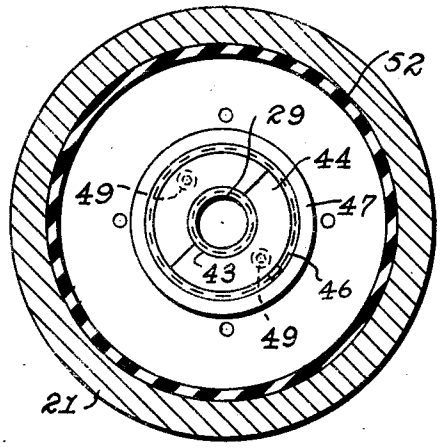


Fig. 2.

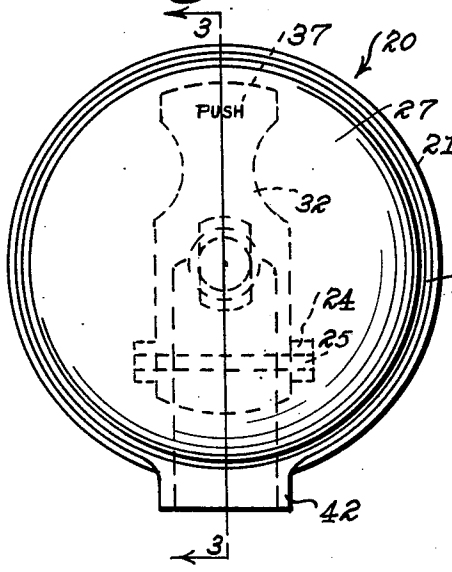
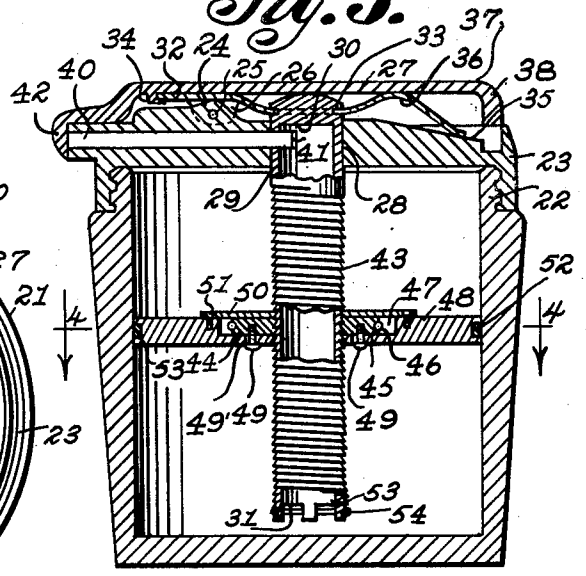


Fig. 3.



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DISPENSING CONTAINER WITH RATCHET TYPE FOLLOWER AND SPRING BIASED CLOSURE

Filed Jan. 20, 1948 2 Sheets-Sheet 2

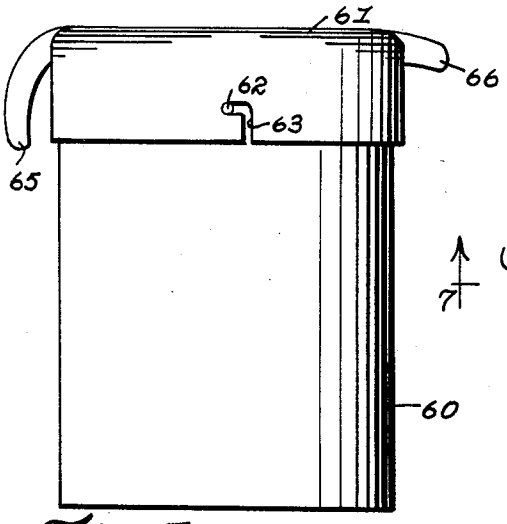


Fig. 5.

Fig. 6.

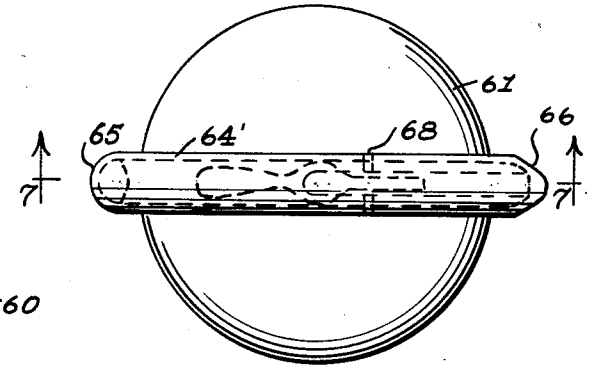


Fig. 11.

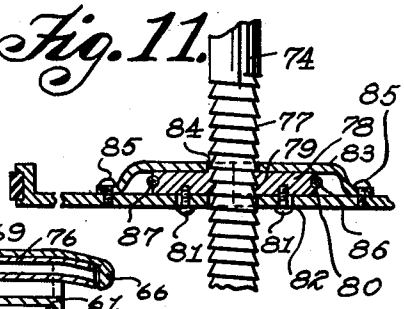
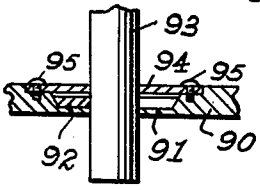
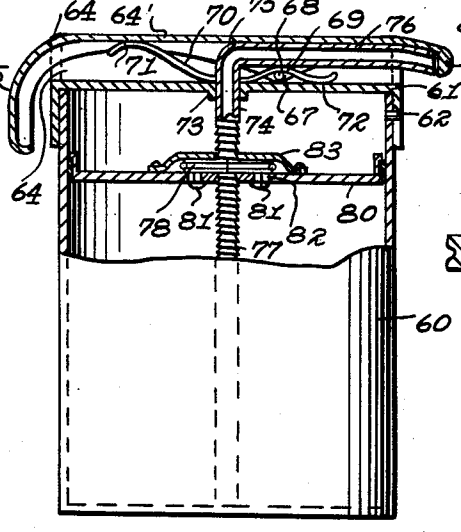


Fig. 7.

Fig. 8.





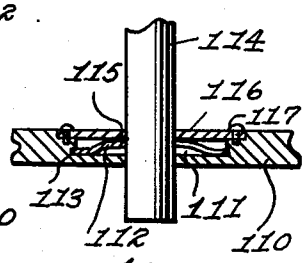
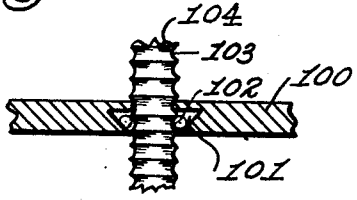


Fig. 10.

Fig. 9.



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DISPENSING CONTAINER WITH RATCHET TYPE FOLLOWER AND SPRING BIASED CLOSURE

Charles L. Dumont, Long Beach, Calif.

Application January 20, 1948, Serial No. 3,321

3 Claims. (Cl. 222—387)

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This invention relates to improvements in dispensing containers that are adapted to dispense liquids, pastes, salves, soap, powders, lubrication or other viscous or semifluid materials.

An object of the invention is to provide a container wherein the contents of the container may be discharged for immediate use, while the unused portion of the contents will be protected from deterioration caused by contact of the air with the unused contents, or any unsanitary conditions that would exist, should the dispensing opening remain open.

Another object of the invention is to provide a container wherein any desired or required amount of the contents may be dispensed by the use of one hand only by a slight downward pressure on the dispensing cap of the container.

With the above and other objects and advantages that will appear during the course of the description of the invention, the invention consists of the novel details of construction, arrangement and combination of parts more fully hereinafter described, claimed and illustrated in the accompanying drawings in which:

Figure 1 is an elevational view of an embodiment of the invention;

Figure 2 is a top plan view of Figure 1;

Figure 3 is a vertical sectional view of Figure 2 on the line 3—3 thereof;

Figure 4 is a cross-sectional view on the line 4—4 of Figure 3;

Figure 5 is an elevational view of a modified form of the invention;

Figure 6 is a top plan view of Figure 5;

Figure 7 is a view partly in elevation and partly in section on the line 7—7 of Figure 6;

Figure 8 is a fragmentary sectional view of one form of actuating means for the piston;

Figure 9 is a fragmentary sectional view of another form of actuating means for the piston;

Figure 10 is a fragmentary sectional view of still another form of actuating means for the piston and

Figure 11 is an enlarged fragmentary sectional view of the actuating means for the piston shown in Figure 7.

Referring more in detail to the drawings, and more particularly to Figures 1 to 4 thereof, the dispensing container embodying the invention is generally designated by the reference numeral 20.

Any material such as plastic, metal, glass or ceramics, may be used in the construction of the container, depending upon the type, style or chemical analysis of the contents to be dispensed.

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The dispensing container comprises a hollow cylindrical body 21 having an open top, the top being out-turned by a vertical tapped flange 22, which is adapted to receive the complementary threaded cap base 23.

The top surface of the base 23 is provided with an enlargement 24 carrying a fulcrum pin 25 on which are mounted for pivotal movement, the depending opposed apertured ears 26 of the cap 27.

The cap base 23 has a central opening 28 in which is positioned the tube 29. The tube 29 has a closed top end 30, and open bottom end 31.

At the upper end of the tube 29, a substantial flat spring 32 is received in the milled slots 33 in the tube. The spring 32, at one end, is received in the keeper tongue 34 formed on the under surface of the cap 27. At the opposite end, the spring has sliding engagement with the inclined surface 35 on the upper surface of the cap base 23, and arched at 36, the spring bears against the inner surface of the cap 27.

The spring 32 retains the tube in engagement with the cap 27, so that when the cap is pivoted on the pin 25, the tube will travel downwardly in a vertical stroke. By pressing on the cap 27 where the indicia 37 is located thereon, the cap can be moved downward by engagement of the flanged edge 38 of the cap into the depression 39 in the upper surface of the cap base 23.

Before pressure on the cap 27, the dispensing outlet 40 in the cap base 23 will, at its inner end, be in communication with the slot or port 41 in the upper end of the tube within the cap base 23. The outer or dispensing end of the outlet 40 is closed by the closure tongue 42 on the top 27.

The circumferential wall of the tube 29 is threaded as at 43 and this tube passes through the split disc 44, the peripheral edge of which is grooved at 45 to receive the split spring ring 46.

The disc 44 is positioned within the central depression 47 in the piston 48 which is of a size to conform to the size of the hollow container 21, and is slidably mounted in the depression 47 by fasteners 49 passing through the enlarged slots 49' in the piston 48.

A disc shaped plate 50 covers the disc 44, and closes the depression 47 in the piston and is fixed to the piston by fasteners 51. A packing ring 52 is positioned in the groove 53 in the periphery of the piston 48 and serves to seal the piston in its engagement with the inner-surface of the wall of the container 21.

The lower end of the tube 29 is milled at several places to provide inlet passages 53 and a

split ring 54 on the extreme lower edge of the tube provides a stop for the piston 48.

The mechanical principle used in the operation of the dispensing container involves the principle of applying pressure to the piston or diaphragm 48 against the contents of the container 21 to force the contents through the inlet passages 53, out of the slot 41 in the tube into and out of the outlet passage 40 in the base cap 23. The only rotation involved in the operation of this device is the rotation that is necessary to move the piston or diaphragm 48 upwardly on the tube 29 to permit the container to be refilled. This rotation is accomplished by the load resisting threads 43 on the tube 29. This thread is of a ratchet load resisting type, designed to resist heavy axial loads in one direction only. Thus as the tube is forced downwardly by pressure on the cap 27 against the split floating disc 44, the piston or diaphragm compresses the contents inside the container, forcing the contents upwardly through the tube and, as the pressure on the cap is released, the tube returns to the original position through the action of the spring 32. The split disc 44 will back on the tube 29 to engage the next threads for subsequent downward strokes as desired.

The amount of the contents dispensed is determined by the pressure on the cap 27 and the number of downward strokes of the tube caused by subsequent pressure on the cap 27.

The disc 44, in its engagement with the threads 43, on the tube 29, will have complementary threads 55 thereon to match the threads 43, so that positive action will be obtained through the engagement of the threads 43 and 55 at the proper time, to effect the above described operation.

The downward travel distance of the cap and tube is determined through the lever action of the fulcrum pin 25, so that the downward travel of the tube 29 is slightly greater than the pitch of the resistance thread 43 on the tube 29.

The tube 29 extends close enough to the bottom of the container 21 so that, at the end of its downward stroke, it will just reach the bottom of the container. The passages 53 thus allow the contents of the container to enter the tube through its full length of downward travel.

The ring 54 prevents the piston or diaphragm from leaving the end of the tube after the contents have been completely dispensed.

After each downward stroke of the piston, the compression on the contents is relieved so that there is no afterflow from the passage 40. No wiping is required, and the closure 42 will seal this passage to prevent deterioration of the contents of the container 21.

In Figures 5 to 7, inclusive, and Figure 11, there is shown a modified form of the invention which comprises the hollow container 60 having cap 61 removably connected thereto through the engagement of the pin 62 with the slot 63, there being a similar pin and slot on the opposite sides of these members to provide secure fastening of the cap to the container.

The cap 61 is provided centrally thereof with a depression 64 in which is mounted the depression member 64', having a depression finger 65 at one end, and a closure lip 66 at the opposite end.

The depression member 64' is provided with depending opposed ears 67 which receive the fulcrum pin 68 which extends through the depression 64 transversely thereof.

The pin 68 has the arched portion 69 of the spring 70 passing thereover, and end 71 of the spring 70 bears against the inner surface of the member 64', while the end 72 of the spring 70 bears against the upper surface of the cap 61.

The cap 61, centrally thereof, is provided with an apertured boss 73 in which is slidably mounted the vertical portion 74 of the tube 75, the horizontal dispensing portion 76 being mounted in the depression 64 with the open end closed by the lip 66.

The tube 75, on the portion 76, is provided with a thread 77, similar to thread 43 on the tube 29. A flat disc 78 engages this thread, and is provided with complementary threads 79 at their points of engagement. The disc is slidably mounted on the upper surface of a piston or diaphragm 80 by means of fasteners 81 passing through enlarged slots 82 in the piston or diaphragm 80. A shield 83 having a central opening 84, is sleeved on the tube 75, and placed over the disc 78, retains the disc in position. The shield is retained on the diaphragm 80 by fasteners 85. The disc is held together by the split spring ring 86 lying in the groove 87 in the periphery of the disc sections, so that the action of this form of the invention is similar to that previously described. When member 64' is depressed by the finger 65, it will move downward on the pin 68, causing the tube to move downward to complete the operation, as previously described.

By spreading the pins 81 within the slots 82, the disc 78 may be expanded so that it can be slid upwardly on the tube without the necessity of screwing it up, as previously described.

In Figure 8, the diaphragm 90 is provided with a tapered depression 91, in which is mounted a split tapered collet 92. The collet can float in the depression and, sleeved on the smooth tube 93, will grip in its lowest position and release in its highest position. A disc-shaped plate 94 secured to the diaphragm 90, over the depression 91 by fasteners 95 retaining the collet in the depression.

In Figure 9, the diaphragm 100 is provided with a tapered depression 101, in which are loosely mounted the balls 102. The balls will engage the grooves 103 in the tube 104 to fix the tube to the diaphragm 100 at their lowest point, and release the tube at their highest point.

In Figure 10, the diaphragm 110 is provided with a depression 111, in which a spring 112 is mounted, the ends being received in the slots 113 at the bottom of the depression 111. The tube 114 passing through the central opening 115 in the spring will be gripped on the downward movement, and freed on its upward movement. A disc-shaped plate 116 covers the depression 111, and is secured to the diaphragm 110 by fasteners 117.

In each of the forms previously described, the diaphragm can be slipped back to the full container position by inverting the container, and causing the collet, balls or spring to disengage the tube. These devices can work on straight serrated ratchet screw threads, ball grooves, or other grip or friction principles.

The principle of the invention has been fully described and several forms have been described and illustrated that will accomplish this principle.

It is believed that the invention, including the various forms, will be apparent to those skilled in the art, and it is to be understood that changes may be made in the details of construc-

tion, combination and arrangement of parts, without departing from the spirit of the invention and the scope of the appended claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In a dispensing container, the combination which comprises a substantially hollow body having a cylindrical cavity therein, a head having a centrally disposed bore removably mounted on said body, said head having a laterally disposed outlet passage communicating with the bore and extended to the peripheral surface thereof, a tube slidably mounted in the bore of the head having an outlet opening therein positioned to register with the said outlet passage of the head, and having a threaded outer surface, the lower end of said tube opening into the interior of said container, a cap hinged to the upper surface of the head and positioned to engage the end of the tube, said cap having an extension providing a closure for the outer end of the outlet passage of the head, a piston threaded on the tube and positioned in the cavity of the body whereby downward movement of the cap actuates the tube to force the piston downwardly, and means in the piston for coacting with the threads of the tube whereby downward movement of the tube moves the piston downwardly and the piston remains stationary with upward movement of the tube.

2. In a dispensing container, the combination of which comprises a substantially hollow body having a cylindrical cavity therein, a head having a centrally disposed bore removably mounted on said body, said head having a laterally disposed outlet passage communicating with the bore and extended to the peripheral surface thereof, a tube slidably mounted in the bore of the head having an outlet opening therein positioned to register with the said outlet passage of the head, and having ratchet-like threads on the outer surface, the lower end of said tube opening into the interior of said container, a cap hinged to the upper surface of the head and positioned to engage the end of the tube, said cap having an extension providing a closure for the outer end of the outlet passage of the head,

a piston threaded on the tube and positioned in the cavity of the body, an internally threaded split disc in the piston positioned to engage the threads of the tube whereby downward movement of the cap actuates the tube to force the piston downwardly and whereby the piston remains stationary with upward movement of the tube, and means resiliently returning the tube and cap to the inoperative position.

3. In a dispensing container, the combination which comprises a substantially hollow body having a cylindrical cavity therein, a head having a centrally disposed bore removably mounted on said body, said head having a laterally disposed outlet passage communicating with the bore and extended to the peripheral surface thereof, a tube slidably mounted in the bore of the head having an outlet opening therein positioned to register with the said outlet passage of the head, and having a threaded outer surface, the lower end of said tube opening into the interior of said container, a cap hinged to the upper surface of the head and positioned to engage the end of the tube, said cap having an extension providing a closure for the outer end of the outlet passage of the head, a piston threaded on the tube and positioned in the cavity of the body, an internally threaded split disc in the piston positioned to engage the threads of the tube whereby the downward movement of the cap actuates the tube to force the piston downwardly, and means resiliently returning the tube and cap to the inoperative position, the threads of said tube having inclined upper surfaces whereby the piston is carried downwardly with downward movement of the tube and is released from the tube with upward movement of the tube.

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