July 8, 1952 O. G. GOODSON 2,602,572

HAND-OPERATED DISPENSER FOR VISCOUS FLUIDS

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Fig. 2.

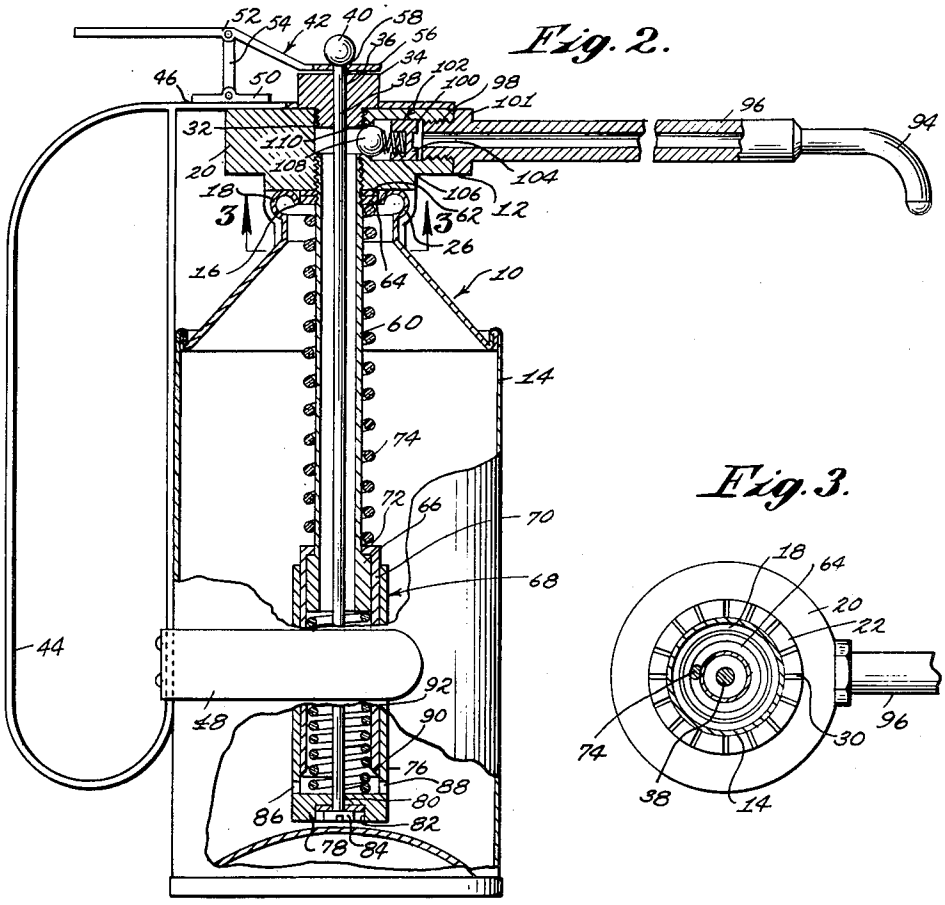
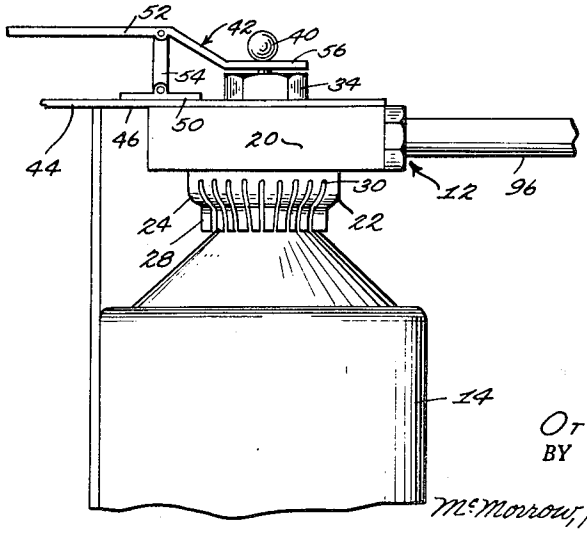


Fig. 3.

Fig. 1.



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HAND-OPERATED DISPENSER FOR VISCOUS FLUIDS

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2 Claims. (Cl. 222—340)

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This invention appertains to a hand operated fluid dispenser and is particularly adaptable for use in dispensing fluids having a high viscosity.

One of the primary objects of this invention is to provide a small and compact dispensing mechanism, which is operatively associatable with a conventional crown type can, means being, therefore, especially provided for mounting the dispensing mechanism in the can.

Another object of this invention is to provide a pumping mechanism, operatively disposed in the can and to provide an operating means, disposed exteriorly of and mounted on the can, the operating means being reactive to a slight manual pressure for effecting a pumping stroke of the pumping mechanism, whereby a predetermined amount of fluid is ejected from the can.

These and ancillary objects and structural features of merit are attained by this invention, as set forth in the following description and illustrated in the accompanying drawing, wherein:

Figure 1 is an enlarged side elevational view of the dispensing mechanism, illustrated in operative attachment to a conventional crown type can;

Figure 2 is a vertical sectional view of the can and illustrating in section the pumping means and operating means therefor, as well as the discharging means; and

Figure 3 is a transverse sectional view taken on line 3—3 of Figure 2.

Referring now more particularly to the accompanying drawing, the hand operated dispenser 10 includes a dispensing mechanism 12, which is operatively associated with a container 14. The container 14 is a conventional crown type can, formed with a mouth 16, having an outer bead 18.

The dispensing mechanism 12 includes a head 20, which is mounted transversely on the mouth 16 of the can and is provided with an elastically expandable gripping member 22. The gripping member includes a depending annular skirt 24 having an inner mouth 26 and a terminating flange 28. Circumferentially spaced vertical slots 30 are formed in the skirt permitting expansion of the flange and skirt over the bead 26, upon mounting the head 20 on the can. The flange 28 is adapted to grip onto the bead 26 in an even pressure contact therewith, the mouth 26 of the skirt encompassing the bead and locating the head 20 in a transverse position on the mouth.

A vertical passage 32 is formed in the head and aligned with the center of the mouth of the can, the upper end of the passage being threaded for the reception of the axially reduced end of a cap

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or plug 34. A vertical bore 36 is formed in the plug to accommodate an operating rod 38, having an enlarged outer end 40. A manually actuable operating means 42 is provided and operatively connected to the rod 38 for raising the rod in the passage and bore.

A substantially elliptical shaped handle 44 is provided and is formed with a lateral mounting flange 46 at one end, the mounting flange being affixed to and projecting laterally from the top surface of the head. The handle 44 is spaced outwardly from and disposed at right angles to the head, in order that the handle may be located in engagement of the side wall of the can and, in furtherance of this, a U-shaped resilient clip 48 is carried by the handle, adjacent the opposing end thereof. The clip 48 encompasses a portion of the side of the can below the mouth and assists in the mounting of the head 20 on the mouth.

The lifting means 42 includes a mounting plate 50, which is affixed to the flange 46 and is formed with upstanding ears. A lifter 52 is pivotally supported by the plate 50, the lifter being attached to the plate by a link 54, one of the terminals of the link being pivoted to the upstanding ears of the plate and the opposing terminal being pivoted to the lifter 52. A contact end 56 of the lifter is offset therefrom and is formed with an opening 58 for the reception of the rod 38, the contact end 56 being engageable with the underside of the enlarged or ball end 40 of the rod for effecting, upon the application of manual pressure to the outer end of the lifter, an upward movement of the rod 38.

The lower end of the passage 32 is threaded for the reception of the upper threaded end of a tubular conduit 60, the conduit depending therefrom into the container. A gasket 62 is circumposed on the upper end of the tube and held in a fixed position by a locking nut 64 engaged on the upper threaded terminal of the tube, the gasket being positioned in the mouth of the container and constituting a closure, with the undersurface of the head resting on the outer edge of the mouth above the bead, as seen in Figure 2.

An outwardly projecting lateral shoulder 66 is formed on the lower end of the tube and a pair of telescopically arranged pumping members 68 are carried by the tube and suspended in a rested position on the shoulder 66.

The pumping members 68 include a sleeve 70, having a lateral inwardly directed flange 72 formed on its upper end and engageable on the shoulder 66, the flange 72 constituting a stop

for limiting the downward movement of the sleeve on the tube. A spring 74 is concentrically coiled on the tube 60, the spring bearing at one end against the locking nut 64 and, at its opposing end on the flange 72. A cylinder 76 slidably encompasses the sleeve 70, the cylinder being provided with an upper open end and a closed lower end 78. The lower end 78 is formed with a vertical bore 80 for reception of the lower terminal of rod 38, the bore 80 having a counterbore 82, within which a locking nut 84 is seated.

Laterally arranged ports 86 and 88 are formed in the side wall of the cylinder, adjacent the end wall 78, and communicate the cylinder with the container, when the cylinder and sleeve are in their rested position, as seen in Figure 2. It will be noted that the lower edge 90 of the sleeve 70 is bevelled and constitutes a valve for closing the ports 86 and 88, upon upward movement of the cylinder 76, as will be described. A spring 92 is housed within the sleeve 70, the spring bearing at one end on the lower edge of the tube 60 and engaging the inner surface of the end wall 78 of the cylinder to resist the movement of the cylinder upwardly on the tube, in cooperation with the spring 74.

A flexible spout 94 is mounted on the head 20, the spout being provided with a connecting tube 96 having its threaded end 98 threadingly engaged in the outer threaded end of a passage 100 transversely formed in the head and communicated with the passage 32. An annular stop 101 is formed on the tube 96 to limit the insertion of the anchoring threaded end in the passage.

A check valve assembly 102 is provided and is operatively interposed between the tube 96 and the passage 32, the check valve assembly 102 including a spring retainer 104 transversely disposed in the passage 100 and spaced inwardly of the outer threaded end of the passage. A spring 106 is seated in the retainer and supports a ball 108, normally seated in the valve seat 110 formed at the inner end of the passage 100.

Prior to the use of the dispenser, the cylinder and sleeve will be in their relative positions, as seen in Figure 2, the ports 86 and 88 of the cylinder establishing communication between the cylinder tube and the container, so that a predetermined amount of fluid is housed within the cylinder and tube. Accidental ejection of the fluid from the cylinder and tube is prevented by the check valve assembly 102. The dispenser is held in one hand, by means of the handle 44 and pressure is applied to the lifter 52 by means of a thumb placed on the outer end thereof. Downward pressure imposed on the end of the lifter causes the contact end 56 to rise and moves the rod 38 upwardly in the passage and bore. Upward movement of the rod 38 will result in an upward or power stroke of the cylinder 76 and sleeve 70. Initially, the cylinder will be moved by the rod to a position, where the lower edge of the sleeve will close off the communicating ports 86 and 88. Thus, initial actuation of the rod 38, under the pressure imposed by the lifter, will result in a movement of the cylinder 76. The sleeve 70 will remain stationary, until the cylinder is moved to a point, where the lower edge 90 of the sleeve bears on the end wall 78 of the cylinder. At that time, further actuation of the rod 38 will effect a common upward movement of the sleeve and cylinder and a discharge stroke of the cylinder. The fluid in the cylinder and tube, under the urging of the end wall 78, acting as a piston, will be forced into the passage 32 and open the check valve, the fluid passing through the tube 96 and the flexible spout 94. Upon the exhaustion of the fluid, the check valve will automatically reseat itself and, the springs 74 and 92 will automatically effect a vacuum stroke of the cylinder. As the telescopically arranged cylinder and sleeve return to their rested position, after completion of the power stroke and automatic reseating of the ball 108, vacuum will form in the passage 32 in the tube, so that as the cylinder moves downwardly away from the sleeve, the sleeve being held by the flange 72 bearing on the shoulder 66, the ports 86 and 88 will again establish communication between the cylinder and container and, due to the vacuum therein, the cylinder and tube will immediately be filled with the fluid.

While the dispenser is particularly and especially designed for dispensing fluids having a high viscosity, obviously, any type of fluids may be dispensed and, also, the dispenser may be used with any type of container, it not necessarily being restricted for operative association with a crown type can.

Having thus described this invention, what is claimed is:

1. In a hand operated fluid dispenser, a container having an open mouth formed with an outer bead, a head member mounted transversely on the mouth, means formed on said member for releasably gripping the bead, said head member being formed with a vertical passage aligned with the mouth, an actuating rod slidably disposed through the passage and depending into the container, a tubular member affixed at its upper end in the passage and housing the rod, a cylinder having an open upper end and a closed lower end arranged within said container so that the open upper end faces said head member, said actuating rod extending through the open upper end of said cylinder and having its lower end secured to the closed lower end of said cylinder, a sleeve slidably encompassing the lower end of said tubular member and having the upper end dependingly connected to the lower end of said tubular member, said sleeve surrounding said actuating rod and extending through the open upper end of said cylinder, a spring operatively positioned between the lower end of said tubular member and the closed end of said cylinder and resisting upward movement of the cylinder on the sleeve, another spring circumposed about said tubular member and bearing against the upper end of said sleeve for resisting the upstroke of the cylinder and the sleeve and automatically stroking the sleeve and cylinder to arrested position, said cylinder having means for admitting fluid from the container into the cylinder and the tubular member, and a discharge spout connected to the head member and communicating with said passage.

2. In a hand operated fluid dispenser, a container having a mouth formed with an outer bead, a head mounted on the mouth, a gripping member on said head frictionally engageable on the bead for securing the head transversely on the mouth, said head being formed with a vertical passage aligned with the mouth, a cap closing off the upper end of the passage and having a vertical bore therein, an actuating rod slidably disposed in the bore and passage and depending into the container, a lifter mounted on the head and operatively connected to the rod, a tube secured to the head and aligned with the passage, said tube housing the rod, an exterior shoulder on the lower end of the tube, a sleeve slidably

disposed on the tube, a stop on the upper end of the sleeve engageable on the shoulder, a cylinder having an open end receiving said sleeve and having a closed end transverse to the tube, means connecting the rod to the closed end, said cylinder having lateral ports for admitting fluid from the container into the cylinder and tube, a spring operatively positioned between the lower end of the tube and the closed end of the cylinder and resisting upward movement of the cylinder on the sleeve, a spring concentrically disposed on the tube and bearing on the sleeve stop for resisting the upstroke of the cylinder and the sleeve and automatically stroking the sleeve and cylinder to a rested position, a spout carried by the head and laterally communicating with the

passage and a check valve interposed between the passage and the spout.

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