March 4, 1924. 1,485,561

C. H. JOY, JR., ET AL.

FLUID DISPENSING DEVICE

Filed Feb. 6, 1922

Fig. 3

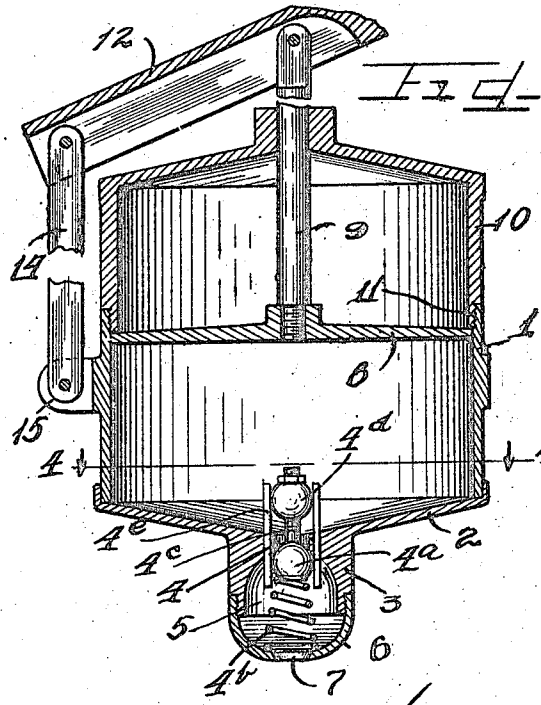


Fig. 1

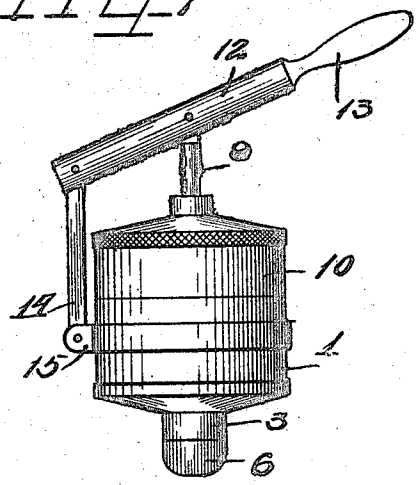


Fig. 4

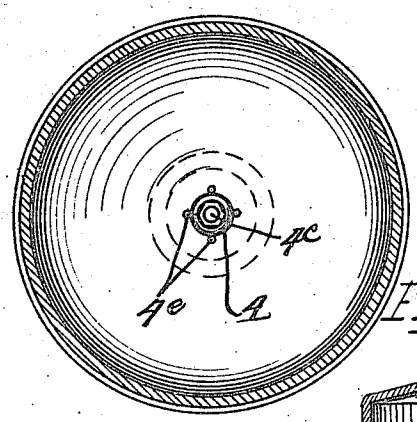


Fig. 2

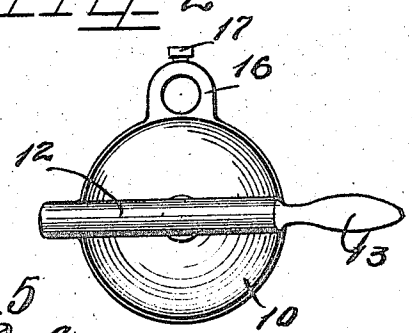
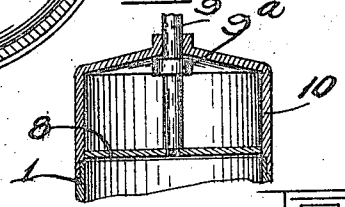


Fig. 5



Witnesses

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Louis J. Sauer.

by Charlton Wills Atty.

Patented Mar. 4, 1924. 1,485,561

UNITED STATES PATENT OFFICE.

CHARLES H. JOY, JR., AND LOUIS J. SAUER, OF CHICAGO, ILLINOIS, ASSIGNORS TO CHARLES H. JOY, OF CHICAGO, ILLINOIS.

FLUID-DISPENSING DEVICE.

Application filed February 6, 1922. Serial No. 534,336.

To all whom it may concern:

Be it known that we, CHARLES H. JOY, JR., and LOUIS J. SAUER, citizens of the United States, and residents of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in a Fluid-Dispensing Device; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the numerals of reference marked thereon, which form a part of this specification.

This invention relates to dispensing devices for fluids, such as shaving cream, soap solutions and other similar substances, and it is an object of this invention to provide a simple and easily operable device that quickly emits the contained fluid, but prevents dripping and waste thereof.

With these and other objects in view, which will become more apparent in the following description and disclosures in the drawing, this invention comprises the novel mechanism and combinations hereinafter described, and more particularly pointed out and defined in the appended claims.

In the accompanying drawings, which illustrate a preferred embodiment of this invention, and in which similar reference numerals refer to similar features in the different views:

Figure 1 is an elevational view of our dispensing device.

Figure 2 is a top plan view thereof.

Figure 3 is a central vertical section through the device with a portion of the operating handle broken away.

Figure 4 is a section on the line 4—4 of Figure 3.

Figure 5 is a fragmentary elevational view upon a reduced scale.

As shown on the drawings:

In referring now to the drawings, it will be noted that our dispensing device comprises a fluid container consisting of a hollow cylindrical body portion 1 having a concave bottom 2 secured thereto in any well-known way, said bottom being provided with a nozzle 3 having a relatively restricted outlet port 4 in which a ball valve 4^a is seated which is urged upwardly against its seat by a spring 4^b. The ball valve 4^a is mounted upon a rod 4^c which extends into the container where it has adjustably mounted thereon a ball 4^d by a threaded connection, and a check nut may be screwed upon the upper end of the rod to lock the ball 4^d in place. A plurality of spaced guide pins 4^e extend through apertures in the nozzle 3 and slidingly embrace the circumferences of the balls 4^a and 4^d and form a guideway therefor to prevent tilting of the rod 4^c and ball valve. When the piston descends sufficiently the ball 4^d will close the port 4; the length of the effective discharge stroke therefore depends upon the position of the ball 4^d on the rod, which can be adjusted to increase or decrease the amount of discharged fluid, as is obvious. This construction therefore provides means for varying the amount of discharged fluid, and acts as a limit for the amount discharged. The port 4 merges into an enlarged cup-shaped recess 5, the end of the spout or nozzle 3 being formed by a partispherical and hollow cap piece 6 secured upon the nozzle 3 in any approved manner as by a screw-threaded connection and provided with an inwardly beveled restricted outlet port 7. The hollow form of the cap piece 6 and the cup-shaped recess 5 provide a discharge chamber of sufficient size to allow proper lateral contraction of the fluid therein for a purpose to be later explained.

A piston 8 is supported for reciprocal movement in the body portion 1 and is provided with a rod 9 secured centrally thereof in any approved manner, as by being screw-threaded therein, the rod extending through a central aperture in the cover 10 with substantially an air-tight fit. The cover 10 may be provided with external screw threads upon its lower end which is recessed so as to bring the outer surface of the cover flush with the outer surface of the body portion, and the upper end of the body portion may be internally screw-threaded to receive the threads of the cover, whereby an annular shoulder 11 will be formed by the lower end of the cover to limit the upward movement of the piston. However, instead of a screw-threaded connection, the lower end of the cover and the upper end of the container may be reduced upon opposite sides, as shown in Figure 5, to provide a slidable telescoping connection, and the piston rod 9 may be provided with an abutment 9^a in the form of a collar engaging the top of the cover to limit the upward movement of the piston. It should be particularly noted that

the cover is sufficiently deep to provide an appropriate air chamber in which the air becomes rarefied through downward movement of the piston.

The upper end of the piston rod 9 extends sufficiently beyond the top of the cover to provide a proper operating or compression stroke. A bifurcated operating lever 12 is pivotally connected intermediate its ends to the piston rod 9. One end of the lever is provided with a handle 13 and the other end is pivoted to a link 14 which extends downward adjacent the device and is pivoted to a bracket 15.

In order that the dispensing device may be conveniently supported, some attaching means may be provided. In the present instance we have illustrated an apertured lug 16 extending from the body portion for receiving a supporting rod or the like, and a set screw 17 screwing through the wall of the lug whereby the device may be clamped to the rod.

In using the device, the shaving cream or fluid is put into the device by removing the cover and piston as is obvious. These are then replaced and the device is ready for use. When it is desired to obtain some shaving cream or fluid from the device, the handle 13 is pressed downwardly whereby the piston compresses the fluid and forces back the spring-pressed ball valve 4^a and ejects the fluid through the nozzle, at the same time substantially filling the discharge chamber. As the piston descends, the air in the air chamber above the piston becomes rarefied and creates a partial vacuum, so that when the handle is released and the compression of the piston ceases, the air will rush in through the port 7 due to the smaller pressure on the upper surface of the piston. As the air rushes in through the port 7, it will force the shaving cream or fluid back or upward and also in lateral directions creating thereby an upwardly dished or cup-shaped depression or meniscus in the cream or fluid at the port 7, which, on account of the viscosity or cohesion of the cream or fluid, will retain its shape and prevent the cream or fluid from dripping or flowing out until the piston is again operated. At the same time, the ball check valve 4^a will spring into its position and prevent the fluid in the container from gradually flowing into the discharge chamber and breaking the meniscus.

It is therefore characteristic of this invention that a partial vacuum is created in the dispensing device creating unequal pressures above and below the piston whereby the air is caused to rush in through the port 7 to equalize the pressure and create a parti-spherical or dish-shaped film or meniscus over the outlet port, and that a check valve is used to prevent the weight of the fluid from breaking the meniscus.

It therefore follows that the aforedescribed dispensing device is not likely to drip when not in use, but will always remain in a cleanly state.

We are aware that numerous details of construction may be varied through a wide range without departing from the principles of this invention, and we therefore do not purpose limiting the patent granted otherwise than necessitated by the prior art.

We claim as our invention:

1. A fluid dispensing device comprising a hollow cylindrical body portion adapted for receiving the fluid, a piston adapted for reciprocating in said body portion, a cover portion comprising a relatively deep cylindrical member removably attached to said body portion for forming a chamber above the piston and having an opening in its top for receiving the piston rod, means for limiting the movements of said piston to substantially the depth of said body portion, a nozzle at the lower end of said body portion, said nozzle having an upwardly extending parti-spherical recess for the purpose set forth.

2. In a fluid dispensing device, a container having a lower fluid holding portion and an upper air chamber, a piston reciprocable in said fluid holding portion, means for preventing the movement of said piston above said fluid portion, a nozzle projecting from the lower end of said container and having an upwardly extending concave recess communicating with said container, and a pair of connected valves for controlling the flow through said nozzle.

3. In a fluid dispensing device, a container, a piston reciprocable in said container, a nozzle projecting from the lower end of said container and having an upwardly extending concave recess communicating with the interior of said container, guide rods supported by said nozzle, a double headed valve structure guided by said rods for controlling the passage into said container, a semi-spherical cap having an outlet port attached to said nozzle, and a spring supported by said cap and bearing against said valve structure.

In testimony whereof, we have hereunto subscribed our names in the presence of two subscribing witnesses.

CHARLES H. JOY, JR.
LOUIS J. SAUER.

Witnesses:
CARLTON HILL,
JAMES M. O'BRIEN.