L. KOOPERSTEIN.

DISPENSING VALVE.

APPLICATION FILED FEB. 20, 1920.

1,416,037. Patented May 16, 1922.

Fig. 1.

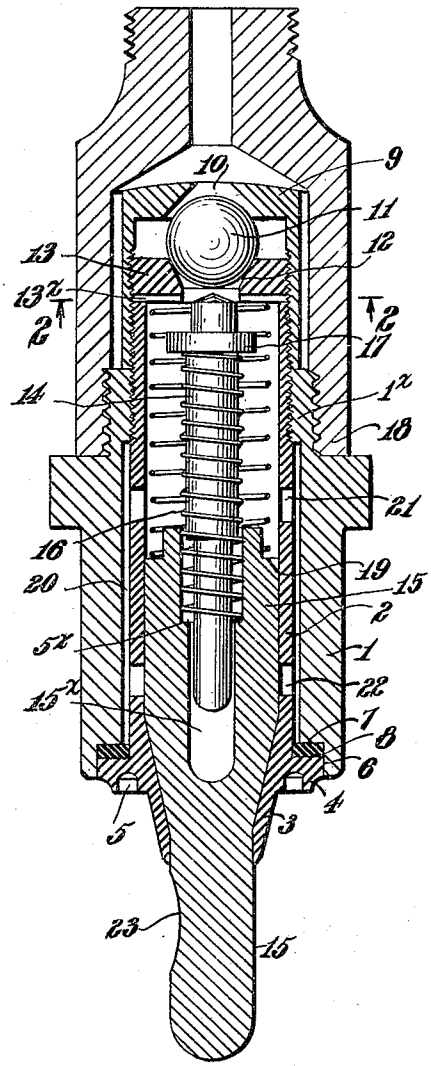
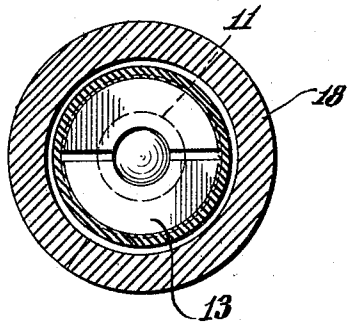


Fig. 2.



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UNITED STATES PATENT OFFICE.

LOUIS KOOPERSTEIN, OF NEW YORK, N. Y., ASSIGNOR TO WEST DISINFECTING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

DISPENSING VALVE.

1,416,037. Specification of Letters Patent. Patented May 16, 1922.

Application filed February 20, 1920. Serial No. 360,147.

To all whom it may concern:

Be it known that I, LOUIS KOOPERSTEIN, a citizen of the United States, residing at New York, county and State of New York, have invented certain new and useful Improvements in Dispensing Valves, of which the following is a full, clear, and exact description.

This invention relates more particularly to that class of valves operated by a push-rod or plunger to dispense a liquid such as soap, the liquid passing into the valve from a source of supply. The object of the present invention is to provide an effective and simple device of the type in question avoiding the use of packings or washers, other features of the invention being hereinafter referred to.

For an understanding of the invention reference may be made to the accompanying drawing, in which—

Figure 1 illustrates an embodiment of the invention in enlarged longitudinal cross section; and

Figure 2 is a transverse section on the line 2—2 of Figure 1, in the direction of the arrow.

The embodiment of the invention illustrated in the drawing comprises a casing 1 formed at its upper end with an inwardly projecting annular flange 1^{x}, which is threaded to receive the threaded upper end of a sleeve member 2, the latter being formed at its lower end with a conical extension 3 and an annular flange 4, the flange being provided with seats 5 for the reception of a tool adapted to rotate the sleeve within the casing during the assembling of the parts. The flange 4 fits within an annular recess 6 formed in the lower end of the casing to provide a shoulder 7, a packing 8 being disposed intermediate the said shoulder and the flange 4. Threaded upon the upper end of sleeve 2 is a cap 9 provided with a conical aperture 10 through which fluid may pass into the sleeve, when this is permitted by the position of a ball 11 normally resting against the conical upper walls of an aperture 12, formed in a disk 13 threaded within the cap. It will be seen that fluid may pass into the sleeve only when the ball is in a position intermediate the valve seats afforded by the conical apertures 10 and 12.

The immediate actuating member for ball 11 is a rod 14, the rod in turn being operated by means of a plunger 15 disposed within the sleeve, and in its lowermost position shaped to closely fit the interior walls including the conical and discharge extension 3 of the sleeve. The plunger is provided with the axial aperture 15^{x} for the reception of the lower end of rod 14 and the rod is supported by the plunger through the instrumentality of a helical spring 16, the lower end of the spring resting against a shoulder 5^{x} and at its upper end contacting with a collar 17 projecting laterally from the rod.

The plunger is normally maintained in its lowermost position as illustrated in Figure 1 by means of a helical spring 18, the spring at one end acting against a shoulder 19 formed on the plunger, and its opposite end contacting with the lower face of disk 13.

By means of the annular flange 1 of the casing, sleeve 2 is held in such position as to provide a chamber 20 intermediate its outer wall and the inner wall of the casing. This chamber communicates with the interior of the sleeve through an inlet duct 21 and an outlet duct 22.

In the operation of the device upward movement of the plunger 5 will, through spring 16, carry the upper end of rod 14 into contact with ball 11, the latter being unseated from disk 13 and thence being moved against the conical aperture 10 in the cap so as to again close the sleeve against the admission of fluid. It will be noted that as the ball reaches a position intermediate the apertures 10 and 12 fluid may flow into the sleeve. Although the rod now remains stationary, the plunger may have a continued movement because of the provision of a clearance intermediate its lower end to the base of socket 15^{x}; and in its continued movement the conical or reduced portion of the plunger passes above outlet port 22 and fluid contained within chamber 20 may pass intermediate the sleeve and the plunger, the latter being cut away at 23 for this purpose. At the instant outlet duct 22 is opened the plunger moves in position to close inlet port 21. If desired, however, inlet port 21 may be disposed above the range of movement of the plunger and hence liquid may flow into chamber 20 during the discharge through port 22. Upon the release of the plunger valve rod 14 moves downwardly and ball 14 in its movement toward seat 12 again reaches

an intermediate position permitting the flow of liquid from the source of supply into the sleeve to replenish that discharge through port 22, and in the continued movement of the plunger inlet duct 21 is opened and outlet duct 22 is closed.

It will be noted that inasmuch as disk 13 is threaded within cap 14, the length of movement of ball 11 to and from its intermediate position, may be adjusted. For the convenient manipulation of disk 13 it is formed with a transverse slot 13^{x} to receive a screw driver or other tool.

Having described my improvements, what I claim is:

1. In a dispensing valve, in combination, a casing, a sleeve disposed within said casing to form a chamber intermediate its outer wall and the casing, inlet and outlet ducts for said chamber and communicating with the interior of the sleeve, a valve controlling the admission of fluid into the sleeve, a plunger normally closing the said outlet duct, the said plunger being adapted in its endwise movement to operate said valve and to successively close the inlet duct and open the outlet duct for the passage of fluid from the chamber, thence intermediate the sleeve and the plunger to a point exterior to the casing.

2. In a dispensing valve, in combination, a casing, a sleeve disposed in said casing to form a chamber intermediate its outer wall and the casing, inlet and outlet ducts for the chamber and communicating with the interior of the sleeve, a valve normally closing the sleeve against the admission of fluid, a plunger movable within the sleeve and formed with a passageway for fluid, a valve operating rod, a spring flexibly connecting the rod and plunger, a second spring normally maintaining the plunger in position to close the outlet duct, whereby an endwise operative movement of the plunger will successively close the valve, close the inlet duct and bring the outlet duct into communication with said passageway.

3. In a dispensing valve, a casing adapted to contain liquid formed with an outlet port, a plunger movable to open and close the outlet port, an inlet valve for the casing comprising a cap formed with a central aperture and a threaded interior wall, a ball adapted to be moved in position to close the aperture and a disk threaded for adjustment within the cap, the said disk being formed with an aperture affording a seat for the ball, and means carried by the plunger for unseating the ball.

4. In a dispensing valve, in combination, a casing, a sleeve disposed within the casing to provide a chamber intermediate its outer wall and the wall of the casing, inlet and outlet ducts for said chamber and communicating with the interior of the sleeve, a plunger disposed within the sleeve, a double-acting valve controlling the admission of fluid to the sleeve, a valve-operating rod, a spring yieldingly connecting the rod and plunger, a second spring acting to normally maintain the plunger in position to close said outlet duct, an operative movement of the plunger actuating the rod to successively close said valve and open the outlet port, a return movement of the plunger actuating the valve to successively permit and shut off flow of fluid into the casing and the plunger in its continued movement closing the outlet port.

Signed at New York city, in the county of New York and State of New York, this 19th day of February, A. D. 1920.

LOUIS KOOPERSTEIN.