May 21, 1929. O. U. ZERK 1,714,254

LUBRICANT DISPENSING DEVICE

Filed Dec. 29, 1924

Fig. 1.

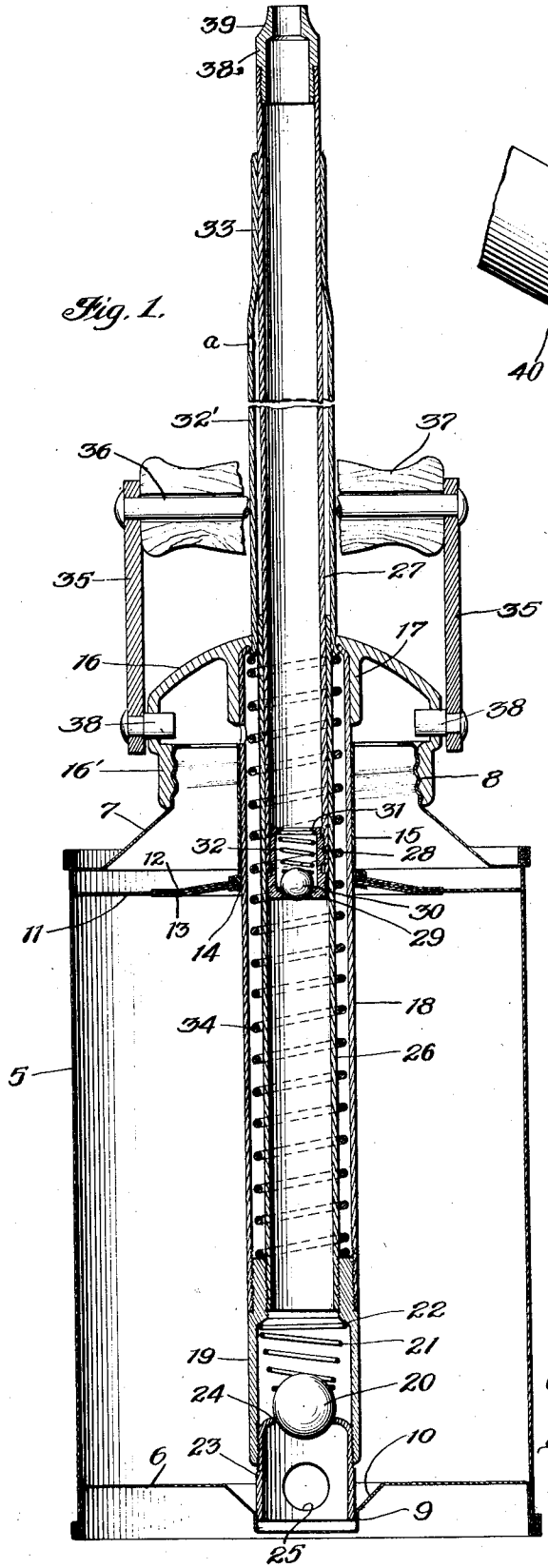
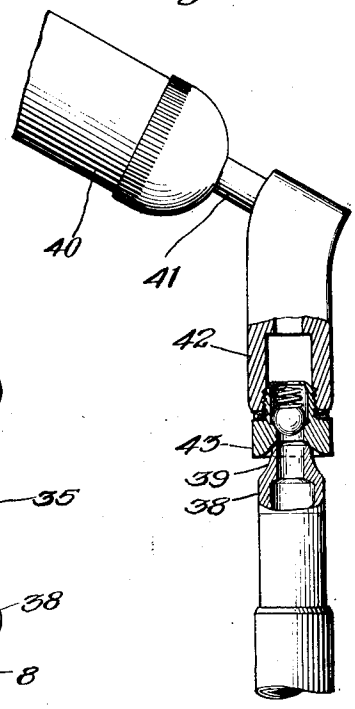


Fig. 2.



Inventor
Oscar U. Zerk.
By Earl A. Pierce.
Atty.

Patented May 21, 1929. 1,714,254

UNITED STATES PATENT OFFICE.

OSCAR U. ZERK, OF NEWARK, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO ALEMITE MANUFACTURING CORPORATION, OF CHICAGO, ILLINOIS, A CORPORATION OF DELAWARE.

LUBRICANT-DISPENSING DEVICE.

Application filed December 29, 1924. Serial No. 758,607.

My invention relates to improvements in lubricant dispensing devices and is particularly concerned with the provision of novel means for enabling an operator easily to fill a grease gun or other similar lubricant dispensing device.

The objects of my present invention are:

First, to provide means whereby an operator can easily and quickly fill a lubricant gun or compressor;

Second, to provide means, such as described, that will prevent, to a very considerable extent, the entrapping of air with the lubricant supplied to the grease gun or compressor;

Third, to provide means of the character described that can be easily and quickly attached to a can or other container holding a considerable quantity of lubricant of such construction as to enable practically all of the lubricant to be withdrawn from such can or container; and

Fourth, to provide a lubricant dispensing device, such as described, that is simple in construction, economical to manufacture and easy to operate.

Other objects of my invention will appear as this description progresses, reference being had to the accompanying drawings in which

Figure 1 is a central, longitudinal section through a dispensing device embodying my invention; and

Figure 2 is a view, partially in elevation and partially in section, disclosing one method of using my dispensing device for filling the barrel of a lubricant compressor.

My invention contemplates the provision of a suitable receptacle 5, having the bottom 6 and the top 7, in which the lubricant is sold. The top 7 of this receptacle, or container, is preferably threaded at 8 to receive a cap, not shown, but which is in place when the lubricant is being transported. The bottom 6 of the container is provided with a central depression or sump 9 that tapers outwardly, as shown at 10, for a purpose about to be described.

In carrying out my invention, the receptacle 5 is to be filled with lubricant before the top 7 is applied and after the receptacle is substantially filled with lubricant a follower, comprising the disc 11, of paper or thin cardboard, and the two annular reinforcing discs 12 and 13, is placed in the top of the can. The discs 11, 12 and 13 are held together by crimping around their inner edges, as shown at 14, the lower end of the sleeve 15. The cap or cover is then applied to the threaded portion 8 of the receptacle and the latter is ready for shipment.

The means for displacing the lubricant from the receptacle 5 and forcing it into a compressor, grease gun or other dispensing device comprises the cap 16, the flange 16′ of which is internally threaded so as to enable it to be screwed upon the threaded portion 8 of the receptacle 5. An annular boss 17 projects inwardly from the cap 16 and a tube 18 has its upper end driven into this boss so as to be tightly retained therein. The lower end of the tube is internally threaded and receives the externally threaded upper end of the tubular member 19 that acts as a valve chamber for the check valve 20 and the spring 21. One end of the spring 21 bears against the valve 20 and the opposite end abuts the shoulder 22 formed in the tubular member 19.

A thimble 23, threaded into the lower end of the tubular member 19, has an inturned flange 24 that acts as a seat for the check valve 20. The thimble 23 is provided with one or more inlet openings 25 that communicate with the receptacle 5.

A cylinder 26 has its lower end threaded into the upper end of the tubular member 19 and extends through a central opening in the cap 16. A hollow plunger 27 is slidably mounted in the cylinder 26 and its upper end extends outwardly past the upper end of the cylinder 26, as shown in Figure 1. A tubular valve cage 28 is threaded into the inner end of the hollow plunger 27 and has its inner end flanged inwardly, as shown at 29, to provide a valve seat for the valve 30. The opposite end of the valve cage is flanged inwardly, as shown at 31, to provide an abutment for one end of the spring 32. The opposite end of this spring rests against the

valve 30 and tends to hold it in its closed position.

A tubular guide member 32′ surrounds the intermediate portion of the plunger 27 in spaced relation thereto, but has its outer end swedged into contact with the outer end of the tubular plunger 27, as shown at 33, so that the guide member 32′ will reciprocate with the plunger 27. The vent *a* permits the escape of air from the space between the tubular plunger 27 and the tubular guide member 32′.

A helical compression spring 34 is confined between the cylinder 26 and the tube 18. The lower end of this spring rests upon the upper end of the tubular member 19, while the upper end of the spring engages the inner or lower end of the guide member 32′ and tends to hold the latter and, therefore, the plunger 27 in their outermost positions.

I prefer to provide the cap 16 with a handle, comprising the links 35, the cross rod 36, the tubular grip 37 and the stud pintles 38 that are pivotally mounted in the cap 16.

In the use of my improved lubricant dispensing device, the operator first removes the cap from the portion 8 of the receptacle or container 5 and then inserts the thimble 23 in the sleeve 15 and pushes the entire apparatus downwardly until the flange 16′ of the cap is brought into engagement with the threaded portion of the top 7. Then, by rotating the cap, the operator secures the dispensing apparatus in operative relation to the receptacle 5. In this position the lower end of the thimble 23 is received by the depression 9 in the bottom 6 of the receptacle. The beveled portion 10 of this depression assists in centering the dispensing apparatus relatively to the receptacle 5.

The upper or outer end of the hollow plunger 27 is provided with a discharge nozzle 38 that may, if desired, be tapered, as shown at 39, for making sealed contact with the dispensing device that is to be filled. In Figure 2 I have illustrated, by way of example, a compressor comprising the barrel 40, the hollow piston rod 41 and the hollow handle 42 communicating therewith. To fill such a compressor or grease gun, the filling opening 43 in the handle is placed over the tapered end of the nozzle 38 and the operator thereupon pushes downwardly upon the handle of the compressor so as to move the hollow plunger 27 into the cylinder 26 against the tension of the spring 34. When the plunger has been pushed completely in, the operator releases the pressure thereon, thereby permitting the spring 34 to return the plunger to the position shown in Figure 1, and then again pushes the plunger inwardly. By repeating this operation the necessary number of times, the compressor barrel 40 can be completely filled with lubricant.

When the plunger 27 is moved inwardly, any air or grease contained in the cylinder 26 will be displaced past the check valve 30, and when the plunger moves outwardly under the tension of the spring 34, a vacuum will be produced in that portion of the cylinder 26 lying inwardly beyond the valve 30. Atmospheric pressure exerted upon the upper surface of the piston comprising the disc 11 will move the latter downwardly, thereby displacing lubricant from the receptacle 5 and forcing it through the opening or port 25 and past the valve 20 into the cylinder 26.

Upon the next inward movement of the plunger 27, the valve 20 will close under the tension of the spring 21, thereby trapping the lubricant in the cylinder 26. Under continued inward movement of the plunger 27, this lubricant is forced past the valve 30 into and through the hollow plunger 27. By repeating the reciprocation of the plunger 27 any desired quantity of lubricant can be displaced from the receptacle 5 and forced into a suitable receptacle or dispensing device. When all of the lubricant has been removed from the receptacle 5 the dispensing apparatus can be removed therefrom and placed in another receptacle that is filled with grease.

I have already referred to the fact that the disc 11 is made of paper or relatively thin cardboard. The object of this is to provide a follower that will readily pass over any inwardly extending projections in the wall of the container 5 caused by dents or other inequalities in the inner surface of the container. It will be readily apparent that if this disc is formed of paper, or other suitable or flexible material, it will flex and pass over any such inwardly extending projection or inequality.

From the above description it will be seen that I have provided simple means for removing lubricant from a receptacle and forcing it into another receptacle or dispensing device.

It should be noted that while I have described the details of construction of the preferred embodiment of my invention, my invention is not limited to these details, but is capable of other adaptations and modifications within the scope of the appended claims.

Having thus described my invention, what I claim is:

1. A lubricant dispensing apparatus comprising a receptacle for holding a supply of lubricant, a cylinder in said receptacle having an inlet port adjacent the bottom of said receptacle, an inwardly opening check valve for controlling the passage of lubricant

through said port, a hollow plunger reciprocable in said cylinder, and having one end extending outwardly beyond the top of said receptacle, a tube surrounding said plunger in spaced relation thereto, a spring between said tube and said plunger and operatively connected to the latter for moving said plunger outwardly, and a piston slidably mounted in said receptacle, said piston having an opening for receiving said tube.

2. A lubricant dispensing apparatus comprising a receptacle for holding a supply of lubricant, a cylinder in said receptacle having an inlet port adjacent the bottom of said receptacle, an inwardly opening check valve for controlling the passage of lubricant through said port, a hollow plunger reciprocable in said cylinder, a tube surrounding said plunger in spaced relation thereto, a spring between said tube and said plunger and operatively connected to the latter for moving said plunger outwardly, and a piston slidably mounted in said receptacle.

3. A lubricant dispensing apparatus comprising a receptacle for holding a supply of lubricant, a cylinder in said receptacle having an inlet port, an inwardly opening check valve for controlling the passage of lubricant through said port, a hollow plunger reciprocable in said cylinder, a tube surrounding said plunger in spaced relation thereto, a spring between said tube and said plunger and operatively connected to the latter for moving said plunger outwardly, and a piston slidably mounted in said receptacle.

4. Means for filling a lubricating device, comprising a receptacle, a cylinder communicating with said receptacle, means closing communication between said receptacle and said cylinder, a hollow plunger having its inner end reciprocable in said cylinder and its outer end projecting out of said receptacle, an outwardly opening check valve in said plunger, a compression spring operatively connected to said plunger for urging said plunger outwardly, a tube in said receptacle housing said spring and a piston slidably mounted on said tube.

5. A lubricant dispensing apparatus comprising a receptacle, a cylinder communicating with said receptacle, a hollow plunger reciprocable in said cylinder for displacing lubricant from said cylinder through said plunger, and a light, flexible piston surrounding said cylinder and slidable relatively to said cylinder and said receptacle.

6. A lubricant dispensing apparatus comprising a receptacle, a cylinder in said receptacle having an inlet port near one end of said receptacle, an annular suction-actuated piston of light, flexible material in said receptacle concentric with and slidable outside said cylinder, and lubricant ejecting means inside said cylinder.

7. A lubricant dispensing apparatus comprising a receptacle, a stationary cylinder in said receptacle, ejecting means in said cylinder, and an annular suction-actuated piston of flexible material throughout in said receptacle concentric with and slidable outside said cylinder.

8. A lubricant compressor comprising an outer tube, a cylinder inside said tube and spaced from the walls thereof, a plunger telescopically mounted in said cylinder, an intermediate tube axially slidable between said cylinder and said outer tube, a connection between said plunger and said intermediate tube, a spring housed between said cylinder and said outer tube and abutting the end of said intermediate tube, and cooperating projections on said outer and intermediate tubes for limiting the expansion of said spring.

9. A lubricant compressor comprising an outer tube, a cylinder inside said tube and spaced from the walls thereof, said cylinder communicating with the interior of said tube, a plunger telescopically mounted in said cylinder, an intermediate tube axially slidable between said cylinder and said outer tube, a connection between said plunger and said intermediate tube, a spring housed between said cylinder and said outer tube and abutting the end of said intermediate tube, and a closure valve for closing one end of said cylinder.

10. A lubricant dispensing apparatus comprising a cylindrical shipping container, and a piston overlying the lubricant therein, said piston being of light, flexible material having flexible edges for yielding when the piston is drawn past a dent in the container.

11. A lubricant dispensing apparatus comprising a cylindrical shipping container, and a piston overlying the lubricant therein, said piston being materially flexible throughout, to yield when drawn past a dent in the container.

12. A lubricant dispensing apparatus comprising a receptacle for holding a supply of lubricant, a cylinder in said receptacle having communication therewith through a valved inlet, a hollow plunger reciprocable in said cylinder, a spring in said receptacle completely surrounding the outside of said cylinder and operatively connected to said plunger for moving said plunger outwardly, and a piston slidably mounted in said receptacle.

13. In lubricating apparatus of the class described, the combination of a large lubricant container having a base upon which it normally rests while in use, a top for said container having a central opening therein, a cover removably secured to said top, a cylinder carried by said cover and depending into said container, a valve controlling communication between said cylinder and

said container, a valved piston slidable in said cylinder to discharge lubricant therefrom, conduit means receiving the lubricant discharged from said cylinder and terminating at the top in a centrally arranged discharge nozzle and seat, said nozzle projecting substantially vertically so that a lubricating gun may be seated by downward pressure for filling purposes, means for raising said piston, and means secured to said cover for handling the device.

In witness whereof, I hereunto subscribe my name this 20th day of December, 1924.

OSCAR U. ZERK.