J. B. GARBER.

PUMP.

APPLICATION FILED MAR. 20, 1915.

1,189,932. Patented July 4, 1916.

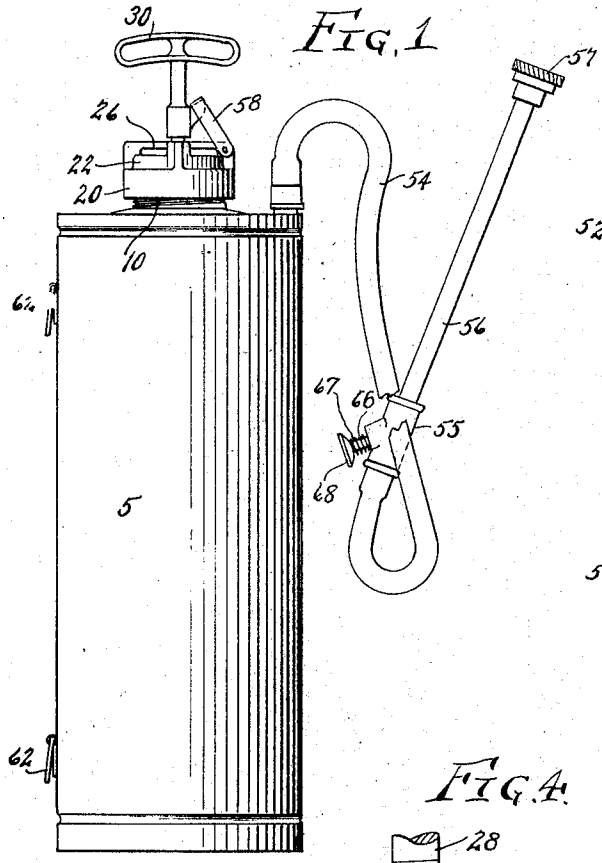


FIG. 1.

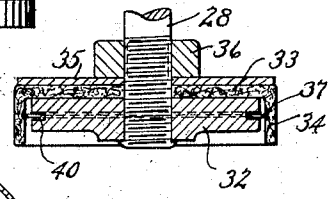


FIG. 4.

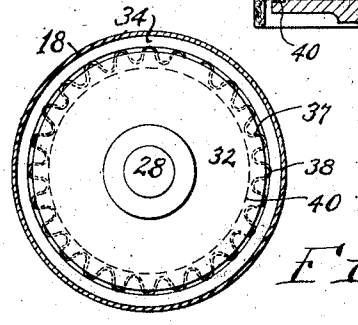


FIG. 3.

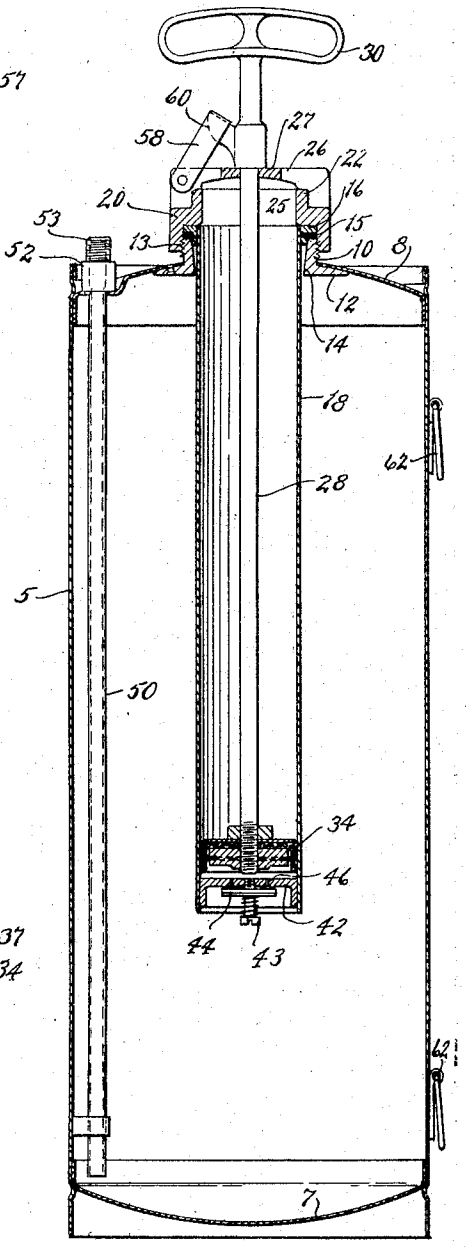


FIG. 2.

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UNITED STATES PATENT OFFICE.

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PUMP.

1,189,932. Specification of Letters Patent. Patented July 4, 1916.

Application filed March 20, 1915. Serial No. 15,711.

To all whom it may concern:

Be it known that I, JESSE B. GARBER, a citizen of the United States, residing at Salem, in the county of Columbiana and State of Ohio, have invented a certain new and useful Improvement in Pumps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to pumps of the class which have a reciprocating plunger carrying a flexible packing, as for example, a flanged leather washer.

One of the objects is to provide a simple device to insure the packing being in proper condition whenever the plunger enters its barrel.

The invention is of particular value in constructions where the plunger is frequently removed from the barrel, an instance of which is found in that type of spraying apparatus which has a tank provided with an internal pump, the plunger of which is removed to enable the charging of the tank. When so embodied, my invention may provide a very convenient arrangement of tank, removable barrel, and removable cap, which latter serves the triple purpose of clamping the barrel to the tank, of guiding the plunger, and of constricting the packing at the end of the stroke to insure its proper reëntrance into the barrel. The automatic constriction, whenever the plunger is raised clear of the barrel, enables a packing to be used which is pressed outwardly by an internal spring, and the invention includes an effective form of such spring and packing.

The invention is hereinafter more fully described as embodied in a spraying device wherein air is compressed in a tank by a pump located axially therein and removably carried by the top of the tank. Such a device is shown in the drawings hereof and will now be described.

Referring to the drawings, Figure 1 is a side elevation of a complete air-pressure spraying apparatus embodying this invention; Fig. 2 is a vertical central section through the same; Fig. 3 is an enlarged horizontal section through the pump cylinder, showing the construction of the pump plunger; Fig. 4 is an axial section showing details of the plunger parts.

Referring specifically to the drawings, 5 indicates a cylindrical tank having a bottom 7 and a somewhat dome-shaped top 8. The top 8 has a central opening through which extends a collar 10 having a flange 12 engaging the under side of the top and secured thereto in any suitable manner, the collar 10 having threads 13 on the outside above the top and having an inside bore 14, shown as flaring upwardly.

18 designates the pump barrel, which is provided at its upper end, on the outside, with a collar 16 having a shallow annular groove in which seats a packing ring 15. This ring rests on the upper edge of the stationary collar 10. The collar 16 is shown as having an annular surface below the packing ring 15, engaging the upper portion of the flared opening 14, to position the upper end of the pump barrel.

In use, the pump barrel is securely clamped to the tank by a spider member 20 having a threaded portion engaging threads on the collar 10, above which it is provided with an annular seat for receiving the collar 16. Extending upwardly above this seat 21 is an annular flange 22. A cylindrical surface 25 is bored through this flange and the portion below it and communicates with the pump barrel, being slightly smaller in diameter while adapted to receive the plunger, as will be hereinafter described. Arms 26 extend upwardly and inwardly from the ring and flanged portions of the spider and join in a disk-like portion at the center, through which is made an opening 27 serving to guide the plunger rod 28 of the pump.

The upper end of the plunger rod is fitted to a suitable handle 30 and the lower end is threaded to receive a plunger head 32 above which is a flexible member 33 of leather or like material, extending outwardly beyond the edge of the disk-like head and downwardly as at 34 to engage the interior of the pump barrel. Above this flexible member is provided a washer 35, held in place by a nut 36. When the handle is raised to its uppermost position the plunger is drawn into the cylindrical cavity 25 in the head 20. As this cavity is slightly smaller in diameter than the barrel 18, the skirt of the leather washer is necessarily constricted so that, as this washer reënters the barrel there is no danger of the advancing edge of it being turned backwardly, jammed or "scuffed," as is otherwise liable to occur. It is well known

that there is frequently difficulty in inserting plungers having flanged leather packing into their barrels, and frequently disarrangement of the skirt of such washer in the operation of the pump. This invention overcomes the difficulty, as, whenever the plunger is raised to its uppermost position, its packing is automatically trued.

When the device shown in the drawings is to be charged, the plunger is raised into the cavity 25 and the head 20 is unscrewed. A suitable bar passed beneath one of the spider arms 26 furnishes a convenient lever for unscrewing. The snug fit of the plunger in the recess of the head normally retains it there when these parts are removed. The removal of the head and plunger frees the barrel so that it may be simply lifted out. This enables the tank to be readily charged through the central opening, after which the barrel and head are replaced. Then, when the handle is forced down, the plunger enters the barrel with its packing in proper condition, owing to the described constriction of the leather skirt.

I prefer to provide yielding means acting outwardly on the intermediate portion of the depending skirt 34 of the packing member, to secure a thoroughly air-tight engagement with the interior of the pump barrel. This yielding means is shown as comprising a spring wire member 37 bent back and forth into a series of loops, the outer portions 38 of which press against the packing. This wire member, when in position, lies in a substantially radial plane and is preferably held in position by a slot 40 in the plunger member 32. This spring is preferably made of a single piece of wire of a suitable length to extend substantially around the interior of the packing and act on its entire circumference. This wire, it will be seen, by tending to straighten itself, presses the packing skirt snugly against the inner surface of the pump cylinder.

A suitable valve is arranged in the bottom of the pump barrel. As shown, this comprises a disk closure 44 pressed upwardly by a spring 43 against the under side of the bottom 42 of the barrel and thus closing openings 46 through the bottom.

When the tank is partially filled with the liquid mixture to be sprayed, or a liquid to be forced from the container for any purpose, the pump is operated, thereby compressing air above the liquid, which may be of a sufficient pressure to allow for discharging substantially the entire volume of liquid without requiring further pumping. The liquid is discharged through a tube 50 extending vertically adjacent the wall of the tank to a point near the bottom and having at its upper end a collar 52, provided with a nipple 53 adapted to receive a suitable hose connection of a hose 54. The hose is connected at its other end to a suitable controlling valve 55, from which leads a discharge pipe 56, shown as carrying a spray nozzle 57. The controlling valve may conveniently comprise a casing having a slidable plug 66 normally pressed outwardly to its seat by a spring 67, a dished head 68 on the plug enabling it to be easily pressed inwardly by the operator's thumb, to allow the liquid to discharge.

The tank may be conveniently carried by the pump handle 30 by latching the handle and plunger rod in its down position. As a suitable means for accomplishing this, I have shown a looped metal strap 58 pivoted to one of the ribs 26 at its ends and having its intermediate portion adapted to engage a hook 60 integral with the depending portion of the handle 30. When the pump is in use, this latched member is merely thrown outwardly free from the hook. When it is desired to carry the tank by this handle, it is latched as shown in the drawing. If the tank is of a size suitable for "knap sack" spraying, rings 62 may be pivoted to the sides of the tank for receiving a suitable strap adapted to extend over the shoulders of the user.

Having thus described my invention, what I claim is:

1. In a device of the character described, the combination of a container, a removable barrel therein, a piston operating in the barrel, and a cap operating to hold the barrel to the container and having a recess of slightly smaller diameter than the interior of the barrel adapted to receive the piston.

2. The combination of a container, a removable barrel therein, a piston occupying the barrel and having a rod, a cap operating to clamp the barrel to the container and forming a guide for the rod and having a cavity which is adapted to receive the piston when withdrawn by the barrel.

3. The combination, with a container having a collar with an external thread, of a pump barrel extending into the container and having an external flange over-hanging said collar, an internally threaded head screwed onto said collar and clamping the pump barrel in position, a piston in the barrel and an actuating rod therefor guided by said head.

4. In a device of the character described, the combination with a pump barrel having an external flange, of a support therefor adapted to embrace the barrel adjacent one end, said flange overhanging and resting on the support, a clamping head adapted to be removably secured to said support and secure the pump barrel in position, a piston in the barrel and an actuating rod therefor extending through said head, and a bore in said head registering with the bore of the cylinder and slightly smaller in diameter,

whereby the piston may be drawn into said bore allowing the removal of the head together with the piston and enabling the piston to be guided into its barrel when the parts are assembled.

5. The combination, with a container having an externally threaded open collar, of a removable barrel occupying said collar and having an outward flange overhanging the upper edge of the collar, a cap having an internal thread engaging the collar and having a shoulder adapted to bear down on the flange, whereby the cap may clamp the barrel in place, said cap having an internal recess of slightly smaller diameter than the barrel, a rod extending through the cap, and a piston on the rod adapted to be drawn into said smaller recess in the cap.

6. In a pump, the combination of a barrel, a removable head having a recess opposite the end of the barrel, and of slightly smaller diameter than the barrel, a plunger within the barrel having a packing comprising a flexible disk flanged in a direction away from the head, and a spring within the skirt of the packing pressing it toward the wall of the barrel, said recess being adapted to receive the plunger and constrict the packing.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

JESSE B. GARBER.

Witnesses:
CHARLES SHAFFER,
FRANK FILSON.