Nov. 28, 1933. C. W. HOLLINGSWORTH 1,937,344

HAND SPRAY PUMP

Filed Sept. 21, 1931

Fig. 1.

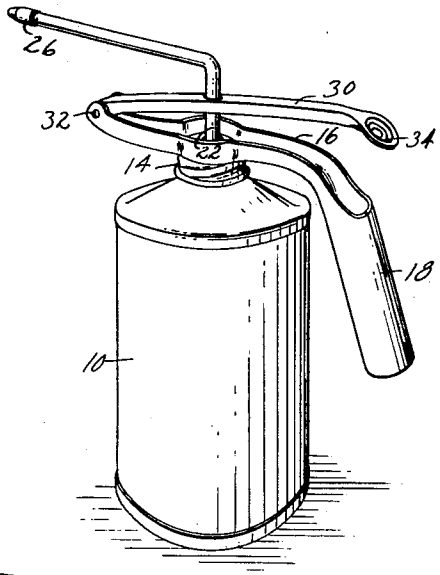


Fig. 2.

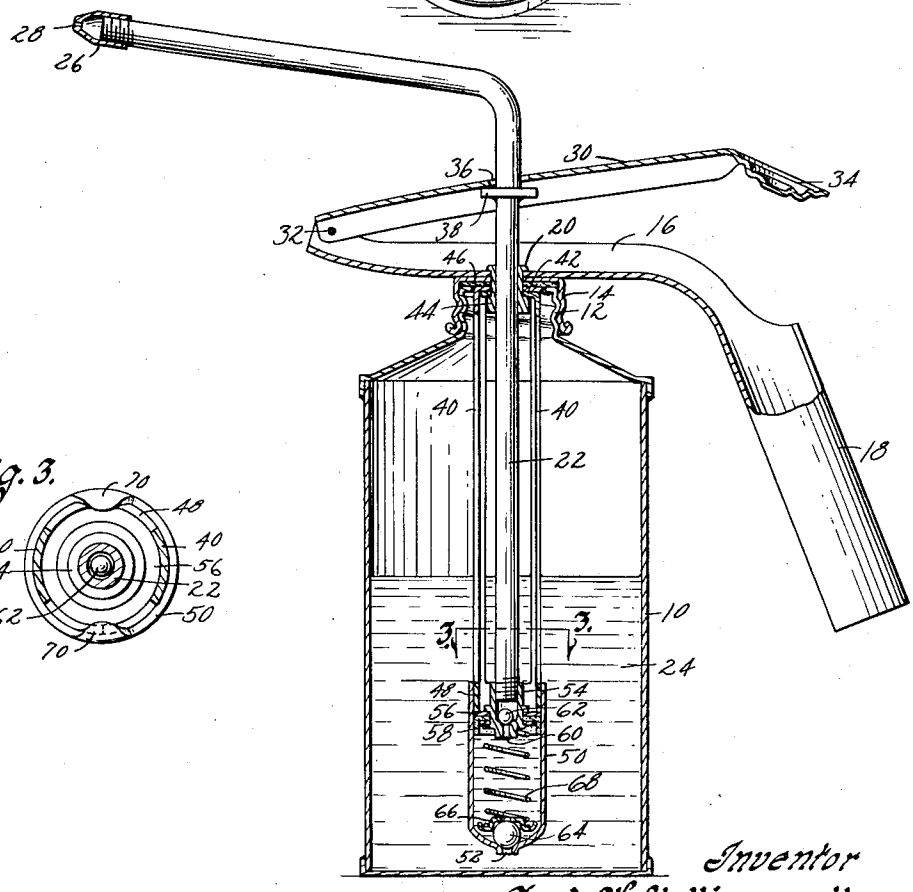


Fig. 3.

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HAND SPRAY PUMP

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Serial No. 563,939

1 Claim. (Cl. 299—97)

The object of this invention is to provide a simple and inexpensive form of spray pump adapted to be used in connection with a container for discharging a stream of liquid forcibly therefrom.

A further object of the invention is to provide an improved spray device for forcibly ejecting a stream of liquid and easily and conveniently directing the stream to the desired location.

With these and other objects in view my invention consists in the construction, arrangement and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claim, and illustrated in the accompanying drawing, in which:—

Figure 1 is a perspective view illustrating a container equipped with a spray device in accordance with my invention.

Figure 2 is a slightly enlarged vertical section of the same.

Figure 3 is an enlarged horizontal section through a portion of the device on the line 3—3 of Figure 2.

The spray device which forms the subject matter of this invention is to be used in connection with a familiar form of container commonly used for disinfecting liquids, liquid insecticide, plant sprays, light oils, and the like, such container as here illustrated being in the form of a cylindrical can 10, having a reduced threaded neck 12. The container may be made of tin or other light weight sheet metal and the threaded neck 12 is provided with an ordinary screw cap 14.

An arm 16 is mounted transversely across the top of the cap 14 and is suitably secured thereto. The major portion of the arm 16 in substantially horizontal position and is turned downwardly at one end and shaped to form a handle 18 adapted to be grasped in the hand of the user.

A sleeve 20 is mounted through the top of the cap 14 and through the central portion of the arm 16 and is riveted or upset at its upper end for the purpose of securely holding the two parts together.

The sleeve 20 serves as a support and slide bearing for a tube 22 which has its lower end extended a considerable distance downwardly within the container 10 and into liquid 24 therein. The tube 22 is bent laterally at a suitable distance above the bearing 20 and is threaded to receive a nozzle 26 which may be provided with one or more restricted discharge apertures 28.

An operating lever 30 is pivoted at 32 on the free end of the arm 16 and is formed at its opposite end with a thumb-piece 34 normally arranged a short distance above the upper end of the handle 18, and in such location that it may be engaged by the thumb of the hand in which said handle is grasped. The lever 30 is formed intermediate of its ends with an opening 36 through which the tube 22 passes loosely and a flange or collar 38 is fixed to said tube immediately beneath said lever.

Fixed to and extending downwardly from the top of the cap 14 is a frame preferably composed of a pair of spaced parallel arms 40 joined at their upper ends by a connecting member 42 through which the sleeve 20 passes. The sleeve 20 is formed at its lower end with an enlargement or shoulder 44 engaging the lower surface of the connecting member. A reinforcing washer 46 preferably is mounted between the top of the cap 14 and the connecting member 42 of the frame to strengthen the parts against bending and distortion.

The frame includes an open ring 48 formed on or fixed to the lower ends of the arms 40, and said ring is engaged and embraced by a cylinder 50 which is open at its upper end and substantially closed at its lower end, said lower end being formed with an inlet port 52.

The lower end of the tube 22 enters and is arranged for reciprocation in the cylinder 50 and is provided with a piston arranged for reciprocation therein. The piston as here shown includes a trunk member 54 threaded on the lower end of the tube and carrying a metallic washer 56 and a cup leather 58.

The lower end of the piston trunk member 54 is provided with a check valve including a restricted aperture 60 and a ball valve 62 engaging the upper end of said aperture.

A ball valve 64 is also mounted in the lower end of the cylinder 50 and normally closes the inlet aperture 52 which preferably is of somewhat greater capacity than the opening 60. On the ball valve 64 rests a concavo-convex washer 66 which is engaged by an expansive coil spring 68 which in turn engages at its upper end the piston. The spring 68 normally acts to hold the ball 64 in closing relation with respect to the aperture 52 and also exerts upward pressure for moving the piston, tube 22, and operating lever 30 to their upward limits of movement.

Any desired means may be employed for removably attaching the cylinder 50 to the frame. In the present instance I have employed a pair of lugs 70 which are formed on the upper end of

the cylinder and are bent inwardly between the arms 40 and over the upper edge of the ring 48.

The container is supplied with any suitable liquid which it is desired to spray or forcibly eject therefrom and the cylinder and frame are inserted through the neck 12 of the container and the cap 14 screwed in place.

The handle 18 is held in one hand of the operator and pressure is applied to the thumb piece 34 for oscillating the lever 30 downwardly. The downward movement of the lever 30, by engagement with the stop collar 38, causes the tube 22 to be moved downwardly through the slide bearing 20 and causes the piston to be reciprocated downwardly in the cylinder 50, thus compressing the spring 68.

When pressure on the operating lever is released the energy stored in the spring 68 will cause the piston and tube to travel upwardly, thus moving the lever and thumb piece back to their normal positions. It will be observed that the lower end of the ring 48 may be employed as a stop for limiting the upward movement of the parts by engagement of the piston washer 56 therewith.

Repeated oscillation through pressure on the lever 30 and countermovement through use of the spring 68 will cause a portion of the liquid 24 to enter the cylinder through the entrance aperture 52 and to enter the piston trunk member 54 and tube through the aperture 60 and then to be carried upwardly through the tube and discharged through the aperture 28 of the nozzle.

Because of the arrangement of the parts the stream of liquid may be caused to be ejected with considerable force and to travel a considerable distance. It will also be found that the stream of liquid may be directed to the desired location with considerable accuracy because the lateral portion of the tube and its nozzle 26 may be pointed and aimed after the manner of a pistol. This spray device is exceptionally useful for spraying plants with liquid insecticide or for spraying disinfecting solutions into desired locations. It is also useful in ejecting quantities of light oil or penetrating oil against desired parts of machinery, such for instance as the body springs of motor vehicles.

If desired, a quantity of the liquid may be kept at all times in the container 10 so that the spray device is always ready for use.

Some changes may be made in the construction and arrangement of the parts of my device without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claim, any modified forms of structure or use of mechanical equivalents, which may be reasonably included within its scope.

I claim as my invention:—

In combination with a container having a removable cover, a spray device comprising an arm fixed to and extending diametrically across the top of the cover, said arm projecting in opposite directions beyond said cover and formed at one end with a handle portion, an operating lever pivoted to the other end of said arm and having a thumb piece above said handle portion, a slide bearing extending through said cover and arm, a tube arranged for reciprocation in said bearing and extending within the container, said tube extending loosely through said lever, a stop collar on said tube just below said lever, said tube being bent laterally and provided with a discharge nozzle on its outer end, a skeleton frame supported from said cover within the container, a cylinder carried by said frame, check-controlled means for admitting liquid from said container to the lower end of said cylinder, a piston on said tube arranged for reciprocation in said cylinder, check-controlled means for admitting liquid from said cylinder to said tube, and a coil spring in the cylinder engaging the lower side of said piston.

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