Feb. 25, 1941. J. FITCH 2,233,162

SPRAYING DEVICE

Filed Oct. 16, 1939

Fig. 1.

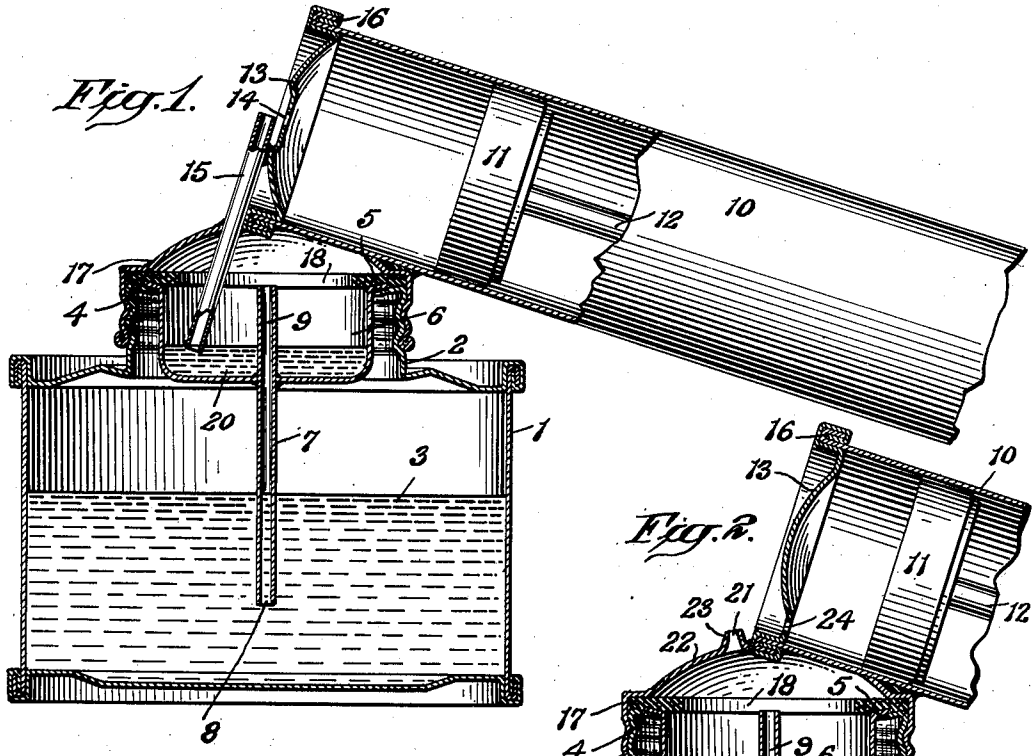


Fig. 2.

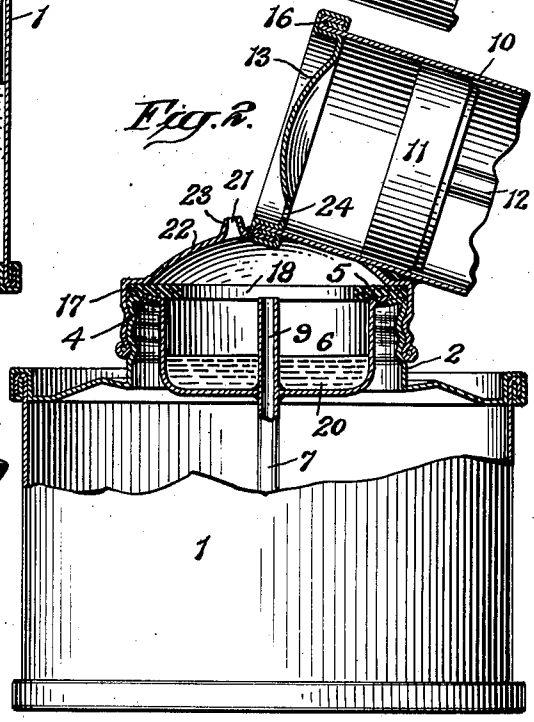
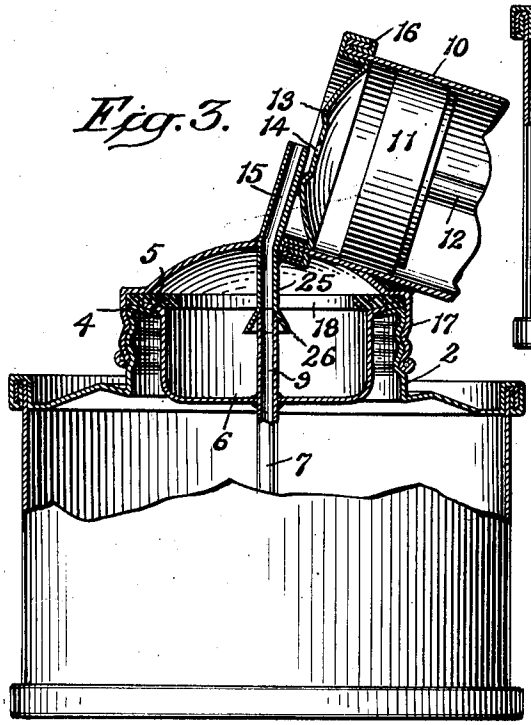


Fig. 3.



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Patented Feb. 25, 1941 2,233,162

UNITED STATES PATENT OFFICE

2,233,162

SPRAYING DEVICE

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Application October 16, 1939, Serial No. 299,708

4 Claims. (Cl. 299—88)

This invention relates to sprayers and more particularly to the type of hand-operated sprayers usually employed for the distribution of liquid insecticide or other material.

At the present time, liquid insecticide is often sold in cans or glass receptacles provided with a thread-on closure cap. A sprayer is employed in connection with such a receptacle, the sprayer usually having a cylinder attached to a cap threaded onto the neck portion of the can or other receptacle, the sprayer also having an attached siphon tube, which, when the sprayer is attached to the receptacle, enters the receptacle to reach the liquid contents thereof. With such an arrangement, the siphon tube projects from the sprayer when the sprayer is detached from the receptacle so that the tube is thus in an exposed and unprotected position where it can be easily damaged, bent or broken off by handling or dropping the sprayer.

The primary object therefore of the present invention, is to provide a co-operating can and sprayer in which the can, when provided with a conventional closure cap, acts as a commercial type of container for the liquid, and in which the sprayer adapted for attachment to the can, will not be provided with an exposed or projecting siphon tube so that the sprayer, when detached from the receptacle cannot be easily damaged during handling, shipment, use or display.

In the accompanying drawing forming a part hereof, Fig. 1 is a sectional view through a sprayer and attached liquid receptacle, showing the invention; Fig. 2 is a sectional view of a modified structure; and Fig. 3 is a sectional view through another modification.

With reference to the structure shown in Fig. 1 the liquid receptacle is shown at 1, the same consisting of a metal can, or it may be composed of glass or any other suitable material. The can or other receptacle 1 is provided with a threaded neck or spout 2 adapted for the reception of a closure cap of conventional form, whereby the can with such closure cap applied, constitutes a complete container for liquid insecticide 3 or any other suitable liquid adapted to be sprayed. The upper end of the neck or spout 2 is formed with an inturned, downwardly inclined flange 4 forming a seat or rest for the out-turned annular flange 5 formed at the top of a cup 6, said cup being thus supported within and surrounded by the neck 2. Located in the cup 6 is a tube 7, said tube being preferably, but not necessarily, located at a substantially central position, and having a lower portion 8 extending downwardly into the liquid contents of the receptacle, and having an upper portion 9 rising within the cup 6. The cup 6 and attached tube 7 may be loose as a unit in the receptacle and capable of being freely lifted out of the same, or it may, if desired, be fixed in position after the receptacle has been filled. In any event, the cup and tube are located in the receptacle, are surrounded by the neck thereon and fully protected thereby when the conventional closure cap is threaded onto the neck of the receptacle.

The sprayer includes a cylinder 10 within which a piston 11 is mounted for reciprocation, said piston being attached to a piston rod 12 which emerges out of the rear end of the cylinder and is provided with a handle, not shown, by which the piston is manually reciprocated. At the opposite end, the cylinder is provided with a closure cap 13 attached to cylinder 10 by lock seam 16 and formed with an air blast opening 14 located adjacent to the upper end of a siphon tube 15 which extends diagonally downward through a threaded cap 17 adapted for removable reception upon the neck 2 of the liquid-holding receptacle 1. Cap 17 is secured to and carried by the cylinder 10 and is provided with a washer or gasket 18 to insure an air and liquid-tight joint between cap 17 and the neck 2 of the receptacle.

When piston 11 is reciprocated suction is created tending to draw liquid from the interior of the receptacle upwardly through tube 7 into the cup 6, as indicated at 20, whereby the cup and the attached cap member 17 form a collection chamber in which liquid gathers. Siphon tube 15 draws liquid from within the cup 6 up to the upper end of the tube from whence it is expelled in the form of a mist or spray by the air blast emanating from the opening 14.

It will be noted that the length of the siphon tube 15 is such that the lower or free end of the same is surrounded and fully protected by the flange or wall of the cap 17. Thus, the sprayer, when detached from receptacle 1 can be handled freely without the possibility of the free end portion of the tube being bent or broken off.

In the modification of the invention shown in Fig. 2, the use of a siphon tube is eliminated. There, an opening or port 21 is punched out of the top or domed portion 22 of cap 17 in such a manner as to produce a short annular flange 23 around aperture 21 so that the effect of a short tube projecting upwardly from the top

of the cap 17 is had. The upper termination of such short tube is located near an air blast opening 24 situated near an edge of the cap 13 rather than in the center of the same. The device of this embodiment operates similarly to that of Fig. 1 except that a normally higher liquid level must be maintained in the cup 6 to enable suction exerted through the short tube 23 to draw the liquid therethrough. The proper liquid level is secured and maintained by merely operating the pump vigorously for a few strokes until spraying occurs.

In the modified structure shown in Fig. 3, the siphon tube 15 has its lower end bent as shown at 25, and provided with a conical termination 26 located centrally of the cap 17 and adapted to fit over the upper end of the upper portion 9 of tube 7 when the cap 17 is fitted on the receptacle. In this embodiment of the invention, the two tubes 7 and 15 being coupled together in the manner set forth, form a substantially continuous siphon tube extending from the interior of the receptacle to a point near the air blast opening. Thus, with such an arrangement, the cup 6 does not constitute a liquid-collection chamber, as explained with relation to the structures of Figs. 1 and 2, but comprises merely a support for holding the tube 7 centrally positioned to have its upper end aligned with and fitted into the conical member 26.

In the several embodiments of the invention shown, the liquid-receptacle comprises a commercial type container independently usable as such. The sprayer adapted for attachment to such container has no projecting elements, such as a siphon tube, and when detached from the container can be handled carelessly without the possibility of damage.

What I claim is:

1. A device of the character described comprising, a receptacle having a threaded neck, a cup seated in and surrounded by said neck, a tube communicating at one end with the interior of the cup and at the other end with the interior of the receptacle, the end of the tube that is located in the interior of the cup extending to a point adjacent to the top of the cup, a closure cap adapted for threaded reception upon the neck of the receptacle to cooperate with the cup in forming a liquid-collection chamber, a cylinder attached to the top of said closure cap, said cylinder having an apertured end closure, a siphon tube having one end disposed adjacent to the aperture in the end closure and its other end located in the cup remote from the tube and to one side of said tube, and a piston adapted for reciprocation within the cylinder.

2. A device of the character described comprising, a receptacle having a neck, a cup having a flange seated upon the upper end of said neck to hold the cup dependent within and surrounded by the neck, a tube secured in said cup, said tube having a portion projecting into the receptacle and another portion rising within and above the bottom of the cup and terminating adjacent to the upper end of the cup, a cap for detachable fitment upon the neck to co-operate with the cup in forming a liquid-collection chamber, a cylinder attached to said cap, said cylinder having an end closure located adjacent to the cap and formed with an air blast opening, a siphon tube having one end located adjacent to the air blast opening and its other end disposed within the cup, said siphon tube having an end located adjacent to the bottom of the cup at a position remote from and to one side of the tube therein, and a piston mounted for reciprocating movement within the cylinder.

3. A device of the character described comprising, a liquid-containing receptacle having a neck, a cup supported in said neck, a tube extending downwardly from the cup into the receptacle to reach the contents of the receptacle, a cap removably received on the neck, a siphon tube attached to the cap and having a part extending into the cup, said part having an end located to one side of the tube in the cup and situated adjacent to the bottom of the cup, the tube in the cup having its upper end situated adjacent to the upper end of the cup, a cylinder attached to the cap, said cylinder having an end closure provided with an air blast opening located adjacent to an end of the siphon tube, and a piston mounted for reciprocation within the cylinder.

4. A device of the character described comprising, a liquid-containing receptacle having a filler opening, a cup supported in said opening, a tube extending through the bottom of the cup and having parts extending above and below said bottom, a closure member for the filler opening, a cylinder attached to the closure member, said cylinder being provided at one end with an air blast opening, a siphon tube extending through the closure member, said siphon tube having an upper end portion projecting externally of the closure member and located adjacent to the air blast opening and having its lower end directed downwardly into the cup to one side of the portion of the tube located therein, said lower end of the siphon tube extending to a lower point in the cup than the upper end of the tube portion located therein.

JOHN FITCH.