April 25, 1939. W. M. VOGEL 2,155,850

SPRAYING DEVICE

Filed July 19, 1938

Fig. 1.

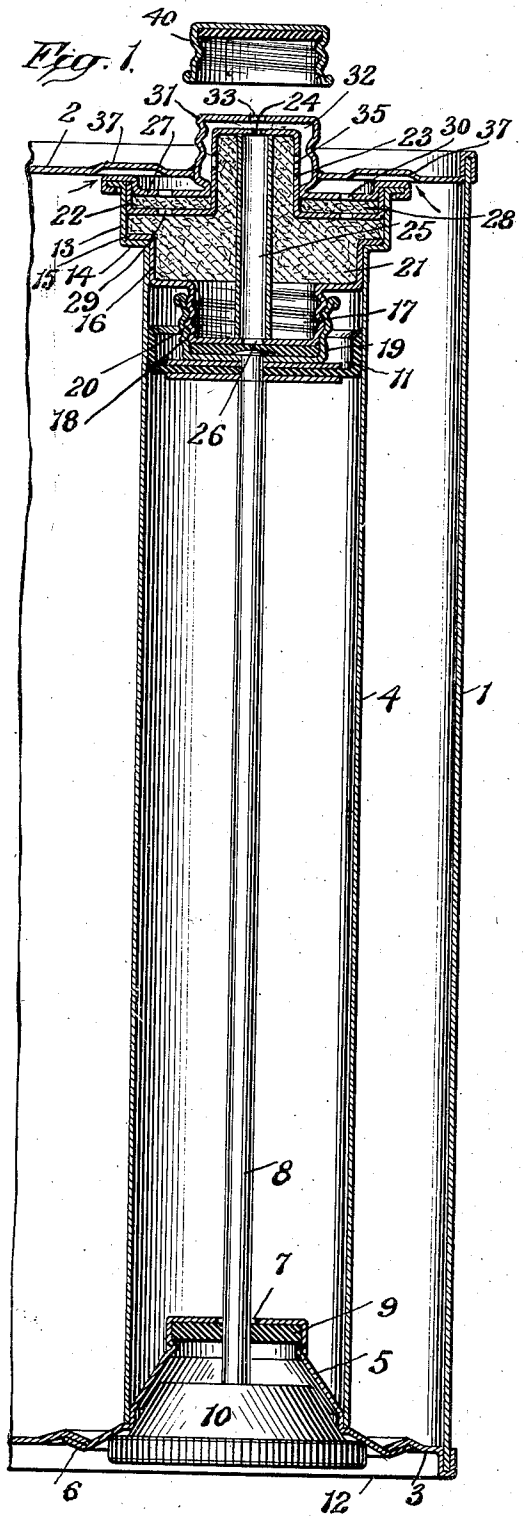


Fig. 2.

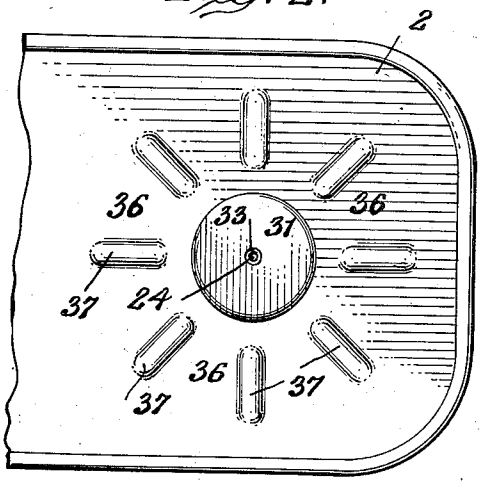
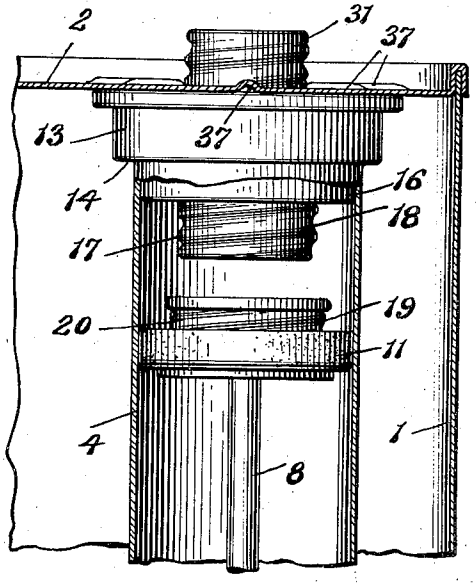


Fig. 3.



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Patented Apr. 25, 1939

2,155,850

UNITED STATES PATENT OFFICE

2,155,850

SPRAYING DEVICE

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Application July 19, 1938, Serial No. 220,040

4 Claims. (Cl. 299—88)

This invention relates to an improvement in spraying devices of the character used for the distribution of liquid insecticide or other liquids, and particularly to a type of sprayer combined with or built in an insecticide can or similar receptacle, an example of such structure being disclosed in my co-pending application, Ser. No. 182,156, filed December 28, 1937.

The present invention has for its main object the provision of a built-in sprayer of the character described by which the contents of the can may be sprayed directly from the can. In the design of a device of this character, a great deal of consideration has to be given to the fact that these cans, filled with the insecticide or other liquid, are often roughly handled during transportation, sale and use, and it is therefore desirable that the spraying device incorporated as a part of the can, be such as to be extremely sturdy; that it shall have no projecting parts or other elements likely to be broken off or damaged during rough handling of the filled can; that there shall be no leakage of the contents should the filled can be tipped over or caused to rest on its side; that the liquid contents of the can shall not be spurted or ejected inadvertently by pressure imposed upon the walls of the can, and that the piston for operating the sprayer be restrained from movement when the sprayer is idle, to thereby prevent operation of the sprayer unless caused by manual reciprocation of the piston.

Among the objects of my invention therefore, is the provision of a sprayer which will satisfactorily fulfill the requirements above expressed; which will direct a fine spray of the liquid contents of the can upon reciprocation of the piston; which will possess all of the satisfactory characteristics of a separate sprayer, yet be combined with and almost wholly contained within the body of the can in which the insecticide or other liquid is contained without requiring the can to assume a different shape from that in which it is customarily made.

In the accompanying drawing wherein an embodiment of the invention is shown, Fig. 1 is a vertical sectional view through a combined can and sprayer made in acordance with the invention; Fig. 2 is a plan view of a top portion of the can showing the spray nozzle; and Fig. 3 is a sectional view of the upper portion of the can with parts of the sprayer also in section, showing the piston in position, or ready for operation.

The body of the can or similar receptacle is shown at 1 and the same may be of any suitable form or size convenient to be held in one hand while the piston of the built-in sprayer is reciprocated with the other hand. A can of approximately quart size has been found convenient, although larger or smaller sizes can be used, and in the form shown the body of the can is substantially rectangular in cross-sectional shape, although it may be of any other desirable shape, as will be readily understood.

Seamed to the upper end of the can body 1 in the conventional manner is the top 2 and similarly secured to the lower end of the body is the bottom 3. Extending through the body of the can from top to bottom thereof is a tube or cylinder 4 constituting a piston chamber. Secured to the lower end of the tube or cylinder 4 and closing the same is a conical plug receptacle or socket 5 which has a laterally extended flange 6 secured to the bottom 3 to close the bottom around the lower end of the cylinder 4. The inner end of the conical plug receptacle 5 is provided with an aperture or hole 7 through which piston rod 8 extends. Pressed into the receptacle 5 is a gasket or washer 9 which prevents leakage of any fluid which might make its way into the cylinder 4. At one end, the piston rod 8 is provided with a conical knob 10 constituting an operating handle by means of which the piston 11 on the opposite end of rod 8 may be reciprocated in the cylinder or tube 4. The knob 10 is so shaped as to fit within the conical receptacle 5 as shown in Fig. 1, when the piston has reached the end of its spraying stroke and is held against reciprocation. When the knob 10 is so seated in receptacle 5 it is located above the lower end 12 of the can so that the can may be stood upright in the conventional way on its bottom without interference by any projecting portions of knob 10. The upper end of the tube or cylinder 4 is widened or enlarged to form a chamber 13, the formation of said chamber producing an annular seat 14 on which the circumferential laterally extending flange 15 of a cup-shaped member 16 rests. Said member 16 is pressed or otherwise tightly fitted in the upper end of cylinder 4 and it is formed with a downwardly extending central cup-shaped portion 17, provided with threads 18.

Secured or otherwise formed on the piston 11 is a cup 19 which is internally threaded at 20, so that it may be received on the threads 18 of the cup-shaped portion 17. That is to say, when the piston 11 is forced toward member 17 as far as it will go by direct manual pressure imposed upon the knob 10, the knob 10 is then manually rotated causing threads 20 in cup 19 to engage with the

threads 19 on cup-shaped member 17. The engagement of cup 19 with member 17 serves to hold the piston against longitudinal movement in cylinder 4 so that the possibility of the sprayer operating or the piston shifting in the cylinder during handling of the can is prevented. The cup 19 also, when in engagement with portion 17, extends over and seals an opening 26 through which liquid might otherwise make its way when the device is in its inoperative position.

Chamber 13 is packed with a soft absorbent material 21 which is adapted to become saturated by the liquid contents of the can, the upper end of cylinder 13 being closed by plate 22 which is formed with an upwardly projecting central portion 23 formed with a central air-opening 24. Opening 24 communicates with the interior of the cylinder 4 by means of an air tube 25 extending vertically downward through chamber 13 and having its lower end communicating with opening 26 formed in the lower end of portion 17 and communicating with cylinder 4. It will be obvious that as piston 11 is forced toward air opening 26, it will direct a blast of air therethrough, through the tube 25 and out through the air opening 24. Fitted over the top of the plate 22 is a somewhat similarly shaped plate 27, the two plates being spaced apart to form an annular chamber between them in which is located an annular section of absorbent material 28. Plate 22 is formed with one or more openings 29 and the upper plate 27 is formed with one or more openings 30.

Plate 27 is formed with a head 31 which fits over and encloses the portion 23 of plate 22 but is spaced therefrom to provide a chamber 32 which does not communicate with the chamber in which absorbent material 22 is located. The head 31 constitutes a spray nozzle and is formed with a central spray opening 33, slightly larger than that shown at 34 and preferably in alignment therewith. Projecting portion 23 of plate 22 is formed with one or more holes 35 which communicate with chamber 32 and connect chamber 32 with chamber 13 in which the absorbent material 21 is located.

Plate 27 is attached to the top 2 of the can at the points 36 between the spaced, raised ribs 37 thereon, these spaced ribs serving to provide passages below them through which the liquid contents of the can may reach the openings 30 and pass therethrough to saturate the absorbent material 21, and also pass through the openings 29 to saturate the absorbent material 21.

In operation, the can is held in the hand and tilted downward or held with the cylinder 4 horizontally disposed to permit the liquid contents of the can to flow by gravity toward the spraying end of the device and enter through openings 30 and 29 to saturate the absorbent material 28 and 21, the saturation of this material being aided also by the suction exerted by the piston 11 as it is drawn away from the cup-shaped portion 17. To operate the piston first requires rotative movement of knob 10 to disengage threads 19 from those shown at 18 so that the piston is released as shown in Fig. 3 and then it is drawn away from portion 17. This action creates suction tending to draw the liquid now surrounding chamber 13 in through the passages formed by ribs 37 and through openings 30 and 29 to saturate the absorbent material 28 and 21. When the piston is forced toward air blast opening 26, it sends a blast of air therethrough and through tube 35 and air-blast opening 23. This creates a suction tending to draw the liquid through the openings 35 from absorbent material 21 and eject it out through spray opening 33.

Through the arrangement disclosed, a very effective spray action is secured and at the same time spurting or spilling of the contents of the can is avoided. When the can is not being used for spraying, a closure cap 40 of conventional form is fitted on the head 32 over spray opening 33.

What I claim is:

1. A spraying device including a cylinder located within a liquid receptacle, a piston in said cylinder, a chamber on one end of the cylinder, the end walls of said chamber having aligned openings through which an air blast is projected by operation of the piston, a tube extending between and connecting said openings, an absorbent material in the chamber around the tube, one end of the chamber projecting beyond one end of the receptacle, said projecting end of the chamber being provided with a siphon opening, a spray nozzle member enclosing said projecting end of the chamber and spaced therefrom, the siphon opening in the projecting end of the chamber being located in the space between the projecting end of the chamber and the spray nozzle and communicating with the interior of the chamber, and a communication between said absorbent material and the can contents whereby said absorbent material becomes saturated by the can contents.

2. A spraying device including a cylinder, a piston for reciprocation therein, said cylinder having at one end walls forming inner and outer chambers, the inner chamber having openings in its opposite end walls connected by a tube, said tube communicating at one end with the cylinder, the inner chamber having a projecting portion surrounded by and spaced from the walls of the outer chamber, the outer chamber having a portion provided with a spray opening located adjacent to one end of the tube, the projecting portion of the inner chamber being apertured within the surrounding part of the outer chamber, an absorbent material in the inner chamber with which said aperture communicates, and a communication between the inner chamber and a source of liquid supply.

3. A spraying device comprising, a liquid-holding receptacle, a cylinder extending through the receptacle, a piston in said cylinder adapted for reciprocation therein, a chamber located at one end of the cylinder, said chamber having apertured end walls, a tube extending through the chamber and connecting the apertures, an absorbent material in the chamber around the tube, a perforated cap portion on the outer end of the chamber extending over one end of the tube and spaced therefrom and having a portion located on the outside of the receptacle, the end portion of the chamber over which the perforated cap portion is located being apertured to establish a communication between the space located between said cap portion and the end of the chamber with the chamber and the absorbent material therein, and means for permitting access of liquid from the receptacle to the absorbent material in the chamber.

4. In a sprayer, a cylinder, a piston mounted for reciprocation therein, a chamber at one end of the cylinder, said cylinder having apertured end walls, an air tube extending from one end of the chamber to and leading out of the other end and connecting the apertures in the end

walls, separated layers of absorbent material in said chamber, a separating wall disposed between the layers of absorbent material and holding the same in separated relation, said wall being formed with a cylindrical extension, an enclosure member fitted over said wall and over the extension thereon and closing one end of the chamber, said enclosure member having a portion extending over and spaced from the cylindrical extension on the wall, said portion of the enclosure member having a part in contact with the cylindrical extension for preventing communication between the space formed between said cylindrical extension and the enclosure member and the chamber, said enclosure member being formed with a liquid spray opening, the cylindrical extension being formed with an air spray opening at one end of the air tube, the cylindrical extension being formed with a siphon opening communicating with one of the layers of absorbent material, the separating wall being apertured to permit passage of liquid from one layer to the other, the enclosure member being apertured to provide communication between one of said layers and a source of liquid.

WILLIAM MARTIN VOGEL.