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INSECTICIDE SPRAYING APPARATUS

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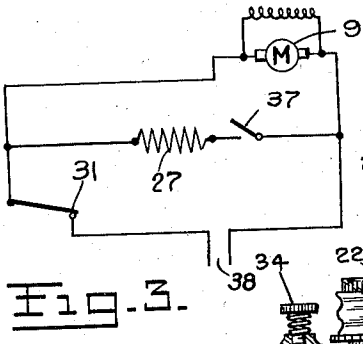


Fig. 3.

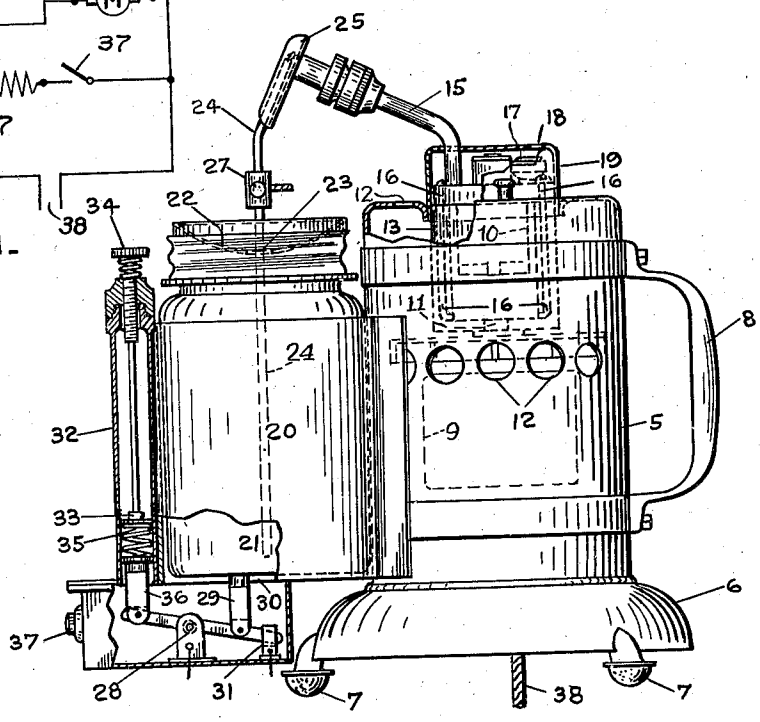


Fig. 1

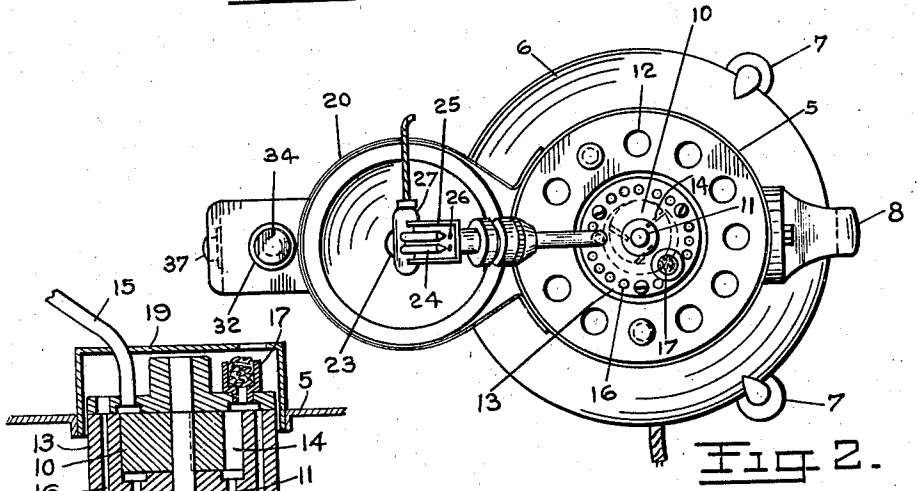


Fig. 2.

Fig. 4.

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INSECTICIDE SPRAYING APPARATUS

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6 Claims. (Cl. 299—88)

My invention relates to insecticide spraying apparatus and particularly concerns a device of this character, which employs a motor driven air pump by means of which compressed air is forced from a nozzle, the position of which is such that the movement of the air draws the insecticide into its path from a juxtaposed tube, and vaporizes, or sprays, the same in a desired direction. The apparatus is preferably used indoors for the purpose of killing insects, although, obviously, it may be employed wherever similar results are required.

One of the objects of the present invention is to provide an insecticide spraying apparatus of this type in which the pump for delivering compressed air at the nozzle is cooled by means of a plurality of vertical passageways arranged in the walls of the same through which cooling external air is drawn prior to the entrance of the air into the pump proper. Furthermore, the pump, which is motor driven, is operated at a reduced speed from that ordinarily employed in order to prevent the same from becoming overheated. Another provision for insuring the proper lubrication of the internal walls of the pump, and consequently to reduce its temperature, is an oil cup situated above one of the vertical passageways through the wall of the same, which cup is filled with an oil saturated cloth. An oil vapor is sucked through this passageway and into the pump proper during the operation of the apparatus.

A further object of the invention is to provide a heating device for warming the liquid insecticide as it passes up the tube provided for the same, the end of the tube being situated adjacent the nozzle for the delivery of the air from the pump. By heating the liquid insecticide before it reaches a point adjacent the spraying nozzle a finer and more complete vaporization of the same is obtained.

Still another important object of the invention is to provide an automatic switch which will break the current to both the heating device and the motor when the amount of liquid insecticide in the apparatus has been decreased, by use, to a sufficient amount to warrant refilling the container for the same. Means are provided, in association with the switch, that may be adjusted to cause the switch to operate at any predetermined time to shut off the device after a desired estimated quantity of the insecticide has been vaporized.

A further object is to form the cap of the insecticide container so that it is concave in shape, which serves the purpose of a funnel enabling the same to be readily refilled and also catches, and returns to the container, any unvaporized insecticide, which may drop off the portion of the tube situated above the same.

My invention further includes other objects, advantages and novel features of construction and arrangement hereinafter more particularly referred to in connection with the accompanying drawing in which Fig. 1 is an elevation, partly in section, of an insecticide spraying apparatus made in accordance with the herein disclosed inventive conception.

Fig. 2 is a plan view of the apparatus, as indicated in Fig. 1, with the top portion of the blower, or pump, casing removed.

Fig. 3 is a diagrammatic view showing the electrical hook-up employed in the apparatus, in connection with the form of the invention shown in Figs. 1 and 2.

Fig. 4 is a vertical section through the air pump.

With reference particularly to Figs. 1, 2, and 3 of the drawing, the insecticide spraying apparatus embodying the present inventive concepts includes a cylindrical housing 5, preferably mounted in a vertical position upon a base 6, having cushioned legs, as indicated, at 7, which maintain the apparatus in a proper position upon a substantially horizontal surface. The apparatus, also, includes a handle member as designated in the drawing at 8. The housing contains a motor 9, which drives a blower, or pump apparatus, 10, to which it is preferably directly connected by means of shaft 11. Air for cooling the motor and the exterior wall of the blower is provided by means of the vents 12, around the side and top of the housing 5. The cylindrical wall of the pump is designated in the drawing at 13 and the rotatable vanes of the rotor of the same are indicated at 14. The vanes of the pump are directed to draw air from the lower portion of the same and discharge it under considerable pressure through a nozzle connection 15, which extends above and to one side of the apparatus. For supplying air to the pump in a manner to prevent its overheating and for providing for its proper lubrication, I have made the following constructional provisions. The wall of the pump is constructed to include a plurality of vertically extending passageways 16, which allows the circulation of air therethrough. During the operation of the pump the upward motion of the air through the same draws air from the exterior of the apparatus in a downward direction through the vented wall 16 of the pump. The continued

passage of the cool exterior air therethrough prevents the cylindrical wall from overheating. A further provision is a lubricating cup 17 in which is located an oil saturated cloth. The cup 17 extends above one of the vertical passageways 16 in the side wall of the pump and the air drawn therethrough contains an oil vapor which lubricates the interior wall of the pump as it passes through the interior of the apparatus towards the nozzle. The motor 9 is, furthermore, operated at a lower speed than is ordinarily the case in order that the rotary speed of the pump be kept within limits to prevent its overheating. The air supplied the blower through the passageways 16 in the cylindrical wall of the apparatus passes through vents 18 located in the top of a cap 19 situated directly above this portion of the device.

A receptacle 20 extends from the housing member 5 and loosely retains a container 21, which holds the insecticide fluid therein. The formation of the cap of the container 21 is rounded, or concave, as indicated at 22 and includes an opening 23 at its lowermost point, so that the same acts as a funnel to permit the refilling of the container without necessitating the removal of the cap. Tubes 24 extend through the opening 23 into the fluid insecticide. The uppermost ends of the tubes 24 are secured to a plate 25 fastened to the tip of the nozzle connection 15. The upper ends of the tubes 24 are located adjacent to and directly under the openings 26 in the end of the nozzle connection through which openings the compressed air from the blower or pump is allowed to escape. It will be understood that the passage of the air over the top of the tubes 24 draws the liquid insecticide in the container 21 up the tubes and atomizes, or vaporizes, the same so that it is carried in this form into the surrounding atmosphere. Any liquid insecticide passing over the top of the tubes 24 that is not vaporized and carried away by the air stream drops back by gravity along the outside of the tube or falls to the concave cap 22 and then returns to the container 21. An electric heating element 27 is employed with the tubes 24, so that the same are warmed and the fluid, passing therethrough, is, consequently, more readily vaporized by the air stream when it reaches its point of exit.

An electric switch element 28 provides means for regulating the operation of the apparatus. The switch is mounted below the receptacle 20, which contains the insecticide fluid container. This switch may be of the ordinary double push button commercial type, one of the buttons, as indicated at 29, projecting through an opening 30 in the bottom of the receptacle 20, so that the base of the container 21 rests upon the top of the same. When the container is in the position shown in Fig. 1, the button 29 secures the pivotal electrical arm of the switch in a closed position with its contact, as indicated at 31. This completes an electrical circuit so that the motor of the apparatus drives the pump and the liquid insecticide is drawn up the heated tubes 24, vaporized and carried into the room by means of the air current from the nozzle connection 15. Means are provided so that the operator of the device may regulate the same to shut it off after a desired quantity, or weight, of insecticide fluid has been vaporized. The same means discontinues the operation of the device after the insecticide in the container has been reduced to a point to the lower level of the tubes 24. This means is in the form of a cylindrical casing member 32 having a plunger 33 therein, a threaded rod with thumb piece 34 above the plunger and a compression spring 35 below the plunger. Button 36 of the electrical switch, below the receptacle 20, which is mounted on the opposite end of the pivot arm of the same to the button 29, contacts the undersurface of the compression element 35. By regulating the position of the screw 34, the compression in the spring 35 is controlled so that when the weight of the container 21, with the insecticide therein, goes below a predetermined, or desired, amount, the switch operates to break the electrical contact at 31, and thereby opens the circuit causing the apparatus to shut off. The movement of the button 29, in this event, pushes the container in an upward direction from which position the same must be manually manipulated, against the action of the spring 35, to effect a closure of the switch to restart the device. Regardless of the position of the screw 34, the spring has sufficient energy to raise the insecticide container when the liquid in the same has been decreased to the level of the lower extension of the tubes 24 therein. A switch 37 separately controls the circuit to the electric heater 27, so that the heater may, or may not, be employed during the functioning of the rest of the apparatus. The electrical hook-up of the apparatus is clearly indicated in Fig. 3 of the drawing, in which, 38 designates the connection to the source of electrical energy.

While I have shown and described the preferred embodiments of my invention, I do not desire to limit myself to the specific forms illustrated, but may alter the construction and arrangement of parts as occasion requires without enlarging the scope of my invention or departing from the spirit thereof as contained in the appended claims.

What I claim is:

1. In a motor driven insecticide sprayer, an air pump, an electric motor for driving said pump, an aspirating nozzle for inserting an insecticide into the air stream issuing from the pump, said pump having a plurality of channels in the wall of the same connected with the intake side of said pump and through which external cooling air from the atmosphere is drawn by the suction created during the operation of the pump, which air is supplied to said nozzle.

2. A motor driven insecticide sprayer as claimed in claim 1, having means for introducing oil vapor through at least some of said channels to lubricate the pump.

3. In a motor driven insecticide sprayer, a vertical rotary motor driven air pump, an aspirating nozzle for inserting an insecticide into the air stream issuing from the pump, said pump having a plurality of vertical passageways, extending downwardly through the wall of the same and connected at the bottom to the intake side of said pump, through which external cooling air from the atmosphere is drawn by the suction created during the operation of the pump, which air is supplied to said nozzle.

4. An apparatus of the class described, comprising an air pump, an electric motor for driving said pump, an insecticide container, means comprising a tube for conveying the insecticide from said container into the air stream issuing from the pump, an electric heating means for said tube and the liquid passing therethrough, a spring operated electric switch for controlling the operation of the motor and electric heating means, and means for automatically opening the

switch to break the electrical connection to both heating means and the motor when the amount of insecticide in the container goes below a desired level.

5. In a motor driven vaporizer, a pump, a motor for driving the same, a jar for containing the insecticide, an aspirating nozzle connected with said pump and jar, electrical means for heating the insecticide as it passes to the aspirating nozzle, a movable electric switch member for supporting the weight of the container, said switch being in circuit with said heater and motor, and biasing means to raise said container and open said switch unless said container holds an operating quantity of liquid.

6. In a motor driven vaporizer, a pump, a motor for driving the same, a jar for containing the insecticide, an aspirating nozzle connected with said pump and jar, electric means for heating the insecticide as it passes to the aspirating nozzle, a double push button switch member for supporting the weight of the container on one button, said switch being in circuit with said heater and motor, and a spring pressing against said other button to raise said container and open said switch unless said container holds an operating quantity of liquid.

GEORGE HETTINGER.