July 5, 1938. W. M. VOGEL 2,123,029

SPRAYING DEVICE

Filed Dec. 28, 1937

Fig. 1.

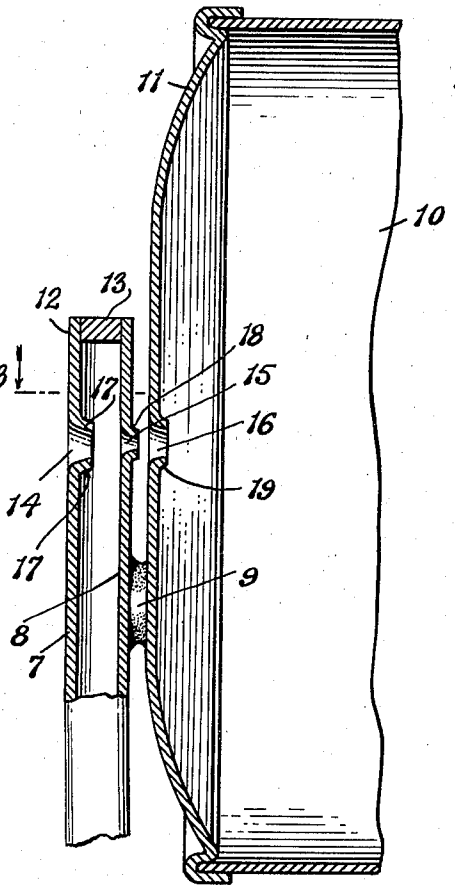


Fig. 2.

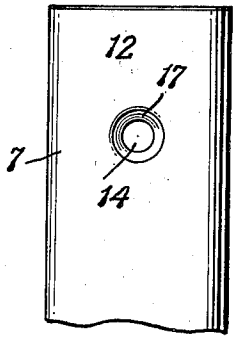


Fig. 4.

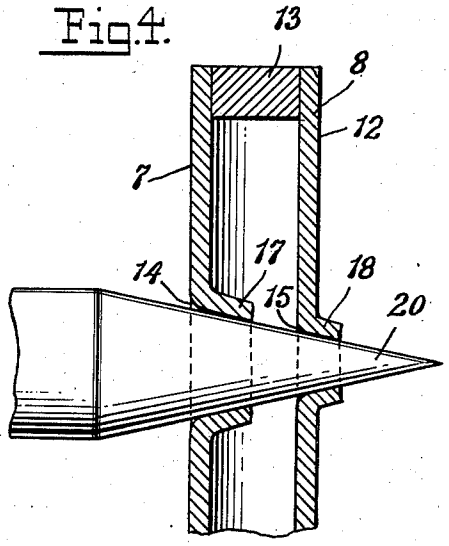
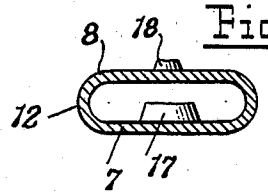


Fig. 3.



INVENTOR

William Martin Vogel

BY

Harry Radzinsky

ATTORNEY

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SPRAYING DEVICE

William Martin Vogel, Bloomfield, N. J.

Application December 28, 1937, Serial No. 182,155

5 Claims. (Cl. 299—88)

This invention relates to spraying devices or atomizers of the character employed for insecticides or similar liquids, and the object of the invention is to provide means by which the spraying action of such devices will be greatly improved without increasing the manufacturing cost of the sprayers.

In the patent to Fitch, No. 1,891,325, dated December 20th, 1932, is shown a type of sprayer over which the present invention is an improvement. In that patent the desirability of forming a suction or siphon tube with aligned apertures or openings of different diameters is pointed out. The present invention relates to further improving a structure of the character shown, by a novel formation of the aligned suction or siphon tube openings whereby greatly improved spraying performance is attained.

More particularly, the invention contemplates the provision of a suction or siphon tube having an outer large opening and an aligned inner smaller opening, both of said openings being preferably simultaneously formed by operation of a conical-ended punch or similar tool, the formation of said aligned openings resulting in the displacement of portions of the metal body of the tube, to cause said displaced portions to form annular, frustro-conical walls thereby causing the aligned spray openings to be of increased length or depth without requiring the utilization of metal of increased thickness for the formation of the suction or siphon tube. This has been found by actual test to greatly improve the atomizing or spraying action of the device.

In the accompanying drawing, wherein an embodiment of the invention is shown, Fig. 1 is a sectional view of the end of a spraying device, showing the formation of the aligned spray openings; Fig. 2 is a front elevation of the upper portion of the suction or siphon tube; Fig. 3 is a sectional view on the line 3—3 of Fig. 1, looking in the direction of the arrows; and Fig. 4 is a sectional view of the upper portion of a spray or siphon tube, showing the manner in which the aligned spray openings are simultaneously formed by a conical-ended punch or similar tool.

In the drawing 10 indicates an elongated cylinder of the kind commonly employed in spraying devices of this character, said cylinder containing the conventional piston to which is secured the operating rod and attached handle. The forward end of cylinder 10 is closed by the cupped head 11 formed with the central aperture 16 through which an air blast is forced by movement of the piston within cylinder 10.

The suction or siphon tube 12 is shown as being of substantially rectangular form in cross section so as to provide a front wall 7 and a rear wall 8. This tube has its lower portion disposed within a fluid receptacle or tank, not shown, but secured to the lower front portion of the cylinder 10 in the conventional manner. The upper portion of the suction or siphon tube is disposed in front of the air outlet 16 in the head 11, as clearly shown in Fig. 1, said upper portion of the tube being secured to the head 11 by means of solder 9 or any suitable equivalent means.

The top end of the tube 12 is closed as indicated at 13, and below the closed top end 13 there is provided transversely through the front wall 7 of the tube, a spray-discharge opening 14. In the rear wall 8 of the tube there is provided an air blast opening 15, located in horizontal alignment with the opening 14 and also in alignment with the air discharge outlet 16. The three openings 14, 15 and 16 are provided in horizontal axial alignment, and the central opening 15 is preferably smaller than those shown at 14 and 16, the advantages of such an arrangement of differently sized openings being fully pointed out in the patent to Fitch, No. 1,891,325, herein referred to.

According to the present invention, the aligned openings 14 and 15 in the walls 7 and 8 of tube 12 are so formed that an annular, frustro-conical wall portion or flange extends rearwardly from each of said openings. Said wall portion or flange is shown extending rearwardly in the tube from opening 14 as at 17 and a similar wall portion 18 extends rearwardly from the opening 15. The air outlet 16 can also be formed, if desired, with a similar wall portion or flange as shown at 19. The aligned openings 14 and 15 in tube 12 can be simultaneously and accurately formed by the use of a conical-ended punch or similar tool, such as shown at 20 in Fig. 4. A blow of the punch not only forms both openings simultaneously and in proper alignment, but it forms them automatically of proper relative size, with that shown at 15 smaller than that shown at 14. By the formation of these openings in the manner just described, the metal of the tube walls is displaced and forced rearwardly or laterally of the tube walls to produce the desired annular walls or flanges 17 and 18 which project from the respective openings 14 and 15. The formation of these walls or flanges 17, 18, 19 causes what would be a normally shallow opening in the relatively thin walls of the tube and head 11 to become greatly

increased in depth and to assume conical formation for its depth. This arrangement is attained without the use of heavier metals for the formation of the tube and head 11 and exhaustive tests show that a very great increase in spraying efficiency results when the openings are formed as described.

While I have herein suggested the formation of the openings 14 and 15 by certain methods of manufacture, it will be understood that other methods may also be followed to produce the desired structure, without departing from the spirit of the invention. I have also shown the walls 7 and 8 of the tube 12, as well as the head 11, each provided with a single opening, and wish to be understood as not limiting my invention thereto, as it will be readily understood that these elements may be provided with several openings, and other changes may be made within the scope of the invention as comprehended by the annexed claims.

What I claim is:

1. In a sprayer of the character described, a siphon tube having aligned openings one of which constitutes a spray opening and the other an air blast opening, one of said openings being larger than the other, each of said openings being surrounded by a conical flange portion extending laterally from the walls of the tube body, both of said flanges extending in the same direction.

2. In a sprayer of the character described, a siphon tube having aligned openings extending transversely through it, the metal displaced out of said openings by the formation of the same constituting an annular, conical flange extending laterally from each opening, said flanges on the openings extending in the same direction.

3. In a sprayer of the character described, a cylinder having an end member, said end member being provided with an airblast opening, the metal displaced out of said opening by the formation of the same forming an annular conical flange extending rearwardly from the opening, a siphon tube having an end portion located in front of said opening, said tube having walls formed with aligned openings in registration with the opening in the cylinder end member, the tube openings having rearwardly extending conical flange portions consisting of metal displaced from the tube walls.

4. In a sprayer of the character described, a siphon tube having a pair of aligned openings extending through its walls, one of said openings being formed with a conical, annular flange extending around it and projecting rearwardly from it and located within the tube, the other opening having a similar flange extending laterally from the tube wall in which it is formed and projecting externally of the tube, one of said openings being larger than the other.

5. In a sprayer of the character described, a siphon tube having aligned spray openings, one of said openings being larger than the other, each of said openings being defined by a conical, annular wall portion composed of metal distorted laterally from the tube walls whereby the effective depth of each of said openings is greater than the thickness of the metal of which the walls of the tube are made, the smaller end of one of the openings being directed toward the larger end of the other opening.

WILLIAM MARTIN VOGEL.