

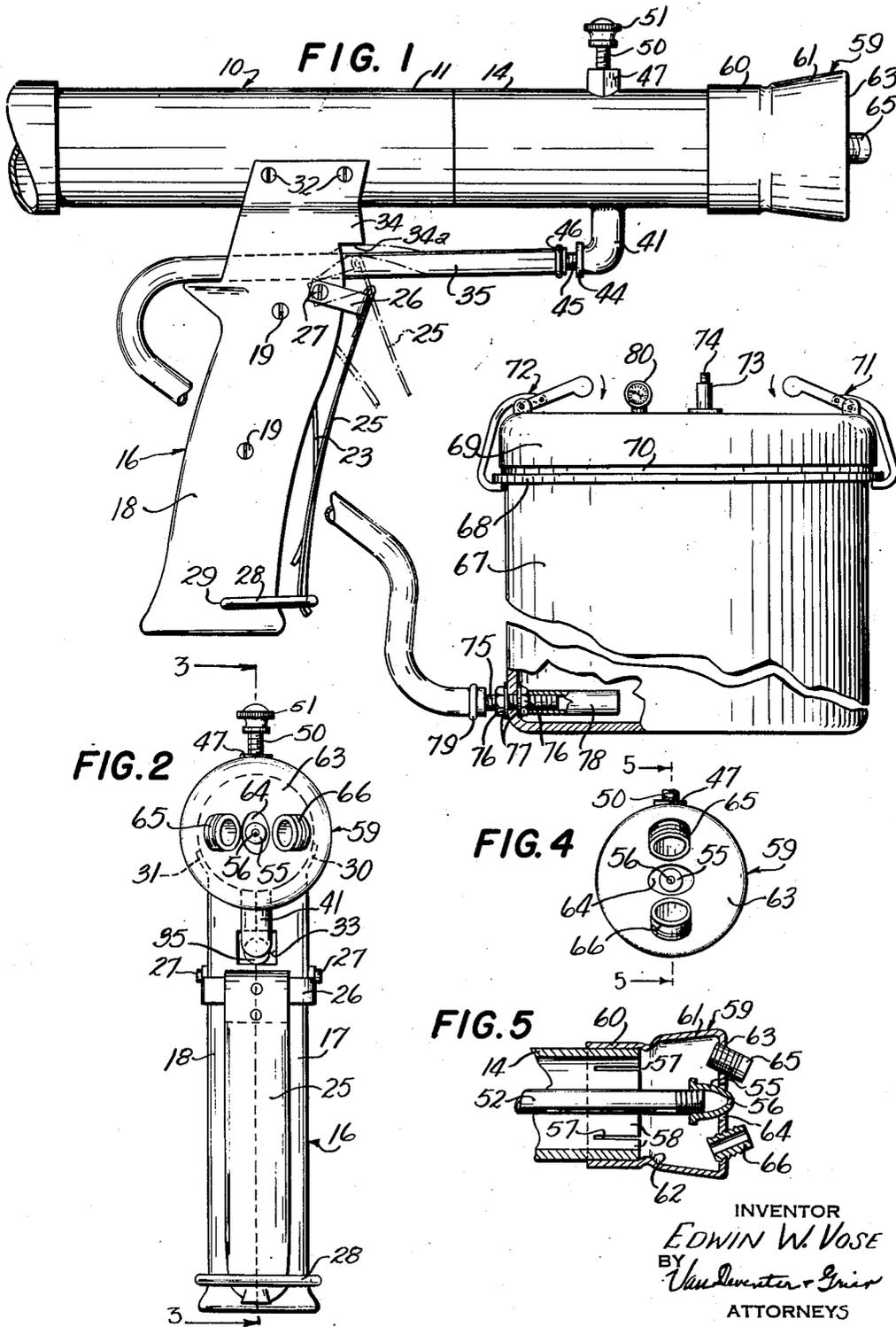
Aug. 11, 1953

E. W. VOSE  
LIQUID SPRAYER

2,648,569

Filed June 24, 1947

2 Sheets-Sheet 1



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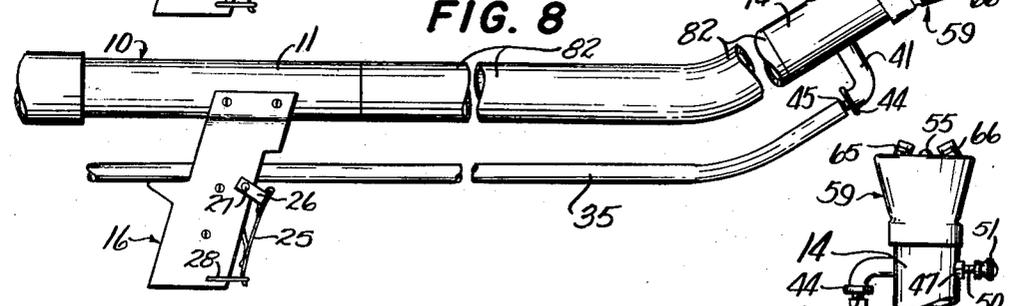
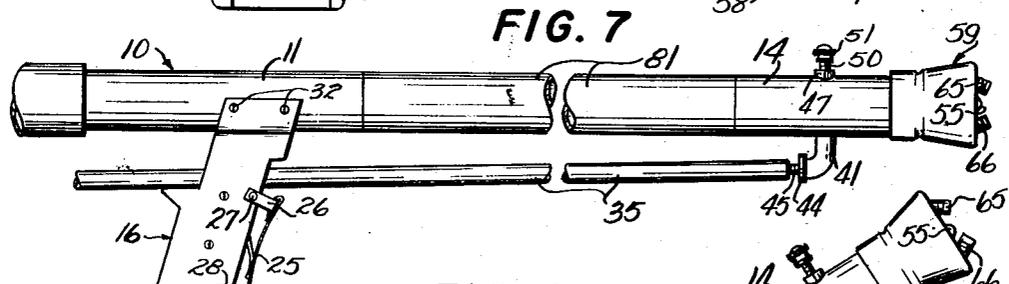
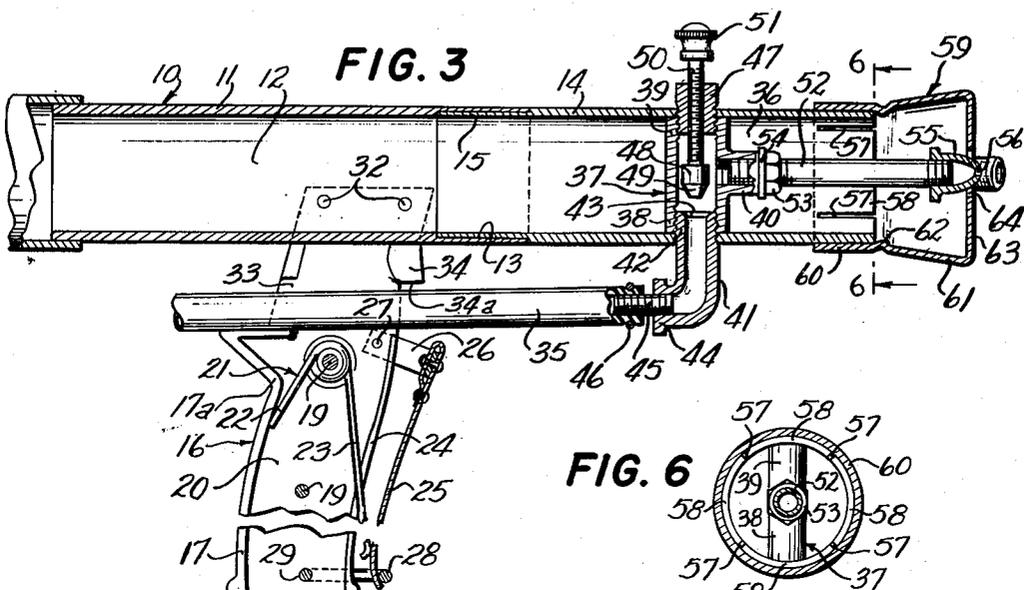
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2 Sheets-Sheet 2



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## LIQUID SPRAYER

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4 Claims. (Cl. 299—86)

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This invention relates to liquid sprayers and has for an object the provision of a liquid sprayer in which the liquid to be sprayed is delivered to the gun via a flexible tube passing through the handle of the sprayer and in which is releasable spring load lever on the handle pinches the flexible tube and cuts off the supply of liquid to the gun.

Another object of the invention is the provision of a spray gun of the character described wherein the spray nozzle of the gun is remote from the operator.

A further object of the invention is to provide manually operated liquid control means that will completely close against the flow of liquids which are impregnated with fibrous and/or granular materials.

In building construction, and particularly in partially or pre-fabricated buildings, the floors may be formed of a composition which requires several days to set sufficiently to be walked upon. According to the present invention the walls and ceilings of such structure may be painted from outside of the building, via the windows, doors, or other openings therein without the necessity of constructing any scaffolding.

According to the present invention my new and improved spray gun is made sectional so that extensions may be inserted between the portion of the gun to which the handle is attached, and the end portion of the gun which carries the "business end" of the sprayer. In one such arrangement a straight tube is inserted between the handle portion and the nozzle portion of the gun. In another form the inserted portion may be bent so that the axis of one part of it is angular with respect to the axis of the other part of it. For example, an angle of 30° has been found to be convenient.

Another form of the invention contemplates the provision of a pipe between the handle portion of the gun and the nozzle portion of the gun which is bent through an angle of as much as 90°. These inserted sections of the spray gun may be of a convenient length to enable the worker to position the spray end of the gun the proper distance from the surface being painted. In some instances the length of the inserted portion may be as much as fifteen, twenty, or even twenty-five feet, and it is my opinion that the length is only limited by the ability of the workman to properly handle the gun.

The invention also contemplates painting the roofs of buildings without the necessity of building scaffolding. Instead, the workman may

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stand on the ground and do the job more expeditiously and more efficiently.

Referring to the drawings, which are given by way of example:

Figure 1 is a side elevation of my new and improved spray gun showing the flexible conduit leading from a pressure vessel containing the fluid to be sprayed, to the nozzle portion of the spray gun, said conduit passing through the handle of the gun and adapted to be pinched off or opened by the operator;

Figure 2 is an elevation of my new and improved spray gun as viewed from the right end of Figure 1;

Figure 3 is a sectional elevation of the spray gun shown in Figure 1;

Figure 4 is an end view of the thimble positioned on the end of the nozzle portion of the spray gun and turned through an angle of 90° from the position shown in Figure 2;

Figure 5 is a fragmentary view in section taken along the lines 5—5 of Figure 4;

Figure 6 is a sectional elevation taken along the lines 6—6 of Figure 3;

Figure 7 is a diagrammatic view showing the air tube of the spray gun of Figure 1 separated and a straight extension inserted therebetween;

Figure 8 is similar to Figure 7 except that the extension positioned between the handle end of the air tube and the nozzle has one portion at an angle of approximately 30° with respect to its main portion; and

Figure 9 is similar to Figures 7 and 8 except that the extension between the spray gun elements is a tubular conduit with one portion at an angle of 90° with respect to the other portion.

Referring first to Figures 1 and 3, the spray nozzle generally designated by the numeral 10, includes a straight tubular portion 11 having a passage 12 therethrough. The tubular portion 11 has an interior counterbore 13 formed in one end thereof. The nozzle 10 also includes a tubular portion 14, the left end 15 of which is reduced in diameter to form a working fit in the counterbore 13 and, therefore, the nozzle may be readily separated and extensions positioned therebetween as will hereinafter be described in connection with Figures 7, 8, and 9.

The portion 11 has secured thereto a handle generally designated by the numeral 16 which consists of a right portion 17 and a left portion 18 which are secured together in any suitable manner; for example, by means of screws 19, leaving therebetween a hollow interior 20 in which is mounted a spring 21, a short leg 22

of which bears against the wall 17a, and a long leg 23 of which extends through a slot 24 in the handle and bears against a lever 25 which is secured to a bifurcated yoke 26 which is pivotally secured to the handle near the upper end thereof by means of screws 27. A wire yoke 28, which may be in the form of a U, has its ends extending into holes 29 in the handle near the lower end thereof and consequently is pivotally secured to the handle. This yoke is provided so that the workman can force the lever 25 towards the handle 16 and then swing the yoke 28 upwardly to engage the lower end of the lever and thus retain it.

The handle 17 (Figure 2) has a curved web 30 partially embracing the nozzle portion 11 and secured thereto by screws. Likewise the handle portion 18 has a web extension 31 similar to the extension 30 which is also secured to the tube portion 11 by means of screws. These screws are designated by the numeral 32 in Figure 1. A rectangular passage 33 is formed in the handle 16, and a hose or other flexible conduit 35 passes through the passage 33 adjacent to a boss 34 formed in the handle, and is connected to the nozzle portion of the spray gun which will presently be described. When the workman squeezes on the lever 25 to release the yoke 28, allowing the latter to swing downwardly, the lever 25 is unlocked and when the workman releases the lever 25 it, under the urge of the spring 21, swings in a counterclockwise direction about the screws 27 as a fulcrum, and the upper end of the lever 25 presses the hose or the conduit 35 against the boss 34 and, thereby, prevents the passage of any fluid through the hose.

The nozzle portion of the gun, as stated above, includes the tubular portion 14, the end of which telescopes into the portion 11. Positioned within the tubular passage 36 in the portion 14 is a T fitting 37 which has legs 38, 39, and 40. The legs 38 and 39 have their axes in alignment and disposed at an angle of 90° with respect to the axis of the portion 14, while the leg 40 has its axis preferably concentric with the passage 36 in the tubular portion 14 and extending toward the right end thereof as viewed in Figure 3.

Threadedly engaging the leg 38 is an elbow 41, the upper end 42 of which has a valve seat 43 formed thereon. The lower end 44 of the elbow has a nipple 45 mounted therein and over which the end of the hose 35 fits. A clamp 46 embraces the end of the hose and firmly secures it to the nipple 45.

Threadedly engaging the leg 39 of the T 37 is a plug 47 which has a threaded hole formed therein. A valve member 48 has a beveled face 49 which is adapted to engage the seat 43. The valve 48 is carried on and is preferably formed integral with a screw shank 50 which threadedly engages the threaded hole in the plug 47. The screw shank 50 may carry on its upper end a knurled knob 51 and by means of this knob the valve 48 may be propelled toward or away from the seat 43 and thus the flow of the fluid to be sprayed may be regulated.

A nipple 52 has its left end, as viewed in Figure 3, threadedly engaging the threaded hole in the interior of the leg 40. A lock nut 53 is provided for locking the nipple in position on the leg 40 of the T, and a gasket 54 is provided for maintaining a seal therebetween. A tip 55 threadedly engages the right end of the nipple 52 and may have formed therein one or more holes or perforations 56. The right end of the

portion 14 has a plurality of longitudinal slots 57 formed therein whereby the portions 58 therebetween are springy and, therefore, firmly engage and hold attachments applied on said end.

Positioned on the right end of the portion 14 is a thimble member 59 which has a straight tubular portion 60 overlying and springingly engaged by the sectors 58, and a frustoconical portion 61 with an integral inwardly extending bead 62 therebetween. The end or head 63 of the thimble has an oval or elliptical opening 64 centrally located therein through which the end of the tube 55 extends.

The head 63 of the thimble also has oppositely disposed tubes 65 and 66 mounted therein. These tubes are angular with respect to the axis of the spray leaving the tip 55 through the orifice means 56, and since the passages within these tubes communicate with the air in the nozzle the spray leaving the gun instead of being conical, is in the form of an ellipse due to the action of the air passing through the elliptical hole 64, and due to the lateral action of air thereon via the tubes 65 and 66. The spray leaving the gun when the thimble 59 is positioned as shown in Figure 2, will be deposited on the surface in the form of a long, narrow, vertical swath. When the thimble is in the position shown in Figure 1, the spray is deposited on the surface being sprayed in the form of a long, narrow, horizontal swath.

Returning to Figure 1, the liquid to be sprayed may be placed in a vessel 67 remote from the spray gun. The vessel 67 may have a flange 68 at the top thereof, and a cover 69 is positioned thereon with a gasket 70 therebetween, and a seal may be effected by movement of the clamping members 71 and 72 in the direction of the arrows. Mounted in the cover is means to be connected to a source of air under pressure; for example, a valve 73 mounted in the cover 69 communicates with the interior of the vessel and has a portion 74 adapted to be connected to a pump or any other convenient source of air under pressure. The vessel 67 has mounted in the wall thereof, adjacent to the bottom, a nipple 75 which may be secured in sealed relation with said wall by means of nuts 76 inside and outside of the vessel with suitable gaskets 77 between each nut and said wall. An open ended pipe 78 may threadedly engage the threads of the nipple 75 extending into the vessel. Outside of the vessel the hose 35 may be pressed over the end of the nipple 75 and may be tightly secured thereon by means of a clamping device 79. A suitable pressure gage 80 mounted on the cover 69 is provided to indicate the internal pressure in the vessel.

The vessel may be loaded with the liquid to be sprayed, the cover may be placed thereon and sealed thereto by means of the clamps 71 and 72 and the vessel connected to a source of pressure; however, before subjecting the vessel to the air pressure the lever 25 is released in the manner hereinbefore described and will assume the position shown in dot-dash lines in Figure 1; thus the hose 35 is clamped between the upper end of the lever 25 and the flat surface 34a of the boss 34 so that no fluid may reach the nozzle. Then after subjecting the interior of the container 67 to pressure the operator may decide whether he wants to apply the spray in long horizontal or vertical swaths. If he wishes the material to be applied in vertical swaths he turns the thimble 59 to the position shown in Figure 2, or if he wishes the swaths to be horizontal he

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turns the thimble to the position shown in Figure 4. Then holding the gun a proper distance from the work he may grasp the lever 25 and force it toward the handle 16 and may then swing the yoke 23 to retain the lever 25 in this position and the liquid will be delivered to the gun continuously and uniformly until the operator wishes to stop the flow of the fluid in which event he releases the lever 25 and allows it to assume the dot-dash position shown in Figure 1.

In Figure 7 the portions 11 and 14 of the spray gun are separated and a straight tubular extension 31 is positioned therebetween. The left end of the extension has a portion of reduced diameter like the portion 15 which forms a working fit in the counterbore 13 formed in the tubular portion 11. This is not shown in Figure 7, but it is similar to the arrangements shown in Figure 3. The right end of the extension 31 has a counterbore formed therein similar to the counterbore 13 formed in the tubular portion 11 and illustrated in Figure 3. The extension 31 may be of any desired length; for example, suppose it is desired to paint the walls of a room from outside the doors or windows thereof, the length of the extension 31 would be sufficient to enable the worker from outside the door or window to position the nozzle end of the gun the proper distance from the surface to be sprayed.

Figure 8 is similar to Figure 7 except that a tubular extension 32 is inserted between the portion 11 and the portion 14, and this extension near the right end thereof has its axis forming an angle of approximately 30° with the axis of the left portion thereof. The tubular extension 32 having its right end angular as described may be adjusted by the operator relative to the axis of the tubular portion 11 so as to direct the spray from the nozzle end of the portion 14 upwardly, laterally, or downwardly, and, thereby obtain a great degree of flexibility.

The arrangement shown in Figure 9 is similar to that shown in Figures 7 and 8, the main difference being that a tubular extension 33 is inserted between the portions 11 and 14 and this tubular extension has the axis of its right end 33a forming an angle of substantially 90° with the axis of the straight portion 33b.

In the prior art many attempts have been made to provide valving means which will completely cut off the flow of liquids which carry aggregates; for example, liquids which have fibrous or granular materials, or both, therein. I have found that my method of clamping the flexible conduit (35, for example) between the anvil or flat surface 34a and the upper end of the lever 25 squeezes the walls of the conduit together and thereby completely cuts off the flow of liquid to the nozzle of the gun. The walls of the flexible conduit in the clamped area appear to close in about any granular or fibrous material lodged therebetween at the time the walls are clamped together and actually contact the opposite wall and effectively forms fluid-tight contact with said opposite wall and thereby completely cuts off the flow of liquid.

From the above it will be seen that applicant's new and improved spray gun with the extensions 31, and/or 32 and 33, provides a tool by means of which a house may be painted both outside and inside, and including the roof without the necessity of erecting scaffolds and without even entering the house itself. It will be understood that where the extensions are employed the hose or flexible conduit 35 is of sufficient length to ex-

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tend from the nipple 45 on the portion 14 to the nipple 75 on the vessel 67.

Although I have herein shown and described my new and improved spray gun and several attachments therefor, it is obvious that many changes may be made in the arrangements herein shown and described, within the scope of the appended claims:

What is claimed is:

1. In a liquid sprayer, a straight air tube adapted to be connected to a source of air having a low pressure of substantial volume, a spray nozzle in said tube adjacent to the discharge end thereof and having a liquid connection extending through the wall of said tube, a handle secured to said tube and having a passage there-through substantially parallel to said tube, said handle having a boss portion extending beyond said passage in the direction of said spray nozzle. a flexible conduit extending from a source of liquid under pressure and via said passage to said liquid connection, a lever having secured thereto a bifurcated yoke pivotally connected to said handle, and spring means for normally urging said lever in direction away from said handle, thereby causing the end of said lever to pinch said flexible conduit against said boss and thereby prevent said liquid from being delivered to said spray nozzle.

2. A liquid sprayer according to claim 1, in which a wire yoke generally in the form of a U has its ends pivoted on said handle near the lower end thereof, said yoke being adapted to be swung upwardly to engage the lower end of said lever after a workman has swung the latter toward said handle in order to disengage the upper end of said lever from said flexible conduit and retain said lever in its disengaged relation with said conduit when it is desired to have liquid flow to said nozzle.

3. In a liquid sprayer, an air tube comprised of at least two portions separably connected together, said connection being intermediate the ends thereof, one of said portions being adapted to have a source of air having a low pressure and of substantial volume connected to the end thereof, a handle secured to said portion near the inlet end thereof and having a passage there-through substantially parallel to said portion, a spray nozzle mounted in the other portion adjacent to the discharge end thereof and having a liquid connection extending through the wall thereof, a flexible conduit connected to said liquid connection and extending via said passage in said handle to a source of liquid under pressure, and means carried on said handle and consequently under control of an operator for clamping said flexible conduit when it is desired to interrupt the flow of fluid to said sprayer and for unclamping said conduit when the flow of fluid to said sprayer is to be reestablished, said portions of said air tube being separated, and a length of conduit inserted between and joining said portions, said conduit being adapted to deliver air from said first mentioned portion to said second mentioned portion and to thereby cause said sprayer to spray with said nozzle remote from the operator.

4. In a liquid sprayer, an air tube comprised of at least two portions separably connected together, said connection being intermediate the ends thereof, one of said portions being adapted to have a source of air having a low pressure and of substantial volume connected to the end thereof, a handle secured to said portion near

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the inlet end thereof and having a passage therethrough substantially parallel to said portion, a spray nozzle mounted in the other portion adjacent to the discharge end thereof and having a liquid connection extending through the wall thereof, a flexible conduit connected to said liquid connection and extending via said passage in said handle to a source of liquid under pressure, and means carried on said handle and consequently under control of an operator for clamping said flexible conduit when it is desired to interrupt the flow of fluid to said sprayer and for unclamping said conduit when the flow of fluid to said sprayer is to be reestablished, said portions of said air tube being separated, and a length of conduit interconnected between said portions, said conduit having a portion of its length coinciding with the axis of said first portion of said air tube and having another portion, the axis of which is angular with respect to the axis of said first portion and coinciding with the axis of said second portion of the tube.

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