

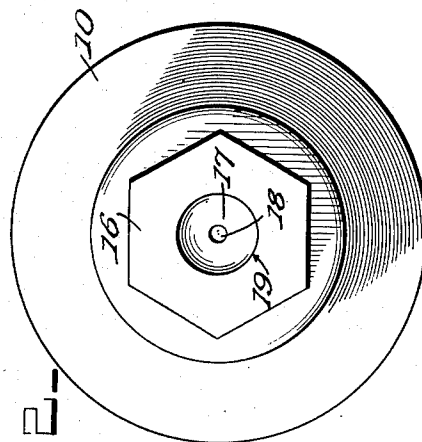
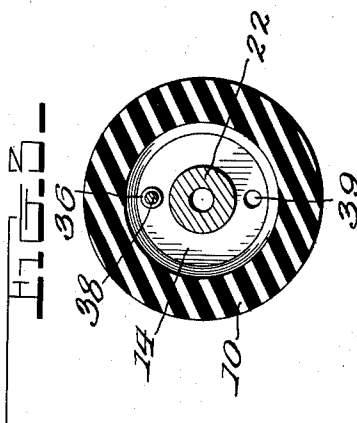
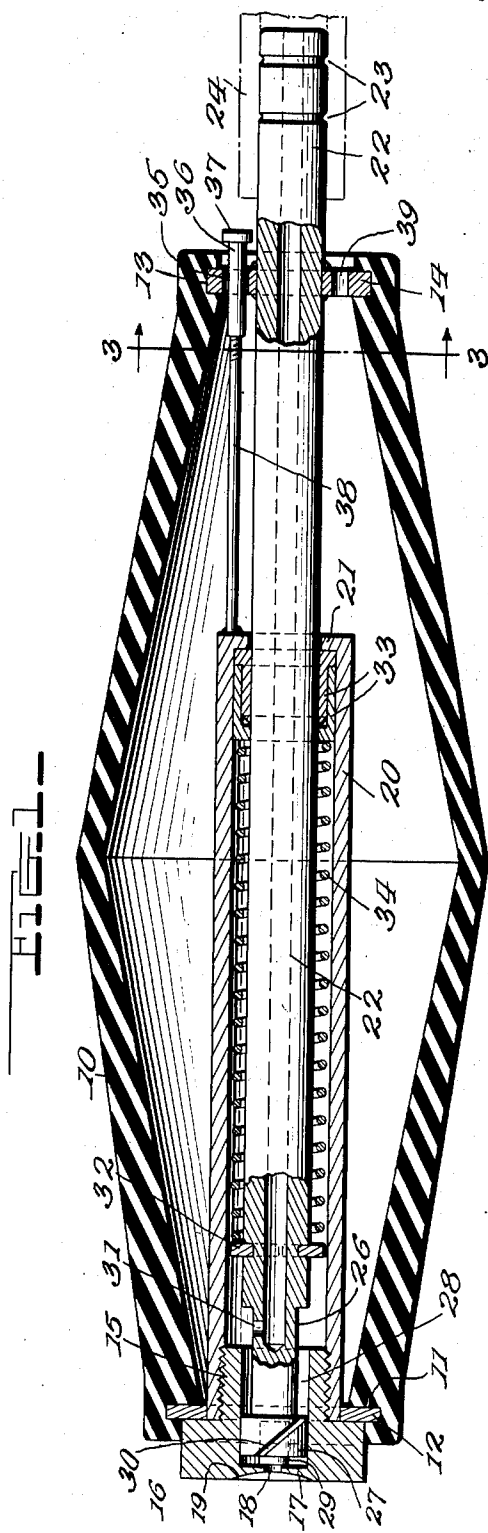
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SPRAY GUN

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SPRAY GUN

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This invention relates to spray guns and has special reference to a valve control for spray nozzles.

In the usual types of valve control for the nozzles of spray guns, some form of inflexible leverage is common. In one of such forms the gun has the general appearance of a pistol, and the trigger of the pistol effects opening of the nozzle valve when pulled and acts to permit closing of such valve when released. Another form, sometimes called a squeeze type, has a lever extending along one side of the gun in such position that upon the gun being gripped in a hand and the hand squeezed, the valve of the gun will open but upon relaxation of the hand the valve will close. Each of these forms is quite complicated and requires a number of linkage members to be interposed between the valve and a manual operating lever such as the trigger or squeeze lever above mentioned.

One important object of this invention is to provide a novel spray gun construction having a nozzle control operating means of improved and simplified character.

Another important object of the invention is to provide a valve control for the nozzles of spray guns wherein such control will be free from any linkage or lever arrangement.

A further object of the invention is to provide a novel spray gun having a body which is itself compressible and wherein the spray nozzle control valve is actuated by the compression and expansion of said body.

Still another object of the invention is to provide, in a spray gun, a hollow elastically deformable body the change of shape of which will control the operation of the nozzle controlling valve of the gun.

With the above and other objects in view, as will be presently apparent, the invention consists in general of certain novel details of construction and combinations of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly claimed.

In the drawings, like characters of reference indicate like parts in the several views, and

Figure 1 is a view taken diametrically through this invention, the view being partly in section and partly in elevation;

Figure 2 is an end view of the invention taken from the left hand in Figure 1; and

Figure 3 is a section on the line 3-3 of Figure 1.

In the embodiment of the invention as here shown, the hollow body 10 of the spray gun is

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preferably formed of rubber of such hardness and elasticity as to maintain its shape unless laterally compressed and regain its shape after release from such compression. The body may also be formed of synthetic material or the like having like properties. The body 10 is of tubular spindle shape, and the wall of this body is thinner at the centrally disposed part of greatest diameter and gradually increases in thickness to each end portion. At one end portion of the body 10 there is provided an internal groove 11 wherein is fitted the periphery of a washer 12. At the other end portion of the body is an internal groove 13 wherein is fitted the periphery of a washer 14. Extending through the washer 12 is an externally threaded sleeve 15 having a hexagonal head 16 formed on its outer end. The outer end of the sleeve is closed by a diaphragm 17 having a small spray opening 18. A cup-like depression 19 is formed in the outer face of the head 16 and surrounds the opening 18. Screwed on the sleeve 15 is a tubular housing 20 having at its inner end an internal flange 21.

Extending through the washer 14 and fixed thereon and slidable through the flanged end 21 is a supply tube 22 for the liquid to be sprayed. The outer end of the tube 22 is grooved as at 23 or otherwise adapted for connection to a suitable hose 24 shown by dotted lines and leading from a tank or the like (not shown). The end of the tube 22 adjacent the sleeve 15 is reduced as at 26 and carries a piston or head 27 which fits in the sleeve 15. The reduced portion 26 is spaced from the inner wall of the sleeve to provide an annular channel or passage 28. Projecting from the head 27 is a boss 29 forming a valve for controlling the opening 18, and this boss also spaces the head 27 from the diaphragm 17. One or more diagonal or spiral grooves 30 are formed in the cylindrical surface of the head 27 and afford not only communication between the passage 28 with the space surrounding the valve boss 29 but cause, when the valve is open, a violent whirling of the liquid in that space to effect breaking of the liquid into a multiplicity of fine drops. The tube 22 is closed at its reduced end but a lateral port 31 opens through the wall of the reduced portion, thus affording communication between the interior of the tube and the passage 28. Surrounding the tube 22 near its reduced end is a groove wherein is fitted a snap ring 32. Resting against the inner face of the flange 21 and fitting tightly in the housing 20 and on the tube 22 is a packing box 33. A coiled

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compression spring 34 surrounds the tube 22 within the housing 20 and bears at one end against the ring 32 and at its other end against the packing box 33. This spring is under sufficient tension to keep the valve 29 normally closed.

An opening 35 is provided in the washer 14 and through this opening extends a sleeve nut 36 having a head 37 on its outer end forming a nut rotating means and a stop for limiting the movement of the nut inwardly. A rod 38 has one end welded to the housing 20 and its other end threaded and engaged in the nut 35.

In order to permit flow of air out of and into the body 10 the washer 14 is also provided with a vent port 39.

In the operation of this device it is to be remembered that rubber, like a liquid, has the peculiar property of being bodily incompressible to any appreciable degree. That is to say, that if a rubber article is deformed by pressure in one direction it must expand in another direction, usually at right angles to the stress line of the deforming pressure. Thus, in the present instance, a pressure exerted circumferentially about the central portion of the body 10 will tend to increase the thickness of this part of the body wall and thus will cause longitudinal expansion of the body. As previously described, one end of the body is closed except for a small central opening for the escape of spray. Secured to the other end of the body 10 is a supply tube carrying a valve normally closing this spray opening. Consequently, to open this valve it is merely necessary to grip the middle of the body in one's hand and compress the same by squeezing. This will cause the valve 29 to move away from the diaphragm 17 leaving the opening 18 free for emission of fluid in a spray. Upon releasing the hand pressure the natural resilience of the body aided by the spring 34 will restore the ends of the body to normal position and seat the valve on the diaphragm.

While there is herein shown and described the preferred embodiment of the invention, it is nevertheless to be understood that minor changes may be made therein without departing from the spirit and scope of the invention as claimed.

What is claimed is:

1. In a spray gun, an elongated tubular body of rubber-like material, said body being longitudinally extensible when circumferentially compressed, a pair of washers located one at either end of said body, a spray nozzle secured to one of said washers, a rigid fluid supply tube secured to the other washer and extending through said washer into said body, a normally closed valve for controlling the supply of fluid from said tube to said nozzle, one coacting member of said valve being fixed to said nozzle and another such member being fixed to said tube, a housing sealed at its outer end to said nozzle and having its inner end surrounding said tube, and a stuffing box located between said housing inner end and said tube and permitting relative movement therebetween for confining the flow of fluid between said tube and said nozzle and keeping the fluid out of contact with said body, whereby neither the dimensions nor the compressibility of said body are substantially affected by the fluid pressure and whereby said washers are supported at a normal longitudinal spacing corresponding to valve closure when the body is free and said washer spacing is increased to open said valve when the body is compressed.

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2. A spray gun as claimed in claim 1 in which said valve is normally held closed by a coil spring encircling said fluid supply tube.

3. A spray gun as claimed in claim 1 in which said body is of spindle shape having its wall gradually increasing in thickness from its center toward each end.

4. In a spray gun, an elongated tubular body of rubber-like material, a closure at one end of the body having a spray opening therein, a second closure for the remaining end of the body, a valve within the body normally closing said spray opening, said first mentioned closure including a sleeve extending into said body, a fluid supply tube extending through and fixed in said second closure, said tube having a reduced end entering said sleeve, said valve being fixed to said reduced end, and a head carried by said reduced end and fitting in said sleeve, said head being provided with peripheral grooves extending between its end faces.

5. In a spray gun, an elongated tubular body of rubber-like material, a closure at one end of the body having a spray opening therein, a second closure for the remaining end of the body, a valve within the body normally closing said spray opening, said first mentioned closure including a sleeve extending into said body, a fluid supply tube extending through and fixed in said second closure, said tube having a reduced end entering said sleeve, said valve being fixed to said reduced end, a head carried by said reduced end and fitting in said sleeve, said head being provided with peripheral grooves extending between its end faces, and a housing surrounding a portion of said tube and fixed at one end to said sleeve and having an internal flange at its other end slidably engaging said tube, said tube having a lateral port opening into said housing.

6. In a spray gun, an elongated tubular body of rubber-like material, a closure at one end of the body having a spray opening therein, a second closure for the remaining end of the body, a valve within the body normally closing said spray opening, said first mentioned closure including a sleeve extending into said body, a fluid supply tube extending through and fixed in said second closure, said tube having a reduced end entering said sleeve, said valve being fixed to said reduced end, a head carried by said reduced end and fitting in said sleeve, said head being provided with peripheral grooves extending between its end faces, a housing surrounding a portion of said tube and fixed at one end to said sleeve and having an internal flange at its other end slidably engaging said tube, said tube having a lateral port opening into said housing, a stuffing box fitted in said housing against said flange, a collar fixed on said tube and spaced from said box, and a compression spring surrounding said tube between said box and collar.

7. In a spray gun, an elongated tubular body of rubber-like material, said body being of spindle shape and having its wall gradually increasing in thickness from its center toward each end, a closure at one end of the body having a spray opening therein, a second closure for the remaining end of the body, a valve within the body normally closing said spray opening, said first mentioned closure including a sleeve extending into said body, a fluid supply tube extending through and fixed in said second closure, said tube having a reduced end entering said sleeve, said valve being fixed to said reduced end, and a head carried by said reduced end and fitting

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in said sleeve, said head being provided with peripheral grooves extending between its end faces.

8. In a spray gun, an elongated tubular body of rubber-like material, said body being of spindle shape and having its wall gradually increasing in thickness from its center toward each end, a closure at one end of the body having a spray opening therein, a second closure for the remaining end of the body, a valve within the body normally closing said spray opening, said first mentioned closure including a sleeve extending into said body, a fluid supply tube extending through and fixed in said second closure, said tube having a reduced end entering said sleeve, said valve being fixed to said reduced end, a head carried by said reduced end and fitting in said sleeve, said head being provided with peripheral grooves extending between its end faces, and a housing surrounding a portion of said tube and fixed at one end to said sleeve and having an internal flange at its other end slidably engaging said tube, said tube having a lateral port opening into said housing.

9. In a spray gun, an elongated tubular body of rubber-like material, said body being of spindle shape and having its wall gradually increasing in thickness from its center toward each end, a closure at one end of the body having a spray opening therein, a second closure for the remaining end of the body, a valve within the body normally closing said spray opening, said first mentioned closure including a sleeve extending into

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said body, a fluid supply tube extending through and fixed in said second closure, said tube having a reduced end entering said sleeve, said valve being fixed to said reduced end, a head carried by said reduced end and fitting in said sleeve, said head being provided with peripheral grooves extending between its end faces, a housing surrounding a portion of said tube and fixed at one end to said sleeve and having an internal flange at its other end slidably engaging said tube, said tube having a lateral port opening into said housing, a stuffing box fitted in said housing against said flange, a collar fixed on said tube and spaced from said box, and a compression spring surrounding said tube between said box and collar.

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