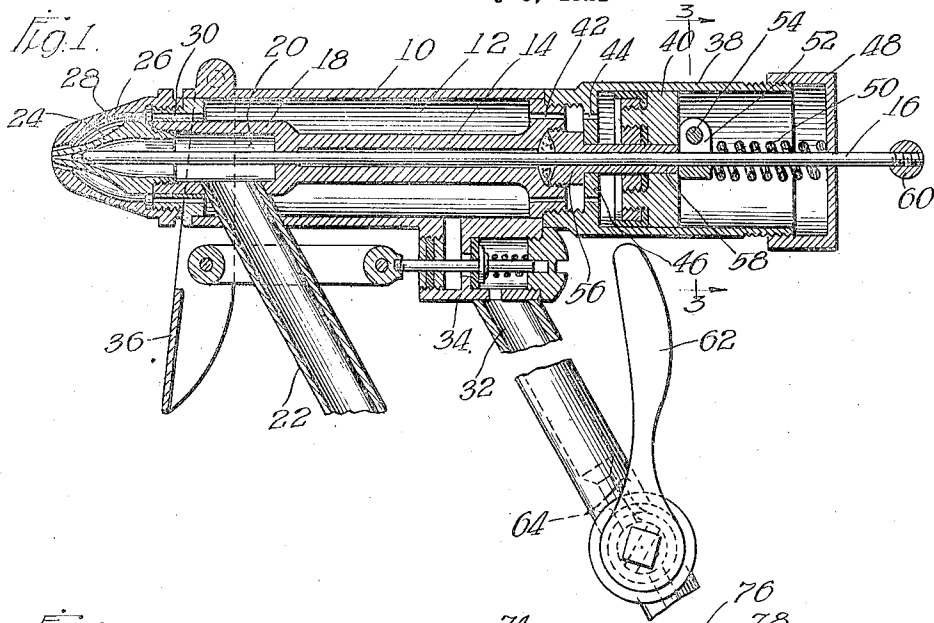
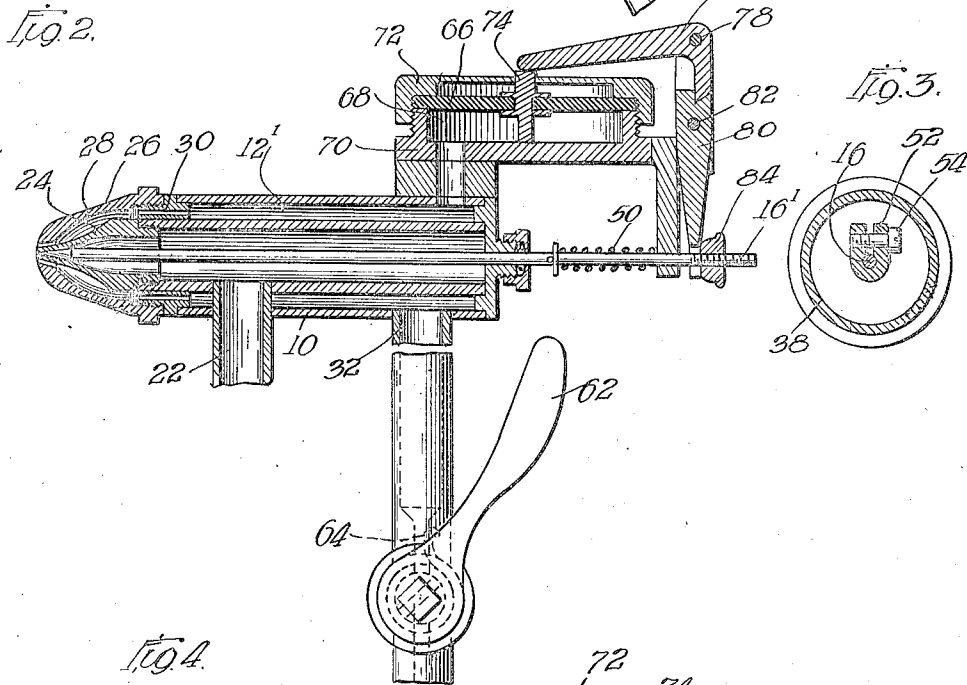
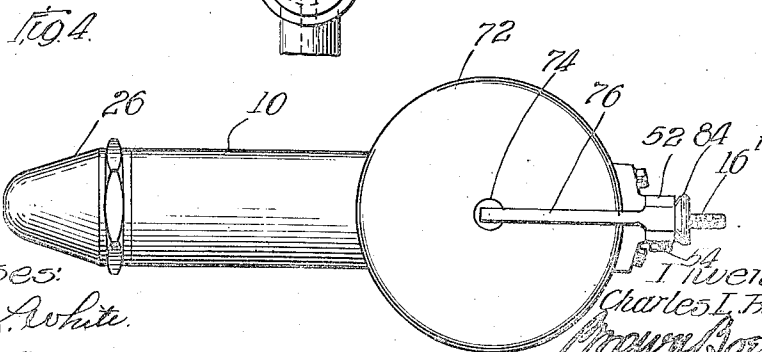


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C. L. BURDICK
PNEUMATIC SPRAYING APPARATUS

Filed May 6, 1921



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PNEUMATIC SPRAYING APPARATUS.

Application filed May 8, 1921. Serial No. 487,283.

My invention relates to pneumatic spraying apparatus, and more particularly to an improvement in the control means for such apparatus, whereby control from a distance is made much simpler, and whereby also an improved functioning of the atomizing elements is obtained, especially when the operation of the brush is being started or interrupted.

One object of my invention is to provide simple means for controlling the operation of an air brush from a distance by means of a single control element. I accomplish this by providing a control element for operating the spraying means operating by direct control of only one of the fluid mediums handled by the device, and by providing automatic means for the control of the supply of the other medium, in proportion to the supply of the medium controlled by the operator.

An important advantage of the construction I employ is that proper atomizing may be obtained under all conditions of operation of the device, especially in starting and stopping the same, and with various rates of discharge.

Further objects and advantages of my invention will become apparent as the description proceeds.

In the accompanying drawings:

Figure 1 is a central longitudinal section of an air brush, in which the principles of my invention have been embodied;

Figure 2 is a section similar to Figure 1, illustrating a modified construction;

Figure 3 is a transverse section on the line 3—3 of Figure 1; and

Figure 4 is a plan view of the parts illustrated in Figure 2.

In the embodiment of my invention selected for illustration, the brush comprises a tubular body 10, defining an annular chamber 12 adapted to receive one of the fluid mediums, in this instance the compressed air. A central tube 14 forms a housing for the control needle 16, which is enlarged at its forward end at 18 to form a reservoir 20 for receiving the other fluid medium, in this instance the liquid sprayed by the device. The liquid is admitted to the reservoir 20 preferably under pressure, through a suitable supply pipe 22, and may leave the same through the tapered nozzle 24, whenever the needle 16 is withdrawn for that purpose. Nozzle 24 is surrounded by an

outer nozzle 26 defining an air space 28, into which compressed air may flow from space 12 through passages 30. The above described atomizing means is old and well known in the art, and per se forms no part of my present invention.

Referring more particularly to Figure 1, the compressed air or other gaseous fluid is delivered through a supply pipe 32 under control of valve mechanism in the casing 34 to the chamber 12. The control valve provided may be of any suitable or preferred type, and, as shown, is controlled by a trigger 36, which single element provides for complete manual control of the entire device. A housing and cylinder 38 on the rear end of the body 10 contains the pressure sensitive piston 40 for controlling supply of liquid in proportion to the supply of gas. The gas pressure in the space 12 is exerted against the front side of the piston by reason of passages 42 and 44 formed in the rear wall of the body 10, and in the diaphragm 46 respectively, which passages establish communication between the chamber 12 and the cylinder 38 in front of the piston 40.

A cap 48 closes the rear end of the cylinder 38, and also functions as a guide for the rear end of needle 16, and as an abutment for the rear end of compression spring 50, the front end of which presses against a thrust block 52 clamped on the needle 16 by means of set screw 54. By screwing cap 48 on or off cylinder 38, the tension of spring 50 may be readily adjusted. To prevent gas in front of piston 40 from leaking into the liquid reservoir 20 around the needle 16, the packing nut 56 carries an extension 58 extending through the piston 40. The rear end of the piston 40 abuts against the thrust block 52, and as the air pressure in front of the piston increases or decreases when operating the device, the tension of spring 50 moves the needle 16 to open or close the nozzle 24. The needle 16 may also carry an enlargement 60 at its rear end for manual operation thereof, if desired.

It will be seen that the opening of the needle valve 16 will depend upon the pressure in the chamber 12. With the parts properly designed, therefore, as soon as the discharge of gas is sufficient to atomize the liquid properly, the initial tension of spring 50 will be overcome, and liquid will be delivered in quantities increasing with the in-

creased flow of air, so that the liquid will be properly atomized at all rates of flow.

The gas supply may also be controlled at any point in the supply line by means of a suitable stop-cock controlled by hand lever 62, and normally held in closed position by a suitable spring 64.

In the embodiment of the invention shown in Figure 2, the pressure sensitive element is the diaphragm 66, defining the upper surface of a chamber 68 formed in a casing 70, which chamber 68 is in communication with the chamber 12'. The diaphragm 66 is clamped in position by a cap 72, and carries a centrally located projection 74. A suitable mechanical transmission is provided for moving needle 16' in proportion to the movement of projection 74. I have illustrated a bellcrank lever 76 pivoted at 78, and actuated by the projection 74, which bell-crank lever actuates the straight lever 80, pivoted at 82 and engaging the nut 84 threaded on the needle 16'. The threaded connection between nut 84 and needle 16' provides for adjustment of the relative position of the diaphragm 66 and needle 16', which adjustment corresponds to that accomplished in Figure 1 by means of the thrustblock 52.

While I have illustrated and described preferred embodiments of my invention in detail, it should be clearly understood that the description is only for purposes of illustration, and that many variations and modifications will naturally occur to those skilled in the art. I aim in the subjoined claims to cover all such legitimate modifications and variations of my invention.

I claim:

1. In combination, liquid and gas nozzles, a pressure chamber feeding said gas nozzle,

a cylinder communicating with said chamber at one end only, a piston in said cylinder, mechanical connections controlled by said piston for governing the supply of liquid, and a spring in the atmospheric end of said cylinder normally tending to move said piston and cut off the liquid supply.

2. In combination, liquid and gas nozzles, a needle controlling the liquid nozzle, a packing for said needle, mechanical means outside said packing for controlling said needle operated by the pressure of the gas supply to the gas nozzle to automatically control the liquid supply, and primary manual control means operating on the gas supply to control the functioning of the entire device.

3. In combination, two nozzles, manual means for controlling the supply to one nozzle, a cylinder and piston subjected on one end to the supply pressure of said nozzle, mechanical means moved by said piston for automatic control of the other nozzle, a cap threaded on the other end of said cylinder, and a spring abutting said cap and piston to bias the piston movement, whereby said cap serves to adjust the tension of said spring.

4. In combination, two nozzles, manual means for controlling the supply to one nozzle, a cylinder and piston subjected on one end only to the supply pressure of said nozzle, mechanical means moved by said piston for automatic control of the other nozzle, a cap threaded on the other end of said cylinder, and a spring abutting said cap and piston to bias the piston movement.

In witness whereof I have hereunto signed my name this 12th day of April, 1921.

CHARLES LAURENCE BURDICK.