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R. W. TRACY

SPRAY GUN

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Fig. 1

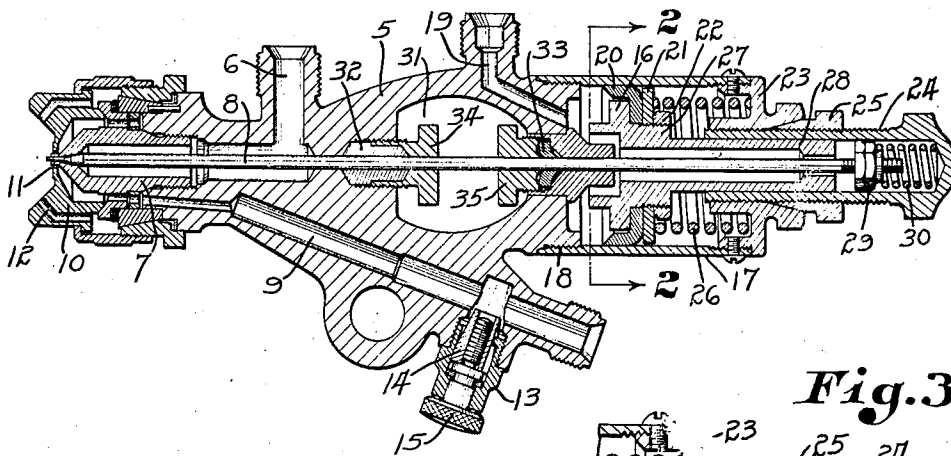


Fig.3

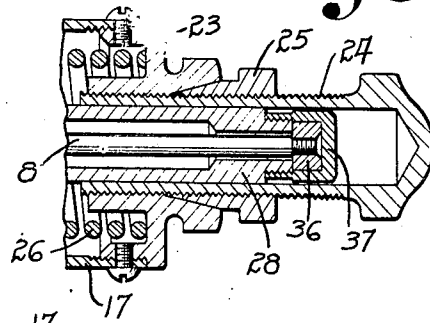
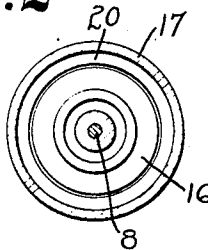


Fig. 2



Inventor

Robert W. Tracy

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Owen & Owen

Attorneys

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SPRAY GUN

Robert W. Tracy, Toledo, Ohio, assignor to The
De Vilbiss Company, Toledo, Ohio, a corpora-
tion of Ohio

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4 Claims. (Cl. 299—140.1)

This invention relates to a spray gun of the type used in spray coating.

The principal object of the invention is to simplify and otherwise improve the needle valve assembly, including the mounting for the needle and the means for controlling it. In the present construction, the opening and closing of the needle valve is controlled by a piston which is reciprocable within a cylinder adapted to be connected to a source of compressed air. The range of the piston is adjusted by means of a hollow screw and the piston has a substantial tail rod which is guided within the hollow adjusting screw to insure the proper alignment of the piston without depending upon the piston leather or the needle. The needle extends through the tail rod of the piston and is removable from the gun without removing either the piston or the cylinder. This also facilitates the removal and replacement of the packing for the needle.

The above and other features of the invention will be more fully described in connection with the accompanying drawing, in which—

Figure 1 is a central longitudinal section of a gun constructed in accordance with the invention;

Figure 2 is a cross-section taken on the line 2—2 of Fig. 1; and

Figure 3 is a longitudinal sectional view of the rear end of the gun, showing a modified construction.

As illustrated in the drawing, the spray gun to which the invention relates comprises a body 5 formed with a passageway 6 for the coating material, which is delivered through a nipple 7 secured in the front end of the body. The flow of the material from the nipple 7 is controlled through the medium of a needle valve 8.

The body 5 is also provided with an air passageway 9 leading to an air nozzle 10 mounted in co-operative relation to the nipple 7. In the preferred construction, the air nozzle 10 is provided with a central orifice 11 which receives the front end of the nipple 7 and with side jet orifices 12, through which air jets are discharged for flattening the spray. The nozzle per se constitutes no part of the present invention and need not be specifically described.

For adjusting the flow of air through the passageway 9, a plug 13 is mounted transversely of the passageway and is provided with a tapered valve 14, which is splined within the plug and is adjustable transversely of the passageway by means of a thumb screw 15.

For controlling the operation of the needle

valve 8 a piston 16 is reciprocably mounted in a cylinder 17, which is secured at one end to the body 5 by an air tight joint 18. The piston is provided with a heavy leather 20, which is secured thereto by a follower ring 21 and nut 22. Compressed air is supplied to the front end of the cylinder 17 through a passageway 19 formed in the body 5.

The rear end of the cylinder 17 is closed by a head 23 into which is screwed a hollow adjusting screw 24, the latter being secured in its adjusted position by means of a lock nut 25.

Normally, when the compressed air is shut off from the passageway 19, the piston 16 is maintained in its foremost or inactive position by 15 means of a spring 26 acting between the ring 21 or some other part of the piston and the cylinder head 23. The piston 16 is formed with an annular shoulder 27, which is adapted to engage the inner end of the adjusting screw 24 to limit the rearward movement of the piston when compressed air is admitted through the passageway 19 to the front end of the cylinder. The piston is also formed with a substantial tail rod 28 which is guided within the hollow adjusting screw 24 and maintains the piston in proper alignment without depending on the piston head or the needle.

The rear end of the needle 8, as shown in Fig. 1, carries adjustable nuts 29, which are engageable by the rear end of the tail rod 28 to open the needle valve. As soon as the compressed air is shut off from the passageway 19, the piston is advanced by the spring 26 and the needle valve is closed by a spring 30, which is seated within the head of the hollow adjusting screw 24 and acts against the nuts 29.

The central part of the body 5 is provided with a transverse opening 31 through which packing 32 and 33 may be inserted. This packing is held in place by screw plugs 34 and 35.

It will be noted that there is normally a space between the nuts 29 and the tail rod 28 when the pressure is shut off. This allows a positive seating of the needle valve and also causes a quick opening of the same by the action of the piston when the pressure is turned on.

In order to remove the needle from the gun, it is only necessary to remove the adjusting screw 24, whereupon the needle may be withdrawn through the rear end of the tail rod 28. With the needle removed it is a simple matter to renew the packing 32 and 33.

In the modification shown in Fig. 3, a head 36 is suitably secured to the rear end of the needle 8

and is covered by a cap 37 which is connected to the rear end of the tail rod 28. In this construction, the parts are so proportioned that the head is revolvable in the cap without end play.

5 The extent to which the needle valve is opened is determined by the adjustment of the screw 24. The inner end of this screw has a comparatively large bearing surface, which engages directly
10 against the shoulder 27, so that it cannot be damaged by the concussion resulting from the high air pressure.

It is to be understood that the construction shown and described is merely for the purpose of illustration and that the invention includes all
15 such modifications as may fall within the scope of the appended claims.

What I claim is:

1. A spray gun comprising a body with a passageway therethrough, a needle valve cooperating
20 with the discharge end of said passageway, a cylinder, a piston reciprocable in said cylinder and operable by fluid pressure to open said needle valve, a hollow adjusting screw with its inner end constituting a stop for the piston when the latter
25 is acted upon by fluid pressure, a hollow tail rod on said piston and through which the rear end of the needle valve projects, and an abutment on said projecting end engageable by said tail rod to open the needle valve when the piston is acted
30 on by fluid pressure, said tail rod and the abutment on the needle valve being guided within said adjusting screw to maintain their alignment.

2. A spray gun comprising a body with a passageway therethrough and having also an opening
35 in the side thereof, a needle valve cooperating with the discharge end of said passageway and extending across said opening, a cylinder secured to said body, a piston reciprocable in said cylinder and operable by fluid pressure to open said needle
40 valve, a hollow tail rod on said piston and through which the rear end of the needle valve projects,

a hollow adjusting screw limiting the range of the piston and in which the said tail rod and needle valve are guided, said needle valve being removable from the gun whenever said adjusting screw is removed, and packing glands for said
5 needle valve at each side of said opening, said glands being removable from said opening whenever the needle valve is removed.

3. A spray gun comprising a body with a material passageway therethrough, a normally
10 closed needle valve cooperating with the discharge end of said material passageway, a cylinder separate from said passageway, a piston having an elongated tail rod reciprocable in said cylinder and operable by fluid pressure to open the needle
15 valve, means yieldingly opposing a fluid pressure actuated movement of the piston, and a hollow member threadedly engaged with the rear of the cylinder to guide said piston by engagement
20 with said tail rod and maintain its alignment, said member constituting also an adjustable abutment to limit the movement of the piston in opening the needle valve.

4. A spray gun comprising a body having a material discharge passageway therethrough, a
25 needle valve adapted to close the discharge end of said passageway, a cylinder carried by said body separate from said material passageway, said body having an air conduit communicating with said cylinder, a piston reciprocable in said cylinder, a hollow tail piece carried by said piston
30 through which said needle valve is extended, means to removably connect said needle valve and said tail piece, means yieldingly opposing a fluid pressure actuated movement of the piston, and
35 hollow guide means for said tail piece adjustably carried by the rear of said cylinder whereby to guide and limit the extent of movement of said piston.

ROBERT W. TRACY.