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SPRAY GUN NOZZLE

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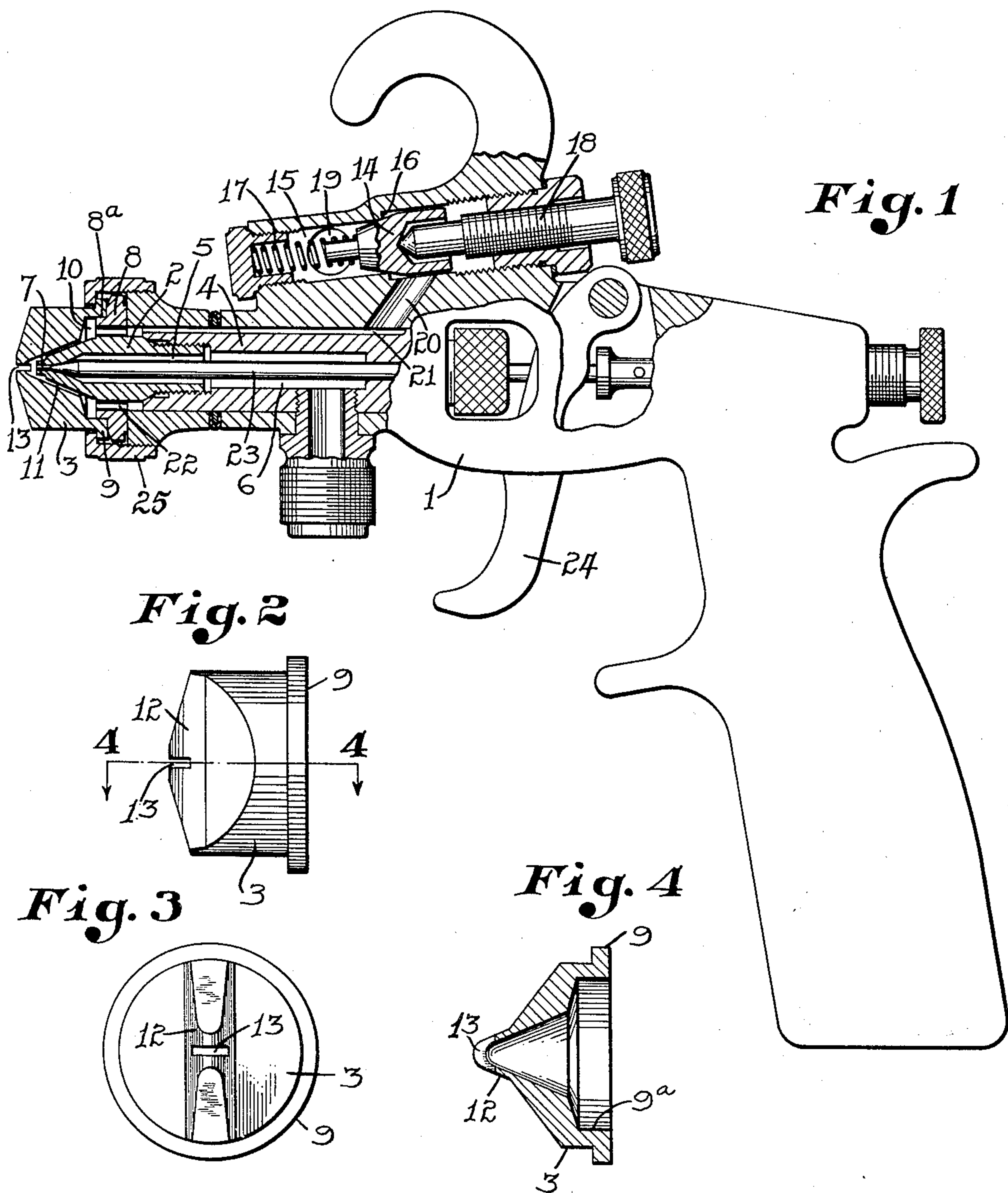


Fig. 2

Fig. 3

Fig. 4

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SPRAY GUN NOZZLE

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This invention relates to spray guns, and particularly to those in which air under pressure is employed to assist in the discharge and atomizing of the material being sprayed, and in which the commingled air and material are discharged together through a slot-like orifice to produce a spray stream of fan-form.

The object of the invention is to improve on the construction of spray guns of this character by so fashioning the outer nozzle member and the slot-like discharge orifice thereof that the material being sprayed will not build up at the end portion of the discharge orifice and thereby soon lessen the efficiency of the spray stream by reducing its width and causing it to have ragged edge portions.

Further objects and advantages of the invention will be apparent from the following detailed description and the accompanying drawing, in which—

Figure 1 is a side elevation of a gun embodying the invention with parts in central longitudinal section. Fig. 2 is an enlarged side elevation of the outer nozzle member of the gun. Fig. 3 is an outer end elevation thereof, and Fig. 4 is a section on the line 4—4 in Fig. 2.

Referring to the drawing, 1 designates the stock or body portion of the spray gun having at its forward end the inner or material discharge nozzle 2 and the outer combined air and material discharge nozzle 3.

The inner nozzle 2 is fixedly attached to the gun body, in the present instance, by having a rearwardly projecting stud portion thereof threaded into the body part 4 with its bore 5 in communication, through a bore 6 in said part, with a source of supply of the material to be sprayed. The nozzle bore 5 terminates at its forward end in a restricted discharge orifice 7 of circular form in cross-section and disposed in the customary forwardly projecting conical end portion of the nozzle. This nozzle is provided at the rear of its conical portion with an annular flange 8 adapted to seat against the forward end of the body portion 1.

The nozzle 3 is of greater diameter than

the body portion of the nozzle 2 and has its inner or rear end cupped to provide a side wall or flange 9 for seating against the flange 8 in spaced relation to the conical portion of the inner nozzle. The inside surface 9^a of the flange 9 is cylindrical and fits over the cylindrical shoulder 8^a formed in front of the flange 8, thereby maintaining the outer nozzle 3 in true concentric relation to the inner nozzle 2. The flat rear face of the flange 9 abuts against the flat front face of the flange 8 to maintain the outer nozzle in exact axial alignment with the inner nozzle. The cupping of the nozzle 3 forms a recess or chamber 10 around the inner end or base of the conical portion of the nozzle 2, and the bottom of this recess is further centrally recessed in conical form to provide the recess 11 which is complementary to and adapted to receive the conical portion of the nozzle 2 in a manner to permit the passage of air forwardly therebetween from the chamber 10. The forward reduced end of the conical recess 11 extends to near the forward end of the nozzle and into a nipple portion 12 on the outer end of the nozzle, which portion, in the present instance, is in the form of a transversely disposed ridge. The discharge orifice from the forward reduced end of the recess 11 is in the form of a slot 13 which is made entirely across the nipple or ridge 12 with its bottom line preferably disposed at a sufficient depth in the nipple to intersect the small end of the recess 11, as shown in Figs. 1 and 4. The discharge end of the inner nozzle 2 preferably terminates short of the discharge orifice 13 of the outer nozzle, as shown in Fig. 1, and the material discharge orifice 7 is axially aligned with the axis of the orifice 13.

The chamber 10 or cup portion of the nozzle 3 has communication with a source of air pressure supply so that air under pressure is discharged through the conical recess 11 uniformly around the discharge end of the inner nozzle and from the orifice 13 together with the material which is discharged in circular stream form from the nozzle 2. The commingled air and material stream discharging from the two nozzles is permitted

to expand lengthwise of the slot 13 so as to produce a spray of fan-form that is of uniform thickness throughout its width by reason of the confining action of the opposing side walls of the slot. The wall of the nozzle 3 is comparatively thick at all points except at the ends of the slot 13 where it is quite thin. The material being sprayed is prevented from accumulating on the bottom wall of the slot 13, due both to the fact that the wall at the ends of the slot is as thin as practicable and due to the fact that the inner nozzle 2 terminates an appreciable distance inside of the bottom of the slot 13. Thus, there is left a minimum amount of surface to which material may cling and from which material may be easily dislodged by the spray stream itself, or by other means, eliminating loss of efficiency due to reduction of the width of the spray, ragged edges, irregular and unsymmetrical spray pattern, or possibly a complete plugging of the nozzle.

The air supply to the air chamber 10 of the nozzle is controlled by a valve 14 which is mounted for reciprocatory movements in a chamber 15 provided in the top portion of the gun body and adapted to seat against a shoulder 16 therein. A coiled expansion spring 17 acts against the inner end of the valve 14 within the chamber 15 and serves to normally unseat the valve while a manually adjustable screw 18 is threaded in the outer end wall of the valve chamber and has its inner end in engagement with the valve 14 to effect a seating thereof or to regulate the extent of opening of the valve which may be desired. Air under pressure is admitted to the chamber 15 through a passage 19 at the spring-engaging side of the valve and passes therefrom at the opposite side of the valve through a passage 20 which is in communication with the chamber 10 through a longitudinally extending passage 21 and passages 22 in the flange 8 of the inner nozzle.

The discharge orifice of the inner nozzle 2 is normally closed by a needle valve 23 which seats therein and which is moved to open position by a retracting movement of the trigger 24, as is common in the art. The outer nozzle 3 is held seated against the flange 8 of the inner nozzle by a union nut 25.

I wish it understood that my invention is not limited to any specific construction, arrangement or form of the parts, as it is capable of numerous modifications and changes without departing from the spirit of the claims.

Having thus described my invention, what I claim as new and desire to secure by United States Letters Patent is:

1. In a spray gun for spraying particles of solid material in a liquid medium, a discharge nozzle formed with a diametric ridge across its outer face and a cross slot at right angles to the plane of the ridge, the inner

face being formed with a conical recess, the apex of said recess being within the center of said ridge and close to the oppositely disposed outer faces of the ridge, whereby the wall of the nozzle is relatively thin at the ends of the slot adjacent the apex of the conical recess to preclude any substantial deposition of the material being sprayed and relatively thick elsewhere.

2. In a spray gun for spraying particles of solid material in a liquid medium, a discharge nozzle formed with a conical recess in its inner face, the outer face of the nozzle having two forwardly convergent surfaces on opposite sides of the center and close to the apex of said recess, said nozzle having a slot cut in a plane perpendicular to the planes of said convergent surfaces, said slot extending through the wall of the nozzle only across the apex of said conical recess whereby the wall at the ends of the slot is comparatively thin so as to preclude any substantial deposition thereon of the material being sprayed.

In testimony whereof I have hereunto signed my name to this specification.

ROBERT W. TRACY.

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