

W. A. HEINRICH.
 SPRAY GUN NOZZLE.
 APPLICATION FILED MAY 10, 1921.

1,438,239.

Patented Dec. 12, 1922.

Fig. 1.

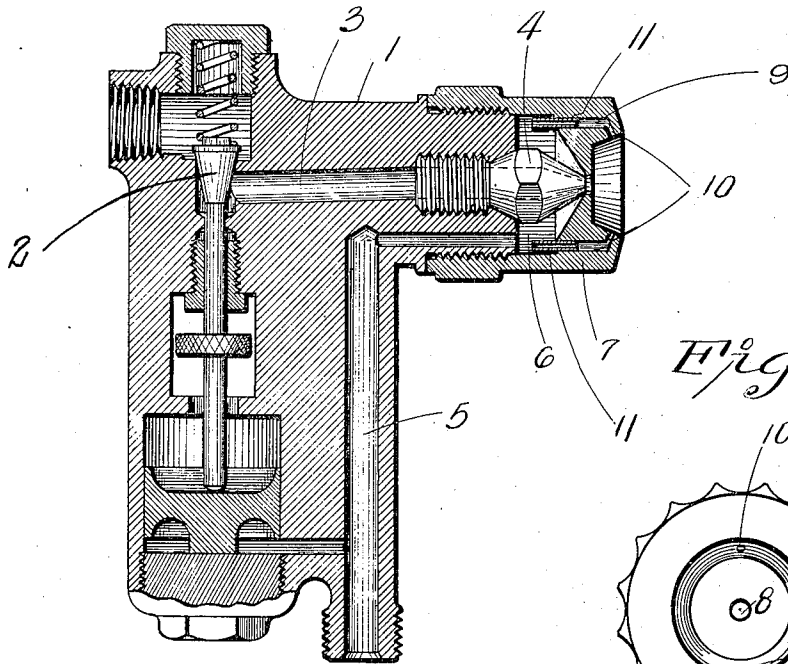


Fig. 2.

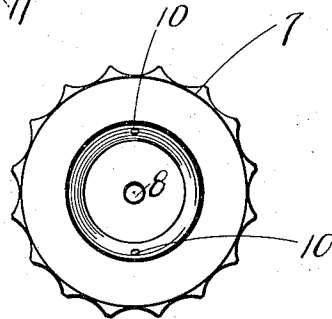
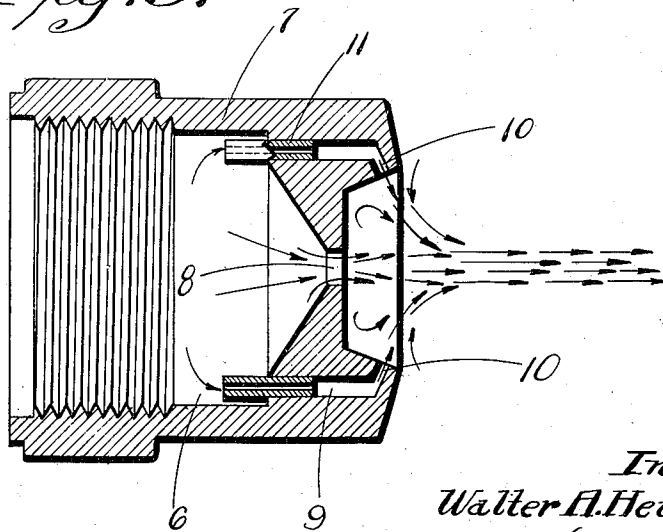


Fig. 3.



Inventor.
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 By *J. P. Cornwall*
 Atty.

UNITED STATES PATENT OFFICE.

WALTER A. HEINRICH, OF ST. LOUIS, MISSOURI, ASSIGNOR TO W. N. MATTHEWS AND BROTHER, INC., OF ST. LOUIS, MISSOURI, A CORPORATION OF NEW MEXICO.

SPRAY-GUN NOZZLE.

Application filed May 10, 1921. Serial No. 468,314.

To all whom it may concern:

Be it known that I, WALTER A. HEINRICH, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Spray-Gun Nozzles, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this application.

This invention relates to a new and useful improvement in nozzles for spray guns and the like, the object being to construct a nozzle in such a manner that liquid paint, varnish, and the like may be applied to a wall or surface in a solid ribbon form. Heretofore, spray guns have been constructed for atomizing paint, either by air pressure or a siphoning action, and in the absence of intersecting blasts of air such spray guns will make a round, or substantially circular, target.

I am aware that hornlike projections have been provided on opposite sides of the central opening through the nozzle and through which central opening the atomized paint is forced or drawn, the hornlike projections emitting blasts of air which meet in front of the central opening for the purpose of producing a fanlike spray. This fanlike spray by such a construction will make a flat or elongated target and will produce what is known as a "fish-tail" effect, i. e., the amount of paint delivered at the edges of the target will be greater than at the center due to the convergence of the lateral blasts at this point and which seem to interfere with the delivery of the paint at the center of the target.

My present invention contemplates the employment of a crater-like recess or cavity in the end of the nozzle through the side walls of which extend diametrically arranged and angularly disposed orifices which emit blasts of air converging to a point slightly in advance of the nozzle and which blasts of air, due to the craterlike formation of the end of the nozzle, appear to create a suction of air into the crater, which air is forced outwardly by the converging blasts onto the paint and air issuing from the centrally arranged opening in such manner that a substantially solid fanlike spray or ribbon of paint is produced, and which

may be solidly laid on the wall or surface being painted.

By the use of my improved nozzle, the "fish-tail" effect appears to be entirely eliminated and the fan-like spray is evenly distributed throughout the length of the target. In speaking of a solid ribbon, I do not wish to be understood as meaning that the paint flows from the central orifice in the nozzle in a solid stream, which is afterwards laid in ribbon formation, because in actual operation, the paint which is forced or drawn from the central orifice of the nozzle is in effect interspersed with air under pressure, and consequently is in the form of a heavy spray, or a light spray, as desired, depending upon the adjustment of the nozzle relative to the nipple, the amount of paint supply to the nipple, the viscosity of the paint, and possibly other controlling conditions. The speed at which the spray gun is moved past the surface being painted, consonant with other conditions just mentioned, will determine the amount of coverage. For practical purposes, the ribbon of paint is substantially solid throughout the length of the target when the parts are adjusted properly and other conditions are maintained in accordance with such adjustments.

Figure 1 is a vertical sectional view of a spray gun equipped with my improved nozzle.

Figure 2 is a front elevational view of the nozzle.

Figure 3 is an enlarged sectional view through the nozzle.

In the drawings, 1 indicates a casting having a valve 2 for controlling the paint conduit 3 which latter terminates in a nipple 4. 5 indicates an air conduit leading through the barrel of the casting and in which a chamber 6 is formed by a nozzle 7 adjustably mounted on the barrel by means of threaded engagement therewith.

Nozzle 7 has a central orifice 8 through which air under pressure from conduit 5 is forced, such air siphoning the paint to be applied through the nipple 4 as disclosed in patent to Johns, No. 1,330,448, dated February 10, 1920.

9 indicates ducts or passages drilled, or otherwise formed in the front end of the nozzle 7 and terminating in restricted openings 10 diametrically arranged with relation to each other for directing the blasts

of air at an angle, which blasts converge toward and intersect at a point slightly in advance of opening 8. The inner ends of passages 9 have tubes 11 arranged therein, said tubes having relatively small openings which practically control the amount of air delivered into the passages 9, so that said air has a chance to expand slightly before issuing from the openings 10. The openings in tubes 11 are slightly smaller in diameter than the diameters of the openings 10. Tubes 11 are preferably removable so that tubes with different sized openings may be used with differing pressures of air.

15 In operation, the air and paint issuing from the orifice 8 would, in the absence of the orifices 10 opening through the side walls of the crater, as described, produce a round target; but, on account of the arrangement and location of the orifices 10 and the opposing blasts of air issuing therefrom, it appears that the opposite sides of the round target are compressed or caused to assume a target fan-like in shape. The blasts of air emanating from orifices 10 apparently draw the air from the edges of the crater into the crater, and by a siphoning action direct the currents of air from the crater onto two sides of the otherwise round target, flattening the same to produce a fan-like spray which is not thinned at its center, but whose center is as solid, if such an expression may be used, as its edges.

20 The crater-like recess with the blasts of air issuing from opposite points through the side walls thereof, which side walls are preferably inclined as shown, apparently produces movements of the air in the crater which effectively flatten the otherwise round target, and these air currents being strongest in line with the orifices 10, will act upon the paint issuing from opening 8 to the desired extent as determined by the sizes of the openings in tubes 11 and the orifices 10 according to the air pressure used.

What I claim is:

1. In a spray gun, a body having an air conduit and a liquid conduit extending beyond the end of said air conduit, and a cup-like nozzle fitting over the discharge end of said body with its inside bottom adjacent to the end of said liquid conduit and provided with a discharge passage aligned therewith, restricted passages through the bottom of said nozzle terminating in por-

tions directed toward and transversely of the axis of said discharge body.

2. In a spray gun, a body having separate liquid and air conduits, and a cup-like nozzle having a central discharge passage aligned with said body liquid conduit and radial discharge passages open to said air conduit leading inwardly towards the axis of said central passage and beyond the end thereof.

3. In a spray gun, a liquid conduit, an air conduit, a nozzle having a crater-like recess in its discharge end, an axial passage through the bottom wall of the recess leading from said liquid conduit, and radial passages in the side of said crater leading inwardly from said air conduit.

4. In a spray gun, liquid supply means, air supply means, and a nozzle having a crater-like recess in its front wall and provided with an axial discharge opening for said fluid supply means, and oppositely disposed inwardly directed orifices in the side walls of said recess for said air supply means.

5. In a spray gun, liquid supply means, air supply means, and a nozzle having a crater-like recess in its front wall and provided with a central orifice for said liquid supply means, the side walls of said crater being inclined and provided with opposite orifices for said air supply means disposed diagonally of said central orifices.

6. In a spray gun, liquid supply means, air supply means, a nozzle having a crater-like recess in its front wall and provided with a central orifice for said liquid supply means, the side walls of said crater being inclined and provided with opposite orifices for said air supply means disposed diagonally of said central orifices; and means for controlling the amount of air passing through said last mentioned orifices.

7. A nozzle for spray guns having a concave recess in its discharge end, the bottom of said recess having a central passage, and the side walls of said recess having longitudinally disposed passages, each terminating in a transverse discharge opening directed towards the axis of the opening in the crater bottom.

In testimony whereof I hereunto affix my signature this 5th day of May, 1921.

WALTER A. HEINRICH.