Dec. 3, 1929. A. SHELBURNE 1,737,896

AIR BRUSH NOZZLE

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Fig. 5.

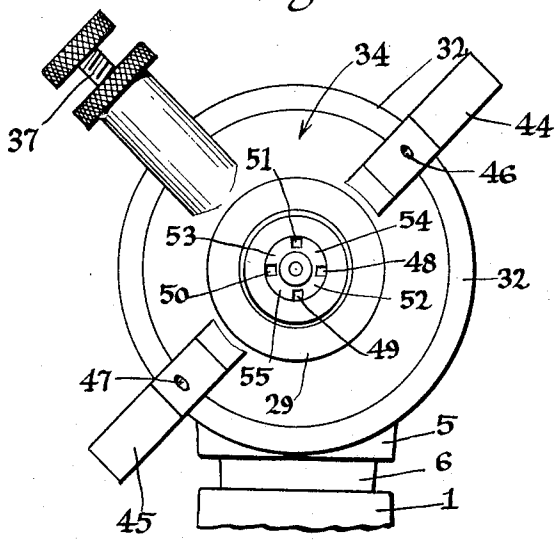

Fig. 1.

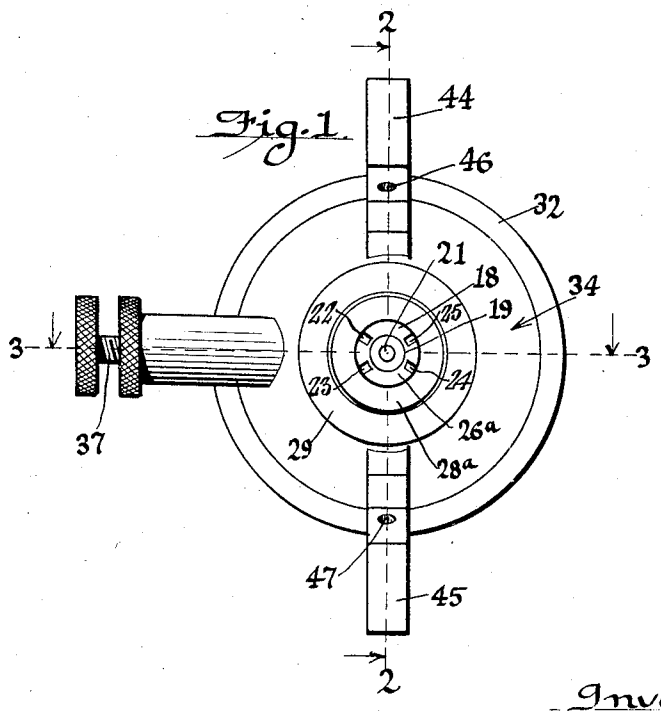

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Fig. 2.

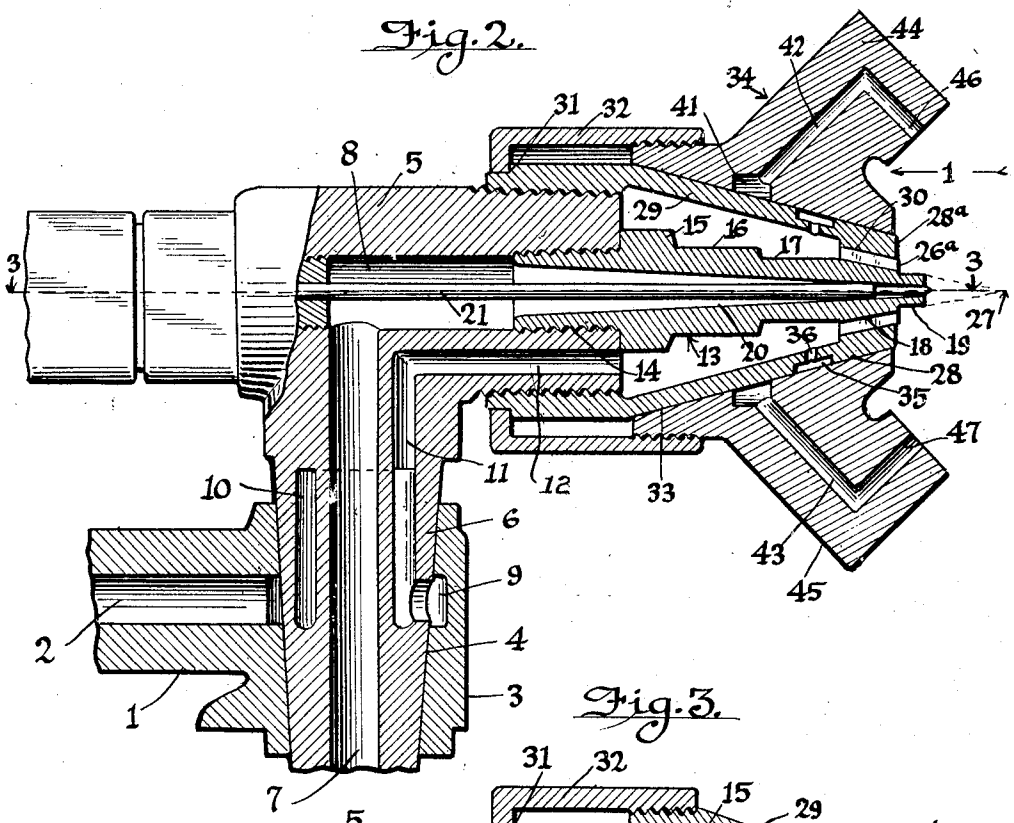


Fig. 3.

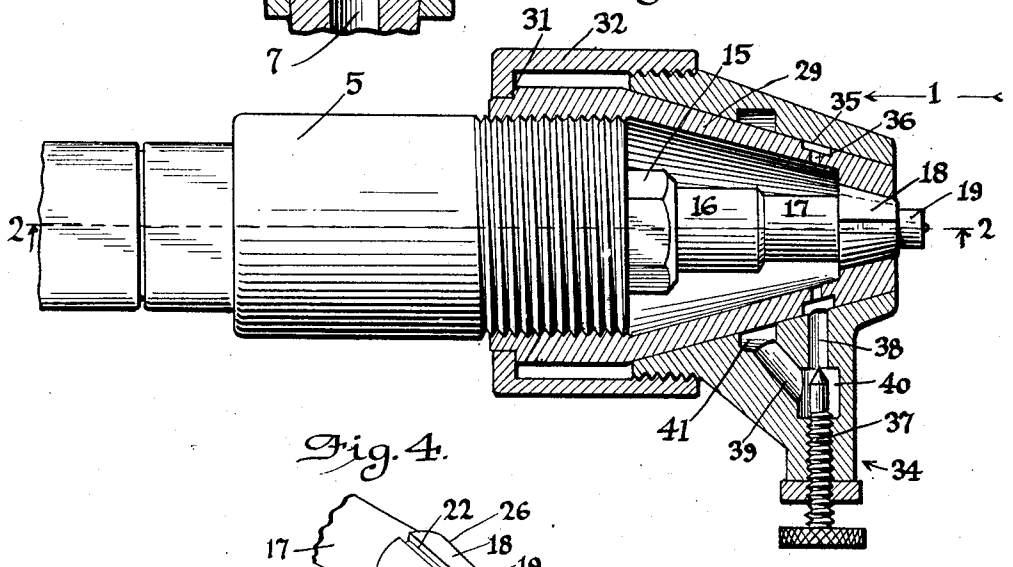
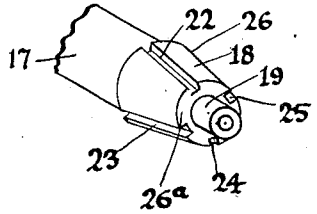


Fig. 4.



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UNITED STATES PATENT OFFICE

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AIR-BRUSH NOZZLE

Application filed October 13, 1924. Serial No. 743,391.

This invention relates to air brushes and particularly to air brush nozzles, and consists of the novel features herein shown, described and claimed.

An object is to provide an air brush nozzle having a spreader attachment rotatably mounted upon the nozzle and held in adjusted position by a union nut swiveled upon the nozzle and screwed upon the attachment.

Another object is to provide an air brush nozzle having means in the discharge end of the air passage for accurately distributing the air in independent jets around the discharging liquid.

Another object is to provide an air brush nozzle having regularly spaced jets in the air passage, the jets being arranged in pairs, and to provide a swiveled spreader attachment connected to the main nozzle by a union nut so that the spreader attachment may be accurately adjusted relative to the pairs of air jets.

Other objects and advantages will appear from the drawings and specification.

The drawings illustrate an air brush nozzle embodying the principles of my invention.

Figure 1 is a front elevation as indicated by the arrows 1 in Figs. 2 and 3.

Fig. 2 is a fragmentary sectional elevation on the lines 2—2 of Figs. 1 and 3 and looking in the direction indicated by the arrows.

Fig. 3 is a horizontal longitudinal section on the lines 3—3 of Figs. 1 and 2.

Fig. 4 is a perspective of the liquid nozzle having the air jets in its periphery.

Fig. 5 is a view analogous to Fig. 1 and showing the spreader attachment adjusted to a different position and showing a modified form of the air jets.

The details of construction and operation shown in the drawings are as follows:

Referring to Figs. 2 and 3, the barrel 1 has an air passage 2, and a head 3 is formed integral with the barrel 1 and has a vertical tapered opening 4 at right angles to the air passage 2. The delivery head 5 has a tapered shank 6 fitting rotatably in the opening 4. A paint passage 7 leads upwardly through the shank 6 to a horizontal bore 8 leading through the head 5. A recess 9 is formed in the head 3 from the bore 4 and communicates with the passage 2. A port 10 is formed in the shank 6 to register with the recess 9 and a passage 11 leads upwardly from the port 10 to the head 5 and connects with the passage 12 formed from the front end of the head 5. The inner liquid nozzle 13 has a nipple 14 screwed into the front end of the bore 8 and a wrench seat head 15 for screwing the nipple in and out jams against the front end of the head 5. The nozzle 13 has a reduced portion 16 in front of the wrench seat 15, a second reduced portion 17 in front of the portion 16, a tapered portion 18 in front of the portion 17, and a straight portion 19 in front of the tapered portion. A tapered bore 20 is formed from the inner end of the liquid nozzle 13 and leads from the bore 8 to and through the portion 19 and a regulating needle valve 21 extends from the back end of the nozzle through the bore 8 and through the bore 20 to and through the portion 19. The portion 18 of the nozzle 13 is considerably enlarged relative to the portions 17 and 19 and small grooves 22, 23, 24 and 25 are milled longitudinally through the enlargement to make air jets regularly spaced apart around the portion 19. The outer face 26 of the enlargement is tapered with its largest end inwardly and smallest end outwardly so that the air jets will converge at or near the point 27 directly in front of the needle valve 21, and the face 26 is accurately finished to form a seat. The outer nozzle cap 28 is screwed upon the head 5 and has a tapered chamber 29 into which the air passage 11 discharges and has a finished seat 30 at its forward end fitting the beveled face 26. The outer end face 26^a of the enlargement 26 and the outer end face 28^a of the cap 28 are flush in cross section or side elevation so that the outer ends of the grooves 22, 23, 24 and 25 are finished all the way around and the air coming through the grooves will discharge freely into the atmosphere, as would not be the case if the enlargement 26 were longer or shorter so that the end faces would be staggered relative to each other, and the result is straight strong streams of air through the grooves. This feature is of spe-

cial importance in procuring a desired spray from the nozzle as a whole and in regulating and varying the form of the spray.

A union nut shoulder 31 is formed around the large end of the nozzle cap 28 to receive the union nut 32. The union nut must be applied before the cap is screwed upon the head 5.

The nozzle cap 28 has a tapered finished annular outer face 33. The spreader attachment 34 fits rotatably upon the face 33 and the union nut 32 is screwed upon the back end of the spreader attachment to tightly seat the spreader attachment upon the nozzle cap 28 and to hold the spreader attachment in a desired adjusted position circumferentially. The spreader attachment is placed in the desired position and held while the union nut 32 is manipulated. An annular groove 35 is formed in the periphery of the nozzle cap 28 and has ports 36 leading from the chamber 29 to the grooves. A regulating valve 37 operates in a port 38 communicating with the recess 35 to control the passage of air from the recess 35 through the port 38. A port 39 leads from the needle valve chamber 40 to an annular internal recess 41 formed in the spreader attachment 34 outside of the face 33 and passages 42 and 43 lead from the annular recess 41 outwardly through the arms 44 and 45 to the discharge orifices 46 and 47. The discharge orifices are at angles of about 45° relative to the line of discharge through the bore 20 and diametrically opposite each other so as to discharge any desired amount of air to the mixture coming from the passages 20, 22, 23, 24 and 25, and the line of convergence of the air coming from the orifices 46 and 47 is slightly in front of the point 27.

Referring to Fig. 1, the air jets 22, 23, 24 and 25 are radial to the axis and evenly spaced apart, and the aggregate spray formed by the liquid and air coming from the nozzle may be accurately formed or regulated by manipulating the union nut 32 to loosen the spreader 34 and adjusting the spreader circumferentially relative to the air jets, thereby varying the direction of the air coming from the orifices 46 and 47 relative to the air coming from the jets 22, 23, 24 and 25.

Referring to Fig. 5, the air jet grooves are arranged in pairs 48 and 49 and 50 and 51, the grooves of each pair being closer together than the adjacent grooves of the pairs. In other words, the spaces 52 and 53 between the grooves of each pair are smaller than the spaces 54 and 55 between the pairs. This arrangement makes a greater range of adjustment because the orifices 46 and 47 may be adjusted in line with the spaces 54 and 55 to any desired extent or in line with the spaces 52 and 53.

In making up the whole nozzle the inner liquid nozzle 13 will be set to hold the grooves through the tapered portion 18 in a fixed position, and manipulating the nozzle for various work, the union nut 32 and the spreader 34 will be operated to produce the desired result by adjusting the orifices 46 and 47 relative to the air jet grooves.

Before the spreader 34 is turned on there will be four distinct streams of air coming from the four orifices and the flow of paint will be stronger in these streams of air than between these streams, and the aggregate form of the spray may be accurately adjusted by turning on the spreader and rotating the spreader while the paint and air is being discharged and noting the result.

It will be noted by the above described construction that the barrel 1 may be held stationary and the delivery head rotated thereon, turning on a vertical axis. This allows the jet to be swung around in a circle or a part of a circle and turning the spreader attachment 34 allows the plane of the jet to be turned on a horizontal axis, thus shifting from say a horizontal spread of the jet to a vertical spread. Thus the manner of mounting the delivery head on the barrel, together with the nozzle and spreader 34 forms a cooperative arrangement giving different spreads and movements to the jets.

Various changes may be made without departing from the spirit of the invention as claimed.

I claim:

1. In an air brush nozzle, a head, and inner liquid nozzle screwed into the head, an outer nozzle cap fitting over the inner liquid nozzle and screwed upon the head, a spreader rotatably mounted upon the outer nozzle cap, and a union nut for holding the spreader in adjusted position.

2. In an air brush nozzle, a head, a union nut, an outer nozzle cap adapted to seat the flange of the nut, and a spreader rotatably mounted upon the outer nozzle cap and adapted to receive the union nut to hold the spreader in adjusted position.

3. In an air brush nozzle, a main nozzle construction including a nozzle cap, a spreader rotatably mounted upon the nozzle cap, and a union nut for holding the spreader in adjusted circumferential position on the nozzle cap.

4. In an air brush nozzle, a head having a liquid nozzle with a central discharge opening secured thereto, another nozzle cap secured in fixed relation to the liquid nozzle, there being a plurality of separate and distinct air passages between the liquid nozzle and cap positioned to cause impinging jets of air to flow at an acute angle on the liquid ejected from the said central discharge opening the air contacting with the liquid outside of the brush nozzle.

5. In an air brush nozzle, a head having a liquid nozzle with a central discharge open-

ing secured thereto, an outer nozzle cap secured in a fixed relation to the liquid nozzle, there being a plurality of separate and distinct grooves between the main body of the nozzle and cap, said grooves causing discharging jets of air to flow at an acute angle on liquid ejected from the said central discharge opening the air contacting with the liquid outside of the brush nozzle.

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

A. SHELBURNE.