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R. W. TRACY

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SPRAY HEAD

Filed Jan. 27, 1928

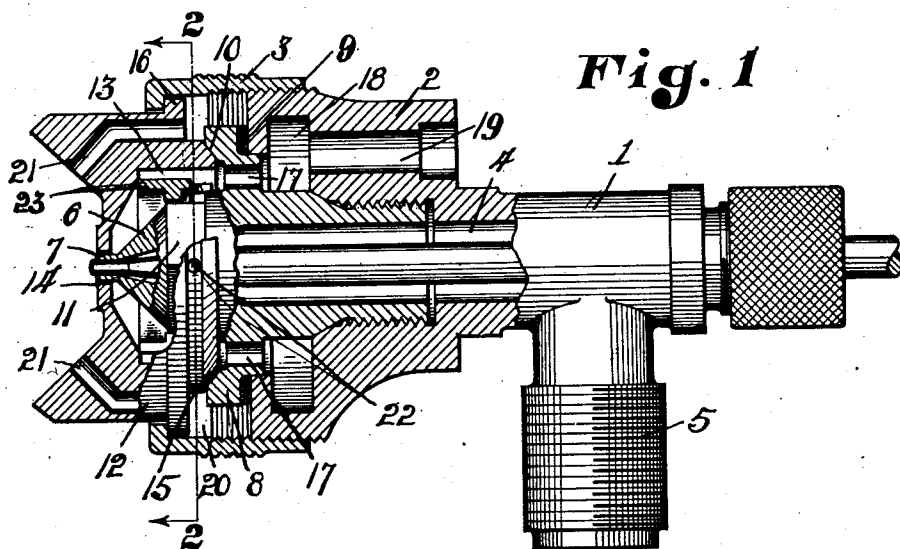


Fig. 1

Fig. 2

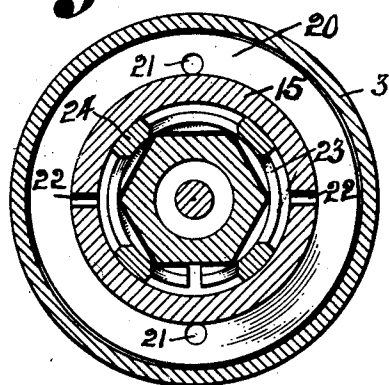
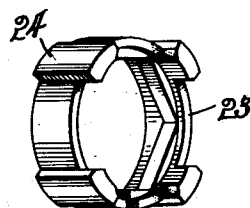


Fig. 3



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SPRAY HEAD

Application filed January 27, 1928. Serial No. 249,814.

This invention relates to spray-heads for use particularly in connection with spraying devices for applying materials in spray form to surfaces to be coated.

5 In devices of this character it is customary to discharge supplemental air jets against opposite sides of the main surface coating spray stream to effect a flattening and broadening thereof, or to create what is commonly
10 referred to as a fan spray. In the use of such supplemental air jets it is found desirable to regulate the volume of discharge of air from the supplemental passages and thereby control the flattening action of the air jets
15 on the main stream to suit the particular material being sprayed or the particular job in hand.

The object of this invention is the provision in a spray-head of this character of simple,
20 efficient and novel means for completely shutting off or controlling the volume of discharge of air from the supplemental air discharge passages, the adjustment of such means being effected by a relative turning of the inner and
25 outer nozzles of the spray-head.

The invention is fully described in the following specification, and one embodiment thereof illustrated in the accompanying drawings, in which,—

30 Figure 1 is a side elevation of a spray-head embodying the invention with a part in central longitudinal section. Fig. 2 is a cross-section thereof on the line 2—2 in Fig. 1 and Fig. 3 is a perspective view of the valve
35 member removed from the spray-head.

Referring to the drawings, 1 designates the portion of a spray-gun body to which the spray-head is attached and which with the spray-head, in the present instance, may
40 be considered as the spray-head unit, inasmuch as it is detachable as a unit from the spray-gun body proper. The assembled connection with a spray-gun body of such a unit equipped with a different construction of
45 spray-head is illustrated in U. S. Letters Patent No. 1,613,588, dated Jan. 4, 1927.

The body member 1 is provided at its forward end with an enlargement 2, which, in the present instance, has its forward end
50 portion externally threaded to permit the

engagement with therewith of a union nut 3. The body 2 has an axially disposed bore or passage 4 therein for communicating through a nipple 5 and any suitable connection with a source of supply of the material to be
55 sprayed.

The inner or material discharge nozzle 6 of the spray-head is threaded into an enlarged portion of the forward end of the bore 4 and has its forward end reduced and terminating
60 in a restricted discharge nipple 7 with its discharge passage in communication with the bore 4, as well understood in the art. The nozzle 6 intermediate its ends is provided with an annular flange or radial enlargement
65 8 which has a gasket seat 9 against the forward end of the body enlargement 2. The flange 8 also provides an annular internal tapered seat 10. The nozzle 6 between its forward reduced end portion and the flange
70 8 is provided with a hexagonal wrench-engaging portion 11.

The outer or air discharge nozzle 12 is of cup form, having the cylindrical cavity or air space 13 in its rear end portion and having
75 its forward end provided with a centrally disposed air discharge orifice 14 through which the nipple 7 centrally projects in spaced relation thereto. The rear end of the outer nozzle 12 is formed with an annular rearwardly projecting flange-like extension 15 forming,
80 in the present instance, an extension of the wall portion of the air space 13 and adapted to seat against the conical seat 10 of the flange 8 of the inner nozzle. The union nut 3 co-acts with a peripheral flange 16 on the nozzle
85 12 to hold the nozzle to its seat against the enlargement 8 in a manner to permit a turning of the nozzle relative to the body member.

When the nozzles 6 and 12 are assembled, the air space or chamber 13 is formed by the nozzle 12 and a portion of the nozzle 6 surrounded thereby, and has communication at its forward end with the air discharge orifice 14 and at its rear end through one or
90 more passages 17 in the flange 8 with an annular chamber 18 in the body enlargement 2, which in turn has communication with a source of air pressure supply through a pas-
95 sage 19 in said enlargement.

An annular air chamber 20 is provided between the body enlargement 2 and nozzle 12 and the flanges 8 and 15 on the inner side and the union nut 3 on the outer side. The outer nozzle 12 has therein the diametrically opposed supplemental air discharge passages 21 which are in communication at their rear ends with the chamber 20 and have their outer ends disposed to direct their streams of air into opposed flattening engagement with the main material laden stream issuing from the central orifices of the two nozzles.

The flange 15 has one or more passages 22 therein opening communication between the chambers 13 and 20 and being of a size to furnish a predetermined volume of air supply to the chamber 20, which volume is usually less than the permissible volume of discharge of air from the supplemental discharge passages 21. In other words, the combined cross-sectional area of the passages 22 is not greater than and is considerably less than that of the passages 21. The size or combined cross-sectional area of the passages 22 is determined by the particular job in hand, several nozzles 12 with passages 22 of various capacities being supplied with a spray-gun so that any one may be used, depending on the requirements.

The supply of air under pressure to the chamber 20 through the passages 22 is controlled by a ring valve 23 which rotatably fits within the cylindrical chamber portion 13 of the nozzle 12 and is split, in the present instance, to adapt it to have releasable close-fitting engagement within said nozzle. The valve is provided around its periphery with a plurality of cut-away portions, leaving a series of pad-like portions 24 in spaced relation around the periphery of the ring adapted by a turning of the valve to be brought into or out of register with the passages 22. It is apparent that the number and spacing of the pads 24 depends on the number and spacing of the passages 22 so as to facilitate a closing or opening of such passages at various points in a turning movement of the nozzle 12 on the nozzle 8. For instance, when using the fan spray feature it may be desirable to have the main stream flattened in a horizontal or a vertical plane, and this is accomplished by turning the nozzle 12 so that its supplemental air discharge passages 21 are both disposed in one or the other of said planes. The disposition of the valve pads 24 with respect to the passages 22, therefore, should be such as to permit the discharge of air from the supplemental passages when the outer nozzle 12 is in either of said operative positions, and at the same time should permit a closing register of the pads with the passages 22 when the outer nozzle 12 had been turned a short distance in either direction from said operative positions for the fan spray.

The inner portion of the ring valve 23 is

fashioned to engage the surface 11 of the nozzle 6 so as to prevent any considerable turning of the valve on such nozzle and at the same time permit the passage of air past the valve through the forward end portion of the air chamber 13. It is apparent that the outer nozzle 12 may have a turning movement on the valve member to bring the passage or passages 22, as the case may be, into register with certain of the valve pads to effect a closing of such passages.

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 Letters Patent is:—

1. In a spray-head of the class described, inner and outer nozzles mounted for relative rotary adjustment and the outer nozzle having supplemental air discharge passages, the nozzles being of different sizes to provide a space therebetween in communication with a source of air pressure supply, means cooperating with the outer nozzle to form a second space in communication with said discharge passages, said spaces having restricted communication of predetermined area with each other, and means in said first space operable by a relative turning of the nozzles to effect an opening or closing of said restricted communication.

2. In a spray-head of the class described, inner and outer nozzles mounted for relative rotary adjustment and the outer nozzle having supplemental air discharge passages, said spray-head having spaced chambers, one space being in communication with the supplemental discharge passages and the other in communication with a source of air pressure supply, said chambers having restricted communication of predetermined area with each other, and means operable by a relative turning of the nozzles to effect an opening or closing of said restricted communication at various points in the relative turning of the nozzles.

3. In a spray-head of the class described, an inner nozzle, a stationary part forming an annular seat in surrounding relation to and at the rear of the discharge end of said nozzle, an outer nozzle seating against said stationary part for rotary movements relative to it and the inner nozzle and forming with the inner nozzle an air space having communication with a source of air pressure supply, said stationary part cooperating with the outer nozzle to form a supplemental air space without said inner space, said outer nozzle having supplemental air discharge passages in communication with the supplemental air space and having restricted pas-

sages between said spaces, the combined cross-sectional area of which bears a predetermined relation to the combined cross-sectional area of the said supplemental passages, and valve means in the space between
5 said nozzles adapted to close said restricted communicating passages when the outer nozzle is in various rotary adjustment positions on the valve.

4. In a spray-head of the class described,
10 an inner nozzle, a seat surrounding and stationary with respect to said nozzle, an outer nozzle having annular rearward extension bearing against said seat and having supplemental air discharge passages without said
15 extension, said outer nozzle forming a space around the inner nozzle adapted to have communication with a source of air pressure supply, means rotatably holding the outer nozzle to its seat, said outer nozzle having communication therethrough between said passages and space bearing a predetermined relation as to size to said supplemental discharge passages, and a valve mounted in
20 said space and adapted to close the communication between said space and passages when the outer nozzle is in a predetermined position of rotary adjustment relative to the valve.

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

ROBERT W. TRACY.

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