Feb. 4, 1947. H. A. ROSELUND 2,415,194

ROTARY NOZZLE FOR USE IN PAN GREASING MACHINES

Original Filed Aug. 27, 1941

FIG-2

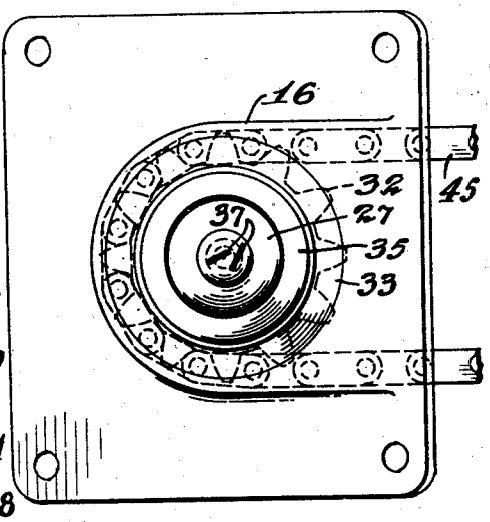
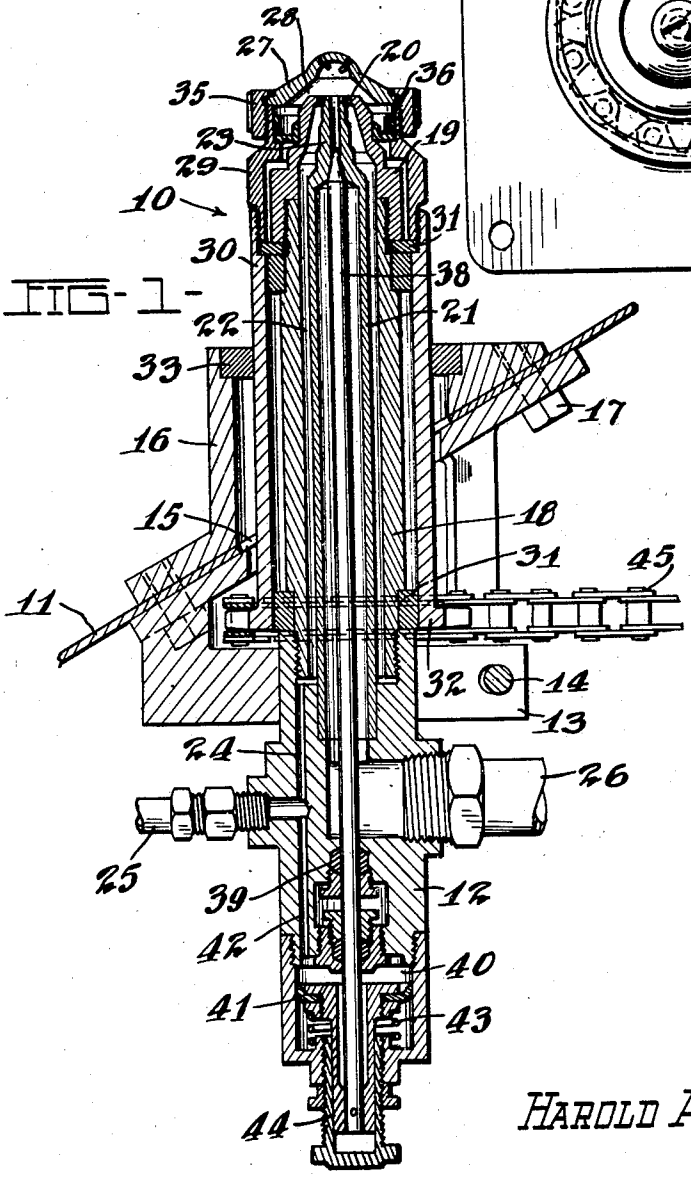


FIG-1



Inventor

HAROLD A. ROSELUND

By Owen & Owen,

Attorneys

Patented Feb. 4, 1947

2,415,194

UNITED STATES PATENT OFFICE

2,415,194

ROTARY NOZZLE FOR USE IN PAN GREASING MACHINES

Harold A. Roselund, Toledo, Ohio, assignor to The De Vilbiss Company, Toledo, Ohio, a corporation of Ohio

Original application August 27, 1941, Serial No. 408,542. Divided and this application May 2, 1944, Serial No. 533,692

3 Claims. (Cl. 91—45)

1

This invention relates to material spraying means, and particularly to a spray gun therefor.

In certain uses for such guns, it is desirable to have the spray therefrom discharge uniformly over a broad area which may be disposed in surrounding relation to the spray head axis or both in such relation and at the end of the spray head crosswise of its axis.

The primary object of the invention is the provision of a spray gun having a novel rotating spray head feature for assisting in effecting both a finely atomized spray and a uniform distribution of the spray throughout an annular area disposed in surrounding relation to the spray head axis and also, if desired, over a cross area at the end of the spray head.

This application is filed as a division of my application Serial No. 408,542, filed August 27, 1941, for a Pan greasing machine, now Patent Number 2,350,708, issued June 6, 1944.

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

Figure 1 is a central longitudinal section of a spray gun embodying the invention, together with a mount therefor, and Fig. 2 is a top plan view thereof.

Referring to the drawing, a spray gun 10 embodying the invention is shown as projected through and mounted in a wall 11 which, in the present embodiment, constitutes the inclined side wall of a sump used in connection with a pan greasing machine, as disclosed in my said application Serial No. 408,542.

The spray gun includes a body part 12 securely held by a split clamp 13 and cooperating screw or bolt 14, which clamp is disposed at the under side of the wall 11 around an opening 15 therein and is secured to said wall and to the flanged lower end of a sleeve member 16 on the upper side of the wall by screws 17. A barrel 18 fixedly rises from the upper end of the body 13, in the present instance being threaded in a socket therein, and extends up through the sump wall opening 15 and member 16 in spaced relation thereto and above the upper end of the latter. A spray nozzle 19 is threaded, or otherwise suitably mounted on the upper end of the barrel 18, and is provided centrally at its upper end with an air discharge orifice 20.

A tube 21, for the passage of the material to be sprayed, is disposed within the barrel 18, in spaced relation thereto, to provide an air passage 22 therebetween and is fixedly mounted in a suitable manner at its lower end in the body 12. The tube 21 terminates at its upper end in a material discharge nozzle 23, which, in the present instance, projects into the air discharge orifice 20 in spaced relation thereto, so that the air discharging from such orifice in surrounding relation to the orifice of the nozzle 23 will act on the material to be sprayed in a manner well understood in the art. The air passage 22 in the barrel 18 has communication at its lower end through a suitable passage 24 in the body 12 with a tube 25 leading to any suitable source of air pressure supply, while the lower end of the tube 21 has communication through a passage in the body 12 with a material supply tube 26 leading from a suitable source of material supply.

2

In order that the spray delivered from the nozzles 19 and 23 of the spray gun may be caused to have a whirling action so as to be more efficiently and uniformly delivered to the side walls of an article being sprayed, and into which the discharge end of the gun may be projected, a cap 27 is mounted over said nozzles in a manner to form a mixing chamber 28 within the cap. This cap is carried, through an intermediate connection 29, at the upper end of a sleeve 30, which surrounds the barrel 18 and has bearings 31 at top and bottom of the barrel or in spaced relation longitudinally thereof, to permit free rotation of the sleeve and its cap relative to the barrel and nozzles.

The sleeve 30, in the present instance, extends down through the member 16, wall opening 15, and a portion of the bracket 13 and carries a sprocket wheel 32 at its lower end in exposed position within said bracket. A gasket 33 is carried at the upper end of the member 16 and coacts with the sleeve 30 to prevent leakage of material between the sleeve and member, which is important should the spray gun be projected into a sump or other liquid container through the bottom or side wall thereof.

The spray cap 27, in the present instance, is attached to the upper end of the member 29 by a union nut 35 and cooperates with a gasket 36 to form the mixing chamber 28 without the discharge ends of the nozzles. The cap is provided with one or more discharge openings 37 which, in the present instance, are two in number and in the form of slots arranged in angular relation to each other, one being adjacent to the axis of the cap and the other being spaced therefrom to effect an efficient discharge of spray streams from the cap both transverse to the spray head axis and lengthwise thereof. The gaskets 36, in

addition to forming a closure for the inner end of the mixing chamber around the nozzles 19, also serve to prevent a spray mixture from passing from the cap chamber 28 down within the rotating parts.

The material discharge nozzle 23 has its orifice normally closed by a needle valve 38 which extends down through the tube 21 and suitable packing glands 39 in the body 12 into an air pressure chamber 40 provided at the outer end of the body. A plunger 41 is fixed to the needle 38 within said chamber and is exposed at its inner side to air pressure within the supply connection 25 through a passage 42, so that air pressure, when turned into the spray gun, is utilized to open the needle valve against the tension of a seating spring 43 acting against the outer side of said plunger. The extent of opening of the needle valve is regulated by the adjustment of a sleeve member 44 threaded in the outer end of the part in which the plunger operates and in position for its inner end to have stop coaction with the plunger.

The rotary sleeve 30 with its spray head or cap 27, in the present instance, is driven from any suitable source by a sprocket chain 45 in engagement with the sprocket wheel 32.

It is apparent that the spray discharge cap 27 and sleeve 30 are the only parts of the spray gun which are rotated, thus permitting the utilization of fixed air and material passages to the discharge orifices of the air and material nozzles, and obviating the necessity of providing rotating joints and parts therefor. In other words, no rotating joints, which ordinarily cause considerable trouble from a leakage standpoint, are necessary in connection with the regular passages for the material and air. The only joint necessary to prevent leakage from a liquid containing sump or receptacle in which the gun may be projected is that effected between the sleeve member 16 and the rotary sleeve 30 past the gasket 33, which latter is readily accessible for inspection and replacement.

It is apparent that in the use of the spray gun, the sleeve 30 and its spray discharging cap 27 are driven at any desired speed from the driving source and that when it is desired to effect a spraying operation, the air tube 25 is opened to the pressure supply source, thus causing a discharge of air through the passage 42 against the plunger 41 to effect an opening of the needle valve 38 and also through the passage 24 and into the space 22 between the tubes 18 and 21 and thence from the orifice 20 into the cap chamber 28. As the material and air discharge from the respective nozzles into the chamber 28, they are mixed therein and discharged in spray form therefrom through the cap openings 37. The rotation of the spray cap during such discharge causes the spray streams to commingle without the cap and discharge radially or transversely to the nozzle axis, or both radially and longitudinally of such axis, depending upon the particular disposition of the openings 37, so as to be directed against the side walls of a cavity or chamber into which the gun may be spraying and also the end wall thereof.

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. A spray gun for the air actuated discharge of coating material in spray-form, including outer and inner concentric tubes adapted to have connections at their inner ends with air and material supply sources, respectively, and having their outer ends each terminating in a restricted discharge nozzle disposed one within the other and each having restricted discharge orifices concentrically disposed, the inner nozzle having its discharge end projected into the restricted discharge orifice of the other nozzle, a rotatable tube encircling said tubes concentric thereto, a cap of shallow-form fixed to the outer end of said outer tube for rotation therewith and forming a shallow mixing chamber without the discharge ends of said nozzles whereby to receive the combined discharge of the air and spraying material from said nozzles, the outer end of said cap being provided in axially spaced adjacent relation to said nozzles with one or more orifices for the discharge of material in spray-form from said chamber, and means for imparting rotation to said outer tube.

2. A spray gun of the class described, comprising three concentric tubes the outer one being mounted for rotation in coaxial relation to the other tubes, the inner tube adapted to have communication at its inner end with a source of material to be sprayed and terminating at its outer end in a restricted nozzle having a discharge orifice, said intermediate tube adapted to have communication at its inner end with a source of air supply and provided at its outer end with a discharge nozzle which receives and is restricted around the discharge end portion of said inner nozzle and cooperates therewith to form an annular discharge orifice concentric to the discharge orifice of the inner nozzle, a cap carried by said outer tube for rotation therewith and forming a shallow mixing chamber over said nozzles and into which they have their discharge whereby material simultaneously discharged therefrom is mixed in said chamber, said cap having spray discharge orifices at the outer side of said chamber, and means for imparting rotation to said outer tube and cap.

3. A spray gun for the air actuated discharge of coating material in spray-form, including separate supply tubes for air under pressure and for a material to be sprayed, with one tube terminating in a restricted material discharge nozzle and the other in an air discharge nozzle restricted around the material discharge nozzle and forming a restricted discharge orifice therearound, said nozzles terminating in substantially a common cross-plane and being stationary, a cap enclosing the discharge ends of said nozzles to form a shallow chamber thereover in which the discharges from said nozzles mix in spray-form, said cap having one or more discharge orifices in axial outwardly spaced relation to the nozzles and being mounted for rotation about the nozzle axes, and means for rotating the cap.

HAROLD A. ROSELUND.

REFERENCES CITED

The following references are of record in the file of this patent:

FOREIGN PATENTS

Number	Country	Date
331,522	French	Apr. 27, 1903