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D. V. DRISCOLL

# APPARATUS FOR APPLYING COATING

Filed March 12, 1927

*Fig. 1.*

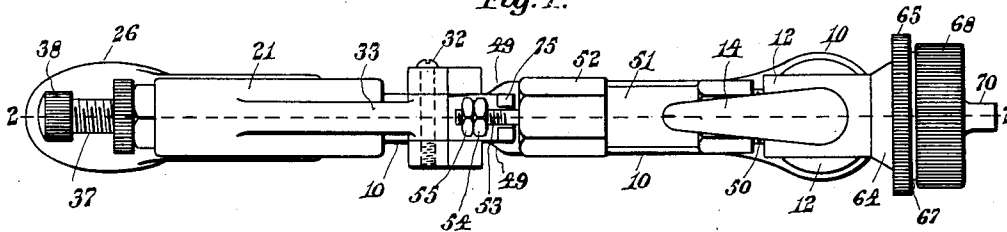


*Fig. 2.*

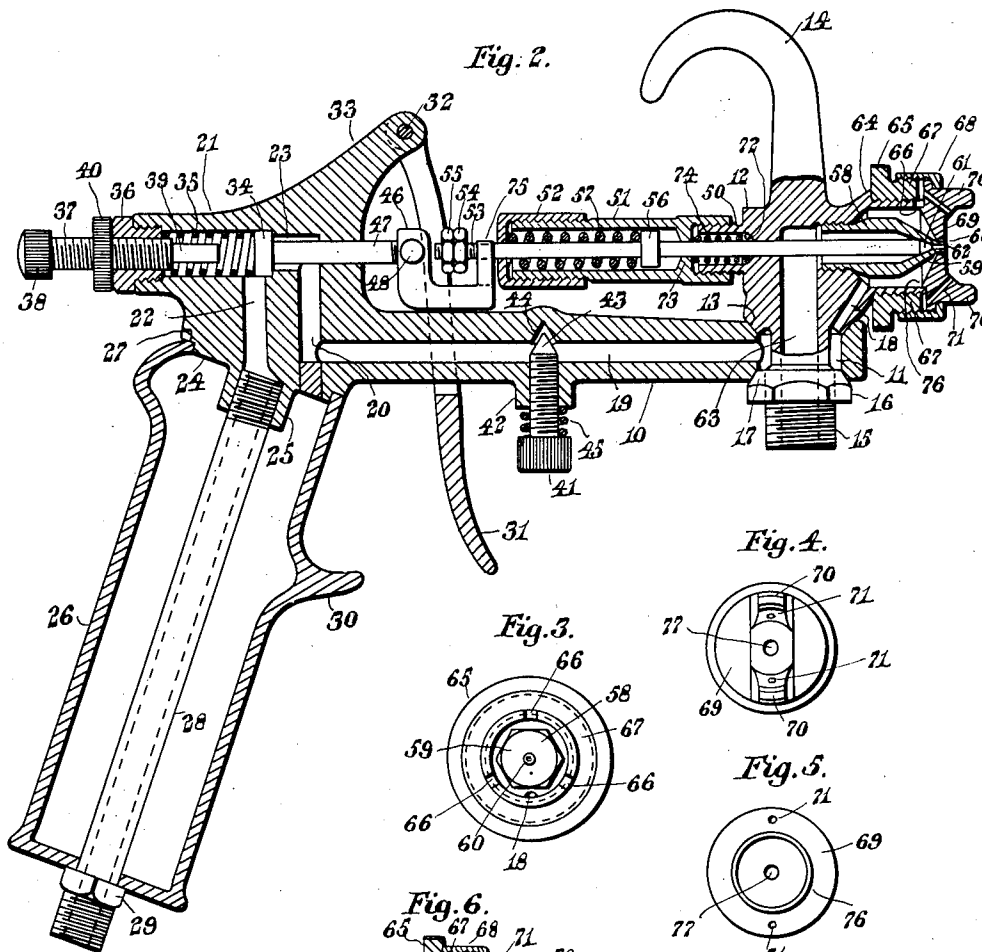


*Fig. 4.*

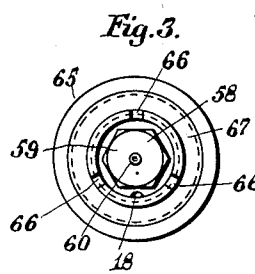


*Fig. 5.*

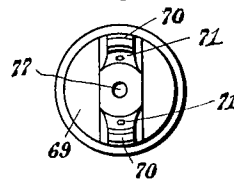


*Fig. 5.*

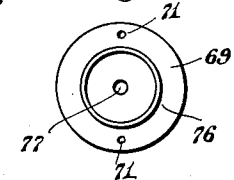


*Fig. 6.*

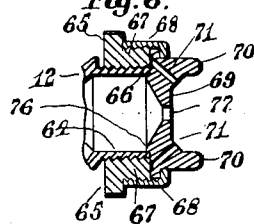
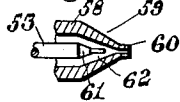


*Fig. 7.*



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## UNITED STATES PATENT OFFICE.

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## APPARATUS FOR APPLYING COATING.

Application filed March 12, 1927. Serial No. 174,803.

This invention relates to apparatus for applying to surfaces a coating of paint, varnish, japan, pigment or other material and has for its object the production of a device of this character which is simple in construction, easily operated and very effective in use.

This object is attained by the mechanism illustrated in the accompanying drawings.

For the purpose of illustrating the invention, one preferred form thereof is illustrated in the drawings, this form having been found to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized, and the invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described except as required by the scope of the appended claims.

Of the drawings:

Figure 1 represents a plan of a device embodying the principles of the present invention.

Figure 2 represents a vertical section on line 2, 2, on Fig. 1.

Figure 3 represents an elevation of the air chamber with the annulus threaded to the outer wall thereof and showing within said chamber the nozzle for the discharge of a coating material.

Figure 4 represents an elevation of the outer face of the rotatable closing disk or air nozzle.

Figure 5 represents an elevation of the inner face of said disk.

Figure 6 represents a vertical section of the air chamber and discharge nozzle therefor showing the annulus closing the radial passages from said chamber and the inclined discharge orifices through the rotatable disk forming the air nozzle, and

Figure 7 represents a vertical section through the nozzle through which the coating material is discharged and showing the valve therefor in open position.

Similar characters indicate like parts throughout the several figures of the drawings.

In the drawings 10 is the body portion of the device used in applying a coating of material, said body portion having near one end thereof an opening 11 in which is dis-

posed a member 12 having a cone-shaped face 13 fitted to the upper end of the opening 11.

The upper end of the member 12 is provided with a hook 14 by which the device may be supported when desired.

This member 12 has a downwardly extending threaded boss 15 upon which is threaded the lock nut 16 which is adjustable on said boss to retain said cone-shaped face upon its seat to prevent leakage at this point.

The upper end of the nut 16 has a cone-shaped face 17 which tightly fits the lower end of the opening 11 thereby hermetically sealing said opening 11 and preventing the escape of any air therefrom except through the passage 18 to the nozzle to be hereinafter described.

When the boss 15 is disposed in the opening 11 the wall of the boss forms with the wall of said opening an annular air space.

Through the body portion 10 is a passage 19 one end of which communicates with the air space or opening 11 while the opposite end communicates with a vertical passage 20 in an upwardly extending projection 21 formed upon the opposite end of the body portion 10.

In this projection 21 is another vertical passage 22 parallel to the passage 20, said vertical passages 20, 22 communicating at their upper ends with a horizontal valve chamber 23.

The body portion 10 is provided beneath the projection 21 with an extension 24 and a boss 25.

The hollow handle 26, at its upper end, surrounds the extension 24 and bears against a flat faced seat 27 formed upon said body portion 10.

Threaded to the boss 25 is the tube 28 the upper end of the bore of which communicates with the lower end of the vertical passage 22.

The lower end of the handle 26 is closed and against the bottom wall thereof bears the flat sided head 29, the lower end of which is threaded to receive a pipe from the source of air supply.

Formed upon the handle 26 is a finger guard 30 the object of which is to prevent the hand in gripping the handle from slipping upwardly, so as to interfere with the

operation of the trigger 31 pivoted at 32 to an arm 33 projecting upwardly from the projection 21.

In the valve chamber 23 is a valve 34 shown in Fig. 2 upon its seat and closing all communication between the passages 20, 22, said valve being retained upon its seat by means of a spring 35.

The rear end of the valve chamber 23 has a closure 36 threaded therein and centrally disposed in this closure 36 is the threaded member 37 having a serrated head 38 at its outer end by which it may be turned to adjust the member 37 endwise.

The member 37 has a stop member 39 projecting from its inner end and the purpose of which is to limit the rearward movement of the valve 34 when it is desired to permit the passage of compressed air from the passage 22 to the passage 20 and then through the passage 19 into the opening or air space 11.

When the member 37 has been properly adjusted it is locked in position by means of the nut 40.

Extending transversely of the passage 19 is the upper end of a regulating valve 41 which is threaded to a boss 42 formed upon the body portion 10.

The upper end of the valve 41 is conical as shown at 43 and adapted to enter the conical recess 44 extending from the passage 19.

When the valve 41 is in the position shown in Fig. 2 the compressed air can pass by the valve but when the conical end 43 enters the recess 44 the amount of air passing to the opening 11 is decreased.

The spring 45 surrounding the shank of the valve 41 serves as a lock nut to retain the valve in its adjusted position.

The upper end of the trigger 31 is bifurcated and straddles a U-shaped member 46 secured to the forward end of the stem 47 of the valve 34.

This U-shaped member 46 has oppositely disposed lugs 48 against which the trigger 31 bears.

The forward movement of the trigger 31 is limited by coming in contact with the shoulders 49 on the opposite sides of the body portion 10.

The member 12 is provided on its rear face with a boss 50 to which is threaded one end of a tube 51 the opposite end of which has threaded thereto a closing cap 52 through which extends a rod or valve member 53, the rear end of which has adjustably mounted thereon the nuts 54, 55.

The rod or valve member 53 has an enlarged portion 56 within the tube 51 and between this enlarged portion 56 and the cap 52 is a spring 57 which tends to force the rod or valve member 53 forward.

In the forward wall of the member 12 is secured the chambered nozzle member 58

having its forward end cone-shaped as shown at 59, and provided with a small tubular projection 60.

The forward end of the rod or valve member 53 is conical as at 61 and fits the inner wall of the cone-shaped part 59 and from this conical end extends a pin 62 through the bore of the tubular projection 60.

The chamber of the nozzle member 58 communicates with a passage 63 extending downwardly in the member 12 and through the threaded boss 15.

The lower threaded end of the boss 15 is adapted to have attached thereto a pipe or other member leading to the source of supply of the material to be used as a coating.

As shown in Fig. 2 the discharge orifice for the coating material is closed so that none of the coating material can be discharged therefrom.

From the front face of the member 12 projects a threaded cylinder 64 forming an air chamber and on which is mounted the annulus 65 adjustable endwise thereof.

The inner chamber of this cylinder 64 communicates with the air passage 18 and the forward end of the cylinder wall has a plurality of radial notches or passages 66 formed therein, preferably three in number.

When the annulus 65 is in the position indicated in Fig. 2 of the drawings these notches 66 are uncovered permitting air to pass outwardly through these notches but if the annulus 65 is moved forward into the position shown in Fig. 6, the notches may be wholly closed so that no air may pass.

The annulus 65 has an annular forward extension 67 to the exterior of which is threaded the cup-shaped member or sleeve 68, the forward end of which extends over a flange on the rotatable disk 69 having outwardly extending lugs 70 by which it may be moved about its axis.

The disk 69 has extending therethrough the air orifices 71 inclined toward each other as shown in Figs. 2 and 6, the outer ends of these passages being opposite the lugs 70 while their inner ends communicate with the annular space between the inner face of the disk 69 and the outer end of the extension 67.

When the annulus 65 is in its forward position as shown in Fig. 6 the inner ends of these orifices 71 are closed.

The boss 50 has a chamber therein in which are disposed packing rings 72 surrounding the rod 53 and between these rings 72 and the wall 73 of the tube 51 is a spring 74 which serves to force the packing rings 72 to their seat and also acts as a lock nut to prevent the tube 51 being accidentally rotated about its axis.

The nuts 54, 55 are normally spaced from the notched upright 75 forming a part of

the U-shaped member 46 so that when the trigger 31 is moved towards the handle 26 there will be no movement of the rod or valve member 53 until the upright 75 comes into contact with the nut 54 and continues its movement to the rear.

When the rod or valve member 53 is thus moved to the rear the pin extension 62 will be removed from the orifice in the coating material nozzle 58 and this coating material may then be discharged in a circular film from said nozzle, the compressed air surrounding said nozzle being discharged at the same time and causing the film of coating material to form a spray substantially circular in cross section.

This is only true, however, when the annulus 65 has been adjusted to entirely cover the notches 66, as shown in Fig. 6, leaving no space between the end of the extension 67 and the rear face of the disk 69.

If instead of a circular spray, it is desired to discharge the coating material in a flat spray the annulus 65 is moved into the position shown in Fig. 2, thereby creating an annular space between the end of the extension 67 and disk 69 through which air may pass to the inclined orifices 71.

When the air is discharged from these orifices 71 against the spray being discharged from the nozzle 58, the two oppositely disposed jets of air will impinge upon the centrally discharged spray and change its shape in cross section from a circular form to the form of a sheet of spray.

The disk 69 may be moved about its axis relatively to the cup-shaped member or sleeve 68 and then by turning the cup-shaped member or sleeve 68 said disk may be clamped in any desired position so that the sheet of spray may be either vertical, horizontal or at any other desired angle.

When the device is in use the operator grasps the handle 26 with three fingers below the guard 30 leaving the forefinger above the guard ready to actuate the trigger 31.

When the operator with the forefinger moves the trigger to the rear, this trigger bearing upon the lugs 48 will move the valve 34 into contact with the stop 39 thereby uncovering the passage 22 and permitting the compressed air or other motive agent to pass through the passages 20, 19, the opening or air space 11, and passage 18, into the air chamber in the extension 64 from which it may pass through the central orifice in the disk 69 and in case the notches or passages 66 are uncovered through the inclined orifices 71.

The passage 22 will be partially uncovered before the upright 75 contacts with the nut 54 and commences to move the rod 53 and consequently the compressed air will be discharged through the orifice in disk

69 before the valve 53 is opened to permit the discharge of the coating material.

Consequently no coating material can be discharged until the motive agent is ready to take care of it and break it into a spray.

On the return movement of the valve rod 53 and air valve 34, when the trigger is released, the conical end of the valve 53 will come to its seat and stop further discharge of the coating material before the supply of motive agent has been fully cut off by the valve 34 coming to its seat.

This feature of the invention is of considerable importance as no coating material can be discharged at any time without the motive agent being present to break it into spray.

The amount of motive agent moving through the passage 19 may be regulated by the adjustment of the valve 41 while the amount of opening of the valve 34 may be varied by adjusting the stop member 39.

This is obviously of great advantage.

Moreover another great advantage is the provision of means whereby the time of opening of the valve 61 relatively to the opening of valve 34 may be varied as desired, this being accomplished by adjusting the nuts 54, 55 along the valve rod 53.

Not only does the stop member 39 limit the movement of the valve 34 but through the medium of the U-shaped member 46 it determines the opening of the valve 53.

By adjusting the stop member 39 the amount of discharge of the coating material may be accurately determined so that at no time will an excessive amount of material be discharged on the article being coated.

The size of the valve 34 is such that when it is opened more air will be admitted to the passage 19 than is necessary to take care of the coating material being discharged.

In view of this fact the regulating valve 41 may be adjusted to permit the passage of the exact amount of air required to take care of any particular coating material being used.

The closing disk 69 is provided on its inner face with a cylindrical projection 76 which accurately fits into the bore of the projection 67 so that the small tubular projection 60 is always centrally disposed in the central opening 77 in the disk 69.

This is of considerable importance as it insures an even distribution of the coating material as it is discharged from the nozzle 58, the discharged material being surrounded upon all sides by an equal amount of air.

The spring 74 acting upon the packings 72 simply retains the packings on their seats and can never be adjusted to such an extent as to cause the packings 72 to bind upon the valve rod 53 and prevent its free movement.

It is believed that the operation and many

advantages of the invention will be understood without further description.

Having thus described my invention, I claim—

1. In a device of the class described provided with passages for compressed air and a coating material; a discharge nozzle for the coating material; a valve therefor; a valve for the air passage having a stem; a member secured to said stem and having a lateral lug; a pivoted trigger coacting with one side of the periphery of said lug to move said member and open the air valve; a forked projection to said member straddling the nozzle valve; and shoulders on the nozzle valve positioned between said lug and projection and adapted to be engaged by said projection during the movement of said member.
2. In a device of the class described provided with passages for compressed air and a coating material; a discharge nozzle for the coating material; a valve therefor; a valve for the air passage having a stem; a member secured to said stem and having a lateral lug integral therewith; a pivoted trigger coacting with one side of the periphery of said lug to move said member and open the air valve; a forked projection to said member straddling the nozzle valve; and a nut on the nozzle valve between said lug and projection adjustable endwise thereof and adapted to be engaged by said projection during the movement of said member.
3. In a device of the class described provided with passages for compressed air and a coating material; a discharge nozzle for the coating material; a valve therefor; a valve for the air passage having a stem; a member secured to said stem and having a lateral lug; a pivoted trigger coacting with said lug to move said member and open the air valve; an upwardly extending forked projection to said member straddling the nozzle valve; and a nut on the nozzle valve between said lug and projection adjustable endwise thereof and adapted to be engaged by said projection during the movement of said member.
4. In a device of the class described provided with passages for compressed air and a coating material; a discharge nozzle for the coating material; a valve therefor; a valve for the air passage having a stem; enclosed springs for retaining both valves seated under normal conditions; a member secured to the stem of the air valve and having a lateral lug formed integral therewith; a pivoted trigger at one side of said lug coacting therewith to move said member and open the air valve; an upwardly extending forked projection to said member straddling the nozzle valve; and a nut on the nozzle valve between said projection and lug ad-

justable endwise thereof and adapted to be engaged by said projection during the movement of said member.

5. In a device of the class described, an elongated body having an air passage extending lengthwise thereof and communicating with a discharge nozzle at one end; a vertical passage communicating with the other end of said passage; a second vertical passage, both vertical passages communicating at the top with a valve chamber; a valve therein normally closing communication between said vertical passages; means for supplying a motive agent to the second vertical passage; means for moving said valve to effect communication between said vertical passages; and an adjustable stop member extending into said valve chamber in the path of said valve.

6. In a device of the class described, a body provided at one end with an opening therethrough and having an air passage leading thereto; means for controlling the supply of air to said opening; a vertical support at the end of said body having a tubular extension centrally positioned in said opening and forming with the wall thereof an annular space, said extension having a cylindrical bore and said support having a cylindrical extension forming the chamber communicating with said annular space; a closing disk for said chamber having a central opening therein; a nozzle within said chamber having its bore communicating with the bore of said extension; a valve for normally closing said nozzle; and means for opening said valve.

7. In a device of the class described, a body provided at one end with an opening therethrough and having an air passage leading thereto; means for controlling the supply of air to said opening; a vertical support at the end of said body having a tubular extension centrally positioned in said opening and forming with the wall thereof an annular space, said extension having a cylindrical bore and said support having a cylindrical extension forming the chamber communicating with said annular space; a closing disk for said chamber having a central opening therein; a nozzle within said chamber having its bore communicating with the bore of said extension and provided with a discharge orifice alined with said central opening; a valve for normally closing said nozzle; and means for opening said valve.

8. In a device of the class described, a body provided at one end with an opening therethrough and having an air passage leading thereto; means for controlling the supply of air to said opening; a vertical support at the end of said body having a tubular extension centrally positioned in said opening and forming with the wall thereof an annular space, said extension having a

cylindrical bore and said support having a chamber communicating with said annular space; a closing disk for said chamber having a central opening therein; a nozzle within said chamber having its bore communicating with the bore of said extension and provided with a tubular extension in said central opening; a valve for normally closing said nozzle and having a pin at its end normally disposed in the bore of said tubular extension; and means for opening said valve.

9. In a device of the class described, a body provided at one end with a lateral opening therethrough and having an air passage leading thereto; means for controlling the supply of air to said opening; a member normally disposed in said opening but removable therefrom and having an air chamber therein and a passage for a coating material; means for admitting air to said chamber; a nozzle within said chamber and communicating with said passage; a valve controlling the discharge from said nozzle; and a disk closing said chamber having an opening in alinement with said nozzle.

10. In a device of the class described, a member having an air chamber therein and a passage for a coating material; means for admitting air to said chamber; a nozzle within said chamber communicating with said passage; a valve controlling the discharge from said nozzle; a rotatable disk closing said chamber having an opening in alinement with said nozzle; radial passages from said chamber; an annulus on said member movable to close said radial passages; and means for locking said disk to said member, said disk having other discharge orifices communicating with said radial passages when uncovered.

11. In a device of the class described, a member having an air chamber therein and a passage for a coating material; means for admitting air to said chamber; a nozzle within said chamber communicating with said passage; a valve controlling the discharge from said nozzle; a rotatable disk closing said chamber having an opening in alinement with said nozzle; an annulus on said member movable lengthwise thereof; radial passages from said chamber to an annular space between said disk and annulus which passages are adapted to be closed by said annulus; and means for locking said disk to said member, said disk hav-

ing oppositely disposed inclined orifices from said annular space to direct air against the film of coating material discharged through the disk opening.

12. In a device of the class described, a member having an air chamber therein; means for admitting air thereto; a nozzle within said chamber; means for admitting a coating material thereto; a valve controlling the discharge from said nozzle; a rotatable disk closing said chamber having an opening in alinement with said nozzle and oppositely disposed inclined discharge orifices; radial passages from said chamber; an annulus movable on said member to close said radial passages and the inner ends of said inclined passages; and means for locking said disk to said member.

13. In a device of the class described, a nozzle for the discharge of a coating material; a valve regulating the discharge of material from said nozzle; a bearing in which said valve reciprocates and having a recessed hub extending therefrom; a housing surrounding and adjustable on said hub; a packing in the recess of said hub and surrounding the valve; a spring within said recessed hub forcing said packing to its seat and another spring within said housing adapted to close said valve.

14. In a device of the class described, a member having an air chamber therein; means for admitting air thereto; a nozzle within said chamber; means for admitting a coating material thereto; a valve controlling the discharge from said nozzle; a flanged rotatable disk closing said chamber having an opening in alinement with said nozzle; an annulus on said member movable lengthwise and forming with said disk an annular space from which extend radial passages to said chamber, said annulus in its movement on said member being adapted to close said radial passages; and a cup-shaped member engaging the flange of said disk and threaded to said annulus, said disk having oppositely disposed inclined orifices from said annular space to direct air against the film of coating material discharged through the disk opening.

Signed by me at 746 Old South Bldg., Boston, Massachusetts, this 9th day of March, 1927.

DANIEL VINCENT DRISCOLL.