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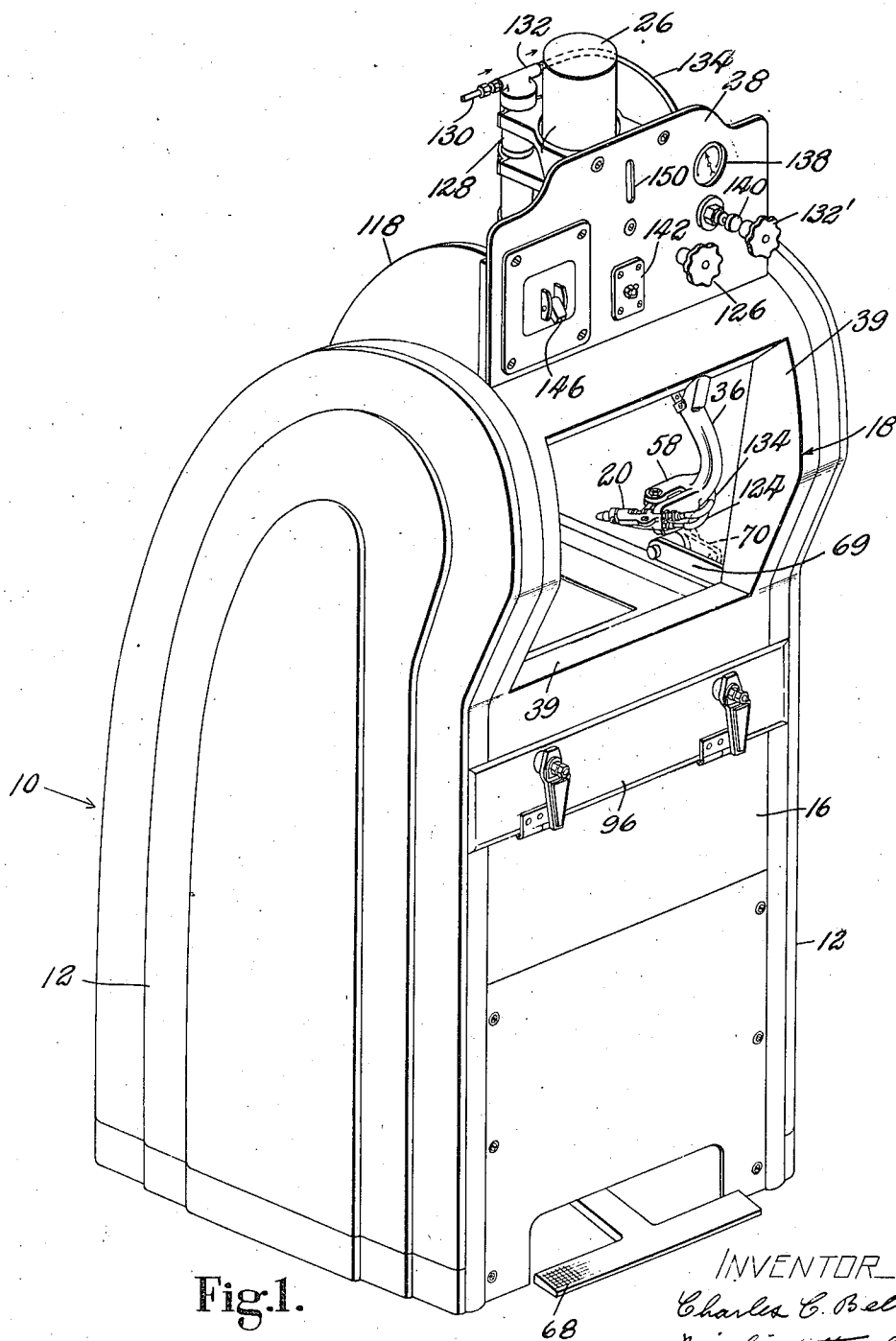
C. C. BELL

2,310,205

CEMENT SPRAYING UNIT

Filed Jan. 8, 1940

3 Sheets-Sheet 1



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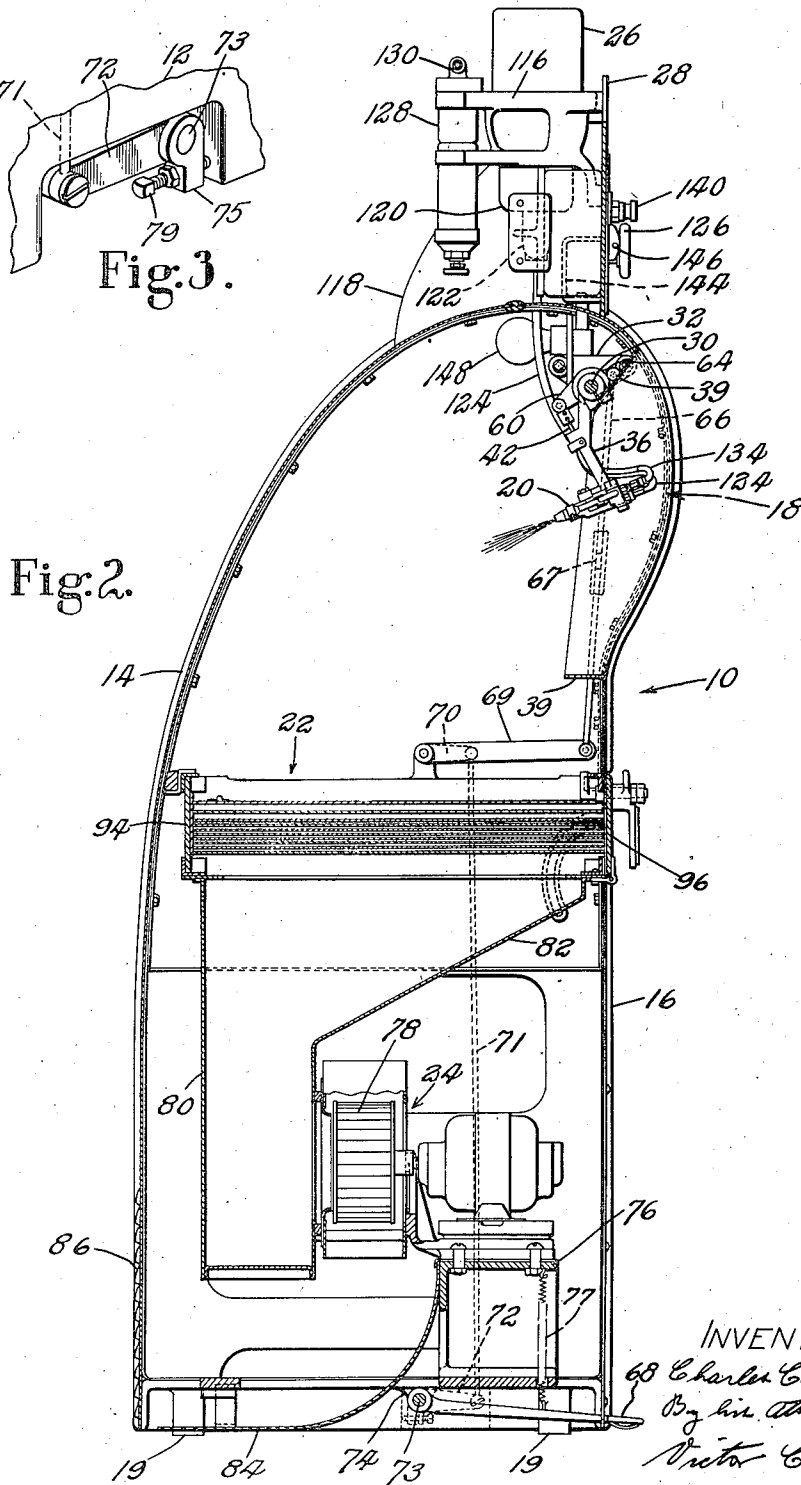
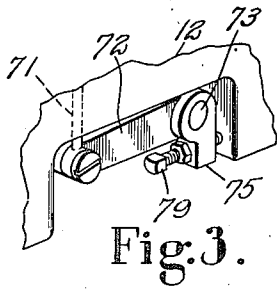
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2,310,205

CEMENT SPRAYING UNIT

Filed Jan. 8, 1940

3 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,310,205

CEMENT SPRAYING UNIT

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Application January 8, 1940, Serial No. 312,848

5 Claims. (Cl. 91—45)

This invention relates to an apparatus for coating articles by means of a spray gun and more particularly to apparatus for use in applying a spray coating to shoe parts.

In the manufacture of shoes, in many instances the application of the coating material may most conveniently be accomplished by a spray gun because in so doing the coating may be evenly distributed and may be applied in small quantities which will dry quickly, thereby permitting the application of several coatings without danger of subsequent checking or peeling.

During the application of a spray coating to an article, particularly if it is of an irregular contour, it is difficult to confine the spray coating to the article to be coated without having a portion thereof disseminated through the air of the room. This difficulty has been eliminated largely by mounting the spray gun in a spray booth in such a position that there is little danger of the atomized sprayed coating being projected into the room and by associating with the booth an exhaust fan for withdrawing the unused atomized particles of the sprayed coating.

Heretofore, in such spray booths the spray gun has been mounted in the booth by a support disposed directly above the spray gun or between the operator and the spray gun and consequently there was a blind spot caused by the support or the gun itself which obstructed the operator's view so that as he moved the shoe about beneath the nozzle of the spray gun he could only guess as to the exact point of application of the sprayed coating material at any given time.

Accordingly, it is an object of the invention to provide improved mechanism for supporting the spray gun so constructed and arranged that the operator will at all times be able to see the area to which the spray is being applied, thereby to improve the distribution of the coating material and to reduce waste.

As illustrated herein, the spray gun is mounted inwardly of the mouth of the spray booth with its nozzle directed inwardly and downwardly and, in accordance with a feature of the invention, is suspended from the top of the spray booth in such a manner that it lies forwardly and to one side of its point of attachment, thereby affording a clear view of the nozzle of the gun so that the operator may move the work accurately with respect to the nozzle. To actuate the gun, a cable is extended from the point of attachment of the gun to the gun, one end of the cable being connected to the discharge valve of the gun and the other being connected by an arm to a rotatable

sleeve, the latter being operable by a treadle to move the cable.

The method for recovering the unused spray which is discharged in the spray booth and the apparatus for carrying out the method, together with special features pertaining to the construction of the apparatus to facilitate cleaning as disclosed and described herein, form the subject matter of a divisional application, Serial No. 368,969, filed December 7, 1940, in my name.

The spray booth and means for supporting a spray gun therein in accordance with the features related will now be described in detail with the aid of the accompanying drawings, in which Fig. 1 shows an angular view of the complete booth;

Fig. 2 shows a vertical section through the booth;

Fig. 3 shows a detail of the treadle-connection adjustment;

Fig. 4 shows an enlarged front elevation of the gun support and operating mechanism for the same;

Fig. 5 shows an end elevation of the spray gun supporting bracket looking from left to right in Fig. 4; and

Fig. 6 shows a plan view of the bracket with a fragment of the gun mounted at the end thereof.

The spray booth embodying the features of the present invention is shown in Fig. 1 as comprising in general a rectangular booth 10 made up of end members 12, a back 14 which extends forwardly over the top, and a front 16 having an opening 18 therein to permit access to the interior of the booth, the booth being supported from the floor by legs 19 (Fig. 2). The booth houses a spray gun 20, a separator consisting of a series of baffles indicated generally at 22 (Fig. 2), and an exhaust unit 24, while the source of coating supply 26 and a control panel 28 are mounted on top of the booth.

In order to reduce, in so far as possible, the tendency for the spray to escape through the opening 18 into the room, the spray gun is mounted inwardly from the opening 18 and the latter is provided with comparatively wide in-turned flanges 39 which serve as deflectors to turn the spray back from the opening. Since the position of the gun renders its operating valve inconvenient, if not inaccessible, to the operator, it is necessary to provide operating means at the exterior of the booth by which the gun may be set in operation without reaching into the booth and also so as to permit the operator to use both hands in turning the shoe or

other article being sprayed. To this end, a rod 30 is mounted horizontally between the sides 12 of the booth in steps 32 fixed to the side walls, the rod being held from rotation therein by set screws 34. Since it is desirable to locate the gun centrally but at the same time to permit a clear view of its discharge nozzle so as to enable the operator to hold the work in the most effective position, an arcuate bracket 36 (Fig. 4) is employed to suspend the gun from the horizontal rod 30, the bracket supporting the gun at the approximate center of the booth but extending laterally and upwardly to one side of the gun. The bracket 36 is attached to the rod 30 by a split clamp 38 which permits angular adjustment of the bracket and therefore of the gun about the horizontal rod 30. This adjustment is desirable because it permits the angle of the direction of the discharge of the gun to be modified to suit the particular conditions, for instance, the height of the operator or the pressure at the gun. The free end of the bracket 36 is furnished with a split clamp 40 for holding the gun 20 which, as illustrated in Fig. 2, is directed inwardly toward the back of the booth with its discharge end tilted down from the horizontal.

The arcuate bracket 36 is U-shaped in cross-section (Fig. 6) so that it constitutes a channel 37 in which there is disposed a flexible cable 42 adapted to throw the gun into operation. The use of a cable 42 for transmitting the force necessary to throw the gun into operation at the end of the arcuate bracket is very convenient because it conforms to the curvature of the bracket, thereby eliminating the necessity for numerous sections of rods connected by universal couplings which are expensive and undesirable. While the cable operates satisfactorily in the open U-shaped channel there is a tendency for spray to accumulate on the cable. To prevent this, and also to insure smooth action of the cable, it may be desirable to encase the cable in a tube 41. When such a tube is used, it is disposed in the open channel from end to end thereof. The ends of the tube are flattened on at least one side at 43 and set screws 45 are threaded through the wall of the bracket against the flattened portion 43 of the tube to prevent longitudinal or rotational movement thereof relative to the bracket.

The connection between the cable and operating mechanism of the gun is through a bell-crank lever 48 (Fig. 6) pivotally mounted at 56 on the end of an arm 58 integral with the lower end of the bracket. One arm of the bell-crank lever 48 is provided with an open-ended slot 46 through which is passed one end of the cable 42. A head 44 is provided at the extremity of the cable, the head being adapted to rest in a depression 47 formed on the arm of the lever so that it will not slide from the open end of the slot. The other arm of the bell-crank lever is forked and embraces the valve rod 50 of the gun 20, the forked end engaging an enlargement 52 on the rod whereby the rod 50 may be operated. The cable is operated to throw the gun into operation by applying a tension force to its opposite end and this is accomplished by connecting the other end of the cable to a radial arm 60 which may be adjusted angularly about the rod 30. In order to insure a straight pull on the cable, a swivel block 49 is interposed between the end of the cable and the arm 60, the swivel block 49 being mounted on a stud 61 projecting from the arm. The end of the cable is secured to the

swivel block by set screws. The arm 60 is adjustably clamped to the end of a sleeve 62, rotatably mounted on the rod 30, whereby the position of the arm relative to the sleeve may be changed to maintain the arm constantly in operating relation with the cable despite any adjustment of the bracket and the gun about the rod 30. The sleeve 62 extends from the bracket along the rod to the wall and is provided with a radial arm 64 integral therewith to which is attached a rod 66 which is divided between its ends and held together by a turnbuckle 67, whereby adjustment in the length of the rod may be readily made. The rod 66 is operable to actuate the sleeve and in turn the cable by a foot treadle 68 at the bottom of the booth, the connections between the rod 66 and the treadle 68 (Fig. 2) being through a series of members indicated in their order of connection 69, 70, 71, 72, and 73. The spindle 73 is rotatably supported at one end by a pair of ears 74 and at the other end in the end wall of the booth. The foot treadle 68 is fixed to the spindle between the ears 74 and is adapted to turn the spindle when the operator presses down upon it with his foot. A spring 77 attached at one end to the treadle 68 and at its other end to a pedestal 76 returns the treadle to its inoperative position when the operator removes his foot. The opposite end of the spindle 73 is operably connected to the rod 71 by a member 72 fixed to the spindle. A stop screw 79 is threaded through a boss 75 formed on the member 72 (Fig. 3) and is arranged to bear against an adjacent part of the frame whereby the downward movement of the member 72 may be limited.

The separator for recovering the unused spray is in the form of a stack of baffle plates 22 which is placed below the gun and forms the bottom wall of the spray chamber of the booth, access being had to the plates for cleaning through a hinged door 96 provided in the front wall of the booth. While the solid particles of the spray tend to fall by gravity toward the baffles, the entraining of smaller particles is augmented by air movement produced by a motor-driven exhaust fan unit 24 which is mounted on the pedestal 76 at the bottom of the booth, the fan 78 being interposed in an exhaust duct 80 the upper end 82 of which is enlarged to include the complete under side of the baffle stack 22 and the lower end 84 of which terminates close to the rear wall of the booth which at this point has been vented at 86 to permit the cleansed air to pass into the room.

The bottle 26 for supplying the coating material to the gun is mounted at the top of the booth in a bracket 116 which is secured to the rear face of the panel 28. The panel 28 is in turn fixed to the top of the booth by a pair of end webs 118. The neck of the bottle is fitted with the usual escape valve (not shown) which permits the contents of the bottle to flow into a cup 120.

A valve housing 122 is connected directly to the bottom of the cup 120 between the latter and a hose 124 leading to the gun. A valve therein (not shown) is controlled by a hand knob 126 provided on the panel 28. The cup 120 is detachable from the bracket 116 in accordance with the showing in United States Letters Patent No. 2,005,729, granted June 25, 1935, to T. J. Doyle, to permit easy cleaning of the same. An air dehumidifier 128 is also mounted on the bracket 116 and through this the air for operating the

gun is passed prior to its use, the air entering at 130 under pressure and leaving at 132 by way of a hose 134 to the gun. The admission of air to the hose leading to the gun is controlled by a valve knob 132' and the air pressure is regulated by a common type of reducing valve (not shown), the valve knob 140 of which is on the panel 29. For convenience in keeping track of the pressure at all times a pressure gage 138 is mounted on the panel adjacent to the regulating valve knob 132'. There is also an electric switch box 144 fixed to the back of the panel with the snap lever 146 on the front of the panel for controlling the exhaust fan unit. One or more electric lamps 148 are mounted in the booth for illuminating the interior of the same, a switch 142 being provided for their operation. For convenience in determining the level of the material in the bottle, a sight slot 150 is provided in the panel directly opposite the bottle.

In use the operator adjusts the angular position of the gun 20 to bring it to the most comfortable height and direction for his use, at the same time adjusting the arm 60 so as to maintain the operating relation of the treadle connection. The pressure valve is then adjusted so that the gun will throw a spray of the requisite amount, the liquid valve 126 is opened and the exhaust unit switch is thrown, whereupon the booth is ready for use. After these preliminary adjustments the work is held by the operator in front of the gun which is set in operation by stepping on the treadle 68 and holding it down. When the operator removes his foot from the treadle, the spring 77 returns it to its inoperative position, thereby shutting off the gun.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In combination, a support, a spray gun, having a discharge valve, fixed to said support and depending therefrom, said spray gun being offset forwardly and to one side of its point of attachment, a cable extending from the point of attachment to said gun, means for connecting one end of the cable to the discharge valve, a rotatable sleeve mounted on the support, an arm connecting the opposite end of said cable to the sleeve, and means controlled by the operator for turning the sleeve thereby to move the cable.

2. In combination, a support, a spray gun having a discharge valve, a bracket depending from the support, one end of the bracket being fastened for angular adjustment to the support, the other end of the bracket being offset forwardly and to one side of the first-named end, said

spray gun being fixed to the second-named end of the bracket, a sleeve movably mounted on the support, means for connecting said sleeve to said valve, said means having a part adjustable on the sleeve to maintain the connection between the sleeve and the valve irrespective of the angular position of the bracket with respect to the support, and means controlled by the operator for oscillating the sleeve thereby to open and close the discharge valve.

3. In a spray booth having an opening for the presentation of work, a transverse rod positioned in the booth above the opening, a depending gun supporting bracket adjustable about said rod, one end of said bracket being offset forwardly and to one side of the other end, a spray gun fixed to said one end, a sleeve rotatable on said rod, operator-controlled means connected to said sleeve adjacent to one end thereof, an arm secured to said sleeve and adjustable about the axis of the sleeve, and gun operating means extending from said arm along said bracket.

4. In combination, a spray booth having a work-presenting opening, a supporting rod carried in said booth and extending from at least an intermediate portion of the opening to a side portion of the booth, a curved bracket adjustably secured to said rod, said bracket extending downwardly, forwardly and laterally toward the middle of the opening, a spray gun held on the lower end of said bracket and directed inwardly of the booth, a gun operating cable extending through said bracket, a sleeve rotatable about said rod, a treadle connection to said sleeve at the side of the booth, an arm clamped on the sleeve and adjustable about its axis, and means for connecting said arm to said cable, whereby operation of the treadle connection causes operation of the gun.

5. In a spray booth, the combination of a support and a spray gun having a discharge valve, a bracket for suspending the gun from the support, one end of the bracket being adjustably secured to the support, a gun secured to the opposite end of the bracket, the gun holding end of the bracket extending forwardly and to one side of its point of connection with the support, a lever arranged to open the valve, a cable connected at one end to said lever, said cable being movable on the bracket to actuate the lever, a sleeve mounted on the support, a radially extending arm adjustably secured to said sleeve, means connecting the opposite end of the cable to said arm, and a rod controlled by the operator for rotating the sleeve.

CHARLES C. BELL.