

Jan. 25, 1938.

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2,106,187

SPRAY COATING APPARATUS

Filed Sept. 9, 1936

2 Sheets-Sheet 1

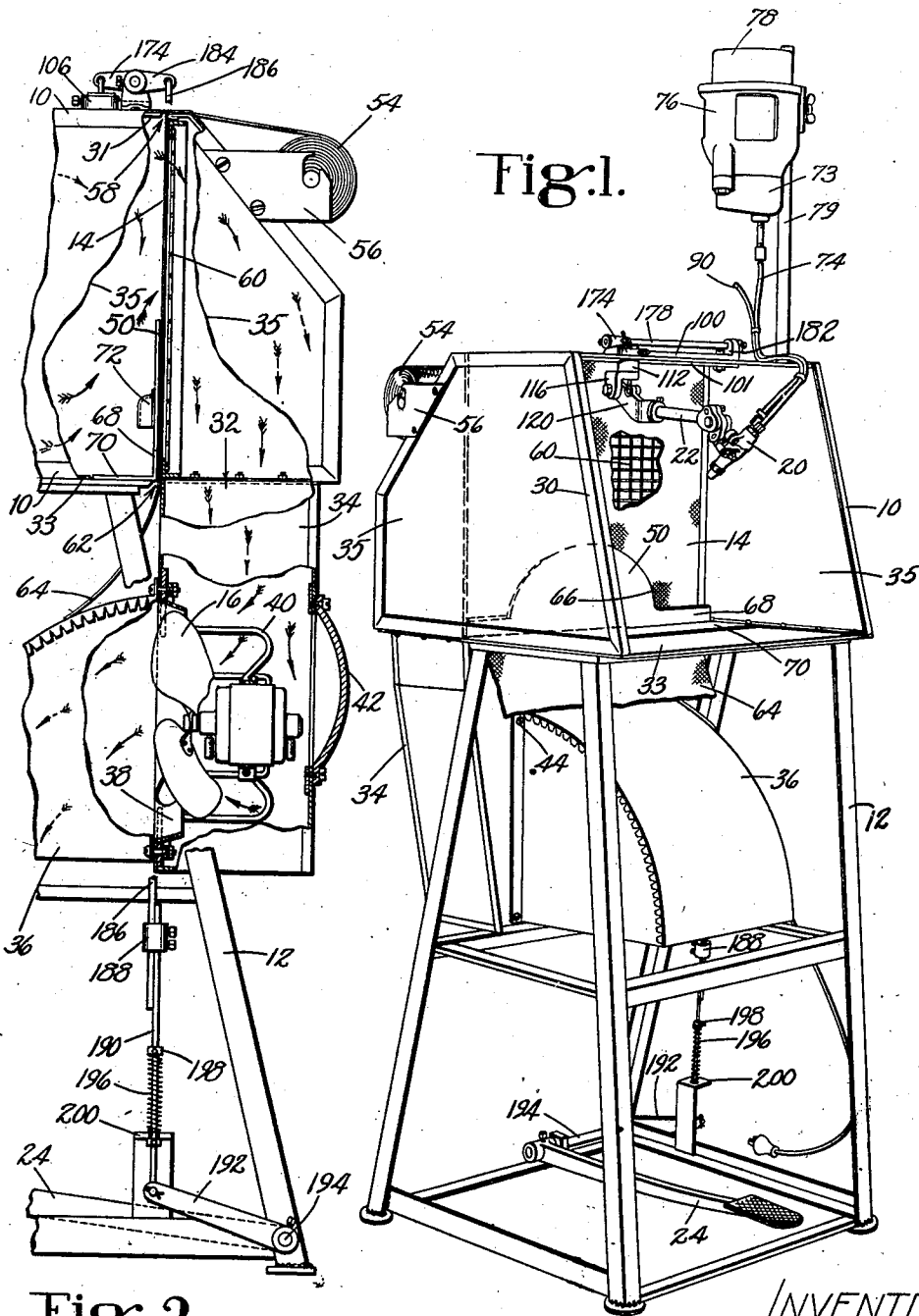


Fig. 2.

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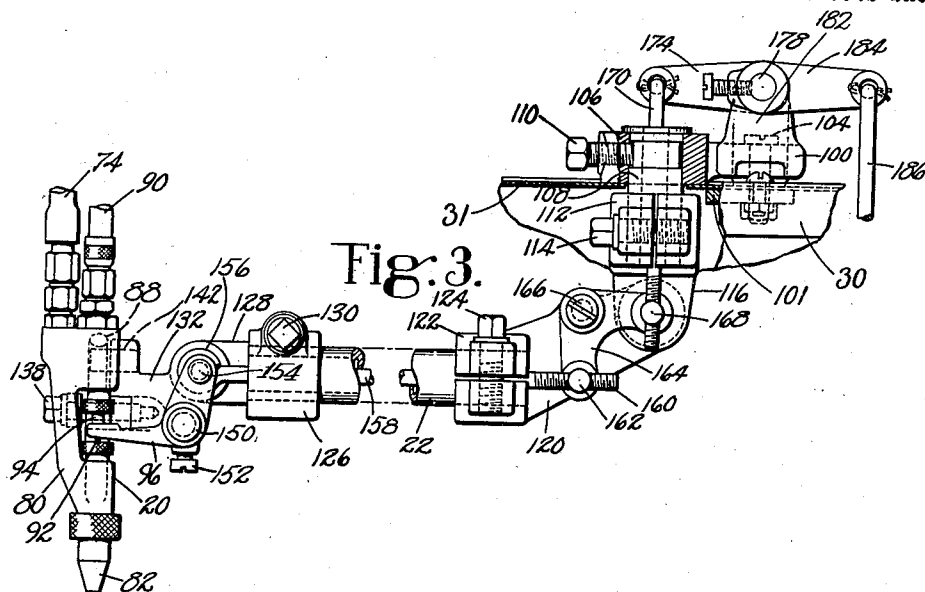
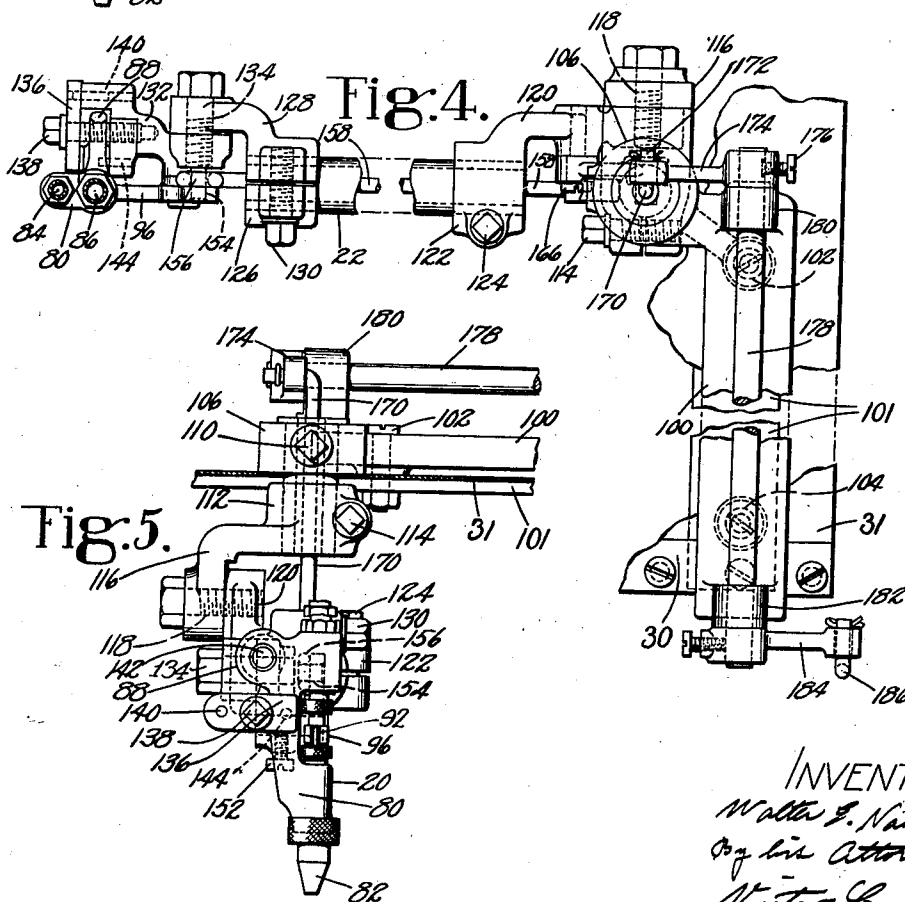
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2 Sheets-Sheet 2



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SPRAY COATING APPARATUS

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14 Claims. (Cl. 91—60)

This invention relates to apparatus for coating articles by means of a spray gun and is herein illustrated as embodied in an apparatus designed particularly for use in applying a spray to shoe parts.

In the manufacture of shoes, and especially during the lasting of the shoes, it is sometimes found desirable to hold the overlaid upper in position, for example, upon the insole, by means of an adhesive such as water-dispersed latex. Conveniently, this latex is applied by means of a spray gun because, in so doing, it is evenly distributed on the margin of the upper which is to be coated or on the margin of the insole and may be applied in small quantities which will dry quickly, thus facilitating the completion of the lasting operation.

During the application of a spray coating to an article, it is difficult to confine the spray to the article to be coated without having some portion of it disseminated through the air of the room. This difficulty has, however, been successfully overcome in the apparatus shown in Letters Patent of the United States No. 2,040,758, granted May 12, 1936, on my application on a spray collector designed for use in connection with a spray gun mounted in fixed position on a separate stand and adapted to be treadle operated. Having positioned the spray collector in the desired relation to the stand supporting the spray gun, the operator holds a piece of work, such as a shoe, in both hands and moves it in front of the spray gun which he operates by means of a treadle.

To suit the convenience of various operators, it is desirable to be able to change the direction in which the spray gun is pointed by moving it, sometimes from side to side and sometimes vertically. Accordingly, an object of the present invention is to provide an improved spray-coating apparatus embodying a supporting arrangement for a treadle-controlled spray gun in which the position of the gun may be readily adjusted without disturbing the operating connection to the treadle.

One feature of the invention resides, in an apparatus of this type, in an adjustable support for a spray gun in connection with which there are provided operating connections to a treadle which do not prevent adjustment of the gun and are undisturbed by any changes in the position of the gun support. As herein illustrated, the gun support is associated with a spray-collecting hood which is mounted on a stand and comprises a jointed arm mounted directly on the hood, the operating connections for the gun being pivotally

supported on the jointed arm in a manner which secures the desired result.

Still other features of the invention reside in an improved arrangement of the spray hood with its electric fan and its filter cloth. In the illustrated arrangement, a supply roll of this cloth is mounted on the spray hood and carried through a slit at the top of the hood, down across the air passage and out through a larger slit at the bottom of the hood. A removable member is provided to close a part of the larger slit and, when this member is moved aside, the coated cloth may readily be drawn through the slit, thus avoiding the sticking which would result if the slit were narrow.

With an arrangement of this kind, in which the gun occupies a fixed angular position with respect to the filter cloth, the major portion of the unused spray is collected in a restricted area or spot thereon, thus making it necessary to change the position of the filter cloth more frequently than would be necessary if it were more uniformly distributed. For this reason, in accordance with another feature of the invention, there is associated with the filter a readily movable metal baffle plate which covers that section of the filter where the latex collects most rapidly. From this baffle plate, the collected latex may be removed in a film at intervals and the frequency with which the filter needs to be changed is reduced. This baffle plate has an angular portion which is useful not only for supporting the baffle plate in position but which also may be utilized as described above to close a portion of the outgoing slit when the baffle is positioned in front of the filter cloth.

These and other features of the invention are described in the following description taken in connection with the accompanying drawings, in which

Fig. 1 is an angular view of the complete apparatus;

Fig. 2 is a side elevation with parts broken away to show the air passage and the fan;

Fig. 3 is a detail, in elevation, of the gun support;

Fig. 4 is a plan view of the same, and

Fig. 5 is a front elevation of the gun and its support.

In order that latex or the like may be sprayed on small, readily portable articles without scattering the spray about the room, this apparatus includes a spray-collecting hood 10 mounted on a stand 12 and provides an air passage in which are positioned a filter cloth 14 and a fan

16. The necessity of picking up the spray gun 20 every time that a piece of work is to be coated is avoided here by supporting the gun on the stand in front of the filter by an adjustable, hollow arm 22 which depends from the top of the hood 10. Associated with this arm is part of a connection between a treadle 24 and the valves of the spray gun, thus enabling the operator to turn the spray on and then off by operating the treadle 24 while he uses both hands to support the work in the path of the spray. This will be later explained. The treadle connections are so arranged in the arm that they are not disturbed by adjustment of the spray gun to various positions with respect to the hood.

As shown in Fig. 1, the stand 12 is fabricated of strips of angle iron and the hood 10, secured by welding or fasteners to this stand, comprises an angle-iron, open frame 30, filled in with sheets of metal attached in any desired fashion thereto. These include a top sheet 31 (Fig. 2), a bottom sheet 33 and side sheets 35. At the rear of the hood 10 beneath an opening providing an exhaust passage 32 is attached a sheet-metal duct 34 closed at the bottom and delivering through an opening in its front side to a deflector 36. The opening between the duct 34 and the deflector 36 is defined by a flange 38 on which is supported the electric fan 16 by means of wires 40. A cover plate 42 gives access to this fan for lubrication and cleaning. The portion of the deflector 36 which is attached to the duct 34 is square so that, by loosening the four attaching bolts 44, the deflector may be turned toward either side instead of downwardly, if that is more convenient, it being understood that the movement of air produced by the fan 16 is into the hood 10 and out through the duct 34 and the deflector 36, as shown by arrows in Fig. 2.

Surplus spray which does not impinge on the work held in front of the gun is caught either by a baffle plate 50 or by the filter cloth 14. The filter may be of any suitable material, such as cheesecloth, and may be conveniently taken from a supply roll 54 supported on brackets 56 at the rear of the hood 10. The strip of cloth is carried through a slit 58 at the top of the hood, down transversely of the hood in front of a supporting grating 60 and out through a slit 62 at the bottom of the hood just in front of the duct 34. It will be evident that the pressure of the air being sucked through this screen draws the filter cloth into contact with the grating 60 which supports it substantially in a plane surface across the air passage of the hood. The position of the gun, having been once determined to meet the wishes of the operator, will be maintained for a considerable period of time. As a result, the surplus spray will be directed at a small area, usually near the lower portion of the filter 14. This fact would render it necessary to renew the screen frequently, pulling the surplus material 64 down through the slit 62 and cutting it off. To make the apparatus more efficient, however, I have provided the baffle plate 50 which has a substantially semi-circular portion 66 covering the area where the greatest amount of material would be collected. This semi-circular portion 66 is joined to a laterally extending portion 68 which is bent to form a horizontal portion 70 resting on the bottom of the hood and supporting the baffle. The accumulation of latex on the cloth screen 14 makes it desirable to have the slit 62 large enough so that the thickened layer of latex on the cloth will not prevent easy downward

movement of the screen when it is to be renewed. Since such a large slit, uncovered, would be inconvenient and inefficient, the arrangement has been made such that the baffle 50 may be moved into a position in which its horizontal portion 70 will cover a portion of the slit, its laterally extending portion 68 being pressed into the corner between the filter 14 and the bottom of the hood. A handle 72 having the general shape of a drawer pull has been provided on the baffle 50 in order to enable the operator to readily pick up the baffle and remove it for cleaning. The latex does not adhere tightly to the metal sheet of the baffle and may readily be stripped therefrom in large pieces when it becomes desirable to clean it at infrequent intervals.

Fluid, such as latex, is supplied to the spray gun from a cup 73 attached to the gun by means of a pipe 74. This cup is secured in fixed relation to a cage 76 in which there is mounted an inverted supply bottle 78, the cage being vertically adjustable on a rod 79 secured to the side of the hood.

The gun 20 may be of any convenient construction but as herein illustrated, comprises a body portion 80 (Fig. 3) having a removable tip 82 to which fluid is supplied through a passage 84 (Fig. 4) and air is supplied through a passage 86. The body of the gun also has a loop-like handle 88 extending outwardly therefrom at right angles to the plane of the passages 84 and 86. Air under pressure from any suitable source is led to the gun through a pipe 90 and the operation of the gun is controlled by a needle valve (not shown) in the fluid passage and connected to a valve-operating rod 92. Associated with this is a valve 94 connected to a rod (not shown) in the air passage, the two being in axial alignment. Actuation of these valves may be effected by a bell crank 96 taking the place of the ordinary trigger of the gun, this bell crank being connected to the treadle 24 in a manner to be later described.

It being desirable that the operator should be able to position the gun substantially at any angle with respect to the hood 10, the gun support has pivotally joined sections. One of these sections, the arm 22, is adjustably connected at its upper end to a crossbar 100 attached to the top of the hood by means of screws 102 and 104 which pass through the top sheet 31 and a plate 101. The crossbar 100 and the plate 101 grip the flange of the angle-iron frame at the right side of the rod. Formed integrally with this crossbar 100 is a laterally extending arm terminating in a ring 106 in which there is swiveled a tube 108 held in position by a set screw 110. Clamped on the lower end of this tube is a member having a split portion 112 surrounding the tube and adjustably held thereon by the pinch screw 114, this member being provided with a depending arm 116 on which there is supported, by means of a horizontally extending pivot screw 118, an arm 120 having a split terminal portion 122 clamped to the upper end of the hollow arm 22 by a pinch screw 124. With the construction just described, it is possible to swing the arm 22 to move the gun from side to side of the hood and also to swing it up and down to carry the gun from the top toward the bottom of the hood.

To provide for changing the angular position of the gun with respect to the arm 22, there is attached to the lower end of the arm a member having a split clamp portion 126 and a laterally extending portion 128, this split clamp portion 126

being secured to the arm by a pinch screw 130. A clamp arm 132 is pivotally attached to the lateral arm 128 by a pivot screw 134. The gun is held on this clamp arm 132 by a clamp plate 136 drawn into engagement with a bushed portion of the body by a screw 138. This clamp plate 136 is kept from turning by a dowel pin 140 and the positioning of the gun on the clamp arm 132 is facilitated by a dowel 142 extending into the eye of the loop 88. Another dowel pin 144 extends from the arm 132 into the body of the gun. By this arrangement, the gun 20 is securely clamped on the arm 132 and it is possible to turn the gun to different angles with respect to the work by turning the arm 132 with respect to the arm 128, thus securing a movement of the gun in a vertical plane. It is also possible to twist the gun with respect to the arm 22 by loosening the pinch screw 130 thereby turning the split clamp 126 on the arm 20.

The before-mentioned connections comprising a linkage between the bell crank 96 which operates the valves of the gun and the treadle 24 are so arranged with respect to various pivot points of this adjustable gun support that no one of the various adjustments hereinbefore described will disturb the chain of connections extending along the arm 22, thus greatly facilitating adjustment of the position of the gun. Starting with the gun, it will be seen that this chain includes the bell crank 96 which is pivotally mounted on the arm 132 by a pin 150 held in the arm by a set screw 152. The other end of this bell crank has a pin 154 by which this bell crank is attached to an eye 156 at the end of a rod 158 extending axially through the hollow arm 22 and terminating in a threaded portion 160. This threaded portion enters a tapped hole in a swivel pin 162 which is attached to the lower arm of a bell crank 164 which, in turn, is secured by a pivot screw 166 to the arm 120 of the support. At the other end of this bell crank is another swivel pin 168 in which is threaded the lower end of a vertical rod 170 extending up through the tube 108 and terminating in a right-angled portion 172 which pivots in a lever 174 secured by a set screw 176 to one end of a shaft 178. This shaft is journaled in ears 180 and 182 extending upwardly from the plate 100 and on the other end of the shaft is another lever arm 184 joined to a treadle rod 186. This rod 186 extends downwardly and is joined by a clamp 188 (Fig. 2) to another rod portion 190 which is pivoted on an arm 192 attached to a cross shaft 194 journaled in the stand 12 and having secured to its other end the arm of the treadle 24. A spring 196 surrounding the rod bears one end on a collar 198 clamped to the rod and at the other end rests on a bracket 200 attached to the stand 12, thus tending always to urge the treadle rod 186 upwardly.

In the illustrated at-rest position of the treadle, the swivel pin 168 is opposite the pivot screw 118 thus permitting up and down movement of the arm 22 without disturbing this connection. At the same time, the vertical rod 170 coincides with the center of the tube 108 so that the arm 22 may be turned from side to side without substantially disturbing the threaded connection to the swivel pin 168. It will also be recognized that when the pinch screw 130 is loosened, for example, the spray gun may be twisted with respect to the axis of the arm 22 without disturbing to any substantial extent the connection between the threaded portion 160 of the rod 158 and the swivel pin 162. At the outer end of the arm, the pivot 154 between

the bell crank 96 and the rod 158 is substantially in alinement with the pivot screw 134, thus making it easy to adjust the arm 132 with respect to the arm 128 without affecting the connections between the trigger bell crank 96 and the rest of the members which form the chain extending to the treadle 24.

In the operation of the machine, having started the fan and adjusted the gun 20 to the desired position, the operator will hold the piece of work in line with the gun and depress the treadle 24 to spray the latex on the work, whereupon compressed air will be supplied to the gun through the tube 90 and coating material, such as latex, supplied from the bottle 78 through the tube 74.

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 stand, a spray gun on the stand having an operating member, a gun support having pivotally joined sections constructed and arranged to permit adjustment in a plurality of planes, said support extending between the stand and the spray gun to hold the latter in the desired position on the stand, and an operator-controlled member remote from the spray gun joined by a linkage to the operating member at the gun to actuate it, said linkage having a connecting portion associated with said support, said connecting portion being jointed in such relation to a joint of the support that adjustment of the position of the gun does not affect the operative-ness of the connection.

2. In combination, a stand, a spray gun carried thereby having an operating member, means for supporting the gun on the stand comprising a jointed arm arranged to permit adjustment of the position of the gun in angularly related planes an operator-controlled member, and connecting means extending between said member and the operating member of the gun comprising a rod having pivotally connected portions, the axes of said pivotal connections coinciding with the axes of the joints of the gun support.

3. In combination, a stand, a spray gun supported thereon and having an operating member, a gun-supporting arm having a hollow portion swingably mounted in said stand, an operator-controlled member, and connections from said member to the operating member of the gun comprising a jointed rod, one portion of which is substantially coaxial with said hollow arm portion.

4. In combination, a stand, a spray gun carried thereby and having an operating member, an arm for adjustably supporting said spray gun on said stand comprising pivotally connected portions, an operator-controlled member, and connections between said member and the operating member of the gun comprising rods interconnected by means including a pivot pin to which one of said rods is rotatably secured substantially at right angles to the pin.

5. In combination, a stand, a spray gun carried thereby and having an operating member, an arm for adjustably supporting said spray gun on said stand comprising pivotally connected hollow portions, an operator-controlled member, and connections between said member and the operating member of the gun comprising rods passing through said hollow connections, said rods being interconnected by means including a pivot pin to which one of said rods is rotatably secured substantially at right angles to the pin.

6. In combination, a stand, a spray gun carried thereby and having an operating member, an

arm for adjustably supporting said spray gun on said stand comprising pivotally connected hollow portions, an operator-controlled member, and connections between said member and the operating member of the gun comprising rods passing through said hollow portions, said rods being interconnected by means including a pivot pin to which one of said rods is rotatably connected substantially at right angles to the pin, said pivot pin having its axis coincident with the axis of the joint between the hollow arms.

7. In combination, a stand, a spray gun carried thereby and having an operating member, an arm for adjustably supporting said spray gun on said stand comprising pivotally connected hollow portions, an operator-controlled member, and connections between said member and the operating member of the gun comprising rods passing through said hollow portions, said rods being interconnected by means including a pivot pin to which one of said rods is rotatably connected substantially at right angles to the pin and including a bell crank pivoted on one of said arms and pivotally joined to the respective rods.

8. In combination, a stand, a spray gun carried thereby and having an operating member, an arm for adjustably supporting said spray gun on said stand comprising pivotally connected hollow portions, an operator-controlled member, and connections between said member and the operating member of the gun comprising rods passing through said hollow portions, said rods being interconnected by means including a pivot pin in which one of said rods is threaded substantially at right angles to the pin and including a bell crank pivoted on one of said arms and pivotally joined to the respective rods, one of the joints between a rod and the bell crank having its axis substantially coincident with the axis of the joint between the hollow portions.

9. In combination, a stand, a spray gun carried by said stand and provided with an operating member, means for supporting the gun on the stand comprising a clamp arm secured to the gun and a support arm secured to the stand pivotally attached to said clamp arm, an operator-controlled member, and connections between said member and the operating member of the gun

comprising a bell crank associated with said operating member and pivoted on the clamp arm and a rod associated with the support arm and joined to the other leg of the bell crank about an axis substantially coincident with the axis between the clamp arm and the support arm whereby adjustment of the clamp arm does not disturb the operativeness of the connections to the operator-controlled member.

10. In a spray-coating apparatus, a spray hood having an exhaust passage, a filter curtain extending across said passage, a spray gun having an operating member, a support arm swiveled in the hood and carrying said spray gun, a treadle mounted on the apparatus, and a jointed connecting rod between the treadle and the operating member of the gun, one portion of said connecting rod having its axis coincident with the axis of the swivel mounting of the gun-supporting arm.

11. In combination, a spray hood having an exhaust passage, a filter curtain, said hood having slits to permit the filter curtain to pass through the hood transversely of the passage, and readily movable means for partially closing that slit through which the filter is drawn after it has become coated.

12. In combination, a spray hood, a gun mounted in adjustably fixed position thereon, a filter in said spray hood, and a movable baffle positioned in front of the filter to cover that portion of the filter toward which the spray gun is pointed.

13. In combination, a spray hood having flat sides provided with slits for the passage of a filter cloth, and a removable baffle plate having an angular portion which may be rested on one of said flat sides adjacent to the outlet slit with the baffle covering a part of the filter.

14. In combination, a spray hood having a transverse filter to catch portions of the spray which are not applied to a piece of work, and a baffle plate associated with said filter, said baffle comprising a portion positioned in front of the filter to receive the major part of the unapplied spray and a laterally extending portion to support the baffle on the hood.

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