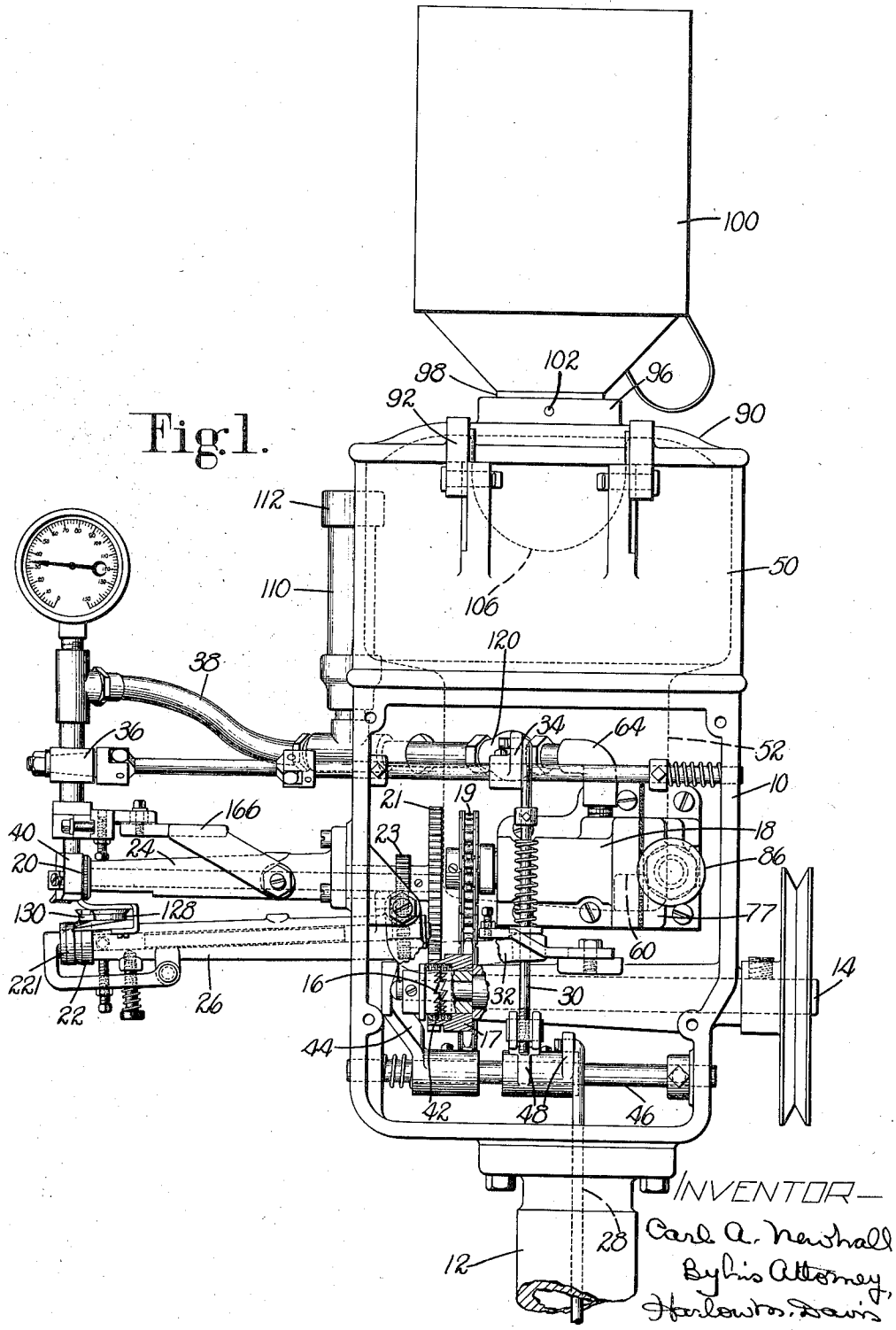
March 16, 1937. C. A. NEWHALL 2,073,647

COATING APPLYING MACHINE FOR SHOE PARTS

Filed Nov. 26, 1934 3 Sheets-Sheet 1

Fig. 1.



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COATING APPLYING MACHINE FOR SHOE PARTS

Filed Nov. 26, 1934 3 Sheets-Sheet 2

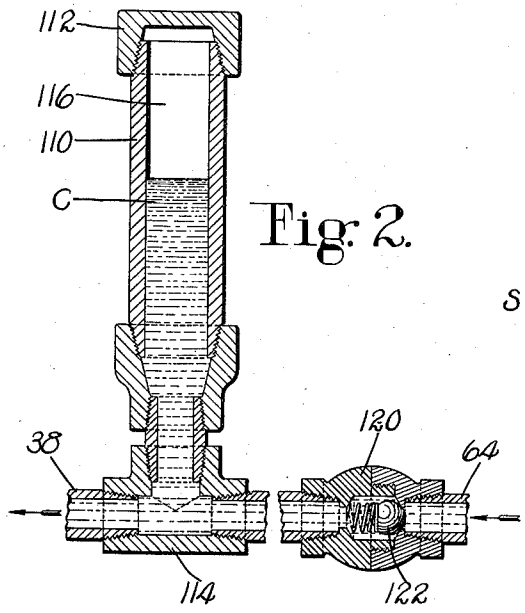


Fig. 2.

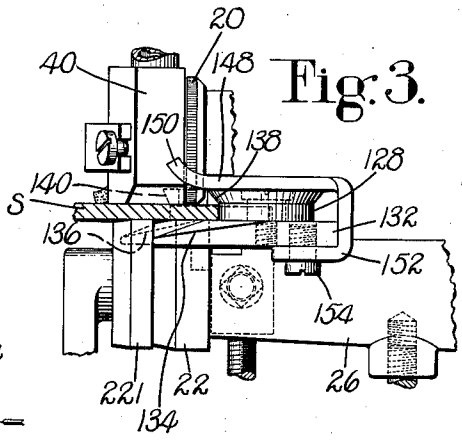


Fig. 3.

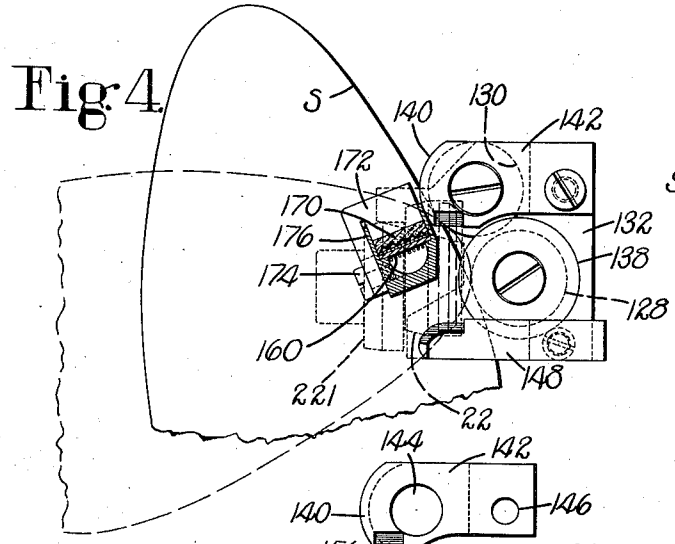


Fig. 4.

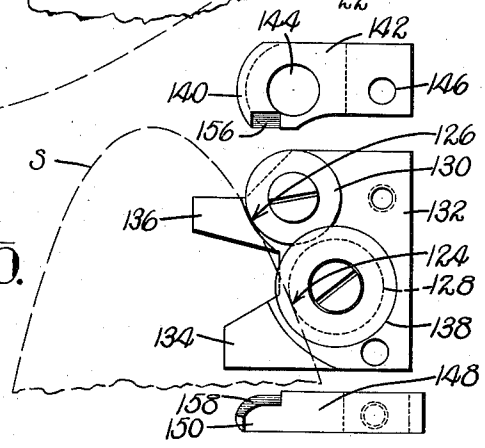


Fig. 5.

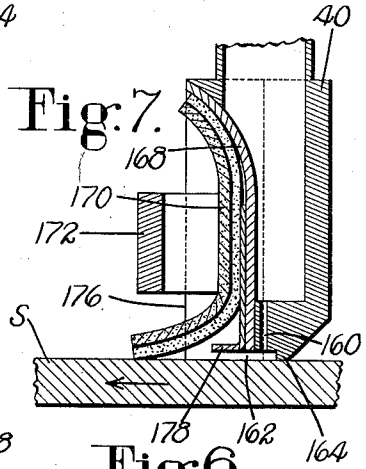


Fig. 7.

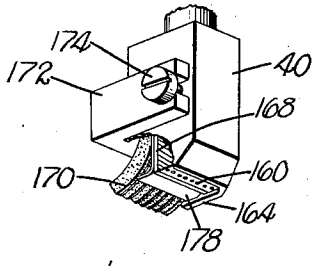


Fig. 6.

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COATING APPLYING MACHINE FOR SHOE PARTS

Filed Nov. 26, 1934 3 Sheets-Sheet 3

Fig. 8.

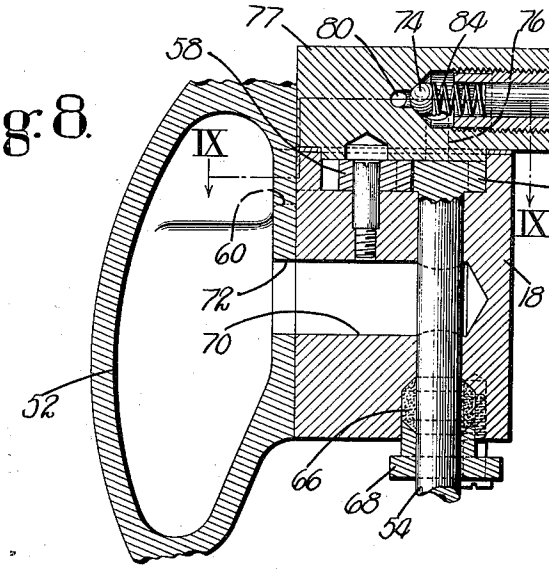


Fig. 9.

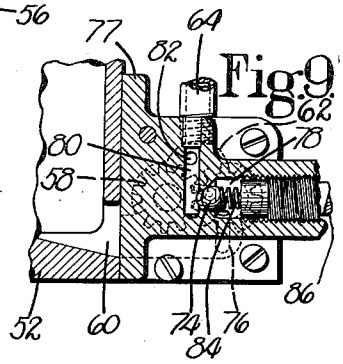
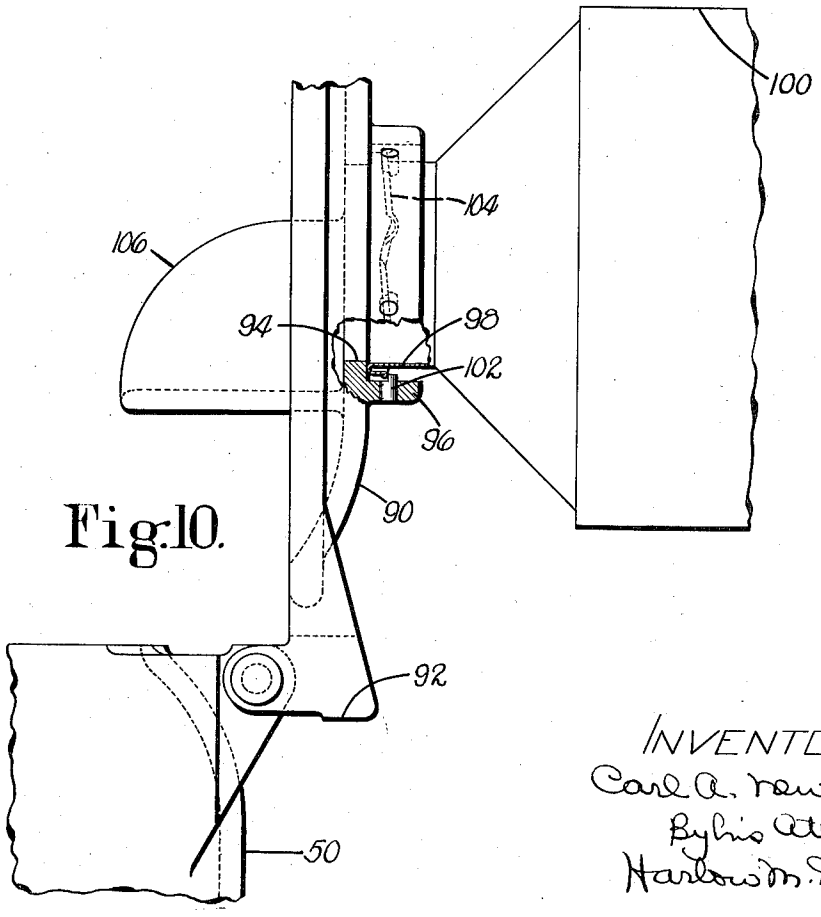


Fig. 10.



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UNITED STATES PATENT OFFICE

2,073,647

COATING APPLYING MACHINE FOR SHOE PARTS

Carl A. Newhall, Peabody, Mass., assignor to United Shoe Machinery Corporation, Paterson, N. J., a corporation of New Jersey

Application November 26, 1934, Serial No. 754,891

10 Claims. (Cl. 91—43)

This invention relates to coating applying machines and is herein shown as embodied in a machine for extruding coating material upon shoe parts, of the type shown and described in Letters Patent of the United States No. 2,042,479, granted June 2, 1936, on my application. An object of the invention is to provide an improved machine which will operate with even greater facility under varying conditions of work and materials.

Important features of the invention relate to an arrangement which facilitates the refilling of the tank of the machine and to an improved nozzle construction of the type in which a rubber spreader is associated with the nozzle and is arranged to bear upon the coating applied to the work passed beneath the nozzle.

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

Fig. 1 is a front elevation of the machine with parts broken away and in section, and a cover removed;

Fig. 2 is a detail in vertical section through the auxiliary pressure chamber and check valve;

Figs. 3 and 4 are fragmentary detail views in elevation and in plan, showing the work gage and the relation thereto of the feed rolls and nozzle;

Fig. 5 is an exploded detail view of the work gage;

Fig. 6 is an angular view of the nozzle and spreader viewed from beneath;

Fig. 7 is a vertical section through said nozzle and spreader;

Fig. 8 is a horizontal section through the pump and a portion of the tank;

Fig. 9 is a detail section on the line IX—IX of Fig. 8, and

Fig. 10 is a view on a larger scale showing the cover of the tank tipped up with a fragment of a supply can attached thereto.

The machine comprises a hollow frame 10 mounted on a column 12 and in this frame is journaled a drive shaft 14 by which power may be supplied through a separable clutch 16 to a gear pump 18, and two feed rolls 20 and 22. A clutch part 17 freely rotatable on the drive shaft is connected to the pump by means of a sprocket and chain 19 and to the shaft of the upper feed roll 20 by means of a pinion cooperating with a larger gear 21. The shafts of the two feed rolls 20 and 22 are interconnected by pinions 23. The upper feed roll 20 is mounted on a shaft journaled in an outwardly extending arm 24 and the lower feed roll is mounted on a shaft journaled in a tiltable arm 26. This lower feed roll is adapted to be raised into contact with the work. When a treadle (not shown) connected to a treadle rod 28 is actuated to move a lever 48, a rod 30 within the frame is pulled down. As this rod moves down, it acts upon an extension 32 of the arm 26 to lift the lower feed roll and to raise a piece of work placed thereon into contact with the upper feed roll 20. It also operates through an arm 34 to open a valve 36 in pipe connections 38 leading from the pump 18 to an extruding nozzle 40. A spring (not shown) associated with the treadle returns the valve 36 to closed position as the treadle is released and the lower feed roll 22 is dropped. The clutch 16, as illustrated, is of the positive type, the separable parts being normally held in disconnected relation by means of a spring 42 surrounding the clutch, and is adapted to be moved into closed position by a cam 44 attached to a pivot rod 46 to which is secured the lever 48 attached to the treadle rod 28 and to the upright rod 30, respectively.

Liquid coating material is supplied to the pump 18 from a tank 50 mounted on the top of the frame and provided with a depending portion 52, the cross-sectional shape of which is seen in Fig. 8. As there shown, the pump comprises a driven shaft 54 journaled in the pump casting and provided at one end with a gear 56 meshing with a cooperating gear 58. Coating material contained in the tank, flowing through an inlet passage 60, is delivered to the lower side of the cooperating gears and is forced thence through an outlet passage 62 (Fig. 9) to a pipe 64. In order to prevent leakage of coating material, a packing 66 surrounds the pump shaft and is held in compressed relation by a gland 68.

Inasmuch as the machine is capable of producing a substantial pressure in the outlet of the pump, there would be a tendency for this pressure to be applied to the packing 66 along any passage resulting from a loose fit of the pump shaft were it not for a novel arrangement provided for this pump which relieves this pressure and reduces the pressure upon the packing 66 to that provided by the hydrostatic head in the tank. This is accomplished by a passage 70, one end of which surrounds the pump shaft and the other end of which communicates through an opening 72 with the interior of the lower portion 52 of the tank. The pressure delivered to the nozzle is controlled, as in the present machine, by means of

a spring-pressed ball valve 74 inserted in a by-pass around the pump. This by-pass comprises a passage 76 extending from the inlet passage 60 upwardly at an angle to a chamber 78 at one side of the ball valve 74, and also comprises a passage 80 extending from the other side of the ball valve and communicating with another passage 82 opening into the pump outlet 62. The pressure of a spring 84 upon this by-pass valve is determined by a hand screw 86.

The filling of the tank 50 is facilitated by an arrangement shown particularly in Fig. 10, from which it will be seen that a hinged cover 90 of the tank 50 has lugs 92 which will hold the tipped-back cover in a horizontal position. This cover has a filling opening 94 surrounding which is a neck 96 with which the neck 98 of a filling can 100 may readily be associated. Any convenient attaching means may be utilized. The bayonet-joint type shown in the drawings comprises flattened studs 102 on the inside of this neck 96 and a series of inclined flanges 104 upon the neck of the filling can 100 acting as wedges to cooperate with the studs in forcing the top edge of the neck 98 into tight engagement with the cover. Having swung the cover 90 to an open horizontal position, 90° from that shown in Fig. 10, a filled supply can 100 may be raised without spilling its contents and the can secured to the cover by the connection 102, 104. The can may then be swung into the position shown in Fig. 1 and the contents allowed to flow into the tank. In order that there may be no possibility of spilling during this inversion of the supply can, the cover is also provided with a lip or spout 106 extending inwardly from the filling opening 94 on the side thereof adjacent to the hinge so that the initial flow of material from the can 100 cannot run down the inside of the cover past the hinge on to the outside of the tank but will always be conducted to the inside of the tank 50.

It will be quite obvious that it is desirable to have coating material delivered from the extruding nozzle 40 as soon as the valve 36 is opened and the feed rolls 20 and 22 are brought into gripping relation with the work. But, whenever the pump is stopped and the valve 36 closed, the coating material leaks back through the pump gears and the pressure is lost. The problem is particularly aggravated in those instances in which the separable clutch connection 16 is provided between the drive shaft and the pump. As a practical matter, it is impossible to get pressure in the pipe connection 38 until a substantial time after the pump has been started. Consequently, there has been provided between the outlet pipe 64 associated with the pump and the pipe connection 38 leading to the valve 36 a pressure chamber 110 (Fig. 2) closed at its upper end by a cap 112 and opening directly into a T 114 interposed in the pipe 38. The coating material C will not completely fill this chamber 110 because an air pocket 116 will be formed therein. The air in the pocket 116 will be somewhat compressed by the pressure applied by the pump.

Associated with the pressure chamber 110 is a check valve 120 having a spring-pressed ball 122 therein which is so disposed with respect to the passage that the valve is opened by the pressure of coating material coming from the pump. When the pump pressure is relieved, however, the ball 122 will close the passage. Then, whenever the operator controlled valve 36 has closed the pipe connection to the nozzle, the coating material C in the auxiliary pressure chamber 110 will be under pressure because of the compression of the air therein. As a result, opening of the valve 36 when the machine is started will permit the pressure chamber to immediately deliver the fluid to the extruding nozzle 40 and the amount of stored-up pressure will be such that there will be a continuous flow through the nozzle, the pump 18 taking up the work of supplying the nozzle before the pressure in the auxiliary chamber 110 has disappeared.

Adjacent to the nozzle 40 and the feed rolls 20 and 22 is an improved gage, best shown in Figs. 3, 4, and 5, which utilizes the principle of the gage described in my prior patent but which is so arranged that the points of contact 124 and 126 (Fig. 5) with the edge of a sole S lie upon the peripheries of rolls 128 and 130. These rolls are journaled on a plate 132. This plate, which is attached to the outer end of the arm 26 (Fig. 3), has tapered, outwardly extending, work-supporting fingers 134 and 136, and, in order that ultra-flexible soles S may readily be held in engagement with the peripheries of the rolls 128 and 130, overhanging members are associated with these rolls. These members comprise a tapered flange 138 upon the upper end of the roll 128 somewhat overhanging the work and an overhanging beveled end 140 on a plate 142 which overlies the work-engaging portion of the periphery of the roll 130. This plate has an opening 144 to receive the head of the screw stud which supports the roll 130 and an opening 146 to receive a screw which will pass through the plate 142 and the plate 132 into the arm 26. In order that it may be made easier to present work to the rolls, a guard member 148 having an upturned end 150 is positioned to overlie the rear edge of the first roll 128 thereby forming a recess in which the edge of the sole may be entered as it is presented to the machine. This guard 148 has a downturned end 152 (Fig. 3) which is attached to the plate 132 by means of a screw 154. It will be understood from Figs. 4 and 5 that the plate 142 is chamfered at 156 and the plate 148 at 158 to avoid interference with the upper feed roll 20. As in the machine of my earlier patent, an idle feed roll 22' is mounted alongside the roll 22 and the plane of the driven feed rolls is angularly related to the line of feed to provide substantially automatic feeding.

The nozzle 40, shown particularly in Figs. 4, 6, and 7, comprises a hollow body portion having a plurality of minute tube-like and preferably capillary outlet passages 160 which communicate with an open-sided recess 162 formed within a rim 164 at the bottom end of the nozzle. This recess is open at the forward end as the work is carried beneath the nozzle in the direction indicated by the arrow in Fig. 6. The nozzle which is supported upon a pivoted arm 166 (Fig. 1) rides on a surface of the work, such as the sole S. The forward side of the hollow body portion is closed by a removable plate 168 against which is pressed a spreader strip 170 of corrugated or ribbed rubber. Being ribbed, no coating material will be removed from the work but it will be well spread or distributed along the length of the applied band. This strip is pressed into place between side flanges 176 which extend in the general direction of movement of the work and are at right angles to the row of passages 160, by means of an L-shaped clamp 172 held in position by a screw 174 passing through a slot, the L-shaped clamp being slotted, as shown in Fig. 4, to receive

one of the thin sides 176 of the body of the nozzle.

The spreader strip 170 rests upon the work, as illustrated in Fig. 7, and spreads, or rubs in, the stripe of coating material which has been applied through the passages 160. In order that this strip may bear effectively on the work, it is made long enough so that it will normally hang below the end of the nozzle and then, being pushed aside by the work presented thereto, will lie upon the freshly coated surface of the sole. This operation of presenting the work is facilitated by the use in the nozzle of a bent supporting member or deflector 178 which lies between the rubber strip 170 and the plate 168 forming the side of the nozzle. It will be noted that the lower end of the bent member 178 extends outwardly toward the rubber strip in such a way that it holds it bent slightly forward in the direction of movement of the work, as shown in Fig. 6, and from which position it is deflected to the position shown in Fig. 7. When the lower end of the strip 170 becomes worn, it may be cut off and, having released the clamp 172, the strip dropped down to present a new portion. For the most effective action of the spreader 170, it has been found desirable to have the ribs thereon extend in the general direction of the line of feed so that there may be as little lateral dragging of the end of the spreader as possible. To secure this desired result, the nozzle has been so disposed that the row of holes 160 lies along a line substantially normal to the line of feed in order that the ribs of the spreader may lie along the line of feed, even though this disposition of the holes 160 does not conform to the ideal relation set up in my prior patent mentioned above.

In the use of the machine, a piece of work, such as a sole S, will be presented with its edge in contact with the rolls 128 and 130 of the edge gage whereupon the treadle attached to the treadle rod 28 will be actuated to pull down the rod, thus raising the lower feed roll 22 so as to grip the sole between the two feed rolls and to bring the work into engagement with the lower end of the nozzle. This same depression of the treadle will also close the clutch 16 to cause the feed rolls to be driven and the pump to be operated, and will open the valve 36. There will be an immediate flow of coating material from the nozzle because of the compression of the air in the pocket 116 of the auxiliary pressure chamber 110 and this will be followed up promptly by pressure supplied from the pump so that there will be no interruption in the flow of coating material. The pressure applied to the coating material will be regulated by adjustment of the hand screw 86 on the by-pass valve and the band of coating material applied through the passages 160 of the nozzle will be smoothed out, lengthwise of the band, by the action of the ribbed spreader strip 170. As in my prior machine, the guiding and feeding actions will be substantially automatic, the sole being held in contact with the edge gages by reason of the angular position of the upper feed roll 20 with respect to the line of feed. The stripe of coating material applied by the nozzle will be of uniform width and at a uniform distance from the edge of the sole by reason of the relation of the line of the roll passages 160 with respect to the contact point 126 of the edge gage. When the supply of coating material in the tank 50 is exhausted, a new supply can 100 will be applied thereto by tipping back the cover 90, detaching one supply can and substituting another, each being held in upright position. The supply can and the cover may then be turned back into operating position, whereupon the coating material flowing out of the can will be carried over the spout 106 to the tank 50 without any leakage.

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

1. In a machine for applying coating material, a tank to hold a supply of coating material, means for filling said tank comprising a hinged cover therefor, said cover having a filling opening, and means for attaching a supply can of coating material to the cover to seal the opening whereby the open can of coating material may be attached to the cover while the can is in upright position and then inverted with the cover to drain into the tank.

2. In a machine for applying coating material, a tank to hold a supply of coating material, means for filling said tank comprising a hinged cover therefor, said cover having a filling opening and a neck around said filling opening, and means for attaching a supply can to said neck constructed and arranged to make a tight fit between the cover and the can and to support the can on the cover when the cover and can are inverted, thereby to permit the contents of the can to drain into the tank.

3. In a machine for applying coating material, a tank to hold a supply of coating material, means for filling said tank comprising a hinged cover therefor, said cover having a filling opening, said cover also having a spout extending inwardly from its inner surface between said opening and the hinge point, and means for securing a supply can to the outer surface of the cover, whereby the supply can may be attached to the cover while the can is in upright position and then the cover and the can turned together to invert the can and to drain the coating material into the tank, said spout conducting coating material to the inside of the tank without permitting it to run down outside of the tank during the interval while the can is being inverted.

4. In a machine for applying coating material, a hollow frame, a tank carried on the upper side of the frame and having a depending hollow portion forming a side for said frame, and a hinged cover for said tank having a filling opening and provided with a spout on its inner surface and a can supporting neck on its outer surface.

5. In a machine for applying coating material, a nozzle having a work contacting end provided with an open-sided recess, said nozzle having at least one passage through the nozzle and having its outlet opening within said recess, a flexible spreader associated with said nozzle adjacent to the open side of the recess, means for clamping said spreader to the nozzle, and means for holding the end of the spreader away from the nozzle in a position where it will drag on the work as relative movement is produced between the work contacting end of the nozzle and a piece of work.

6. In an extruding machine, a rigid hollow nozzle having a work-contacting end portion provided with a U-shaped recess the open end of which is at the leaving side of the nozzle, said nozzle having at least one passage opening into the recess with its outlet end removed from contact with the work, and a flexible spreader strip associated with the nozzle adjacent to the open end of the recess and normally extending beyond the work-contacting end of the nozzle, the work-

contacting face of said spreader strip being ribbed whereby coating material extruded from said nozzle will be spread over the surface of the work by the ribbed spreader strip without wiping from the work any substantial amount of the extruded material.

7. In a machine for applying coating material, a nozzle one end of which is adapted to contact with the work, a passage through the nozzle terminating adjacent said work contacting end thereof, a resilient spreader strip releasably supported on the work-leaving side of the nozzle and arranged to bear upon the work, said strip being long enough to permit a worn lower end to be severed and a fresh portion brought down into operative position, the resilience of said spreader tending to move it to a position, when free, where the end of the spreader will be below the nozzle, and a deflector associated with the free end of said spreader thereby to hold it away from the nozzle in the direction of movement of the work.

8. In a machine for applying coating material, a nozzle yieldably supported in depending position and adapted to contact with a piece of work to be coated as the latter is moved under the nozzle thereby to present successive portions of the work thereto, a resilient spreader secured to the work-leaving side of the nozzle and comprising a strip of rubber long enough to depend below the nozzle when no work is presented, and a deflector interposed between the nozzle and the end of the spreader thereby to hold the end of the spreader away from the nozzle in the direction of movement of the work.

9. In a machine for applying coating material, a nozzle having a work contacting end provided with an outlet opening past which a piece of work may be moved to present successive portions to the nozzle, said nozzle having side flanges extending in the direction of movement of the work, a resilient spreader strip clamped to the nozzle between said side flanges and constructed and arranged normally to depend below the nozzle, and a deflector interposed between the nozzle and the free end of the spreader strip thereby to hold it away from the outlet of the nozzle in a direction substantially parallel to the sides of the nozzle and to the direction of movement of the work.

10. In a machine for extruding coating material, an applying nozzle having a plurality of small outlet openings arranged in a row, said nozzle having forwardly extending side flanges positioned substantially normal to the row of holes, a spreader strip clamped between said side flanges, and guide means comprising work engaging rolls spaced in the direction of feeding movement for determining a line of feed which is substantially at right angles to the row of holes.

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