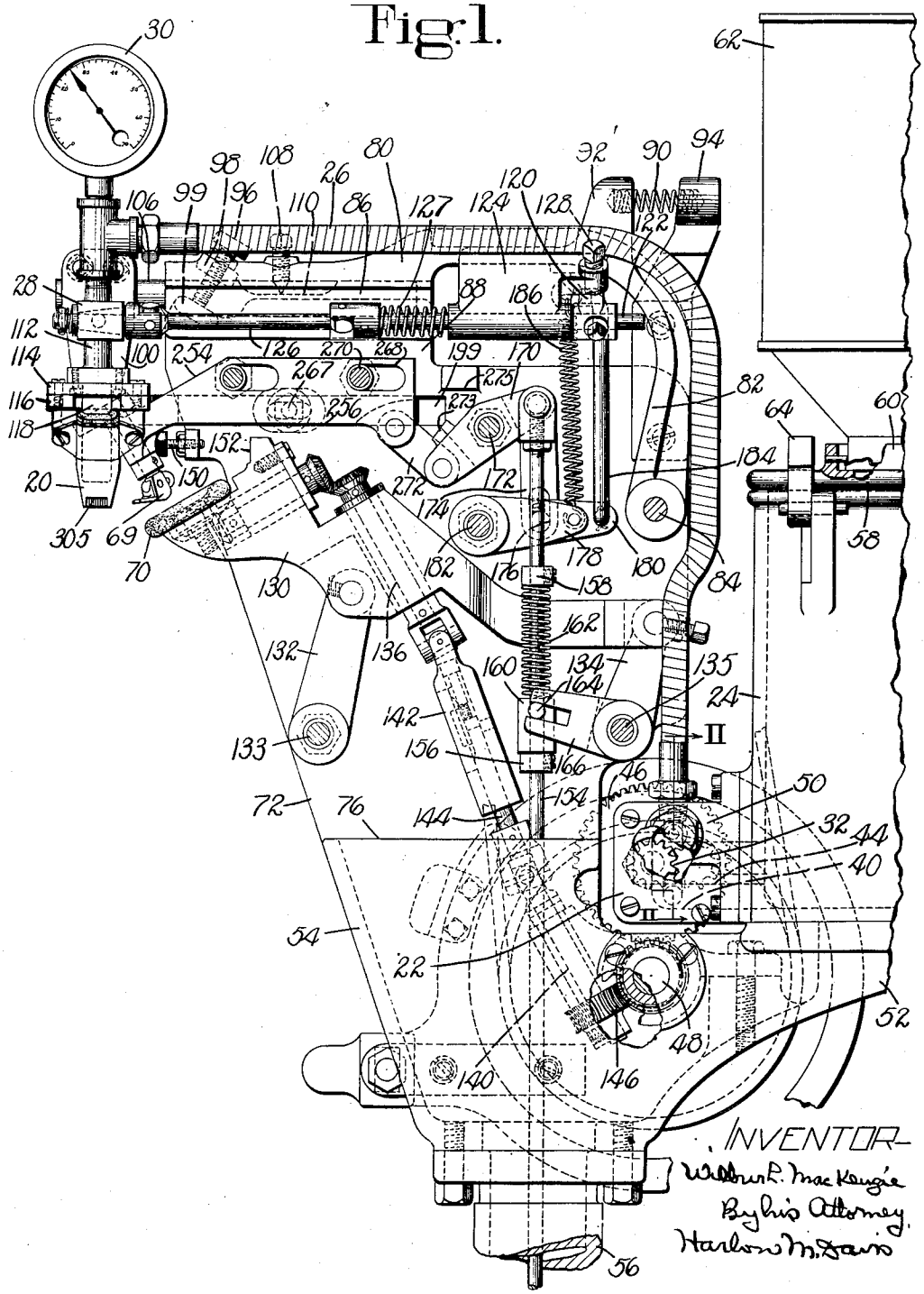
Nov. 30, 1937. W. L. MacKENZIE 2,100,341

SHOE BOTTOM COATING MACHINE

Filed Nov. 24, 1934 5 Sheets-Sheet 1

Fig. 1.

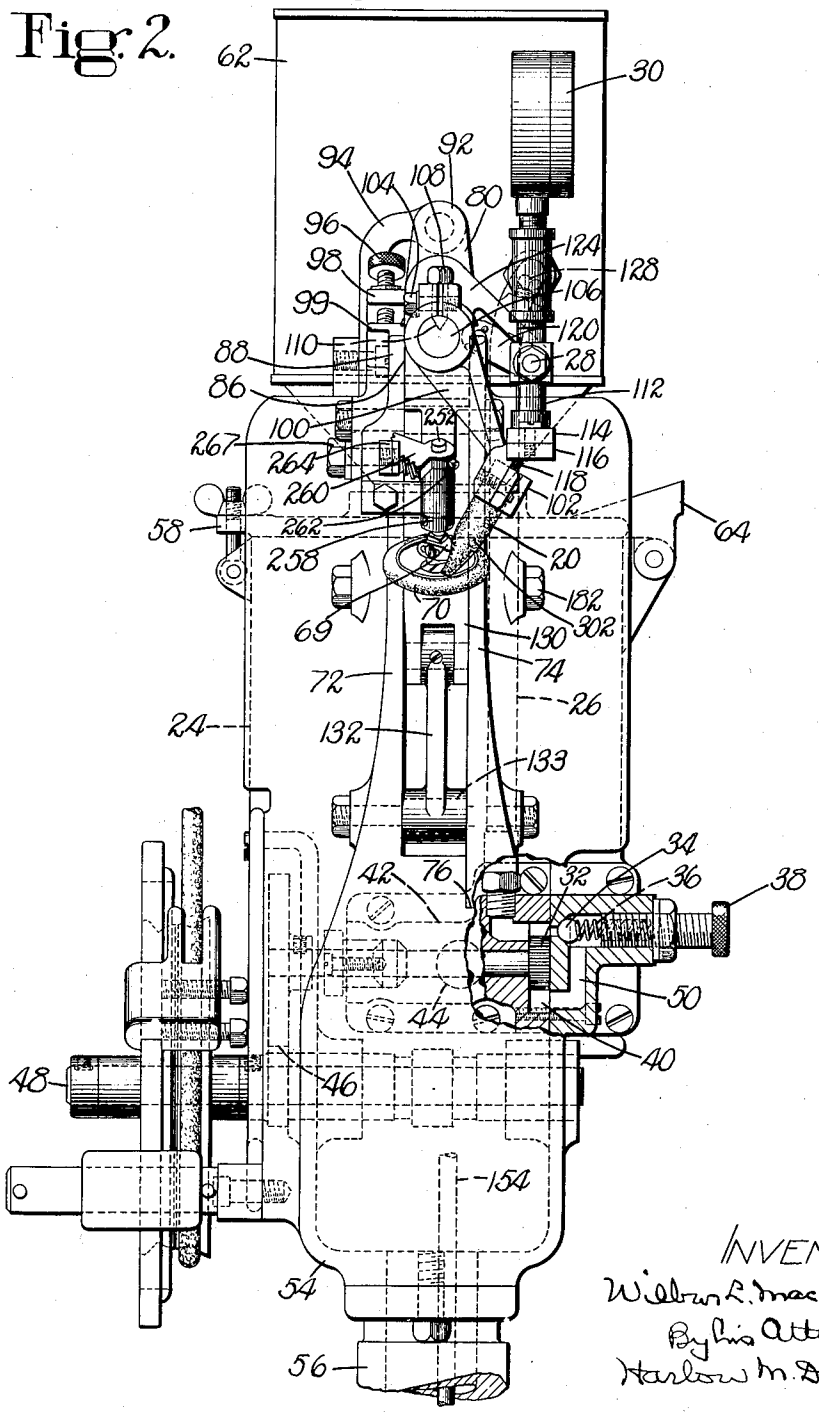


Nov. 30, 1937. W. L. MacKENZIE 2,100,341

SHOE BOTTOM COATING MACHINE

Filed Nov. 24, 1934 5 Sheets-Sheet 2

Fig. 2.



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SHOE BOTTOM COATING MACHINE

Filed Nov. 24, 1934 5 Sheets-Sheet 3

Fig. 3.

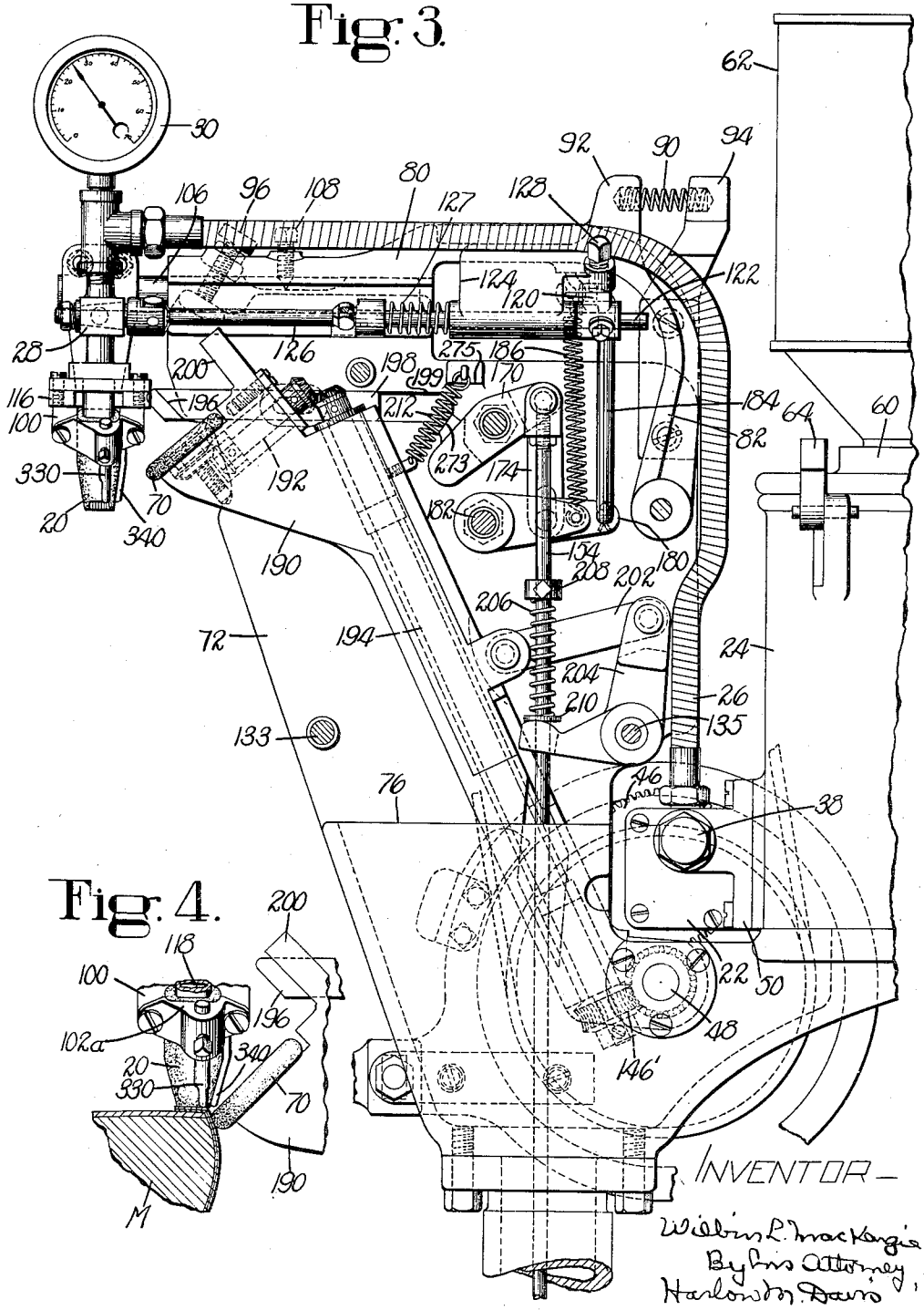


Fig. 4.

Nov. 30, 1937. W. L. MacKENZIE 2,100,341

SHOE BOTTOM COATING MACHINE

Filed Nov. 24, 1934 5 Sheets-Sheet 4

Fig. 5.

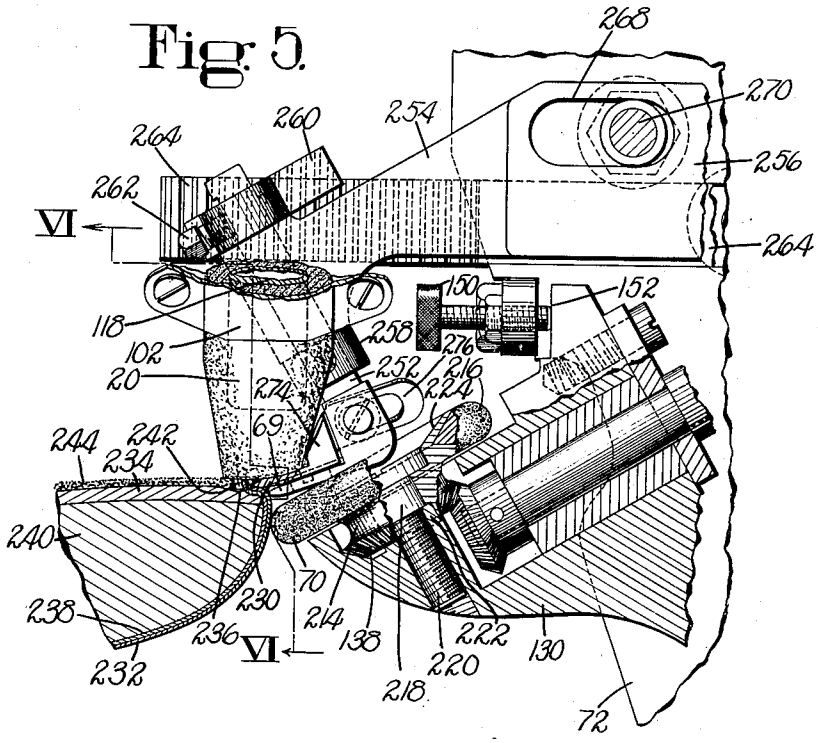


Fig. 6.

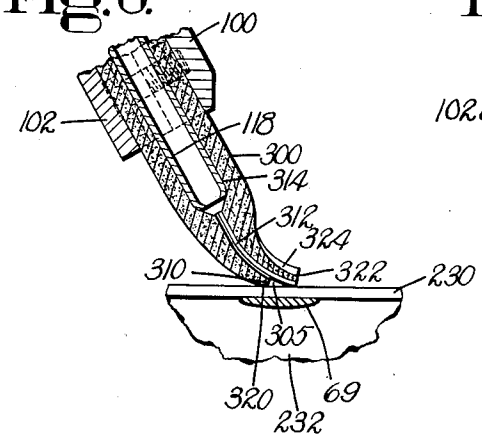
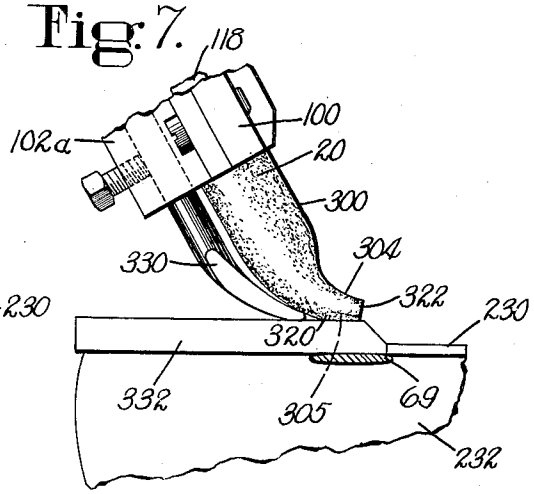


Fig. 7.



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SHOE BOTTOM COATING MACHINE

Filed Nov. 24, 1934 5 Sheets-Sheet 5

Fig. 8.

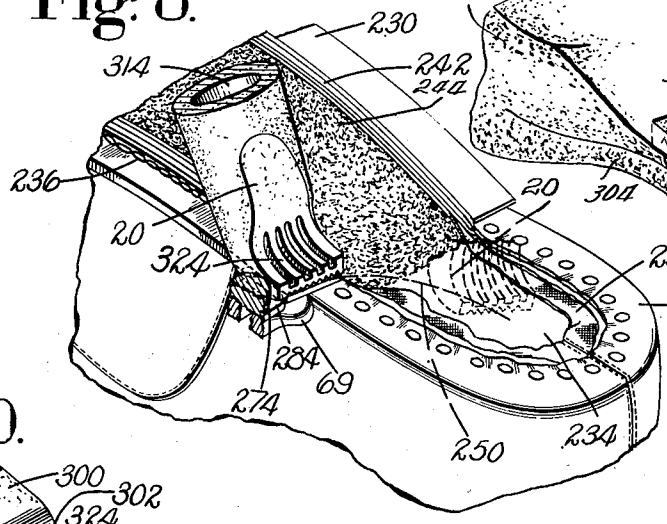


Fig. 14

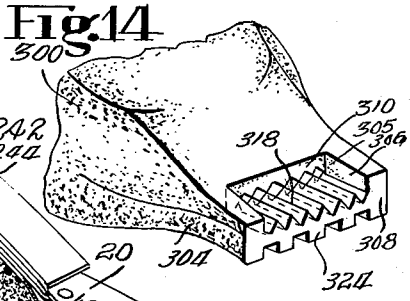


Fig. 10.

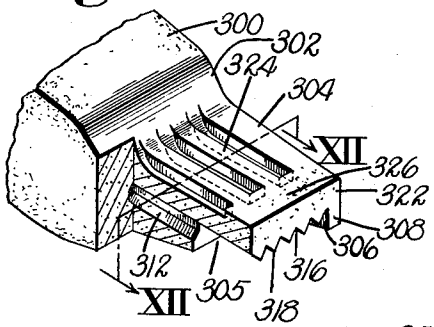


Fig. 9.

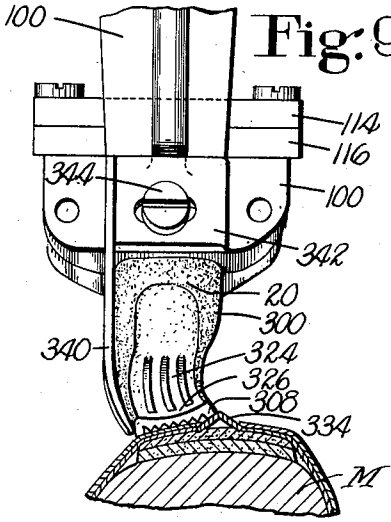


Fig. 11.

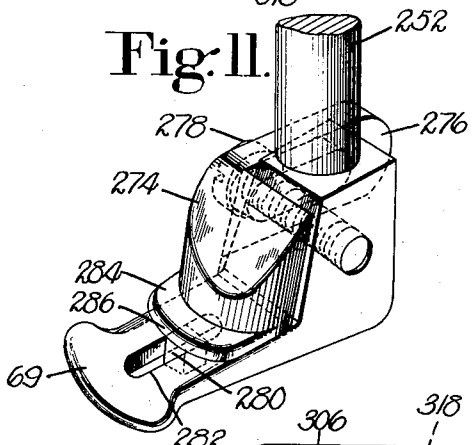


Fig. 13

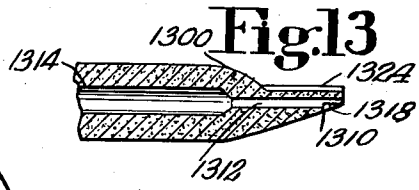
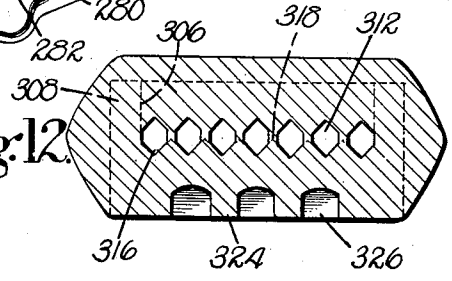


Fig. 12.



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Patented Nov. 30, 1937 2,100,341

UNITED STATES PATENT OFFICE

2,100,341

SHOE BOTTOM COATING MACHINE

Wilbur L. MacKenzie, Beverly, Mass., assignor to United Shoe Machinery Corporation, Paterson, N. J., a corporation of New Jersey

Application November 24, 1934, Serial No. 754,648

38 Claims. (Cl. 12—80)

This invention relates to coating applying machines, being principally concerned with machines of the extruding type. It is herein illustrated as embodied in a machine particularly adapted for applying a coating to the bottom of a shoe prior to the application of a sole thereto.

In the manufacture of compo shoes, the sole of the shoe is secured to the overlasted upper and, it may be, to other portions of the shoe principally by an interposed coating of adhesive which, for ease of discussion, will hereinafter be termed cement. Commonly, this cement is of the pyroxylin type, is quite viscous and tends to be quick drying, and a marginal stripe is applied to the bottom of the shoe. In many shoes, this stripe will lie upon the overlasted margin of the upper. If the compo shoes are of the welt type, then the cement will be applied to the outwardly extending welt and to the adjacent inseam or between substance. The problem of applying a coating to the particular surfaces in question is rendered extremely difficult by the nature of those surfaces. In compo shoes which have no welt, the margin of the overlasted upper is rarely flat and in many portions is wrinkled and creased. Furthermore, the profile of the bottom surface of a shoe is not regular and the relation of the bottom surface to other parts of the shoe varies markedly according to the style of the shoe and the shape of the last. If the application of cement is to the welt and inseam, as in compo welts, then the flesh surface of the welt is rough, the inseam has many crevices and may not have been trimmed evenly, and the welt is flexible and frequently curves heightwise out of the plane of the adjacent bottom of the shoe.

An object of the present invention is to provide an improved coating applying machine by means of which coating material may be applied in predetermined quantities per unit of area coated and may be positioned upon the uneven surface inherently involved in this kind of work accurately and with such a high degree of continuity that substantially no uncoated portions are to be found.

Illustrated herein as suitable for use in this machine is an improved extruding nozzle which is not claimed herein since it forms the subject matter of a divisional application Serial No. 90,168, filed July 11, 1936, in my name and it is largely by reason of the construction and arrangement of this nozzle that the problems relating to continuity, uniformity and the ability to locate the coating in a predetermined position have been solved. In the illustrated machine, the nozzle is supported for heightwise yielding movement and is inclined downwardly and forwardly so that the outlet end of the nozzle extends in the general direction of forward movement of the work and rides on the work. Preferably and as illustrated, the nozzle has a resilient tip portion capable of yielding and twisting, and which may be kept in firm contact with the irregular, uneven surface to be coated, avoiding the danger of a lateral spreading of the coating material and assisting in leaving a deposit upon the work which is of a uniform thickness. A feature of the invention resides in members associated with this nozzle to control its deflection, under pressure of work presented to it, laterally and heightwise.

The application of a uniform quantity of coating material to a piece of work by means of an extruding nozzle presupposes a relative movement between the work and the nozzle at substantially uniform speed. Quite obviously, such feeding movement is more difficult to obtain with a shoe than with a piece of sheet material, such as a sole, and any mechanism which is employed must not interfere with the operation of the nozzle or become soiled with coating material from the nozzle. Accordingly, another feature of the invention resides in a machine having an improved feeding mechanism embodying a driven feed wheel mounted for contact with the side of the shoe, and supported for movement bodily toward and away from the side of the shoe. The illustrated machine being provided with a depending nozzle, a shoe presented thereto is held in the hands of the operator in inverted position and is turned to apply successive portions of the margin of the bottom of the shoe to the nozzle. Lateral movement of the feed wheel toward and away from the shoe enables the feed wheel to be kept away from the nozzle during periods when no shoe is presented thereto, thereby avoiding danger of soiling the feed wheel and, hence, transferring some coating material to the side of the shoe. It will also be readily understood that the curvature of the undercut shank portion of the shoe is markedly different from the curvature of the side of the shoe at the heel or at the toe portion. To meet this situation, the feed wheel is mounted for movement by the operator outwardly to a fixed position, is normally firmly held in that position but is permitted to yield inwardly toward the machine in order to accommodate the varying curvatures of the sides of a shoe as it is turned about beneath the nozzle. Provision is made, moreover, for driving the feed wheel in all positions and, in the case of that form of the machine which is particularly designed for the coating of compo welts, the mounting is such that the movement of the feed wheel is a straight line movement in substantially a horizontal path. Provision is also made, in accordance with other features of the invention,

so that the movement of the feed wheel into operative engagement with the shoe precedes the opening of the valve which allows the extrusion of coating material and, vice versa, the closing of the valve precedes the withdrawal of the feed wheel, thus giving still further protection against accidental disposal of coating material upon the feed wheel.

Support of the welt in firm engagement with the end of the nozzle is accomplished, in accordance with another important feature of the invention, by means of a welt supporting finger which is mounted adjacent the nozzle and moved out into operative position as the feed wheel is moved out. Preferably and for reasons which will later appear, the finger is mounted for movements both of rotation and of translation.

These and other features of the invention will be described in the following specification and shown in the accompanying drawings, in which—

Fig. 1 is a side elevation of the head of the machine with a side cover removed;

Fig. 2 is a front elevation of the head of the machine;

Fig. 3 is a view similar to Fig. 1 of a modified form of the machine designed particularly for applying cement to the bottoms of shoes which have no welt;

Fig. 4 is a fragmentary view showing the nozzle and the feed wheel of the machine of Fig. 3 in engagement with a portion of a shoe;

Fig. 5 is a view on a much larger scale showing a portion of a welted shoe in section, together with the operating parts of the form of the machine shown in Figs. 1 and 2 which cooperate therewith;

Fig. 6 is a fragmentary view showing a substantially vertical section on the line VI—VI of Fig. 5, this being taken substantially axially of the nozzle and showing the deflection of the tip of the nozzle as the work is brought into contact with it;

Fig. 7 is a fragmentary view showing the nozzle of the machine pressed against the bottom of a shoe having a spring heel lift;

Fig. 8 is an angular view of a portion of the bottom of a welted shoe showing a nozzle resting upon the butt end of the welt ready to apply a coating thereto;

Fig. 9 is a detail view showing the tip of a nozzle riding on the bottom of a shoe adjacent to a ridged shank piece;

Fig. 10 is an enlarged angular view of the tip of a nozzle designed particularly for the bottoms of shoes which have no welts;

Fig. 11 is an enlarged detail angular view of a welt supporting finger;

Fig. 12 is an enlarged section through the end of a nozzle such as is shown in Fig. 10 but in inverted position and on a much larger scale;

Fig. 13 is a longitudinal section through a modified nozzle, and

Fig. 14 is an enlarged angular view of the tip of the nozzle shown with the recess facing up.

There is shown principally in Figs. 1, 2 and 5 a machine which finds particular application in applying a coating, such as of pyroxylin cement, to the margin of the bottom of a welted shoe prior to the application of a sole thereto. The cement is extruded directly upon the flesh side of the welt and upon the inseam. On the other hand, the modified form of the machine shown in Figs. 3 and 4 is particularly adapted for applying a similar coating material to the margin of the bottom of a shoe which has no welt, prior to the application of a sole thereto. To this end, both forms of the machine are provided with a nozzle 20 to which a coating material, hereinafter for convenience termed cement, will be supplied under pressure by means of a pump 22 from a receptacle 24. The nozzle and the pump are connected by a flexible hose 26, and the passage of cement is controlled by a valve 28, the pressure being indicated by a gage 30. The pump 22 comprises a pair of intermeshing gears 32 (Fig. 1) and a by-pass ball valve 34 (Fig. 2) held in position under the pressure of a spring 36, the compression of which may be adjusted by a hand screw 38. When the compression of the spring is increased, the pressure in the hose 26 is increased and more cement will be applied to each unit area of the margin to be coated. The gears 32 are seated in a chamber formed as a recess 40 in the end of a casting 42 through which there is a passage 44 (Fig. 2) leading to the receptacle 24. One of the gears 32 is mounted on a shaft which passes through this block and through a stuffing box at the far end, and is driven by gears 46 from a driving shaft 48. The by-pass valve 34 is positioned in a removable cover plate 50. The receptacle 24 is mounted upon a shelf 52 formed as an integral part of a frame 54 for the head of the machine, this in turn being adapted to be supported upon a column 56. It will be noted that the receptacle 24 is provided with a hinged cover 58 having an upstanding neck 60 fitted for detachable engagement with the neck of a supply can 62, as shown in Fig. 1. Lugs 64 (Fig. 2) upon the cover 58 contact with the side of the receptacle 24 when the cover is tipped over into a horizontal position so that, in applying a filled can 62, the cover of which has been removed, the upright can may be raised and engaged with the neck 60 of the tilted cover, after which the can and the cover may be tipped back into upright position and the contents of the can allowed to flow into the receptacle 24. Each form of the machine is also provided with a driven rubber-tired feed wheel 70 which is movably mounted, as will be later described, so that it may be retracted to an inoperative position which is not beneath the nozzle and then, at the will of the operator, brought out into an operative position engaging the side of a shoe, as shown in Figs. 4 and 5, to cause a feeding movement of a shoe held up to the machine in inverted position by an operator.

In general, the arrangement is such that an operator holding a shoe in inverted substantially horizontal position presents that portion of the bottom of the shoe adjacent to the heel breast line to the nozzle and by depressing a suitable treadle (not shown) moves the feed wheel 70 out into contact with the work and also opens the valve 28 to allow a flow of cement through the nozzle 20. The rotation of the driven feed wheel 70 causes a progressive movement of the shoe and this is guided by the operator to present to the nozzle the margin of the bottom of the shoe around the toe end thereof back to a corresponding point on the other side of the shoe with the result that there is applied a marginal band of cement in a predetermined amount. This band may be uniformly positioned in spite of the changing transverse contour of the shoe bottom.

The upper part of the frame, as will be evident from an inspection of Figs. 1 and 2, comprises upright spaced side pieces 72 and 74, the latter of which is severed at the line 76 so that it forms a removable cover which facilitates the assembling of the machine. Mounted between these plates 72

and 74 is a nozzle-supporting arm 80 having a depending rear end 82 journaled upon a cross pivot 84. Along the forward end of this lever arm are opposed surfaces 86 which slidably contact with the inner adjacent faces of upwardly extending flanges 88 (Fig. 2) upon the side pieces of the frame. Upward tilting movement of this nozzle supporting arm 80 is opposed by a spring 90 received between a lug 92 on the lever and a bracket 94 secured to the frame member 72 (Fig. 2). The normal lowermost position of the arm 80 is determined by means of a screw 96 (Figs. 1 and 2) threaded in a flange 98 upon the lever and contacting with a flange 99 upon the side piece 72 of the frame. By adjusting this screw, the heightwise relation of the nozzle with respect to the feed wheel 70 may be adjusted to bring the nozzle as close as is practical to the wheel. This done, the inward yielding movement of the feed wheel as it comes to the inside shank portion of a shoe will be kept at a minimum.

The nozzle 20 which, as will be later described in greater detail, may be constructed of yielding material, such as soft rubber, is held upon the lower end of a hanger 100 by a clamp plate 102, this arm being held in the desired angular position upon a supporting rod 106 attached to the arm 80 by means of pinch screws 104 (Fig. 2) passing through a split portion of the arm. It is intended that the operator of the machine shall face the side of the machine illustrated in Fig. 1 and present the shoe to the lower end of the nozzle 20 and to contact with the feed wheel 70 at substantially its outermost point. This point serves as a turning point for the work. If, as sometimes occurs, the habits of an operator are such that he brings the shoe into contact with the feed wheel at one side or the other of this point, then it is possible to make a corresponding adjustment of the position of the lower end of the nozzle, to bring it adjacent to the turning point, by loosening the pinch screws 104 and turning the hanger 100 upon the supporting rod 106, and then reclamping the arm. This correction will keep the band of cement parallel to the edge of the shoe. The rod 106 is mounted for axial adjustment in the outer end of the arm 80 and is held in position and prevented from turning by the cooperation of the pointed end of a set screw 108 with a V-shaped groove 110 in the rod. By loosening this screw 108, the nozzle may be moved in and out to vary its location with respect to the corner of the shoe, thus allowing the band of cement to be located exactly at the edge of the bottom margin or to be spaced therefrom by an uncoated margin.

Associated with the valve 28 is a fitting 112 (Figs. 1 and 2) which is screwed to a plate 114 and this plate is mounted upon spaced fingers 116 which are integral with the hanger 100. Formed as a component part of this structure is a metallic tubular extension 118 over the lower end of which the upper end of the nozzle 20 is forced. The arrangement recited provides a tight passageway from the flexible hose 26 to the nozzle 20. Operation of the valve itself is secured by actuating a valve arm 120 secured to a valve rod 122 which is journaled in a depending flange 124 formed integrally with the arm 80. Inasmuch as the nozzle-supporting hanger 100 is capable of angular adjustment around the rod 106, provision is made for avoiding any binding of the connection between the valve 28 and the operating rod 122 by interposing a section 126 joined to the valve and the rod respectively by means of universal joints. A part of one of these universal joints is forked so that it may readily be separated and a spring 127 coiled around the rod 122 keeps this universal joint in operative engagement. This arrangement allows the operator to disconnect the rod 122 from the valve 28 by pressing backward against the spring whenever it is desired to render the valve inoperative. A stop screw 128 threaded in the flange 124 contacts with the valve rod actuating arm 120 to limit its movement in valve closing direction. A mechanism for actuating this valve rod 122 to open the valve at the will of the operator will be later described.

Feed of the work by the driven rubber-tired feed wheel 70 is greatly facilitated by the fact that this wheel is movably mounted and yieldable to accommodate variations in the contour of the shoe or resulting from the different ways in which operators present shoes to the machine. As shown in Fig. 1, the feed wheel 70 is journaled in a movable carrier 130 and this carrier in turn is supported upon pivoted links 132 and 134 turning on shouldered cross bolts 133 and 135 extending between the frame sides 72 and 74 (Fig. 2). The feed wheel carrier 130 is, therefore, movable in and out substantially in a straight line which is a horizontal path. To drive the feed wheel, the carrier is provided with a shaft 136 interconnected by means of miter gears and a short intermediate shaft with a gear 138 (Fig. 5) on the feed wheel 70. The shaft 136 is connected to a shaft 140 journaled in the frame by means of a telescoping shaft 142, 144 which is joined to the shafts 136 and 140 by means of universal joints. A worm and worm wheel 146 interconnects the shaft 140 with the drive shaft 48. It will be observed from Fig. 2 that the carrier 130 fits snugly between the inner faces of the side plates 72 and 74 of the frame thereby to guide the carrier in its movement. The limit of outward movement is controlled by a stop screw 150 (Fig. 5) which cooperates with a vertical surface 152 on the carrier. Lateral movement of the feed wheel to take it away from the nozzle also greatly facilitates the presentation of a piece of work to the machine as it enables the operator to tilt the shoe to such an angle to the horizontal that the butt end of the welt can be placed over the finger 69 in the inoperative position of the latter which is shown in Fig. 1.

Operation of the feed wheel carrier 130 under the control of the operator is effected by means of a treadle (not shown) normally held up by a spring (not shown), which treadle is connected to a treadle rod 154 (Fig. 1) having collars 156 and 158 held thereon by set screws. Interposed between these collars and slidable on the rod is a sleeve 160 held normally in engagement with the lower collar by a spring 162. This sleeve has a laterally extending pin 164 received in a slot in an arm 166 which is joined with the arm 134 to make a bell crank. When the treadle is depressed, the carrier 130 and the feed wheel 70 are moved out into engagement with the work to a position limited by the stop screw 150. If the operator pushes inwardly upon the feed wheel as he guides the shoe beneath the nozzle, the spring 162 will yield to permit this inward movement of the feed wheel while maintaining it yieldably in contact with the shoe. The movement of the treadle rod 154 is sufficient to carry the lower collar 156 away from the sleeve 160 when the stop surface 152 contacts with the screw 150. The treadle rod is interposed between the side frame plates 72 and 74, and passes down through the interior of the column 56.

For operation of the valve arm 120, the treadle rod is pivotally joined at its upper end to a lever 170 which is mounted on the shouldered cross bolt 172 extending between the sides of the frame. This lever 170, therefore, serves as a guide for the upper end of the treadle rod and is joined to a pin 176 by a link 174 slotted at its lower end. This pin 176, held by a set screw, passes between the spaced arms 178 and 180 of a lever pivoted at 182 between the sides of the frame. The length of the slot in the link 174 is about half the length of the normal movement of the treadle rod 154. The longer arm 180 of the lever is connected by a rod 184 with the valve operating arm 120 while the other arm 178 has attached to it the lower end of a spring 186, the upper end of which is hooked over an eye in the nozzle-supporting arm 80. This spring 186 tends normally to lift the double lever 178, 180 and to close the valve 28.

In the form of the invention used when the shoe has no welt and shown in Fig. 3, the feed wheel 70 can, for reasons which will be later explained, approach the nozzle at a sharper angle and this enables a simpler feed wheel carrier 190 to be utilized. The lower end of this carrier is pivoted upon the bearings for the drive shaft 48 and the feed wheel is driven from a stub shaft 192 connected to a shaft 194 extending heightwise of the carrier and joined to the drive shaft by a worm and worm wheel 146[1]. Here, a stop flange 196 is provided upon a slide 198 received in a groove 199 in the side frame 72 and adjustably positioned therein by means of a clamp screw. This flange 196 cooperates with an upstanding finger 200 on the upper end of the carrier 190 when the carrier has been swung outwardly to shoe engaging position, as shown in Fig. 4. In this form of the machine, the treadle rod 154 is pivoted at its upper end to the lever 170, the extent of movement of which is limited by contact of a boss 273 on the lever with a stop 275 on the frame member 72. The carrier 190 is joined to the treadle rod 154 by a link 202 connected to the upper end of a bell crank 204 pivoted on the cross bolt 135, the lower arm of which is forked to receive the treadle rod 154. A spring 206 surrounding the treadle rod and held in position by a collar 208 bears at its lower end upon a washer 210 resting upon a curved surface on the forked end of the lower arm of the bell crank 204. This spring 206 permits an inward yielding movement of the feed wheel under pressure of the work, as does the spring 162 in the form of the machine shown in Fig. 1. A spring 212 is interposed between the frame and the carrier 190 to retract the carrier after the treadle rod has been released.

The feed wheel 70 comprises a hub 214 (Fig. 5) on the lower portion of which is formed the miter gear 138 and the upper portion of which is provided with a V-shaped peripheral groove to receive a rubber ring 216 which is rounded upon its outer periphery and is V-shaped on its inner periphery. The hub 214 is mounted for rotation upon the enlarged portion 218 of a screw 220 which is threaded into the carrier 130. An upstanding flange 222 on this carrier 130 is received within a recess in the miter gear 138 to steady it. It is noted that the upper portion of the hub 214 is recessed at 224 to avoid interference with the welt supporting finger 69.

When the machine is to be utilized for the application of a coating of cement, for example, to the attaching surface of a welt 230 which will be of relatively flexible material, the need for the welt supporting finger 69 becomes apparent. In Figs. 5 and 8, the welt 230 is shown as attached to the upper 232 and to an insole 234 by means of a seam 236. This seam passes not only through the upper 232 but also through the lining 238 of a shoe, which has been built upon a last 240, and through the between substance 242 of the channeled insole. At this stage of the manufacture of the shoe, a filler 244 will usually have been applied to the exposed surface of the insole. The desire of the manufacturer is to apply a marginal stripe of cement which will coat the whole width of the attaching surface of the welt 230 and the between substance 242. Usually the machine will be regulated to extrude the cement in a quantity sufficient to not only coat the welt but also to fill the interstices formed by the inseam stitches 236 or between the edges of the upper, lining and between substance.

It is important that, during intervals between the presentation of pieces of work to the machine, the welt supporting finger 69 should occupy an inoperative position which is away from the tip of the nozzle 20 to avoid soiling this finger with cement. It has been found also that it is not desirable to present a welted shoe to the nozzle by pushing the butt end of the welt into the tip of the nozzle. Such a procedure would result frequently in wiping off a small quantity of cement upon the butt of the welt which would be carried over on to the grain side thereof and the upper, and where it would be apt to damage the appearance of the completed shoe. To avoid the first difficulty, the welt supporting finger 69 is mounted for movement toward and away from the nozzle and to avoid the second difficulty, the finger is given a combined motion of rotation and translation which allows the butt of the welt to be laid over the finger in its inoperative position and then causes the movement of the finger to carry the work forwardly and outwardly so that the nozzle shall, in its starting position, occupy a position similar to that shown in dotted lines in Fig. 8 and its point of contact with the work shall be carried along a path 250 which is substantially a portion of an ellipse thereby bringing the nozzle laterally over the butt end of the welt into the position shown in full lines in Fig. 8 without any opportunity for wiping off cement upon the end of the welt.

Accordingly, the finger 69 is carried upon the lower end of a shaft 252 which is journaled in an extension 254 of a slide 256. It will be seen from Figs. 1 and 5 that the axis of this shaft 252 is inclined to the vertical. From Fig. 2 it will be seen, however, that the axis is substantially in the same plane as the axis of the feed wheel so that, when the finger is brought into operative position, it will lie in that plane. The shaft 252 is held in the extension 254 by means of a collar 258 and a toothed segment 260 which latter is held in position upon the upper end of the shaft by a set screw 262. The toothed segment 260 meshes with a rack 264. This rack is supported in the groove 199 in the side frame 72 and is adjustably positioned by means of a bolt 267 passing through a slot therein. This groove 199 (Fig. 1) is the same as that which, in the form of the machine shown in Fig. 3, receives the bar 198 carrying the stop flange 196. The slide 256 has slots 268 to receive and be supported by the enlarged portions of shouldered bolts 270 extending between the side frames 72, 74 and clamped therein. These bolts, as well as various other

bolts used as pivots (133, 135, 172, 182), serve to keep the side frames in a predetermined spaced relation such that they may cooperate with the feed wheel carrier 130 to guide the latter. Movement is imparted to the slide 256 by a link 272 (Fig. 1) joining the slide with the outer end of the lever 170 to which the treadle rod is connected. Upon depression of the treadle rod, the slide 256 is moved outwardly thereby imparting a movement of translation to the shaft 252 carrying the finger 69. At the same time, the meshing of the segment 260 with the rack 264 imparts a partial rotation to the finger-carrying shaft. At the beginning of this movement, the finger 69 lies, when viewed from above, at an angle of approximately 45° to the path of the work, which path may be taken to be substantially normal to the sheet of the drawing at a point beneath the nozzle. When the slide 256 has been moved to the full extent of the movement imparted by the lever 170 through the link 272, the finger will have been rotated by the shaft 252 to occupy a position substantially at 90° to the length of the path of the work. At the time when this movement is completed, the boss 273 upon the lever 170 is brought into contact with the stop surface 275 on the side member 72 of the frame. At this time, the toggle formed by the lever 170 and the link 272 will be slightly beyond the dead center and will, therefore, act as a rigid strut holding the slide 254 in its outermost position. It will be noted that, by reason of the lost motion connection 176 between the link 174 and the lever 178, 180, a depression of the treadle rod 154 first moves the welt gage 69 and the feed wheel 70 out into operative position and then opens the valve 28. When the treadle is released and the rod 154 raised by the spring 186, then the actions take place in the reverse sequence and the valve 28 is closed before the welt gage and feed wheel are withdrawn. This aids in preventing a deposit of cement upon these work contacting parts of the machine.

The upper face of the finger 69 supports a combined welt gage and nozzle rest 274 (Figs. 5 and 11). This gage 274 has a slotted flange 276 allowing the gage to be adjustably positioned upon the finger 69 and clamped there by a screw 278. The gage is centered upon the finger by means of a depending tongue 280 received in a slot 282 running lengthwise of the finger. This gage 274 has an extension 284 of a reduced thickness which is approximately the same as that of the welt, and which has an edge 286 which, in operative relation as shown in Fig. 5, abuts the edge of the welt and acts as a gage for the welt. It will be understood, however, that it is intended that the finger 69 shall be seated in the bottom of the welt crease and that this extension 284 of the gage serves also as a support for the edge of the nozzle, as will be later described.

The successful operation of the machine depends to a considerable degree upon the construction of the nozzle 20. The work to be coated is of irregular contour both laterally and heightwise of the shoe and provides a relatively rough surface to which cement may be applied uniformly only with considerable difficulty. For such work, the improved construction herein shown and described provides a nozzle which may be made of relatively flexible material, such as soft rubber, and by means of which a controllable quantity of cement may be applied with great regularity and in a uniform manner. This nozzle comprises a hollow body portion 300 (Fig. 6) having a large passage 314 which receives the tubular extension 118 extending downwardly from the bottom of the plate 114 and at an acute angle thereto (Fig. 2). The flattened end of the nozzle is reduced in thickness as at 302 (Fig. 10) and slightly in width (Figs. 1 and 5) so that it may be flexed from a position in which it lies substantially symmetrical with respect to the center plane of the body 300 to a position, such as is shown in Figs. 6, 8 and 9, in which the tip 304 is bent at a decided angle to the body 300. This tip 304 is provided with a substantially U-shaped, open-ended recess 305 defined laterally by the inner faces 306 (Figs. 10 and 12) of side flanges 308 and by an inner, end surface 310 (Fig. 6). The open side of the recess is positioned adjacent to the work and as the work travels with respect to the nozzle, the direction of feeding movement is away from the open end of the recess so that the recess is open at the forward end of the nozzle tip, thereby permitting the deposition of a band of cement. Depending upon the quantity of cement extruded, as determined by the setting of the screw 38 (Fig. 2), this will leave parallel stripes or a single band of cement of uniform character, the width of which will be determined by the space between the side flanges 308. Minute passages 312 (Fig. 6) lead from the interior of the body portion to the inner corner of this recess. These passages are preferably of such a size that they are capillary and, therefore, function like the capillary tubes employed in the nozzle shown in Letters Patent of the United States No. 2,058,461, granted October 27, 1936, in the name of Joseph W. Johnson for Improvements in nozzles for machines for preparing soles for cement shoes. Conveniently, the nozzle is constructed by molding and when this is done, a core (not shown) which forms the large passage 314 may carry a series of six-sided rods (not shown) having a cross sectional shape like that of the passages 312, shown much enlarged in Fig. 12. Conveniently, too, these rods are extended to the extreme end of the nozzle and two sides of each rod are utilized to form V-shaped grooves 316 separated by V-shaped ribs 318. In the use of the nozzle, these ribs 318 rest upon the work, as indicated in Figs. 6, 8 and 9, and prevent the open end of the recess 305 from being closed by the pressure of the work against the nozzle. The tip of the nozzle serves also as a wiper or spreader by which the applied coating is rubbed into the work and evenly distributed in the direction of the length of the applied band. Preferably, the spacing of the V-shaped ribs is such that the grooves formed therebetween will be completely filled with cement at the particular pressure applied, thus insuring a good contact of the cement with the work without too much pressure by the nozzle on the work. It has been found that too wide a spacing of these ribs tends to produce stripes of cement upon the work, which stripes, though they may be very slightly separated when originally applied, are of sufficient body so that they tend to shrink away from each other and to leave markedly separated stripes, a condition which is not usually desirable. A spacing between the ribs of one-twentieth of an inch has been found to be suitable. The nozzle rests upon the work at a point on the nozzle which, for convenience, will be termed the heel 320 (Figs. 6 and 7) of the nozzle and at its extreme tip 322. There is, accordingly, opportunity for the cement to completely surround the ribs 318 at the inner part

of the recess 305 and thus to lubricate these ribs to such an extent that wear upon them is substantially eliminated. To secure adequate contact between the tip of the nozzle and the work, the tip 304 is provided on its upper face with a series of parallel reinforcing ribs 324 (Figs. 8 and 10). When the nozzle is to be used for welt cementing, as in Fig. 8, these ribs extend as such all the way to the end of the nozzle. It is sometimes found desirable for this kind of work also to reduce the depth of the end portions of the side flanges 308 and, if it is desired to have a band of cement of uniform thickness, also to chamfer the end portions of the ribs 318. This construction is shown in Fig. 13 where similar parts are indicated by similar numerals to which 1000 has been added. If the nozzle is to be used for shoe bottoms of compo shoes of the type illustrated at M in Fig. 9, then it is found desirable to interconnect the ribs 324 by means of a transverse rib 326 (see also Fig. 10) formed integrally with the tip of the nozzle to prevent undue distortion and to keep the V-shaped ribs 318 near the center of the outlet end of the recess from being pressed so firmly against the work as to divide the resulting band of cement into spaced parallel stripes, for example.

The spreader action of the tip of the nozzle has been found to be of considerable advantage in the elimination of bubbles in certain types of work. The reason for these bubbles is not fully understood. They may result from the fact that in very rough work the coating of cement bridges a small pocket containing air. This air may then interact with the material of the cement to form a greater quantity of gas which expands the layer of cement and makes a protruding bubble. Such bubbles either harden as protruding lumps or else burst and form distinct crater rims which protrude from the work and are a hindrance in securing perfect adhesion between the shoe parts. Whatever the explanation may be, they are definitely eliminated by the spreading or wiping action of the tip of the nozzle as the ribs 318 therein are dragged through the applied coating. Many manufacturers desire that the coating shall be of full thickness at the outer edge of the work so that there shall be no doubt that perfect adhesion is secured at this point. If the sole adheres to the shoe along the outer margin of the applied band of cement, then a satisfactory job results. If there is any tendency to imperfect adhesion at this point, then it does not make much difference how much cement may have been applied to the inner edge of the margin because the sole will break away from the shoe at the outer edge. The machine herein illustrated is of decided utility because of its inherent action in applying a band of cement to the margin of a shoe which will be of full thickness at the outer edge without being so thick as to cause "squeeze-out" and the consequent danger of soiling the upper. The nozzle construction appeals to operators as no time is required for cleaning the machine when it is left for the night. It is simply necessary to smear a quantity of cement over the recessed end of the nozzle and to allow it to harden thereon, preventing any cement in the passages of the nozzle from drying out. When the machine is again desired for use, the operator needs only to distort the tip of the nozzle, breaking away the hardened cement and leaving the nozzle in condition for immediate use.

For some classes of work, such as those in which there are abrupt changes of heightwise contour, it is found desirable to provide a skid finger 330 which is held by a set screw in a nozzle clamp 102a (Figs. 4 and 7). This is particularly useful in a shoe of the type shown in Fig. 7 having a spring-heel lift 332 and a welt 238 and in which it is desired to apply cement around the margin of the heel end of the shoe as well as around the forepart. The skid 330 riding over the corner formed by the breast edge of the lift will raise the nozzle supporting arm 80 and facilitate the passage of the nozzle over this corner. The skid 330 also serves to determine the amount which the nozzle may be bent by the upward pressure of a piece of work against the end of it. If the nozzle is not bent sufficiently, the heel 320 of the nozzle will not be brought into contact with the work and the cement will be extruded, uncontrolled, upon the portions of the work which are approaching the nozzle and will very likely spread laterally beyond the desired limits. If, on the other hand, too much pressure is applied, the tendency will be to cause the extreme tip end of the nozzle to tilt upwardly away from the work so that the full wiping action of the latter is not secured and the band will be wider than desired. It has been found in the particular construction herein illustrated that a setting of the skid finger 330, such that, in the undistorted condition of the nozzle, the end of the skid is spaced from the surface 310 at the inner end of the recess by one-sixteenth of an inch, measured axially along the nozzle, gives exactly the desired results, as above described. The screw 96 serves to provide an initial adjustment of the height of the nozzle with respect to the level of the welt gage 69 when the machine is being set up, substantially as has been described in connection with the form of the machine shown in Fig. 3.

In the application of cement to welt shoes, as illustrated in Fig. 8, it is usually desired to bring a band of cement all the way to the edge of the welt and, consequently, the inner face 306 of the side flange 308 of the nozzle should coincide with the edge of the welt. This is effected to advantage by allowing the side flange 308 to rest upon the portion 284 of the welt gage 274. This reduces the wear on this flange 308, as there is no contact between it and the moving welt. In a shoe of type M, as shown in Fig. 9, it is quite common to provide a shank reinforcing member 334 which is rigid and has sharply inclined sides. The narrowness of the shank portions of such shoes forces the nozzle to ride on one side of this shank member and has some tendency to cause the tip of the nozzle to diverge outwardly or to slide laterally beyond its intended path. The machine may be provided with a side finger 340 having a plate 342 to permit it to be attached to the under side of the arm 100 by a screw 344 passing through a slot in this plate. The lower end of this finger 340 is curved and lies closely alongside the outer face of the flange 308 at the outside of the nozzle serving as an abutment ready to support the nozzle when deflected and thereby to avoid this tendency. In the welt machine of Fig. 8, this function is performed by the side of the gage 274 serving similarly as an abutment.

In using the machine to apply cement to welt shoes, the operator stands facing the side of the machine shown in Fig. 1. The direction of feeding movement is directly away from him substantially at right angles to the direction of sliding movement of the carrier 256 (Fig. 5) for the welt supporting finger 69. This finger in an inoperative position extends outwardly at about

45° to the line of feeding movement and the finger itself turns upwardly slightly. The shoe presented to the machine is positioned with the toe toward the operator, it being tipped up slightly and turned in toward the machine at about 45° to the line of feed. The lower end of the nozzle will then rest upon the bottom of the shoe inwardly of the welt and at a point near the butt of the welt, as shown in dotted lines in Fig. 8. When the treadle is depressed, giving the welt supporting finger an outward and a rotative movement to bring it into the welt crease and to force the shoe outward, the shoe is also turned manually to bring it into the line of feed and into a substantially horizontal position. The feed wheel does not contact with the shoe until the latter is in this position and fully ready for the application of cement. One important result of the arrangement above described is that there is no tendency for the butt of the welt to wipe cement from the lower end of the nozzle when the shoe is being positioned. If it did, it would be highly probable that the cement would work over on to the grain surface of the welt and on the upper, both of which are very detrimental. This is avoided, however, because the end of the nozzle is brought into contact with the shoe at a point inwardly of the welt and then, as the shoe is given a combined turning and sliding movement with the welt supporting finger, slides over the bottom of the shoe and the welt in a diagonal direction until it reaches its operative position where it will apply cement to the whole width of the welt but without coating the edge of the welt.

Depression of the treadle in this machine does three things: it moves out the slide **256** carrying the welt support **69**, it moves out the feed wheel **70** to engage the side of the shoe and it opens the valve **28** to allow cement to flow through the nozzle **20**. The outward movement of the feed wheel lags behind the movement of the welt supporting finger and the opening of the valve is timed so that no pressure is applied to the residual cement in the nozzle until the work is in proper position beneath the nozzle. This outward movement of the welt finger is carried to a limiting position which is fixed with respect to the nozzle except as the latter may have heightwise movement. On the other hand, the carrier for the feed wheel is moved out to a point where it brings the wheel into engagement with the side of the shoe and in that position is yieldable to accommodate variations in the shape of the shoe. This yielding movement of the feed wheel also permits the welt finger always to be fully seated at the bottom of the welt crease. The action of the machine upon shoes having wide variations in heightwise contour at the bottom of the shoe is greatly facilitated by reason of the pivotal mounting at **84** of the nozzle-supporting arm **80**, thus allowing the nozzle and its support to be lifted bodily substantially vertically at times for a short distance against the tension of the spring **90**. It will be noted that the connection between the rod **184**, connected to the valve arm **120**, and the actuating arm **180** is close to the pivot **84** so that lifting movement of the nozzle-supporting arm **80** does not affect to any substantial extent the position of the valve **28**.

While the machine is employed for compo shoes, such as shown at M (Fig. 4), the form of the machine shown in Fig. 3 will be employed. In this form, there being no welt supporting finger, it is possible to provide a simpler construction of the feed wheel carrier **190** and to mount the feed wheel **70** at a sharp inclination, bringing it out into contact with the shoe by movement through an arc around the center of the drive shaft **48**. This may be contrasted with the arrangement shown in Figs. 1 and 5 in which the inclination of the plane of the feed wheel **70** is reduced to approximately 30° to the horizontal and the movement of the feed wheel carrier **130** is substantially a straight line, horizontal movement so that there will be no contact between the feed wheel and the elbow of the finger **69**. Thus, it is possible to bring the feed wheel closer to the finger by reason of the depression **224** in its upper surface. In either of the machines, when the end of the margin of the work is reached, the treadle is released, closing the valve and then, after the interval allowed by the lost-motion connection **176**, moving the feed wheel away from the work and, in the case of a welt shoe, returning the welt finger **69** to its inoperative position, as shown in Fig. 1. It will be recalled that the feed wheel **70** is driven continuously. Accordingly, it is desired that the feed wheel **70** shall not be brought into contact with a shoe until the shoe is in position ready for the application of cement, as is insured particularly by the arrangement illustrated in Fig. 1.

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

1. In an extruding machine, a nozzle mounted on the machine and having a depending flexible work-contacting end portion, and a work-contacting rigid finger mounted adjacent to and to the rear of said nozzle thereby to limit the deflection of the resilient end portion by work raised into contact with the finger and nozzle as the work is moved forwardly beneath the nozzle.

2. In an extruding machine, a nozzle mounted on the machine and having a depending, thin, flat, flexible work-contacting end portion, and a depending rigid member disposed close to the side of the flexible end portion of the nozzle to act as an abutment limiting lateral flexing of said end portion.

3. In an extruding machine, a nozzle having a depending work-contacting end portion, a work-contacting skid finger disposed adjacent to and to the rear of said nozzle, and means for supporting said nozzle and skid finger for heightwise yielding movement.

4. In an extruding machine, a nozzle having a flexible depending work-contacting end portion, said end portion having a recess on the work-contacting side thereof, a passage through said nozzle opening into said recess, a work-contacting skid finger disposed closely adjacent to the closed end of said recess, and means for supporting said nozzle and skid finger for heightwise yielding movement.

5. In an extruding machine, a depending flexible nozzle inclined downwardly and forwardly in the direction of movement of the work, means for supporting said nozzle, and an abutment disposed alongside the work-contacting end of the nozzle thereby to prevent lateral deflection of the flexible nozzle in a direction to overhang the corner of a piece of work being presented to the nozzle.

6. In an extruding machine, a frame, a nozzle carrier angularly adjustable with respect to the frame, a nozzle on said carrier, a pipe on the carrier for supplying said nozzle, a valve also

on the carrier having a casing interposed in said pipe and rigidly connected with said nozzle, an operator-controlled valve-operating rod journaled in said frame, a flexible connection between said rod and said valve whereby angular adjustment of the nozzle carrier does not interfere with the connection between the rod and the valve.

7. In an extruding machine, a frame, a carrier arm pivotally mounted upon the frame, a nozzle carrier secured to said arm, a nozzle on said carrier, a tube supplying said nozzle, a valve interposed between the tube and the nozzle, a valve rod journaled in the frame, and a flexible connection between said rod and said valve permitting pivotal movement of said arm without interference with the turning of the valve by the rod.

8. In an extruding machine, a depending nozzle positioned to deliver cement to the bottom of an inverted shoe, a power-driven feed wheel to contact with the side of the shoe, and treadle-operated means for supporting said feed wheel for bodily movement laterally of the nozzle toward and away from the nozzle and the side of the shoe.

9. In an extruding machine, a nozzle to which the bottom of a shoe may be presented, a feed wheel for contact with the side of the shoe, a movable support for said feed wheel, means for driving said feed wheel in all positions of the support, and operator-controlled means for moving said support.

10. In an extruding machine, a nozzle to which the bottom of a shoe may be presented, a feed wheel for contact with the shoe, a movable support for said feed wheel, means for driving said feed wheel in all positions of the support, and operator-controlled means, including a spring, for moving said support to carry the feed wheel into yielding contact with the shoe.

11. In an extruding machine, a nozzle, a feed wheel, a carrier for said feed wheel mounted for movement laterally toward and away from the nozzle, an adjustable stop for limiting the movement of the feed wheel toward the nozzle, and operator-controlled means for yieldably moving said feed wheel support.

12. In an extruding machine, a depending nozzle, a drive shaft below the nozzle, a feed wheel driven from said shaft and movable laterally toward and away from the side of an inverted shoe presented to said nozzle, a support for said feed wheel pivotally mounted below the nozzle, means for driving said feed wheel in all positions of the support, and operator-controlled means for moving said support.

13. In an extruding machine, a nozzle, a feed wheel movable laterally toward and away from said nozzle, a movable support for said feed wheel, pivotally-mounted means for moving said support, and operator-controlled means resiliently connected with said pivotally mounted means for pressing said feed-wheel support to a predetermined limiting position and allowing retrograde movement of the support under pressure of the work.

14. In an extruding machine, a nozzle, a valve controlling said nozzle, a movably mounted feed wheel, a movable support for said feed wheel, means for driving said feed wheel in all positions of the support, and operator-controlled means for moving said support toward said nozzle to bring it into contact with a shoe presented to the nozzle and moving said valve.

15. In an extruding machine, a nozzle, a valve for controlling said nozzle, a work support mounted for bodily movement laterally of the nozzle, operator-controlled means for moving said work support, and a lost-motion connection between said operator-controlled means and said valve.

16. In an extruding machine, a nozzle, a valve controlling said nozzle, a movably mounted feed-wheel support, a feed wheel thereon, a stop for limiting the movement of said support toward work being presented to the nozzle, operator-controlled means resiliently connected to said support to move it toward the stop, and a lost-motion connection between said operator-controlled means and said valve.

17. In an extruding machine, a nozzle, a welt-supporting finger having a shank portion and an angularly related welt-engaging end portion, and means for turning said finger around its shank to bring the end portion into engagement with the welt to support it against the nozzle.

18. In an extruding machine, a nozzle, a welt-supporting finger having a shank portion and an angularly related end portion, a movable support in which said shank portion is pivotally mounted, and means for moving said support constructed and arranged to impart to the welt-supporting finger a movement of rotation and of translation.

19. In a machine for applying a coating to welt shoes, an applying device, a welt-supporting member to hold the welt in coating relation to the applying device, said member having a shank portion and a work-contacting end portion, and means for imparting to said member a movement of rotation about the axis of its shank portion and of translation toward and away from the applying device.

20. In an extruding machine, a nozzle, a welt-supporting finger having an angularly related welt-engaging end portion, and means for imparting movements of translation and of rotation to said finger to bring the end portion into engagement with a welt to hold it against said nozzle.

21. In a shoe-coating machine for operating upon the bottoms of shoes to which a welt has been attached, an applying member adapted for engagement with the sole-engaging surface of the welt of a shoe, a driven feed wheel for engagement with the side of said shoe, and a finger having a welt-supporting end portion, said feed wheel having a recess on its upper face to receive a portion of said welt-supporting finger thereby permitting a closer relation between the feed wheel and the finger.

22. In an extruding machine for operating upon the bottoms of shoes to which a welt has been attached, a depending nozzle adapted for engagement with the sole-engaging surface of the welt of an inverted shoe, a driven feed wheel for engagement with the side of said shoe, a welt-supporting finger, depending means for supporting said finger, a driven feed wheel for engagement with the side of the shoe, and means for supporting said feed wheel for substantially straight line movement toward and away from the shoe.

23. In an extruding machine for operating upon the bottoms of shoes to which a welt has been attached, a depending nozzle adapted for engagement with the sole-engaging surface of the welt of an inverted shoe, a driven feed wheel for engagement with the side of said shoe, a

finger having a welt-supporting end portion joined to an upwardly extending shank portion, said feed wheel having a recess on its upper face to receive a portion of said welt-supporting finger thereby permitting a closer relation between the feed wheel and the finger, and means for supporting said feed wheel for substantially straight line movement toward and away from the shoe.

24. In an extruding machine, a depending nozzle for applying a coating to the sole-engaging surface of the welt of a shoe, and operator-controlled means for engaging the shoe to push it laterally from a position where the nozzle engages the mid-portion of the shoe bottom to move the end of the welt laterally under the nozzle without wiping the coating material on the end of the welt.

25. In an extruding machine for operating upon the bottoms of welt shoes, a depending nozzle, an operator-controlled shoe-engaging member, and means for imparting to said shoe-engaging member a combined motion of translation and rotation thereby to move said shoe with respect to the nozzle along a curved path to bring the end of the welt laterally beneath the end of the nozzle.

26. In an extruding machine for operating upon the bottoms of welt shoes, a depending nozzle, a depending carrier having an angularly arranged terminal portion for engagement in the welt crease of the shoe, and operator-controlled means for imparting to said carrier a combined movement of translation and rotation thereby to bring said terminal portion into the welt crease and to push the shoe laterally to move the end of the welt beneath the nozzle.

27. In an extruding machine, a nozzle, a valve controlling said nozzle, a movably mounted feed-wheel support, and means for moving said support and for imparting an operating movement to said valve constructed and arranged to effect said movements in predetermined timed relation.

28. In an extruding machine, a nozzle, a valve controlling said nozzle, a movably mounted feed-wheel support, and means for moving said feed-wheel support and opening said valve constructed and arranged to bring the feed wheel into contact with the work before the valve is opened.

29. In an extruding machine, a nozzle, a valve controlling said nozzle, a feed-wheel, a support therefor mounted for movement toward and away from said nozzle, and operator-controlled means for moving said feed-wheel support and operating said valve constructed and arranged to shut the valve before the feed wheel is carried away from the nozzle.

30. In an extruding machine, a nozzle, a valve controlling said nozzle, a movably mounted feed-wheel support, a feed wheel thereon, a movably supported welt-crease-entering finger, and means for moving said finger and said support and operating said valve in a predetermined sequence.

31. In an extruding machine, a nozzle, a valve controlling said nozzle, a movably mounted feed-wheel support, a feed wheel thereon, a movably supported welt-crease-entering finger, and means for moving said feed wheel support and said finger toward and away from the work, said means being connected to said valve to operate it and being also constructed and arranged to bring the feed wheel and the finger into contact with the work before the valve is opened.

32. In an extruding machine, a nozzle, a valve controlling said nozzle, a movably mounted feed-wheel support, a feed wheel thereon, a movably supported welt-crease-entering finger, and means for moving said feed-wheel support and said finger toward and away from the work, said means being connected to said valve to operate it and being also constructed and arranged to close the valve before said wheel and finger are moved out of contact with the work.

33. In an extruding machine for operating upon the bottoms of welt shoes, a depending nozzle, an operator-controlled movable finger for engagement in the welt crease, a movably supported operator-controlled feed wheel for engagement with the side of the shoe, and means for moving said finger and said feed wheel constructed and arranged to bring the finger substantially into operative position in the crease before the feed wheel contacts with the side of the shoe.

34. In an extruding machine for coating the bottoms of welt shoes, a depending nozzle, a movably supported welt-crease-entering finger adapted to overlie the welt in a position beneath the nozzle, a valve for controlling said nozzle, and means for moving said crease-entering finger into position and for opening said valve constructed and arranged to substantially complete the movement of the finger before the valve is opened.

35. In an extruding machine for coating the bottoms of welt shoes, a depending nozzle, a movably supported welt-crease-entering finger adapted to overlie the welt in a position beneath the nozzle, a valve for controlling said nozzle, a shoe-engaging feed roll mounted for movement toward and away from the shoe to a position substantially beneath said nozzle, and means for controlling the movements of said finger and feed roll constructed and arranged to open the valve after the welt is interposed between the nozzle and the work-engaging parts.

36. In an extruding machine for coating the bottoms of shoes, a depending nozzle, a feed wheel for engagement with the shoe adjacent to the nozzle, a support in which said feed wheel is journaled movable laterally toward and away from the nozzle, means for driving said feed wheel in all positions of the support, operator controlled connections for moving the feed-wheel support to carry the feed wheel into engagement with the shoe, and resilient means interposed in said connections.

37. In an extruding machine for coating the bottoms of shoes, a depending nozzle, a feed wheel for engagement with the side of a shoe presented to said nozzle, a feed-wheel support pivotally mounted in said machine to carry the feed wheel toward the nozzle into engagement with the shoe, means for driving said feed wheel in all positions of the support, and operator controlled means for moving said support to carry the feed wheel into engagement with the side of a shoe.

38. In an extruding machine for coating the bottoms of shoes, a depending nozzle, a feed wheel for engagement with the side of a shoe presented to said nozzle, a feed-wheel support pivotally mounted in said machine to carry the feed wheel toward the nozzle into engagement with the shoe, means for driving said feed wheel in all positions of the support, a treadle, and connections between said treadle and said feed-wheel support embodying a resilient member thereby permitting the feed wheel to be moved into contact with the shoe and to yield to accommodate the varying contour of the side of the shoe.

WILBUR L. MacKENZIE.

CERTIFICATE OF CORRECTION.

Patent No. 2,100,341. November 30, 1937.

WILBUR L. MacKENZIE.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, first column, line 3, strike out the word "lever"; page 6, second column, line 51, for "rigid" read ridged; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 1st day of March, A. D. 1938.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)