

July 12, 1938.

F. V. HART

2,123,281

MACHINE FOR PRESSING THE BOTTOMS OF SHOES

Filed Oct. 2, 1935

2 Sheets-Sheet 1

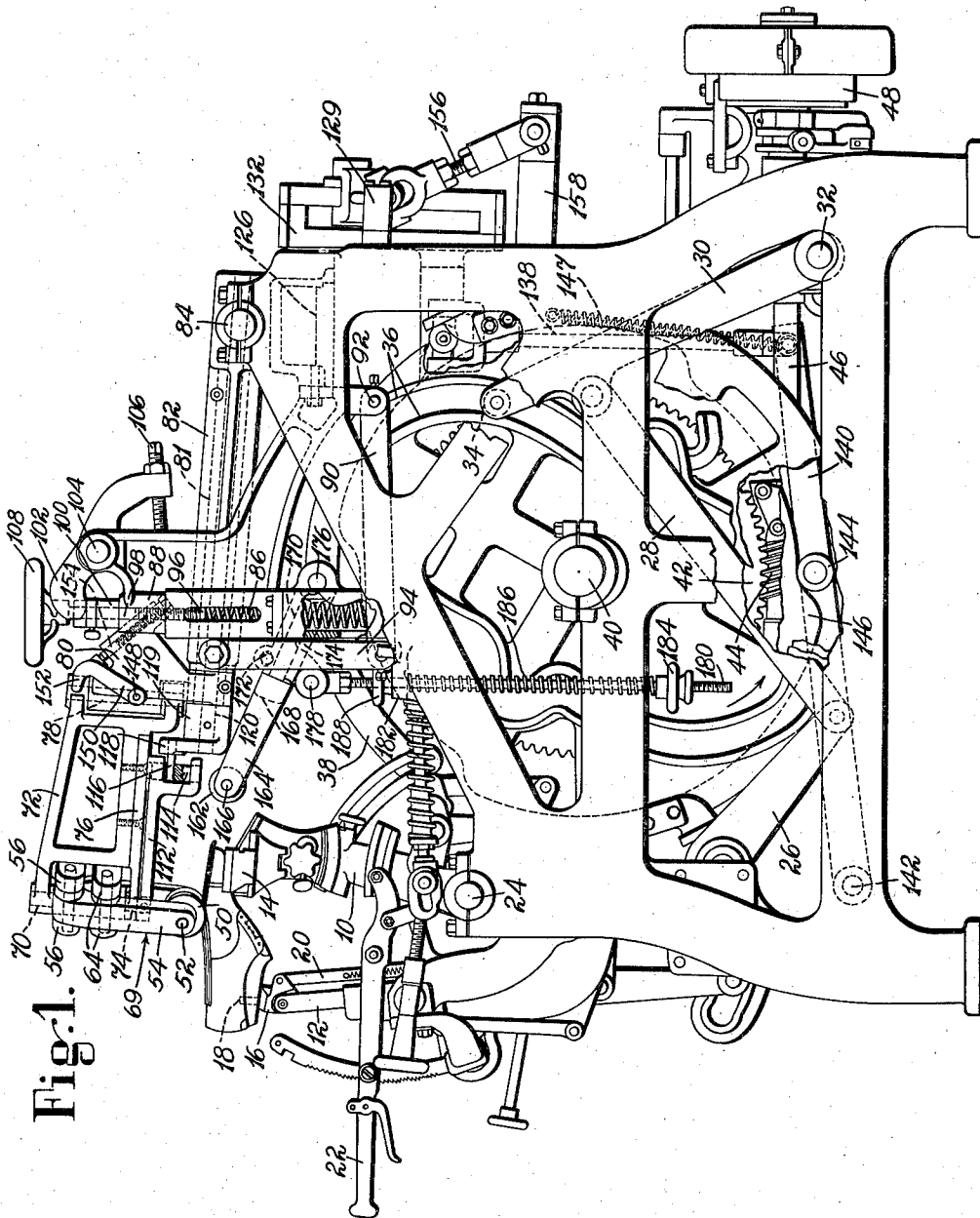


Fig. 1.

INVENTOR
Fred W. Hart
By his attorney
Victor Gold

July 12, 1938.

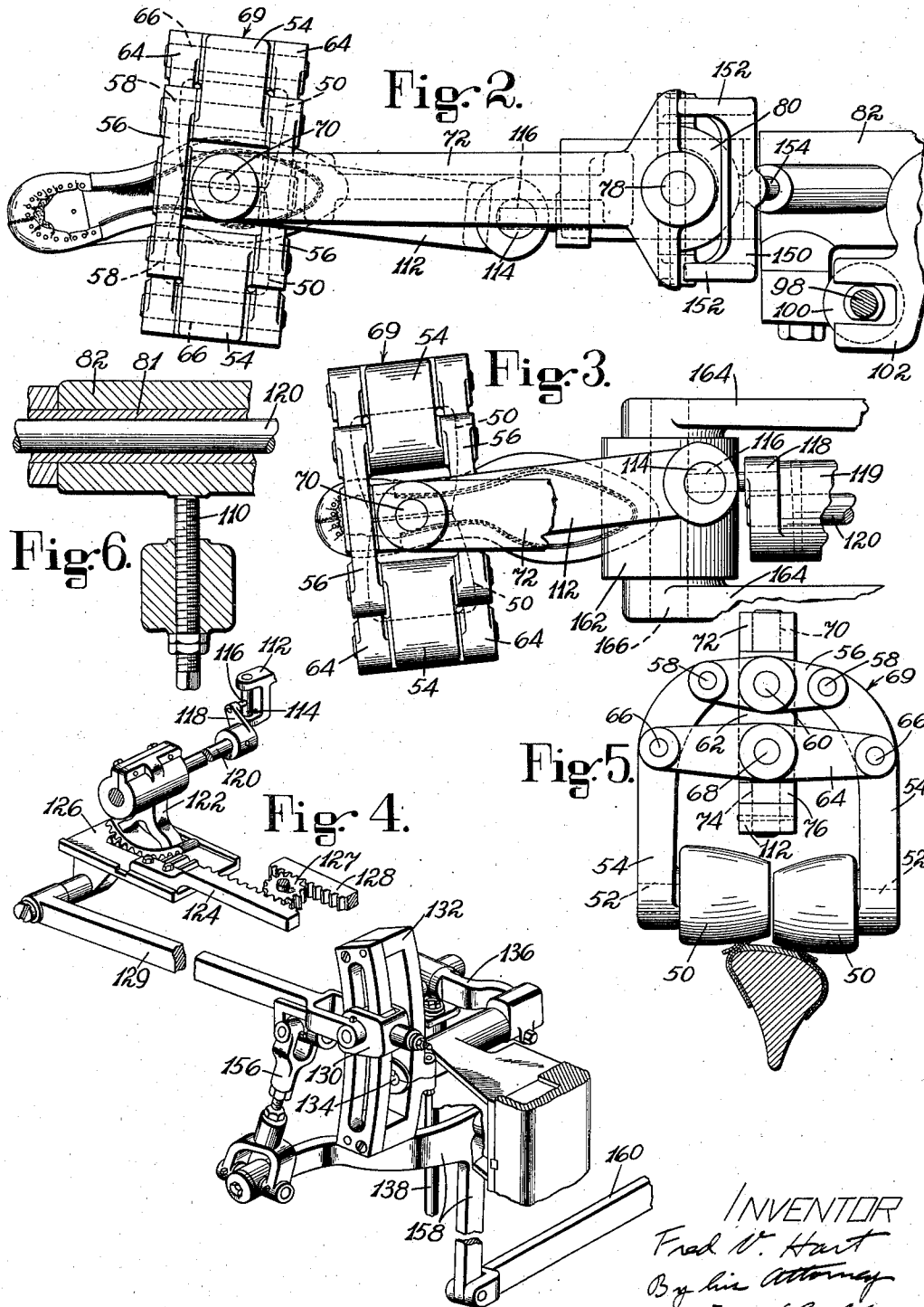
F. V. HART

2,123,281

MACHINE FOR PRESSING THE BOTTOMS OF SHOES

Filed Oct. 2, 1935

2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

2,123,281

MACHINE FOR PRESSING THE BOTTOMS OF SHOES

Fred V. Hart, Lynn, Mass., assignor to United Shoe Machinery Corporation, Paterson, N. J., a corporation of New Jersey

Application October 2, 1935, Serial No. 43,220

26 Claims. (Cl. 12—34)

This invention relates to machines for pressing the bottoms of shoes, and in some aspects has more particularly in view the provision of improved means for pressing the bottoms of welt shoes before the outsoles are applied. In the manufacture of shoes of this kind it is sometimes the practice, after the welt-sewing and in-seam-trimming operations, to apply compacting pressure to the in-seam materials, i. e., the parts of the welt, upper and insole which are directly connected together by the in-seam stitches, preparatory to the laying of the outsole. For this purpose there have been utilized to some extent machines of a type commonly used for leveling outsoles with rolling pressure, characteristic features of which are disclosed, for example, in United States Letters Patent No. 1,667,761, granted on May 1, 1928 upon an application of E. E. Winkley and H. A. Davenport. The present invention is herein illustrated as applied to a machine of that type, but it is to be understood that it is not thus limited in its applicability and also that in various features it is not limited in utility to the pressing of in-seam materials as distinguished from other bottom-pressing or leveling operations.

In view of the lateral "swing" of the forepart of the usual modern right or left last and the corresponding angular relation between the longitudinal median line of the forepart and that of the shank portion of the shoe bottom, the present invention, in one aspect, provides novel means for controlling the relation between a shoe and a device for applying pressure progressively to the forepart and shank portions of the shoe bottom so that the device will operate in substantially the same angular relation to these different portions. The invention is herein illustrated as applied to a machine having a pair of rolls for pressing shoe in-seam materials respectively along the opposite sides of the shoe bottom, and for the purpose in view there is provided automatic means for turning at the proper times about an axis extending heightwise of the shoe a holder which supports the rolls, so that the axes of the rolls will extend substantially at right angles to the longitudinal median lines of the forepart and shank portions of the shoe bottom in operating on these different portions. This contributes to uniformly effective action of the rolls along the opposite sides of the shoe bottom; and to the same end, in accordance with a further feature of the invention, the rolls are so supported as to permit them to shift bodily in directions widthwise of the shoe as determined

by the angularly related forepart and shank portions of the shoe bottom in the progressive action of the rolls on the shoe. In the construction shown provision for such bodily movements of the rolls is afforded by a roll carrier mounted to swing about an axis which extends heightwise of the shoe and is displaced a substantial distance from the shoe lengthwise of the latter, this carrier serving as a support for the above-mentioned holder for the rolls which is turned automatically at predetermined times as and for the purpose above described.

In accordance with another feature of the invention there is provided novel means for controlling the pair of rolls in such manner as to permit them to move relatively to each other in directions heightwise of the shoe as determined by the contour of the shoe bottom while substantially equalizing their pressures on the shoe. For this purpose, in the construction shown, the rolls are supported on arms extending heightwise of the shoe and connected together by equalizing levers freely movable about axes extending lengthwise of the shoe. As herein illustrated, the rolls have shoe-pressing faces which are convex lengthwise of their axes, this construction being particularly advantageous for pressing in-seam materials since better insurance is thereby afforded that the pressure of the rolls will be concentrated over the in-seam.

For better insurance that adequate pressure will be applied to the in-seam materials at the end of the toe in operating on a shoe of any style or size, the machine herein shown is provided with an additional roll which acts on the shoe at the toe end only. This roll is so formed and arranged as to extend all across the toe end of the shoe bottom in its operation on the shoe, and in the construction shown it is supported and controlled independently of the pair of rolls above described.

The above and other features of the invention, including various novel details of construction and combinations of parts, will now be more particularly described by reference to the accompanying drawings and pointed out in the claims.

In the drawings,

Fig. 1 is a view mainly in right-hand side elevation of a machine in which the invention is embodied, with certain parts broken away, showing the machine as it appears in operating on a shoe and with the pair of rolls engaging the ball portion of the shoe;

Fig. 2 is a plan view of a portion of the machine with the parts positioned as in Fig. 1.

Fig. 3 is a plan view of a portion of the structure shown in Fig. 2, with the parts positioned as they appear in the operation of the pair of rolls on the shank portion of the shoe;

5 Fig. 4 is a perspective view of mechanism provided for turning the roll carrier about an axis extending heightwise of the shoe to position the rolls differently for operation on the forepart and on the shank portion of the shoe respectively;

10 Fig. 5 shows the roll carrier and the rolls in front elevation and illustrates the manner of operation of the rolls on a shoe shown in section, the rolls engaging the same portion of the shoe as in Figs. 1 and 2; and

15 Fig. 6 shows in vertical section means provided for positioning the pair of rolls initially at the correct height.

Machines of the well-known type illustrated are twin machines, having two sets of operating instrumentalities for operating respectively on shoes in different locations in the machine. The present disclosure is limited substantially to one such set of instrumentalities, and only such parts of that set as it is necessary to refer to for an understanding of the invention will be herein-
after described in detail.

For supporting a shoe in position for the bottom-pressing operation machines of the illustrated type are provided with a shoe support or
30 jack comprising a toe post 10 and a heel post 12 which are relatively adjustable for shoes of different lengths. The toe post 10 carries a toe rest 14 for supporting the toe end of the shoe, and pivotally mounted on the heel post 12 is a
35 block 16 on which is a spindle 18 arranged to enter the spindle hole in the last. Through connections including a link 20 the block 16 and its spindle 18 are tipped by a hand lever 22 to tip the last and shoe and thus to press the toe end
40 of the shoe firmly down upon the toe rest 14, as more fully disclosed in United States Letters Patent No. 1,719,158, granted on July 2, 1929 upon an application of E. E. Winkley and H. A. Davenport.

45 The jack as a whole is mounted for swinging movements in directions lengthwise of the shoe on a rock shaft 24, and such movements are imparted to the jack by automatic operating means to cause the pair of rolls hereinafter described to
50 traverse the forepart and shank portions of the shoe bottom. This operating means is of substantially the same construction as disclosed in United States Letters Patent No. 1,239,664, granted on September 11, 1917, upon an application
55 of W. C. Baxter, and comprises an operating lever 26 connected by a link 28 to another lever 30 which is pivoted at 32 on the frame of the machine, the lever 30 in the construction herein shown carrying a roll 34 engaged by a path cam
60 35 carried as heretofore by a wheel 38 fast on a cam shaft 40. Secured to the wheel 38 is a worm wheel 42 engaged by a worm 44 on a shaft 46 which is operated through a clutch 48. By means not herein shown in detail the clutch is actuated by the operator to start the machine and
65 is actuated automatically to bring the machine to a stop at the end of each half revolution of the wheel 38. This starting and stopping mechanism is of substantially the same construction as disclosed in United States Letters Patent No. 2,063,919, granted on December 15, 1936 upon an
70 application of J. P. Fredericksen.

For the bottom-pressing operation the machine is provided, in accordance with the present invention, with a pair of rolls 50 (Fig. 5) ar-

ranged to operate respectively on the opposite sides of the shoe bottom. These rolls are arranged end to end on parallel axes, and by means presently to be described they are held at all
5 times in nearly contiguous relation to each other and are so controlled as to permit them to move relatively to each other heightwise of the shoe in accordance with the contour of the portions of the shoe on which they apply their pressures. The rolls progressively decrease in diameter from
10 their outer ends toward their inner ends, and they are convex lengthwise of their axes for better insurance that they will concentrate their pressures on the in-seam materials. By reason of the tapering form of the rolls they apply to
15 the in-seam materials pressures directed somewhat inwardly widthwise of the shoe as well as heightwise of the shoe, as is desirable for best results in the pressing operation. It will further
20 be evident that in operating on the comparatively narrow shank portion of a shoe portions of the surfaces of the rolls which are comparatively near their inner ends and are therefore more
25 inclined to their axes than other portions will press on the in-seam materials, which is desirable because of the greater lateral convexity of the shank portion of the shoe bottom.

The rolls 50 are rotatably mounted on pins 52 (Fig. 5) fast in upwardly extending arms 54
30 which are curved inwardly toward each other at their upper ends. At their extreme upper ends the arms 54 are pivotally connected respectively to the opposite ends of two short equalizing levers 56 by means of rods 58 which extend through
35 the arms and the levers, the two levers being pivotally mounted midway between their opposite ends on a rod 60 extending lengthwise of the shoe through a block 62 supported as hereinafter described. Somewhat below their upper ends the
40 arms 54 are also pivotally connected respectively to the opposite ends of two longer equalizing levers 64 by rods 66, the levers 64 being pivotally mounted midway between their opposite ends on a rod 68 extending lengthwise of the shoe through
45 the block 62. The levers 64 are normally substantially parallel to the levers 56 above them. It will be evident that this construction, whereby the rolls 50 are positively connected together, permits such relative movements of the rolls
50 heightwise of the shoe under control of the shoe as may be required by the contour of the shoe bottom while insuring that substantially equal pressures will be applied by the two rolls to the in-seam materials at the opposite sides of the shoe bottom. The lengths of the levers 56 and 64
55 are so proportioned that in any such relative movements heightwise of the shoe the rolls are maintained at approximately the same distance apart.

The arms 54, the levers 56 and 64, and the block 62 may be termed collectively a holder for
60 the rolls 50, designated generally by the reference numeral 69, and in the construction shown this holder is mounted to turn about an axis extending heightwise of the shoe. This is accomplished by providing the upper end of the block 62 with a
65 stud 70 rotatable in a bearing formed in an arm of a carrier 72 and in providing the lower end of the block with a stud 74 rotatable in a bearing formed in an arm 76 fast on the carrier 72. The two studs 70 and 74 are in alinement with each other,
70 and turning movement of the block 62 about the axis of these studs is effected by means and for a purpose hereinafter described. Also for a purpose hereinafter described the carrier 72 is mounted at its rear end for swinging movement
75

about an axis extending heightwise of the shoe and displaced a substantial distance from the shoe lengthwise of the latter, through the provision of a rod 78 on which rearwardly extending arms of the carrier are pivoted above and below portions of a bracket 80 supporting the rod. The bracket 80 is fast on the forward end of a sleeve 81 secured in an arm 82 which is similar to the roll-supporting arm of prior sole-leveling machines of the illustrated type, this arm being pivoted at 84 to the frame of the machine for swinging movements in a vertical plane. The arm 82 is controlled by a spring 86 mounted in a housing 88 on the frame of the machine and bearing at its lower end on a lever 90 which is pivoted at 92 to the frame and is connected by a link 94 to the arm 82. The upper end of the spring 86 bears on a disk 96 engaged by the lower end of a rod 98 which is threaded in a sleeve 100 slidable vertically in the housing 88. Bearing on the upper end of the sleeve 100 is the forked arm of a lever 102 pivoted at 104 on the frame. Heretofore in leveling machines of the illustrated type mechanism has been provided for operating the lever 102 to vary the pressure on the shoe automatically in the course of the cycle of operations, but in the construction herein shown the lever is held stationary during the operation of the machine on the shoe. For this purpose there is threaded in an arm of the lever a screw 106 which bears on the frame. It will be understood that by adjustment of the screw 106 the sleeve 100 may be preliminarily adjusted to vary the compression of the spring 86 and thus to vary the amount of pressure applied by the rolls 50 to the shoe. Ordinarily, however, this result will be accomplished by turning the screw-threaded rod 98 through use of a hand wheel 108 fast on the upper end of the rod. The initial position of the rolls 50 heightwise of the shoe is determined by means shown in Fig. 6, comprising a screw 110 vertically adjustable in the frame and serving as a support for the forward end of the arm 82. This screw is preferably so adjusted that as the toe end of the shoe is carried under the rolls they are lifted somewhat against the resistance of the spring 86 by the action of the shoe thereon, so that adequate pressure will be applied to the in-seam materials in further movements of the shoe support.

In addition to the provision afforded for substantially equalizing the pressures of the two rolls 50 on the shoe as hereinbefore described, it is also desirable for the best results with respect to uniformity in the treatment of the in-seam materials along the opposite sides of the shoe bottom that the rolls be positioned with their axes substantially at right angles to the longitudinal median lines of the forepart and shank portions of the shoe bottom in operating on these different portions. In view of the lateral "swing" of the forepart of the usual modern last, this requires that the rolls be differently positioned relatively to a shoe in operating on the forepart and shank portions respectively, and it is for this purpose that the holder 69 supporting the rolls is movable about an axis extending heightwise of the shoe as hereinbefore described. For controlling the holder there is fast on the stud 74 which projects downwardly from the block 62 a rearwardly extending arm 112 provided with a forked rear end in which is swiveled a pin 114. Extending at right angles to the pin 114 and rotatable in a bearing in the latter is a crank pin 116 carried by a crank arm 118 projecting from a hub 119 which is fast on the forward end of a rock shaft 120

mounted to turn in the sleeve 81. This rock shaft is controlled by mechanism which is in many respects similar to mechanism provided heretofore in sole-leveling machines for tipping the leveling roll laterally of the shoe, as disclosed in the previously mentioned Letters Patent No. 1,667,761. As shown in Fig. 4, there is fast on the rear end portion of the rock shaft 120 a gear sector 122 which maintains contact in all positions of the arm 82 with a rack bar 124 fast on a slide 126 movable in a guideway in the frame of the machine. The rack bar 124 is connected by a pinion 127 to another similar rack bar 128 for controlling the roll holder of the other set of instrumentalities of the twin machine. The slide 126 is connected by a link 129 to a member 130 adjustably movable along a slotted crank arm 132 fast on a rock shaft 134. This rock shaft is provided with a crank arm 136 connected by a link 138 to a lever 140 (Fig. 1) which is pivoted at 142 on the frame and provided with a roll 144 engaged by a cam 146 carried by the wheel 38. A spring 147 connected to the lever 140 tends to raise the lever and holds the roll against the cam. The cam 146 is so formed that during the portion of the inward swinging movement of the jack when the rolls are traversing the forepart of the shoe bottom from the toe end rearwardly the rolls are maintained with their axes substantially at right angles to the longitudinal median line of the forepart, as illustrated in Figs. 1 and 2. At that time in the movement of the jack when the rolls are located substantially at the junction of the forepart and shank portions of the shoe bottom the cam 146 imparts a downward movement to the lever 140 and thereby turns the roll holder 69 to a position in which the axes of the rolls are substantially at right angles to the longitudinal median line of the shank portion of the shoe bottom for operating on that portion in the manner illustrated in Fig. 3. The jack-operating cam 36 is so formed that at the end of the full inward movement of the jack it receives a short outward movement and then a short inward movement to cause the rolls to operate repeatedly along the shank portion of the shoe bottom, after which it receives a full outward movement to carry the shoe from under the rolls just before the machine is brought to a stop. At that time in the full outward movement of the jack when the rolls are again located substantially at the junction of the forepart and shank portions of the shoe bottom the lever 140 is raised by the spring 147, as permitted by the shape of the cam 146, to position the rolls again with their axes substantially at right angles to the longitudinal median line of the forepart of the shoe bottom.

It will be evident that with the rolls positioned as above described their axes extend in oblique relation to the directions of movement of the shoe and jack, and accordingly there is a tendency for them to shift bodily in one direction widthwise of the shoe in operating on the forepart and in the opposite direction in operating on the shank portion in their rolling action on the shoe bottom. Such shifting movement of the rolls under control of the shoe is permitted by the mounting of the roll carrier 72 for swinging movement about the axis of the rod 78 as hereinbefore described. This insures against any rubbing action of the rolls on the shoe lengthwise of their axes, and also permits the rolls to maintain positions with their inner ends substantially equidistant from the opposite sides of the shoe bottom, so that portions thereof which are of substantially equal diameters will operate on the in-seam materials along

the opposite sides of the shoe. This further contributes to uniformity in the treatment of the different portions of the in-seam materials.

While the roll carrier 72 is thus mounted to swing about the axis of the rod 78, it is desirable to centralize it normally with respect to such swinging movements so that the rolls will be positioned initially in proper relation to the toe end of each shoe in beginning their action on the shoe. For this purpose there is pivotally mounted at 148 (Fig. 1) on the bracket 80 a controller 150 provided with two arms 152 arranged to engage flat faces on the rear end of the carrier 72 at opposite sides of the rod 78. The controller 150 is engaged by a spring-pressed plunger 154 mounted in the bracket 80 and is normally held by this plunger with both its arms 152 in contact with the rear end of the carrier 72 for maintaining the carrier in a centralized position. It will be understood that the plunger 154 is readily yieldable to permit the carrier 72 to swing in one direction or the other as determined by the shoe through its contact with the rolls 50.

The amount which the roll holder 69 is turned automatically by the mechanism shown in Fig. 4 may be preliminarily adjusted in accordance with the character of the work by movement of the link 129 and the member 130 along the slotted crank arm 132 to vary the effective length of the crank arm. For this purpose the link 129 is connected by a link 156 to one arm of a bell-crank lever 158 pivotally mounted on the frame of the machine. Connected to the other arm of this bell-crank lever is a link 160 which extends to the front of the machine and is adjustable by mechanism not herein shown but which may be of the same character as that disclosed in United States Letters Patent No. 889,287, granted on June 2, 1908 on an application of E. E. Winkley, for adjusting a corresponding link 32 therein shown.

In order to insure that in operating on a shoe of any style or size adequate pressure will be applied to the in-seam materials at the extreme end of the toe, the machine herein shown is provided with an additional roll 162 arranged to extend across the toe end of the shoe bottom and so positioned as to be engaged by the shoe and to apply pressure to the in-seam materials at the toe end of the shoe near the end of the inward swinging movement of the jack. The roll 162 is supported on a roll carrier comprising two arms 164 (Figs. 1 and 3) which are spaced far enough apart to clear the hub 119 and carry a rod 166 on which the roll is mounted for turning movement. The two arms 164 at their rear ends are joined by a web 168 from which extends a rod 170 clamped by a screw 172 in a split bearing in an arm 174. The arm 174 is mounted for swinging movements heightwise of the shoe on a pin 176 supported in the frame of the machine and is pivotally connected by a pin 178 to a downwardly extending threaded rod 180. The rod 180 extends loosely through an opening in a boss 182 on the frame, and between this boss and a nut 184 on the rod is a compression spring 186 which tends to swing the arm 174 in a downward direction. A nut 188 threaded on the rod 180 and engaging the boss 182 limits downward movement of the arm 174 and is adjustable to vary the normal position of the arm and accordingly the normal position of the roll 162 heightwise of the shoe. It will be understood that this roll is so positioned as to be engaged by the in-seam materials at the extreme toe end of the shoe in a location somewhat below the axis of the roll near the end of the inward

swinging movement of the jack, so that the roll is lifted a short distance against the resistance of the spring 186 by the action of the shoe thereon. By adjusting the nut 184 the amount of pressure applied to the shoe by the roll may be varied. As illustrated, the periphery of the roll 162 is straight lengthwise of the axis of the roll, although the roll may be differently shaped if desired.

The manner in which the machine operates on a shoe having been already fully explained in describing the various parts, no further description of the operation is necessary. While the rolls are herein illustrated as directly engaging the in-seam materials, they may, if the condition of the work renders it desirable, act upon the materials through a flexible saddle such as disclosed, for example, in United States Letters Patent No. 1,644,971, granted on October 11, 1927 upon an application of E. E. Winkley and H. A. Davenport. Such a saddle may be applied to the shoe by use of the hand lever 22 in the manner disclosed in the previously mentioned Letters Patent No. 1,719,158. It will be understood that when the saddle is used the rolls act in all respects in the same manner as hereinbefore described except that they apply their pressures to the in-seam materials through the saddle instead of by direct engagement with the materials.

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

1. In a machine for pressing the bottoms of shoes, the combination with a shoe support, of a device for applying pressure progressively to the forepart and shank portions of the bottom of a shoe on said support upon relative movement of said device and support lengthwise of the shoe, and means for effecting relative turning movement of said device and support about an axis extending heightwise of the shoe in predetermined time relation to their relative movement lengthwise of the shoe when the device is located substantially at the junction of the forepart and shank portions of the shoe bottom to cause the device to operate in substantially the same angular relation to one of said portions of the shoe bottom as to the other portion.

2. In a machine for pressing the bottoms of shoes, the combination with a shoe support movable in directions lengthwise of a shoe thereon, of a device for applying pressure progressively to the forepart and shank portions of the bottom of the shoe in response to such movement of the shoe support, and automatic means for turning said device about an axis extending heightwise of the shoe at a time in the movement of said support when the device is located substantially at the junction of the forepart and shank portions of the shoe bottom to cause said device to operate in substantially the same angular relation to one of said portions of the shoe bottom as to the other portion.

3. In a machine for pressing the bottoms of shoes, the combination with a shoe support, of means comprising a roll for applying pressure progressively to the forepart and shank portions of the bottom of a shoe on said support upon relative movement of said roll and support lengthwise of the shoe, and automatic means for positioning said roll with its axis substantially at right angles to the longitudinal median line of the forepart portion of the shoe bottom in operating on that portion and for then shifting it substantially at the junction of the forepart and shank portions to a different position to present

its axis substantially at right angles to the longitudinal median line of the shank portion of the shoe bottom.

4. In a machine for pressing the bottoms of shoes, the combination with a shoe support, of a pair of rolls for applying pressure respectively to the in-seam materials of a welt shoe on said support along the opposite sides of the forepart and shank portions of the shoe bottom simultaneously before an outsole is placed on the shoe in response to relative movement of said support and the rolls lengthwise of the shoe, and automatic means for positioning said rolls with their axes substantially at right angles to the longitudinal median line of the forepart of the shoe bottom in operating on that portion of the shoe and for then turning them about an axis extending heightwise of the shoe to position them with their axes substantially at right angles to the longitudinal median line of the shank portion of the shoe bottom in the further operation of the rolls on that portion.

5. In a machine for pressing the bottoms of shoes, the combination with a shoe support, of a pair of rolls for applying pressure respectively to the in-seam materials of a welt shoe on said support along the opposite sides of the forepart and shank portions of the shoe bottom simultaneously before an outsole is placed on the shoe in response to relative movement of said support and the rolls lengthwise of the shoe, a holder supporting said rolls, and means for effecting relative turning movement of said holder and the shoe support about an axis extending heightwise of the shoe to change the relation between the rolls and the shoe at that time in the pressing operation when the rolls are located substantially at the junction of the forepart and shank portions of the shoe bottom.

6. In a machine for pressing the bottoms of shoes, the combination with a shoe support movable in directions lengthwise of a shoe thereon, of a pair of rolls for applying pressure respectively to the in-seam materials of a welt shoe on said support along the opposite sides of the forepart and shank portions of the shoe bottom simultaneously in response to such movement of the shoe support, a holder supporting said rolls and mounted for turning movement about an axis extending heightwise of the shoe, and cam-operated mechanism connected to said holder for turning it to change the relation of the rolls to the shoe at that time in the movement of the shoe support when the rolls are located substantially at the junction of the forepart and shank portions of the shoe bottom.

7. In a machine for pressing the bottoms of shoes, the combination with a shoe support movable in directions lengthwise of a shoe thereon, of a pair of rolls for applying pressure respectively to the in-seam materials of a welt shoe on said support along the opposite sides of the forepart and shank portions of the shoe bottom simultaneously in response to such movement of the shoe support, a holder supporting said rolls and mounted for turning movement about an axis extending heightwise of the shoe, and automatic mechanism for imparting an adjustably variable amount of turning movement to said holder to change the relation of the rolls to the shoe at that time in the movement of the shoe support when the rolls are located substantially at the junction of the forepart and shank portions of the shoe bottom.

8. In a machine for pressing the bottoms of

shoes, the combination with a shoe support, of a device for applying pressure progressively to the forepart and shank portions of the bottom of a shoe on said support upon relative movement of said device and support lengthwise of the shoe, and means supporting said device for bodily swinging movement and for turning movement about different axes extending heightwise of the shoe in its operation on the shoe.

9. In a machine for pressing the bottoms of shoes, the combination with a shoe support, of a device for applying pressure progressively to the forepart and shank portions of the bottom of a shoe on said support upon relative movement of said device and support lengthwise of the shoe, a support for said device mounted for swinging movement under control of the shoe about an axis extending heightwise of the shoe, and means for turning the device relatively to its support about an axis extending heightwise of the shoe in predetermined time relation to the relative movement of the device and the shoe support lengthwise of the shoe.

10. In a machine for pressing the bottoms of shoes, the combination with a shoe support, of a device for applying rolling pressure progressively to the forepart and shank portions of the bottom of a shoe on said support upon relative movement of said device and support lengthwise of the shoe, a support for said device mounted for swinging movement under control of the shoe about an axis extending heightwise of the shoe in accordance with the angular relation of the forepart and shank portions of the shoe bottom, and automatic means for turning said device relatively to its support about an axis extending heightwise of the shoe when the device is located substantially at the junction of the forepart and shank portions of the shoe bottom to cause it to operate in substantially the same angular relation to one of said portions of the shoe bottom as to the other portion.

11. In a machine for pressing the bottoms of shoes, the combination with a shoe support, of a pair of rolls for applying pressure respectively to the in-seam materials of a welt shoe on said support along the opposite sides of the forepart and shank portions of the shoe bottom before an outsole is placed on the shoe in response to relative movement of said support and the rolls lengthwise of the shoe, a roll carrier mounted for swinging movement about an axis extending heightwise of the shoe to permit bodily movement of the rolls laterally of the shoe under control of the shoe, a holder supporting the rolls on said carrier and mounted for turning movement about an axis extending heightwise of the shoe, and automatic means for controlling said holder to position the rolls with their axes substantially at right angles to the longitudinal median line of the forepart of the shoe bottom in operating on that portion of the shoe and then by turning movement of said holder to position them with their axes substantially at right angles to the longitudinal median line of the shank portion of the shoe bottom in the further operation of the rolls on that portion.

12. In a machine for pressing the bottoms of shoes, the combination with a shoe support, of a pair of rolls for applying pressure respectively to the in-seam materials of a welt shoe on said support along the opposite sides of the forepart and shank portions of the shoe bottom before an outsole is placed on the shoe in response to relative movement of said support and the rolls length-

wise of the shoe, a roll carrier mounted for swinging movement about an axis extending heightwise of the shoe to permit bodily movement of the rolls laterally of the shoe under control of the shoe, a holder supporting the rolls on said carrier and mounted for turning movement about an axis extending heightwise of the shoe, and cam-operated mechanism connected to said holder for turning it to change the relation of the rolls to the shoe when the rolls are located substantially at the junction of the forepart and shank portions of the shoe bottom.

13. In a machine for pressing the bottoms of shoes, the combination with a shoe support, of a device for applying pressure progressively to the bottom of a shoe on said support along both sides of the shoe bottom upon relative movement of said device and support lengthwise of the shoe, and a support for said device mounted for swinging movement under control of the shoe about an axis extending heightwise of the shoe and displaced a substantial distance from the shoe lengthwise of the latter to permit the device to shift bodily in directions widthwise of the shoe as determined by the contour of the shoe in response to action of the shoe thereon.

14. In a machine for pressing the bottoms of shoes, the combination with a shoe support, of a pair of rolls for applying pressure respectively to the insole materials of a welt shoe on said support along the opposite sides of the forepart and shank portions of the shoe bottom before an outsole is placed on the shoe in response to relative movement of said support and the rolls lengthwise of the shoe, and a roll carrier mounted for swinging movement about an axis extending heightwise of the shoe and displaced a substantial distance from the shoe lengthwise of the latter to permit bodily movement of the rolls in different directions widthwise of the shoe under control of the shoe in accordance with the angular relation of the forepart and shank portions of the shoe bottom.

15. In a machine for pressing the bottoms of shoes, the combination with a shoe support, of a pair of rolls for applying pressure respectively to the insole materials of a welt shoe on said support along the opposite sides of the forepart and shank portions of the shoe bottom before an outsole is placed on the shoe in response to relative movement of said support and the rolls lengthwise of the shoe, a roll carrier mounted for swinging movement about an axis extending heightwise of the shoe and displaced a substantial distance from the shoe lengthwise of the latter to permit the rolls to shift bodily in directions widthwise of the shoe under control of the shoe, and spring means arranged to maintain said carrier normally in a predetermined position and against the resistance of which the carrier is thus movable in response to the action of the shoe on the rolls.

16. In a machine for pressing the bottoms of shoes, the combination with a shoe support, of a pair of rolls for applying pressure respectively to the opposite sides of the bottom of a shoe on said support in response to relative movement of said rolls and support lengthwise of the shoe, and means positively connecting said rolls together for simultaneous movements relatively to each other heightwise of the shoe as determined by the contour of the shoe in the course of their operation thereon.

17. In a machine for pressing the bottoms of shoes, the combination with a shoe support, of a pair of rolls for applying pressure respectively to the opposite sides of the bottom of a shoe on said

support in response to relative movement of said rolls and support lengthwise of the shoe, and equalizing connections between said rolls arranged to permit them to move relatively to each other heightwise of the shoe as determined by the contour of the shoe bottom while substantially equalizing their pressures on the shoe.

18. In a machine for pressing the bottoms of shoes, the combination with a shoe support, of a pair of rolls for applying pressure respectively to the opposite sides of the bottom of a shoe on said support in response to relative movement of said rolls and support lengthwise of the shoe, and mechanism including an equalizing lever connected respectively to the different rolls at its opposite ends and mounted substantially midway between its opposite ends for movement about an axis extending lengthwise of the shoe to permit relative movement of the rolls as determined by the contour of the shoe while substantially equalizing their pressures on the shoe.

19. In a machine for pressing the bottoms of shoes, the combination with a shoe support, of a pair of rolls arranged end to end for applying pressure respectively along the opposite sides of the bottom of a shoe on said support in response to relative movement of said rolls and support lengthwise of the shoe, upwardly and downwardly extending arms supporting said rolls at their lower ends, an equalizing lever connecting said arms together between their upper and lower ends, and a shorter equalizing lever connecting said arms together at their upper ends, said levers being mounted substantially midway between their opposite ends for movements about axes extending lengthwise of the shoe to permit the rolls to adjust themselves relatively in accordance with the contour of the shoe bottom while substantially equalizing their pressures on the shoe.

20. In a machine for pressing the bottoms of shoes, the combination with a shoe support, of a pair of rolls for applying pressure respectively along the opposite sides of the bottom of a shoe on said support in response to relative movement of said rolls and support lengthwise of the shoe, said rolls being arranged with their axes extending widthwise of the shoe and having their shoe-pressing faces convexly curved lengthwise of their axes, and mechanism connecting said rolls together for relative movements heightwise of the shoe as determined by the contour of the shoe while substantially equalizing their pressures on the shoe.

21. In a machine for pressing the bottoms of shoes, the combination with a shoe support, of a pair of rolls for applying pressure respectively to the insole materials along the opposite sides of the bottom of a welt shoe on said support in response to relative movement of said rolls and support lengthwise of the shoe, said rolls being arranged with their inner ends opposed to each other and being of smaller diameter at their inner ends than at other shoe-pressing portions thereof, the shoe-pressing faces of the rolls being convexly curved lengthwise of their axes, and mechanism connecting said rolls together for relative movements heightwise of the shoe as determined by the contour of the shoe while substantially equalizing their pressures on the insole materials at the opposite sides of the shoe bottom.

22. In a machine for pressing the bottoms of shoes, the combination with a shoe support, of a pair of rolls for applying pressure respectively along the opposite sides of the forepart and shank portions of the bottom of a shoe on said

support in response to movement of said support lengthwise of the shoe, and another roll so located relatively to the movable shoe support as to apply pressure to the shoe at the toe end only of the shoe bottom.

23. In a machine for pressing the bottoms of shoes, the combination with a shoe support, of a pair of rolls for applying pressure respectively along the opposite sides of the forepart and shank portions of the bottom of a shoe on said support in response to relative movement of said rolls and support lengthwise of the shoe, means for turning said rolls as a unit about an axis extending heightwise of the shoe in predetermined time relation to said relative movement to position them in different relations to the shoe in operating on the forepart and shank portions respectively, and another roll arranged to apply pressure at the toe end of the shoe bottom and relatively to which the pair of rolls are movable about said axis.

24. In a machine for pressing the bottoms of shoes, the combination with a shoe support, of a pair of rolls for applying pressure respectively along the opposite sides of the forepart and shank portions of the bottom of a shoe on said support in response to relative movement of said rolls and support lengthwise of the shoe, said rolls being movable as a unit about an axis extending heightwise of the shoe in the course of their operation on the shoe, another roll arranged to apply pressure at the toe end of the shoe bottom, and means for supporting and con-

trolling said other roll independently of the pair of rolls.

25. In a machine for pressing the bottoms of shoes, the combination with a shoe support, of a pair of rolls for applying pressure respectively along the opposite sides of the forepart and shank portions of the bottom of a shoe on said support in response to relative movement of said rolls and support lengthwise of the shoe, said rolls being arranged with their inner ends opposed to each other and being relatively movable heightwise of the shoe as determined by the contour of the shoe bottom in the course of their operation thereon, and another roll supported independently of said pair of rolls and arranged to extend across the toe end of the shoe bottom to press on the shoe in that location.

26. In a machine for pressing the bottoms of shoes, the combination with a shoe support, of a pair of rolls for applying pressure respectively along the opposite sides of the forepart and shank portions of the bottom of a shoe on said support in response to relative movement of said rolls and support lengthwise of the shoe, said rolls having their shoe-pressing faces convexly curved lengthwise of their axes and being relatively movable heightwise of the shoe in operating thereon, and another roll arranged to extend across the toe end of the shoe bottom to press on the shoe in that location and having its shoe-pressing face substantially straight lengthwise of its axis.

FRED V. HART.