

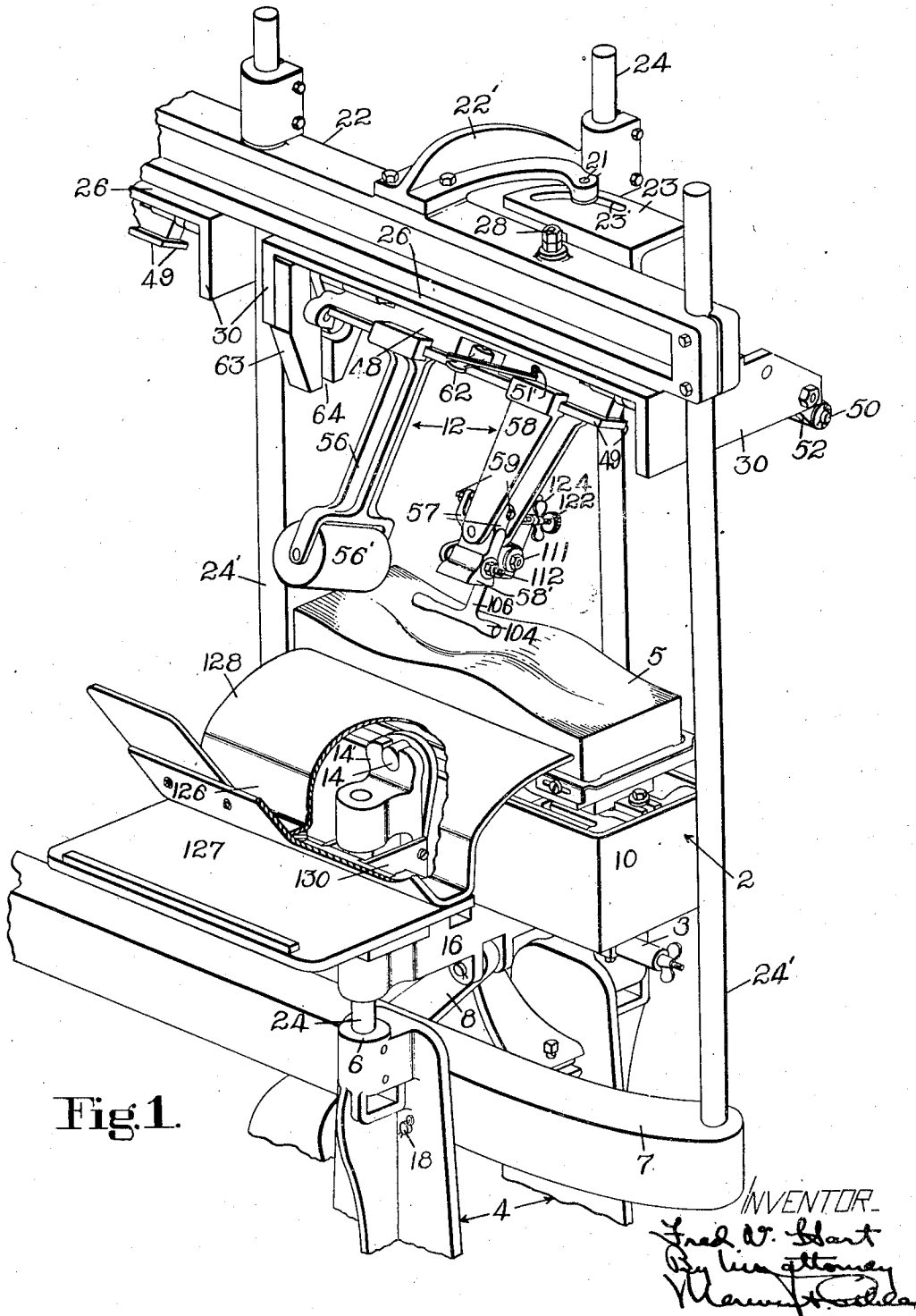
Jan. 11, 1944.

F. V. HART
SOLE-LAYING MACHINE

2,338,764

Filed May 25, 1942

4 Sheets-Sheet 1



Jan. 11, 1944.

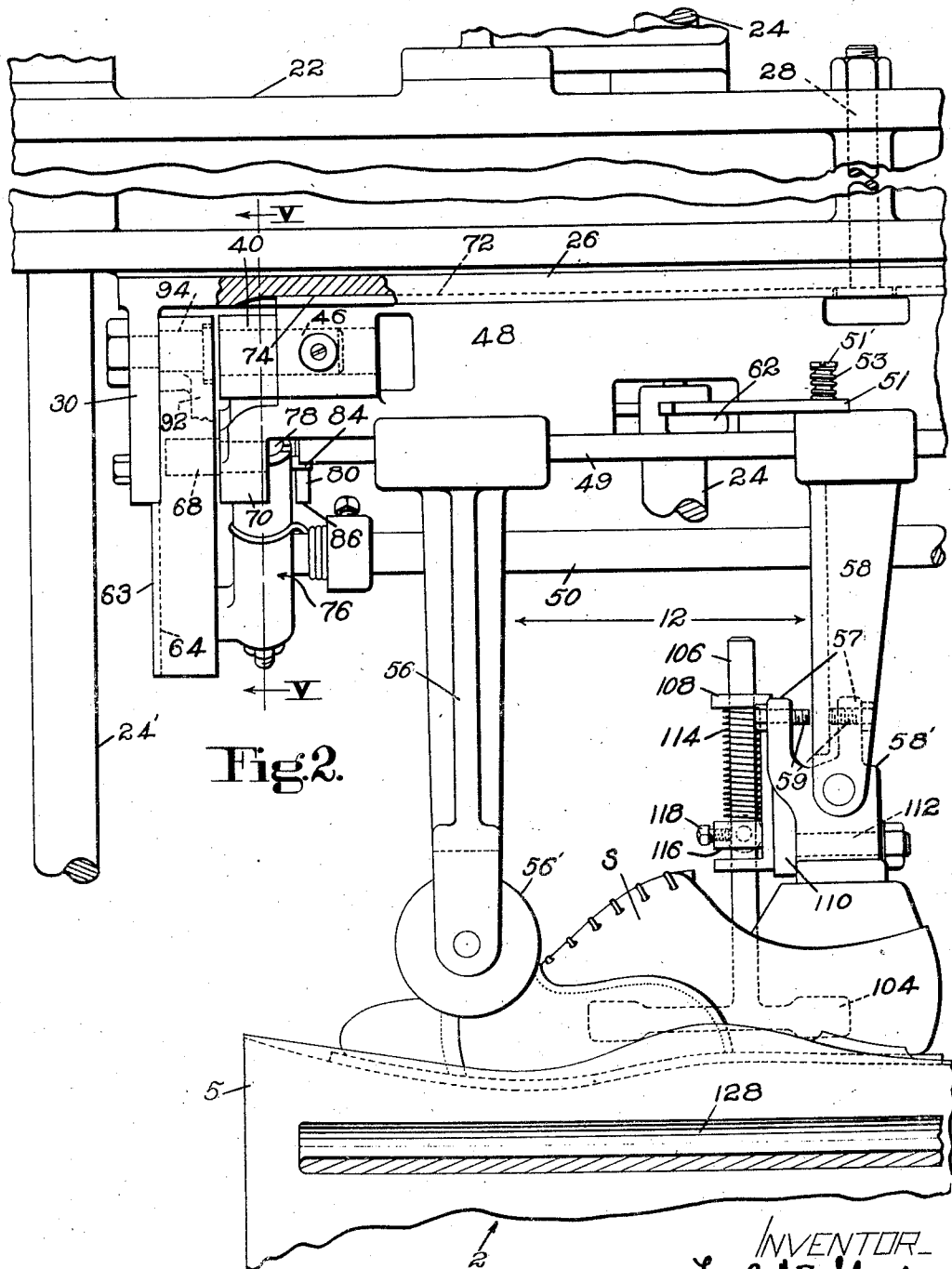
F. V. HART

2,338,764

SOLE-LAYING MACHINE

Filed May 25, 1942

4 Sheets-Sheet 2



Jan. 11, 1944.

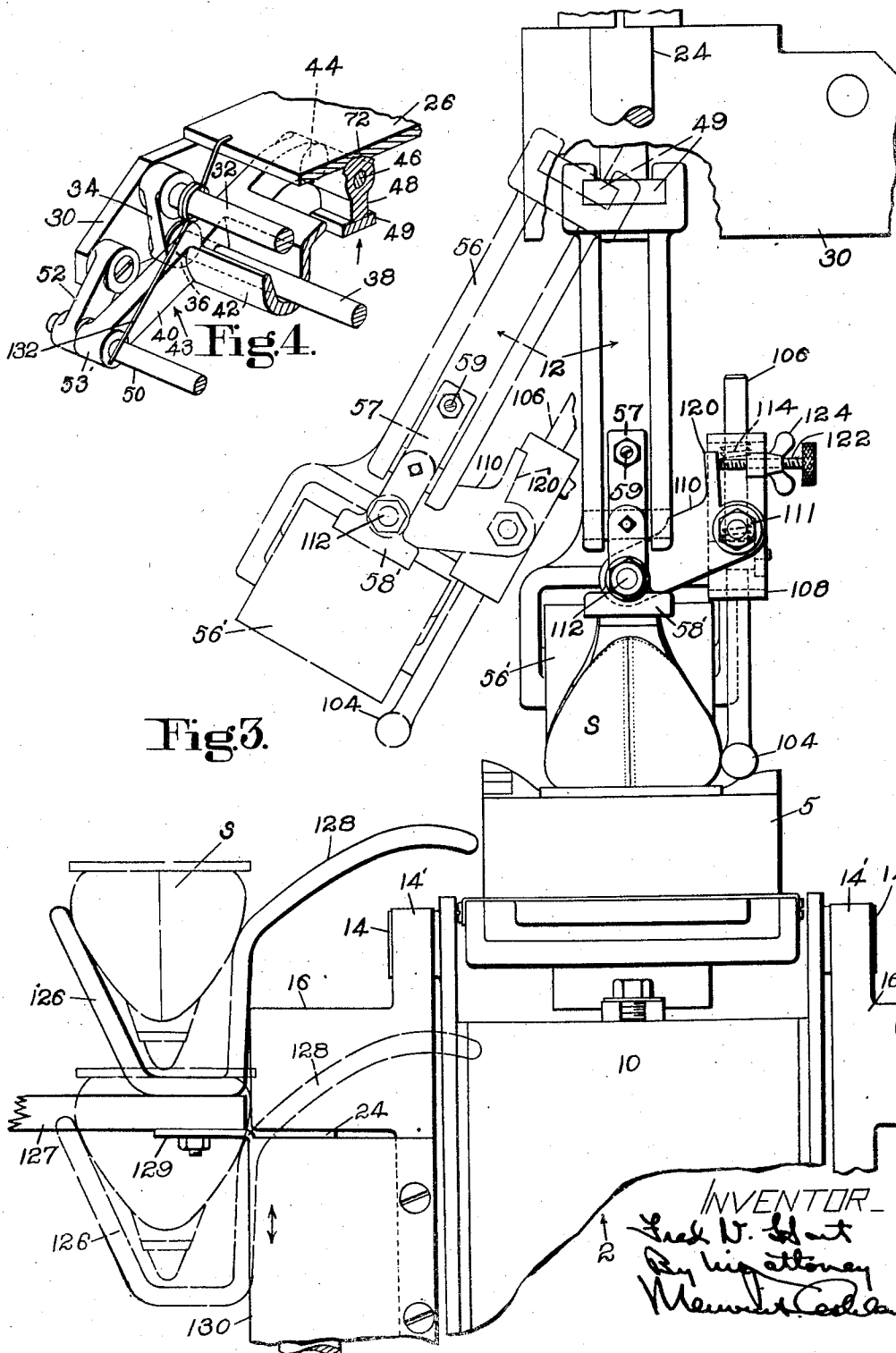
F. V. HART

2,338,764

SOLE-LAYING MACHINE

Filed May 25, 1942

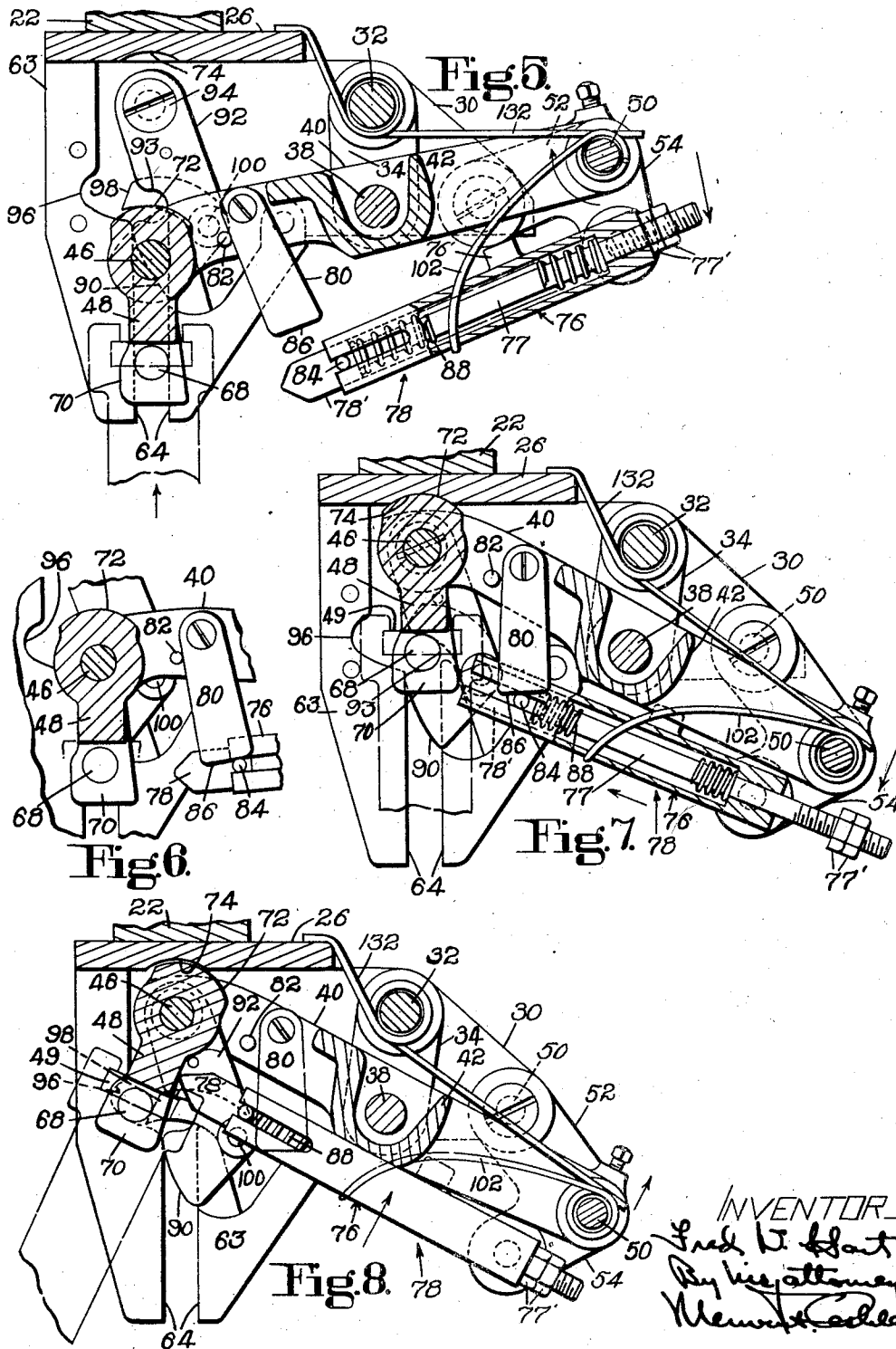
4 Sheets-Sheet 3



2,338,764

Filed May 25, 1942

4 Sheets-Sheet 4



UNITED STATES PATENT OFFICE

2,338,764

SOLE-LAYING MACHINE

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

Application May 25, 1942, Serial No. 444,310

41 Claims. (Cl. 12—33)

This invention relates to machines for pressing the bottoms of shoes and is herein illustrated as a two-station sole-laying machine designed to lay or press soles upon the bottoms of shoes prior to their permanent connection with the shoes.

A machine of this type is shown in United States Letters Patent No. 1,549,243, granted August 11, 1925, on an application filed in the name of Erastus E. Winkley, and is constructed with two sets of instrumentalities which are substantially duplicates of each other. Each set of instrumentalities includes a jack having a toe piece which engages the toe portion of a shoe and a heel piece which engages the top of the last, and a resilient pad mounted to be moved by toggle means into engagement with the bottom of the shoe, the aforesaid jack serving to support the shoe against the upwardly directed pressure applied by the resilient pad to the bottom of the shoe. In such machines the instrumentalities are so arranged that as a shoe is subjected to pressure by one set of instrumentalities a shoe previously operated upon by the other set is released from pressure in order that the sole-laying operation may be carried on continuously.

It is an object of this invention to embody in each of the instrumentalities means for automatically ejecting the finished shoe from the machine when the pressure is released, thereby to improve the efficiency of the machine.

In accordance with a feature of the invention, the support for the shoe is so constructed and arranged that it may be moved transversely of the pressure-applying means to a forwardly inclined position, and means is associated with the support which is adapted to engage a side of the shoe and to eject it from the pressure-applying means during the transverse movement of the support. As illustrated, during the loading operation, a shoe is placed against the aforesaid means adapted to engage the side thereof and the support is moved from its forwardly inclined position rearwardly and downwardly to bring the shoe held thereagainst into engagement with the pressure-applying means. Thereafter, the supporting means and the pressure-applying means are moved to a position to apply pressure to the bottom of the shoe. Transverse movement of the support is automatically effected, upon reverse movement of the pressure-applying means, by means associated with the support and actuated by the movement of the pressure-applying means toward pressure-applying position.

Other features of the invention reside in means for sustaining the supporting means in a position to be acted upon by the means for moving it to a transverse position, thereby to eject a shoe, means for rendering the aforesaid means inoperative so that when the operator places the next shoe to be operated upon against the support and swings it rearwardly to a vertical position it will descend by gravity, thereby bringing the shoe into engagement with the pressure-applying means, and a basket for receiving the ejected shoe in an inverted position so that the operator may readily pick up the shoe and place it on a rack. Novelty also resides in pivotally mounting the supporting means, which comprises a rubber roll for engaging the forepart of the shoe and a block for engaging the top face of the heel-end portion of the last so that it may be adjusted angularly about a vertical axis with respect to the pressure-applying means.

The specific features of the invention will now be described in detail with reference to the accompanying drawings, in which

Fig. 1 is a perspective view of a portion of the machine in which the invention is embodied;

Fig. 2 is a view of the machine in side elevation, showing a shoe engaged by the holding and pressure-applying instrumentalities;

Fig. 3 is an end elevation showing a portion of the machine as seen from the right-hand end of Fig. 1;

Fig. 4 is a perspective view of a portion of the means for mounting the jack for vertical and swinging movement with respect to the pad; and

Figs. 5, 6, 7 and 8 are sections taken on the line V—V of Fig. 1, showing the means for swinging the jack and associated shoe-engaging members transversely of the pad in various stages of its inoperative and operative positions.

Machines of the type herein illustrated are twin machines, each comprising two sets of instrumentalities which are substantially duplicates of each other and are operated alternately to apply pressure to different shoes in different locations in the machine, the arrangement being such that as a shoe is subjected to pressure by one set of instrumentalities a shoe previously operated on by the other set is released from pressure. Only one of said sets of instrumentalities is herein illustrated or need be referred to for an understanding of the present invention.

Each set of instrumentalities comprises broadly, pressure-applying means 2 and means 12 for supporting each last and shoe against pressure applied on its bottom face. The pressure-applying

ing means and the shoe-supporting means in the illustrated construction are supported by vertical rods or posts 24, 24' which extend upwardly from the base 4 of the machine. The post 24 at the front of each half of the machine, as shown, does not extend upwardly beyond the pressure-applying means so as to leave that means unobstructed for the ready presentation and removal of the work.

Included in each set of instrumentalities is a forwardly and rearwardly extending horizontal bar 16 (Fig. 1) slidable vertically on the pair of vertically disposed posts 24 which serve as guides therefor. The means for operating the slide bar 16 and the pressure-applying means includes a link 8 and other mechanism not herein shown in detail, since it is fully disclosed in the above-mentioned Letters Patent No. 1,549,243. It will be understood that a shoe is presented to the machine by the operator when the pressure-applying means is in its lowermost position in the machine, and that in the operation of the machine, the pressure-applying means is moved upwardly to apply pressure to the shoe, after which the machine comes automatically to rest. In the next operation of the machine the shoe is released by downward movement of the pressure-applying means simultaneously with the application of pressure to another shoe by the other twin mechanism.

Each crossbar 16 supports a box 10 provided with a pair of trunnions 14 mounted in bearings 14' on the crossbar 16 so that the box 10 may tip about an axis extending laterally of the shoe. The box 10 is maintained normally in a predetermined position by means of a spring-controlled plunger 3 which is carried by the box and bears against the crossbar, the box being held against the plunger by gravity which tends to tip the box about its trunnions in a counter-clockwise direction, as seen from the front of the machine. It will be understood that by this means the box is steadied and maintained normally in a predetermined position but is permitted to tip about the axis of the trunnions in one direction or the other as the pressure is applied to the shoe.

Each box carries a resilient pad 5 the upper surface of which is shaped in substantial conformity to the desired contour of the portions of the bottom of the shoe which it engages and is accordingly curved more or less lengthwise of the shoe to fit the curved portions of the shoe bottom.

The shoe-supporting means 12 is mounted above the pressure-applying means 2 upon a crosshead 22 which is supported partly by the two rear posts 24 of the machine and partly by three other posts 24', these latter posts being fixed at their lower ends in a crossbar 7 which runs widthwise of the machine and is supported by horizontal forwardly and rearwardly extending rods 18, one of which is shown in Fig. 1, which, in turn, are supported by the base 4.

The crosshead 22, as shown, is adjustably secured at its ends and center to the vertical posts 24' and intermediate these posts also to the posts 24 by braces 22'. The rear posts 24 increase the rigidity of the structure and resist bending or twisting of the posts 24' when the machine is being shifted about from one place to another. Adjustable on guideways 40 formed at the lower edges of members 48 suspended from the crosshead, as will appear hereinafter, is the shoe-supporting means or jack 12,

comprising a toe post 50 and a heel post 50 which serve to support the shoe against upwardly directed pressure applied on its bottom face. The toe post has a rubber-covered roll 56' thereon for engaging the shoe or last at the top of the forepart and the heel post, in the construction herein shown, has a block 58' arranged to engage the top face of the heel-end portion of the last. The block 58' is pivoted on the heel post for swinging movement about an axis extending laterally of the shoe and is provided with upwardly projecting opposed fingers 57 (Fig. 2) through which are threaded screws 59 for engaging opposite sides of the heel post 50 to limit adjustably swinging movement of the block 58' in either direction lengthwise of the shoe. It is evident that by means of the screws 59 the bottom of the block may be adjusted so that it will bear evenly upon the top of the last. The toe post and the heel post are connected together and to a hand lever 62 by which they may be moved simultaneously toward or from each other, as heretofore in machines of the type illustrated. Threaded into the top of the heel post and through a link 51 forming part of the aforesaid connection is a screw 51'. Between the head of the screw and the link there is disposed a spring 53 which acts to hold the toe and heel posts in adjustable position.

As thus far described, the machine herein shown is generally similar to that shown in the above-mentioned Winkley patent, with the exception of the arrangement of the posts 24 and 24' which are disposed, as previously explained, in such a manner as to avoid any interference with the work as it is presented to and removed from the pressure-applying means of the machine.

In the illustrative machine one station is provided with a pad for right shoes and the other with a pad for left shoes, and the shoes are placed in the machine upon their respective pads in the same direction, that is, with the toes pointing toward the left as seen in Fig. 2. The direction illustrated, however, is not to be taken as a limitation, since it is obvious that the pads may be reversed so that the toes of the shoes point toward the right. By arranging the pressure-applying pads so that the right and left shoes may be placed on their respective pads with their toes in the same direction, the successive operations which the operator performs each time he picks up a shoe, places a sole on the bottom thereof, and inserts the shoe in the machine will be identical regardless of whether a right or a left shoe is being placed in the machine. This naturally provides for a maximum of efficiency. It is to be observed, however, that when the pads are arranged in this manner the inside of the shank of the right shoe faces the front of the machine and the inside of the shank of the left shoe faces the back of the machine, that is, away from the operator. When lowering the right shoe into position on its pad, the operator butts the shank of the shoe up against the arched portion of the pad, pulling the toe forward slightly under the rubber-covered roll 56' which engages the top of the forepart of the shoe, thus getting a snug fit at the inside of the shank. Some operators have hesitated to pull the shoe in as snugly as is desired because of a fear that the roll 56' will not then engage the top of the shoe squarely. This is particularly true when the operator lowers the left shoe onto its pad since the inside of the shank of the left shoe faces away

from him and he cannot see it. The tendency, therefore, is not to push the toe of the shoe rearwardly far enough to get a snug fit between the pad and the inside shank. As a result, the sole is not pressed as snugly at the inside shank portion of the left shoe as it is along the inside shank portion of the right shoe. To overcome this tendency, it has been found desirable to set the rubber-covered roll 56' slightly toward the rear of the center line of the pad and the block 58' a corresponding amount toward the front of the pad in that station which will receive the right shoes, and vice versa in the station that will receive the left shoes. When this is done, the toe of the shoe must be pulled forwardly or pushed rearwardly so that the roll 56' will squarely engage the top of the forepart and, accordingly, a snug fit will be insured between the inside shank and the pad. This is accomplished herein by pivotally attaching the plates 26 to the crosshead 22, bolts 28 being employed for this purpose. Angle plates 23 are welded to the rear edges of the plates 26 and are provided with arcuate slots 23' through which bolts 21 are passed and threaded into the braces 22'. This construction provides for angular adjustment of the jacks with respect to the center lines of the pads in accordance with the size and style of the shoes and for locking them in their adjusted positions.

The illustrated machine is provided with means for automatically ejecting each shoe from the machine at the end of each pressure-applying operation, a basket being provided at the front of the machine in position to receive each shoe. This avoids the necessity for the operator to remove shoes from the twin mechanisms before loading them, each shoe being held in one of the baskets until the operator conveniently may pick it up and place it on a shoe rack. This is accomplished herein conveniently by causing the jack 12 to move transversely of the resilient pad toward the front of the machine and by mounting on the jack means adapted to engage the side of the shoe so that as the jack swings, the shoe is brushed or ejected from the resilient pad. As illustrated herein, the jack 12 is mounted so that it has a limited amount of vertical movement from its lowermost position (Fig. 2) to a pressure-applying position, and this movement is employed, as will subsequently appear, to cause means associated with the jack automatically to move or displace the jack transversely of the resilient pad to a forwardly inclined position for each shoe operated upon.

To permit movement transversely of the resilient pads, the members 48, from which the jacks depend, are pivotally suspended from the ends of pairs of spaced arms 40 (Fig. 4), by studs 46 fixed in the ends of the members 48, the studs being received by bosses 44 formed at the ends of the arms. The axes of the studs lie in a horizontal plane above the resilient pads so that when the members 48 are caused to swing, the jacks will move in arcs transversely of the pads.

To permit vertical movement of the jacks, each pair of arms 40 is rigidly joined by a U-shaped crossbar 42 and the frames 43 formed thereby are mounted for rocking movement upon horizontal shafts 33, each shaft being hung at its ends in bosses 36 formed at the lower ends of links 34. The links 34 are, in turn, pivotally connected to spindles 32 the ends of which are sup-

ported by depending flanges 30 formed integral with the horizontal plates 26.

In the illustrated machine, upward movement of each jack is limited by engagement of the top edge of the member 48 with the horizontal plate 26. To afford an adequate bearing surface and to reduce the tendency for the jack to swing to one side or the other during the application of pressure, the top edge of the member 48 is rounded off to provide a convex portion 72 and the underside of the plate 26 is provided with a shallow groove 74 frictionally to receive the convex portion.

As each jack 12 is moved upwardly from its lowermost position into pressure-applying position, it is guided and held against lateral swinging movement relatively to the pressure-applying means by the engagement of a stud 68 (Fig. 2) carried by the member 48 with a vertical slot 64 (Fig. 1) formed in a plate 63 fastened to the inside face of one of the depending flanges 30. As illustrated, each slot 64 is provided near its upper end with a lateral recess 96 (Fig. 5) adapted to permit lateral movement of the stud 68 when the resilient pad has reached pressure-applying position, that is, the jack can swing about the axis of the studs 46 as a center when the convex portion 72 is in contact with the groove 74. It is to be understood that with the parts in the positions above described the jack will be held effectively against any lateral swinging movement during the pressure-applying operation by the frictional engagement of the member 48 with the plate 26 in the groove 74.

The illustrated machine is further provided with means which is normally inoperative but which is arranged to be rendered operative in response to the upward movement of the jack for thrusting the jack transversely of the resilient pad at the end of each pressure-applying operation. This means, which will now be described, comprises a device 78 (Fig. 5) which when the jack is in its initial lowermost position occupies the position indicated in Fig. 5 but which in response to the upward movement of the jack is moved into engagement with an extension 70 on the member 48. Consequently, as soon as the pressure is released by retraction of the resilient pad, the device 78 will swing the jack about its axis of rotation. When the pressure is released, however, the jack and latched shoe tend to fall under the influence of gravity so quickly that unless means is provided for preventing it the stud 68 will enter the top of the slot 64, thereby confining the jack before the device 78 has time to swing it transversely of the resilient pad. If this happens, the jack falls to its initial position and, in doing so, retracts the device to an inoperative position. To prevent this, a lever 92 is pivotally fastened by a screw 94 to the plate 63 so that it hangs down adjacent to the slot 64. A notch 93 is formed in the lever approximately opposite the lateral recess 96, and the free end of the lever below the notch is provided with a sloping surface 99 which lies in the path of the end of the stud 68. As a result, when the jack rises, the stud 68 meets the surface 99 of the lever 92 and deflects the lever until the jack reaches its pressure-applying position, whereupon the stud occupies a position opposite the notch 93 and the lever falls back to its original position. When, therefore, the resilient pad is retracted, the stud, and consequently the jack, is supported at the level of the transverse recess 95 by the

notched lever, and the device 78 will be given ample time to swing the jack transversely.

The device 78 for swinging the jack about the axis of the studs 46 is carried by the frame and is movable from inoperative to operative position and back by the vertical movement of the jack. As shown herein, a rod 50 (Fig. 4) is fixed between the ends of the arms 40 in bosses 53' with its opposite ends extending beyond the bosses. The projecting ends of the rod 50 are journaled in arms 52 which, in turn, are pivotally fastened to the plates 30. One of the arms has formed integral with it a second arm 54 (Fig. 5) to the free end of which is pivotally connected the device 78.

Referring to Fig. 5, the device 78 comprises a tubular housing 76, open at one end and partially closed at the other end, in which there is disposed a rod 77 having at one end a head 78' which slidably fits the open end of the housing and at its opposite end has a threaded portion which passes through the partially closed end of the housing. Within the housing and surrounding the rod 77 between the head 78' and the partially closed end of the tube there is positioned a compression spring 88. A pin 84 is fixed to the head 78' and extends into a slot 84' formed longitudinally of the housing. A pair of nuts 77' hold the rod 77 in the housing against the action of the coiled spring 88 and provide means for varying the distance the head 78' will move from the housing. A nub 76' is formed on the side of the housing and, when the device 78 is in its inoperative position (Fig. 5), the nub engages an end of the arm 54 and is held thereagainst by a spring 102 which is coiled about the rod 50 and has one end hooked about the housing 76 and the other end extending into an opening in the hub of the arm 52.

As the jack is moved upwardly, the frame 43 is tipped about the shaft 33 in a clockwise direction from the position shown in Fig. 4 toward the position shown in Fig. 7, and during this movement the arm 54 pivots about the rod 50, thereby moving the housing 76 inwardly toward the member 43 until the pin 84 comes into contact with the lower end 86 of a finger 80 (Fig. 6) pivotally fastened to one of the arms 40, the finger 80 at this time resting against a stop 82 (Fig. 6). Continued inward movement of the housing 76 caused by continued vertical movement of the jack brings the end of the housing opposite the depending extension 70 on the member 43, as seen in Fig. 7, the finger 80 during this movement of the housing 76 acting by engagement with the pin 84 to cause compression of the spring 88. When the jack is in its uppermost position, the head 78' of the rod 77 is in engagement with the extension 70 on the member 43 with the spring 88 fully compressed. Immediately upon release of the shoe from pressure by retraction of the resilient pad 5, the spring 88 acts to move the rod 77 to the left (Fig. 6), the pin 84 riding by the end 86 of the finger 80 and the head 78' of the rod acting by engagement with the projection 70 to swing the jack laterally of the pressure-applying pad 5 forwardly toward the operator (Fig. 8).

The jack, as heretofore pointed out, is provided with a rubber roll 56 for engagement with the top of the forepart of the shoe and with a block 58 arranged to engage the top of the heel end of the last. Consequently, transverse movement of the jack will not of itself push the shoe from its position on the resilient pad. To provide for ejecting the shoe, there is associated

with the jack means 104 (Figs. 1, 2 and 3) which depends from the jack and which is arranged in the upward movement of the parts to contact the rear side face of a shoe on the supporting pad 5. Accordingly, when the jack moves transversely of the pad, the shoe is pushed from the pad. The means 104 is a T-shaped member, as will be observed by reference to Figs. 1 and 2, the stem 106 of which extends upwardly through openings formed in the arms of a C-shaped clamp 108, the latter being pivotally connected to a bracket 110 (Fig. 3) by a bolt 111. The bracket 110 is fastened by a bolt 112 to the block 59 at the lower end of the heel post. A projection 120 rises from the bracket 110 and forms an abutment for the end of a screw 122 which is carried by the C-shaped clamp. This permits adjustment of the C-shaped clamp about an axis parallel to the length of the shoe so that its position may be varied for different widths of shoes. A lock nut 124 provides means for locking the screw 122 in its adjusted position. The T-shaped member 104 is held yieldably close to the surface of the resilient pad by a spring 114 disposed between one end of the C-shaped clamp and a collar 116 mounted on the stem and fixed thereto by a thumbscrew 118.

A basket, shown at 126, is provided for receiving the shoe in an inverted position. The basket is fastened to a platform 127 which, in turn, is fastened to a horizontal lip 129 projecting from a plate 130 which is secured by screws to the crossbar 16. An apron 123 projects upwardly and inwardly from the basket toward the resilient pad for receiving the shoe and guiding it as it is projected toward the basket.

In loading the machine prior to tripping the power-operated mechanism which applies the pressure to the shoe, the operator picks up a shoe, places it against the rubber-covered roll 56' and the block 58', which engage respectively the forepart of the shoe and the top part of the rear end of the last, and pushes the shoe rearwardly against the T-shaped member 104, thereby swinging the jack from its forwardly-inclined position (Figs. 3 and 8) to a vertical position where it will drop by gravity to a position above the pad. It is evident, however, that if the device 78 remains in contact with the projection 70 on the member 43, when the operator attempts to swing the jack into a vertical position he will meet with considerable resistance, since the moment arm to which the force of the spring 88 is applied is relatively long. To reduce the moment arm to make it easier to return the jack to a vertical position, it is desirable to move the device 78 toward the axes of the studs 46. This is taken care of, as seen in Fig. 8, by the spring 102, since when the pin 84 clears the lower end of the finger 80 during the forward movement of the device 78 it is free to swing upwardly. The upward movement of the device 78 is limited by the bottom of the crossbar 42 (Fig. 8).

For moving the lever 92 into an out-of-the-way position to permit the jack, after it has been swung rearwardly into a vertical position, to return by gravity to its lowermost position, there is provided a pawl 93 which is pivoted to the lever 92 and which, when the jack is in its forwardly inclined position with the stud 68 in the lateral recess 96, falls by gravity down behind the stud 68 (Fig. 8). As the jack is swung reversely to its vertical position, the stud 68 by engagement with the pawl 93 acts to swing the

lever 92 in the same direction as the jack into an out-of-the way position, thus permitting the stud 68 to enter the slot 64. The weight of the jack is sufficient to cause it to fall and as it falls the frame is tilted in a counterclockwise direction. This raises the end of the frame upon which the device 73 is mounted and moves it to the position shown in Fig. 4. The movement of the parts as effected by the fall of the jack is sudden and to lessen the shock a spring 132 is coiled around the spindle 32 with one end hooked on the edge of the plate 25 and the other end bearing against the rod 50.

In the operation of the machine, a shoe is picked up and placed against the inclined jack in contact with the roll 56', the block 58' and the T-shaped member 104, and is pushed rearwardly to a vertical position, whereupon the jack descends by gravity, carrying the shoe with it into engagement with the resilient pad 5 which is in its lowest position. During the lowering of the shoe into engagement with the pad, the operator has an opportunity to guide it and adjust it so that it will occupy the proper position on the pad. The operator then starts the power operation of the machine, whereupon the resilient pad at that side of the machine where the shoe is placed rises and the resilient pad at the other side descends. The shoe, together with the resilient pad and jack, is raised until stopped by engagement of the convex portion 72 of the member 48 with the groove 74 of the plate 24. When this occurs, the machine comes to rest with the shoe under pressure. While the shoe is held under pressure the operator presents a shoe to the other half of the machine, since at this time the resilient pad associated therewith is in its lowest position. When the machine is again started, the shoe to which pressure was applied is released and ejected, and the shoe which was presented to the other half of the machine is subjected to pressure. During the rise of the resilient pad and jack at one side of the machine from their lowermost positions to pressure-applying positions, the notched lever 92 and stud 68 associated therewith are brought into co-operation, thereby to sustain the jack in its uppermost position upon the release of the pressure and retraction of the resilient pad. Simultaneously, the device 73 is moved from an inoperative position to a position in contact with the projection 79 on the member 48 and the spring 83 is fully compressed. During the retraction of the opposite resilient pad 5, the jack 12 is swung transversely of the pad by the device 78 so that the member 104 pushes the shoe into the basket 126. Time is also afforded for the operator to place the next shoe in position and to swing the jack from its forwardly-inclined position rearwardly into a vertical position, whereupon it drops to its lowest position, bringing the shoe into contact with the associated resilient pad in readiness for the next cycle of operations.

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

1. In a machine for applying pressure to the bottoms of shoes, pressure-applying means arranged to receive a shoe thereon bottom downward, supporting means for holding the shoe in engagement with the pressure-applying means, means for moving said pressure-applying means relatively to said supporting means to apply pressure to the bottom of the shoe on said pressure-

applying means and then to release the shoe from pressure, means arranged to be rendered operative in response to the movement of said pressure-applying means to apply pressure to the shoe for moving the shoe-supporting means transversely of the pressure-applying means upon the release of the shoe from pressure, and means associated with said supporting means for ejecting the shoe from the pressure-applying means during the transverse movement of said supporting means.

2. In a machine for applying pressure to the bottoms of shoes, supporting means for a shoe, pressure-applying means arranged to engage the bottom of the shoe while held by the supporting means, means for moving the pressure-applying means relatively to the supporting means to apply pressure to the bottom of the shoe and then to release the shoe from pressure, means for moving the supporting means transversely of the pressure-applying means upon the release of the shoe from pressure, said means being actuated by the movement of the pressure-applying means to apply pressure to the shoe, and means associated with the supporting means and arranged by engagement with the shoe to eject it from the machine during the transverse movement of the supporting means.

3. In a machine for applying pressure to the bottoms of shoes, pressure-applying means arranged to receive a shoe thereon bottom downward, a support for the shoe, said pressure-applying means and the supporting means being located initially in spaced-apart relation, said supporting means being movable to bring the shoe into engagement with the pressure-applying means and being movable thereafter together with the pressure-applying means into a position to apply pressure to the shoe, means for effecting such movement of the pressure-applying means and the support to apply pressure to the shoe and for thereafter moving the pressure-applying means relatively to the support to release the shoe from pressure, means for automatically moving the support transversely of the pressure-applying means upon the release of the shoe from pressure, and means carried by the support and arranged to engage a side of the shoe to eject the shoe from the machine during the transverse movement of the support.

4. In a machine for applying pressure to the bottoms of shoes, pressure applying means arranged to receive a shoe thereon bottom downward, a support for the shoe, an abutment, said support being movable to bring the bottom of the shoe into engagement with the pressure-applying means, means to move the pressure-applying means and support to bring the support into engagement with the abutment and thereafter to move the pressure-applying means relative to the support to apply pressure to the bottom of the shoe, means for moving the support transversely of the pressure-applying means upon the release of the shoe from pressure, said means being actuated by the movement of the support toward said abutment, and means associated with the support and arranged to engage a side of the shoe to eject the shoe from the machine during the transverse movement of the support.

5. In a machine for applying pressure to the bottoms of shoes, pressure-applying means arranged to receive a shoe thereon bottom downward, supporting means for holding the shoe in engagement with the pressure-applying means, means for moving said pressure-applying means

and said supporting means to a pressure-applying position, means for maintaining the supporting means in vertical alinement with the pressure-applying means during a part of its movement, means arranged to be rendered operative in response to the movement of said pressure-applying means to apply pressure to the shoe for moving the shoe-supporting means transversely of the pressure-applying means upon the release of the shoe from pressure, and means associated with the supporting means for ejecting the shoe during the transverse movement of the supporting means.

6. In a machine for applying pressure to the bottoms of shoes, pressure-applying means arranged to receive a shoe thereon bottom downward, a support, said support being displaceable from a position directly above the pressure-applying means to a position to one side thereof, means for holding the support in its displaced position, said support being movable from its displaced position against the opposition of said last-named means to a position above the pressure-applying means and thereafter movable toward the pressure-applying means to bring a shoe held in engagement with the support into engagement with the pressure-applying means, means operable to move the pressure-applying means and the support to apply pressure to the bottom of the shoe, said means for holding the support in its displaced position being arranged to be rendered operative in response to the movement of said pressure-applying means to apply pressure to the shoe to move the support to said displaced position upon the release of the shoe from pressure, and means associated with the support for ejecting the shoe during the displacement of the support.

7. In a machine for applying pressure to the bottoms of shoes, pressure-applying means arranged to receive a shoe thereon bottom downward, a support for holding the shoe, means for moving the pressure-applying means relative to the support to apply pressure to the bottom of the shoe, means arranged to be rendered operative in response to the movement of said pressure-applying means to apply pressure to the shoe for moving the shoe support transversely of the pressure-applying means upon the release of the shoe from pressure, and means associated with the support for ejecting the shoe during the transverse movement of the support.

8. In a machine for applying pressure to the bottoms of shoes, pressure-applying means arranged to receive a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means for moving the pressure-applying means and the support to a pressure-applying position, means arranged to be rendered operative in response to the movement of said support to its pressure-applying position for moving the shoe support transversely of the pressure-applying means upon the release of the shoe from pressure, and means associated with the support for ejecting the shoe during the transverse movement of the support.

9. In a machine for applying pressure to the bottoms of shoes, pressure-applying means arranged to receive a shoe thereon bottom downward, a jack for holding the shoe in engagement with the pressure-applying means, means for moving said pressure-applying means to apply pressure to the bottom of the shoe while supported by said jack, means for moving the jack

transversely of the pressure-applying means upon the release of the shoe from pressure, said means being actuated by the movement of the pressure-applying means, and means associated with said jack for ejecting the shoe from the pressure-applying means during the transverse movement of the jack.

10. In a machine for applying pressure to the bottoms of shoes, a resilient pad arranged to receive a shoe thereon bottom downward, a jack for holding the shoe in engagement with the resilient pad, means for moving said resilient pad to apply pressure to the bottom of the shoe while supported by said jack, means for moving the jack transversely of the resilient pad upon the release of the shoe from pressure, said means being actuated by the movement of the resilient pad, and means associated with said jack for ejecting the shoe from the resilient pad during the transverse movement of the jack.

11. In a machine for applying pressure to the bottoms of shoes, pressure-applying means arranged to receive a shoe thereon bottom downward, a jack having a toe piece for engaging the toe portion of the shoe and a heel piece for engaging the top of the heel end of the last, means for moving said pressure-applying means to apply pressure to the bottom of the shoe while supported by said jack, means for moving the jack transversely of the pressure-applying means upon the release of the shoe from pressure, said means being actuated by the movement of the pressure-applying means, and means associated with the heel piece to eject the shoe from the pressure-applying means during the transverse movement of the jack.

12. In a machine for applying pressure to the bottoms of shoes, pressure-applying means arranged to receive a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means for moving the pressure-applying means and said support to a pressure-applying position, means for holding the support in its pressure-applying position after the release of the shoe from pressure, means for swinging the support transversely of the pressure-applying means upon the release of the shoe from pressure, said means being actuated by the movement of the support toward pressure-applying position, and means associated with the support for ejecting the shoe from the pressure-applying means during the transverse movement of the support.

13. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe in an upright position, a support for holding the shoe in engagement with the pressure-applying means, means for moving the pressure-applying means and support to a pressure-applying position and for thereafter moving the pressure-applying means reversely to release the shoe from pressure, means for preventing reverse movement of the support with the pressure-applying means upon the release of the shoe from pressure, means for then swinging the support transversely of the pressure-applying means, and means associated with the support for ejecting the shoe from the pressure-applying means.

14. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means for moving the pressure-applying means and support to a pressure-applying position and for thereafter moving

the pressure-applying means reversely to release the shoe from pressure, a latch for preventing reverse movement of the support with the pressure-applying means upon the release of the shoe from pressure, means for then swinging the support transversely of the pressure-applying means, and means associated with the support for ejecting the shoe from the pressure-applying means.

15. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means for moving the pressure-applying means and support to a pressure-applying position and for thereafter moving the pressure-applying means reversely to release the shoe from pressure, a pin on said support, a latch co-operable therewith to prevent reverse movement of the support with the pressure-applying means upon the release of the shoe from pressure, the upward movement of the pressure-applying means moving the pin into a position to be engaged by the latch, means for then moving the support transversely of the pressure-applying means, and means associated with the support for ejecting the shoe from the pressure-applying means.

16. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means associated with the support to engage a side of the shoe, means for moving the pressure-applying means and the support to a pressure-applying position, a pin on said support, a latch arranged by engagement with said pin when the support is in pressure-applying position to hold the support against reverse movement with said pressure-applying means upon the release of the shoe from pressure, and means for moving said support transversely of the pressure-applying means.

17. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means associated with the support adapted to engage a side of the shoe, means for moving the pressure-applying means and the support to a pressure-applying position, means for holding the support in its pressure-applying position upon reverse movement of the pressure-applying means to release the shoe from pressure, and means for swinging the support transversely of the pressure-applying means upon the release of the shoe from pressure, the support being arranged when returned to its vertical position to move said holding means to an inoperative position whereupon said support will return to its original position.

18. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means associated with the support to engage a side of the shoe, means for moving the pressure-applying means and the support to a pressure-applying position, means for holding the support in its pressure-applying position upon reverse movement of the pressure-applying means to release the shoe from pressure, means for swinging the support transversely of the pressure-applying means upon the release of the shoe from pressure, and a pawl associated with said holding means, the support

being arranged when returned to a vertical position to actuate said pawl to move the holding means to an inoperative position to permit said support to return by gravity to its initial position.

19. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means associated with the support to engage a side of the shoe, means for moving the pressure-applying means and the support to a pressure-applying position, a latch for holding the support in said pressure-applying position, means for swinging the support transversely of the pressure-applying means upon release of the shoe from pressure in response to reverse movement of said pressure-applying means, and a pawl associated with said latch, the support being arranged upon reverse swinging movement to operate said pawl to move the latch to an inoperative position to permit said support to return by gravity to its initial position.

20. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means associated with the support to engage a side of the shoe, means for moving the pressure-applying means and support to a pressure-applying position, means for holding the support in said pressure-applying position after release of the shoe from pressure, means for swinging the support transversely of the pressure-applying means, and means for limiting the transverse movement of the support.

21. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means associated with the support to engage a side of the shoe, means for moving the pressure-applying means and the support to a pressure-applying position, and means for swinging the support transversely of the pressure-applying means upon the release of the shoe from pressure, said last-named means being moved into an operative position by the movement of the support from its initial to pressure-applying position.

22. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a support for the shoe, means associated therewith to engage a side of the shoe, means for moving the pressure-applying means and the support to a pressure-applying position, and means for swinging the support transversely of the pressure-applying means upon the release of the shoe from pressure, the movement of the support from loading to pressure-applying position moving said last-named means into an operative position and simultaneously imparting to said means latent energy.

23. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means associated with the support to engage a side of the shoe, means for moving the pressure-applying means and the support to a pressure-applying position, and a spring-pressed plunger for imparting transverse movement to the support upon release of

the pressure, the movement of the pressure-applying means into pressure-applying position moving said plunger into an operative position and simultaneously compressing the spring.

24. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means associated with the support to engage a side of the shoe, means for moving the pressure-applying means and the support to a pressure-applying position, an ejector means operable to swing the support transversely of the pressure-applying means upon the release of the shoe from pressure, said ejector means being mounted adjacent to the support, and an arm operable by the movement of the support to pressure-applying position to move said ejector means into an operative position.

25. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means associated with the support to engage a side of the shoe, means for moving the pressure-applying means and the support to a pressure-applying position, a spring-pressed plunger operable to swing the support transversely of the pressure-applying means upon release of the shoe from pressure, said plunger being mounted adjacent to the support, means operable by the movement of the support to pressure-applying position to move the plunger into an operative position, and means for compressing the spring during the movement of the plunger into operative position.

26. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for supporting a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means associated with the support to engage a side of the shoe, means for moving the pressure-applying means and the support to a pressure-applying position, a plunger adjacent to the support, a spring for forcibly urging the plunger toward the support, and means operable by the movement of the support to pressure-applying position to move the plunger into an operative position, the movement of the plunger into operative position moving the plunger against the opposition of the spring to compress it.

27. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means associated with the support to engage a side of the shoe, means for moving the pressure-applying means and the support to a pressure-applying position, a plunger adjacent to the support, a spring for forcibly urging the plunger toward the support, means operable by the movement of the support to pressure-applying position to move the plunger into contact with the support and an abutment co-operable with the plunger to cause it to compress the spring during the movement of the plunger into contact with the support.

28. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means associated with the support to engage a side of the shoe,

means for moving the pressure-applying means and the support to a pressure-applying position, plunger means operable to swing the support transversely of the pressure-applying means upon release of the shoe from pressure, said plunger means being mounted adjacent to the support, means operable by the movement of the pressure-applying means into pressure-applying position to move said plunger means into engagement with the support, and means for holding said plunger means at a predetermined point of contact with said support.

29. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means associated with the support to engage a side of the shoe, means for moving the pressure-applying means and the support to a pressure-applying position, plunger means operable to move the support transversely of the pressure-applying means upon release of the shoe from pressure, said plunger means being swingable about a horizontal axis adjacent to the support, means operable by the movement of the pressure-applying means into pressure-applying position to move said plunger means into engagement with the support at a predetermined distance from said axis, and means for moving said plunger means closer to said axis after said support has been moved to its transverse position.

30. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means associated with the support to engage a side of the shoe, means for moving the pressure-applying means and the support to a pressure-applying position, ejector means for moving the support transversely of the pressure-applying means, means operable by the movement of the pressure-applying means into pressure-applying position to move said ejector means into engagement with the support, an abutment for guiding the ejector means during its movement to cause the ejector to contact the support at a given point, and resilient means operable to move the ejector means inwardly of said given point after the support has been moved to its transverse position.

31. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means associated with the support to engage a side of the shoe, means for moving the pressure-applying means and the support to a pressure-applying position, a plunger adjacent to the support for moving it transversely of the pressure-applying means, a spring for forcibly urging the plunger toward the support, means for adjusting the length of movement of the plunger, means operable by the movement of the support to pressure-applying position to move the plunger into contact therewith, means for simultaneously compressing the spring and guiding the plunger during its movement so that it contacts the support at a given point, means for moving the plunger inwardly of said given point when the support moves to its transverse position, and a stop to limit the inward movement of said plunger.

32. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for re-

ceiving a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means for moving the pressure-applying means and the support to a pressure-applying position, means to swing the support transversely of the pressure-applying means upon release of the shoe from pressure, said means being actuated by the movement of the pressure-applying means, and T-shaped means carried by the support and movable with the support to eject the shoe from the machine.

33. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means for moving the pressure-applying means and the support to a pressure-applying position, means to swing the support transversely of the pressure-applying means upon release of the shoe from pressure, said means being actuated by the movement of the pressure-applying means, and means mounted at the lower end of the support arranged to engage the side of the shoe during the transverse movement of the support, said last-named means being adjustable heightwise of the shoe.

34. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means for moving the pressure-applying means and the support to a pressure-applying position, means to swing the support transversely of the pressure-applying means upon release of the shoe from pressure, said means being actuated by the movement of the pressure-applying means, and means mounted on the lower end of the support arranged to engage a side of the shoe during the transverse movement of the support, said last-named means being adjustable widthwise of the shoe.

35. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means for moving the pressure-applying means and the support to a pressure-applying position, means to swing the support transversely of the pressure-applying means upon release of the shoe from pressure, said means being actuated by the movement of the pressure-applying means, and means carried by the support and movable therewith to eject the shoe, said last-named means being yieldable on said support to and from the pressure-applying means and adjustable transversely of the pressure-applying means.

36. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means for moving the pressure-applying means and support to a pressure-applying position, means to swing the support transversely of the pressure-applying means upon the release of the shoe from pressure, said means being actuated by the movement of the support, means movable with the support to eject the shoe, and means for receiving the ejected shoe in an inverted position.

37. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means for moving

the pressure-applying means and the support to a pressure-applying position, means to swing the support transversely of the pressure-applying means upon the release of the shoe from pressure, said means being actuated by the movement of the support, means movable with the support to eject the shoe, and means for receiving the ejected shoe, said means comprising a tray positioned at one side of and below the pressure-applying means to receive the shoe in an inverted position.

38. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means for moving the pressure-applying means and the support to a pressure-applying position, means to swing the support transversely of the pressure-applying means upon the release of the shoe from pressure, said means being actuated by the movement of the support, means movable with the support to eject the shoe, and a tray for receiving the ejected shoe, said tray being provided with an apron over which the shoe rolls as it is ejected from the pressure-applying means, the length of the apron being such that the shoe will land in the tray in an inverted position.

39. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a support for holding the shoe in engagement with the pressure-applying means, means for moving said pressure-applying means relative to the support to apply pressure to the bottom of the shoe while held by said support, means to turn the support about a vertical axis with respect to the pressure-applying means, and means to fix it at a predetermined angle with respect to the longitudinal center line of the pressure-applying means.

40. In a machine for applying pressure to the bottoms of shoes, pressure-applying means for receiving a shoe thereon bottom downward, a vertical spindle, a support, mounted on said spindle, for holding the shoe in engagement with the pressure-applying means, means for moving said pressure-applying means relative to the support to apply pressure to the bottom of the shoe while held by said support, means for turning the support about the spindle to a predetermined angular position with respect to the longitudinal center line of the pressure-applying means, and means for locking the support in its adjusted position.

41. In a machine for applying pressure to the bottoms of shoes, a resilient pad for receiving a shoe thereon bottom downward, a jack for holding the shoe in engagement with the resilient pad, said jack having a toe piece for engaging the forepart of the shoe and a heel piece for engaging the top of the heel end of the last, means for moving the resilient pad to apply pressure to the bottom of the shoe while held by said jack, means for angularly adjusting the jack with respect to the resilient pad to move the toe piece to a predetermined position forwardly or rearwardly of the longitudinal center line of the resilient pad, the heel piece being moved simultaneously a corresponding angular amount rearwardly or forwardly of the center line of the pad, and means for locking the jack in said predetermined position.

FRED V. HART.