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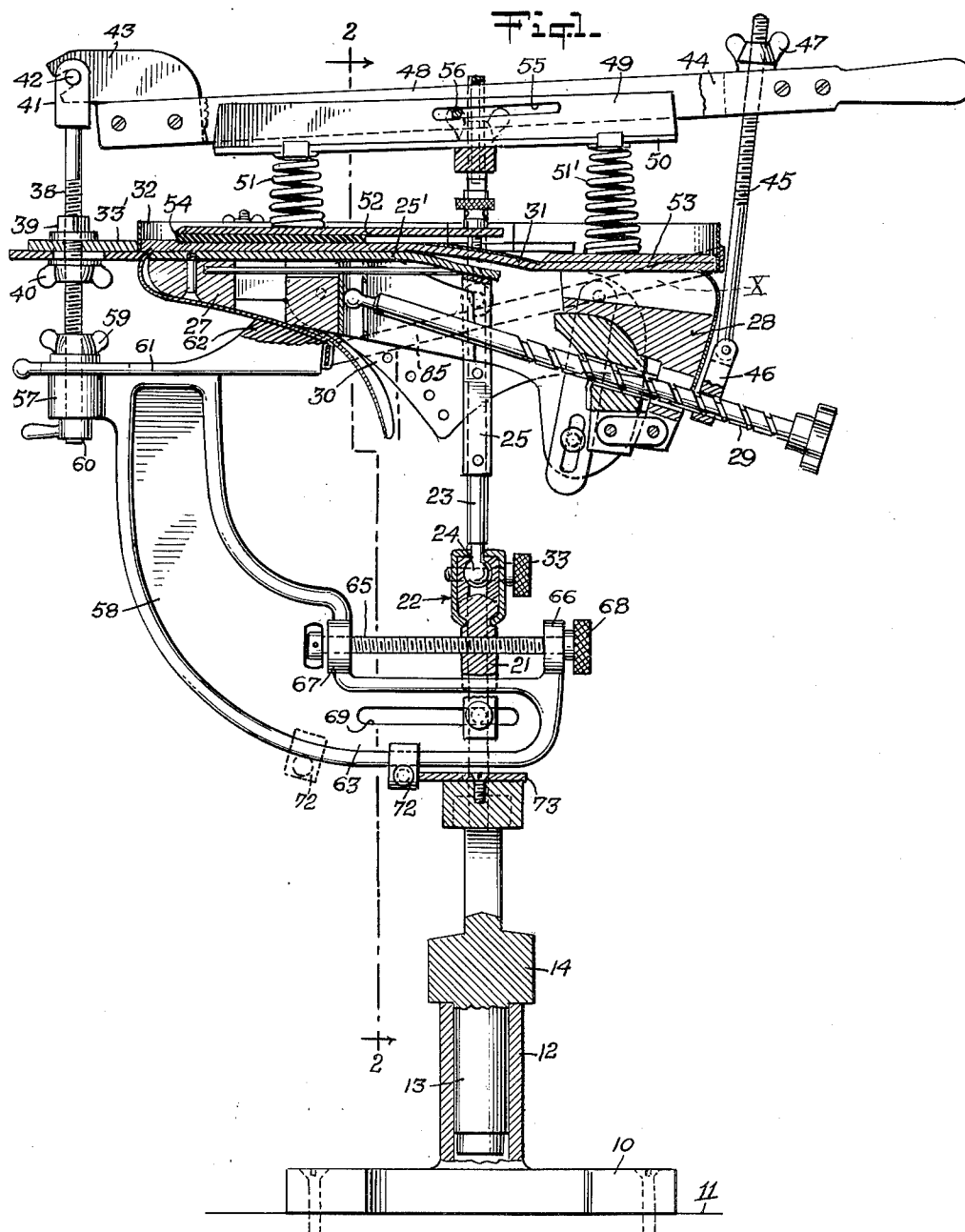
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SHOE SOLING APPARATUS

Filed Oct. 18, 1949

3 Sheets-Sheet 1



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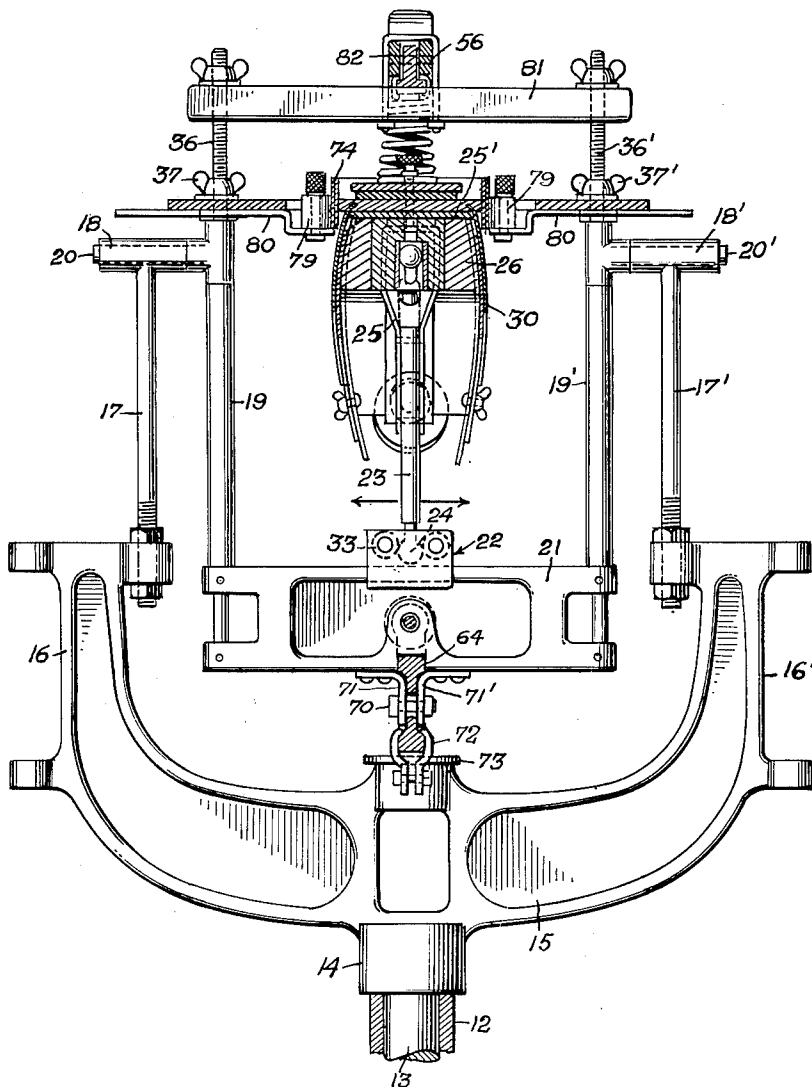
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Fig 2.



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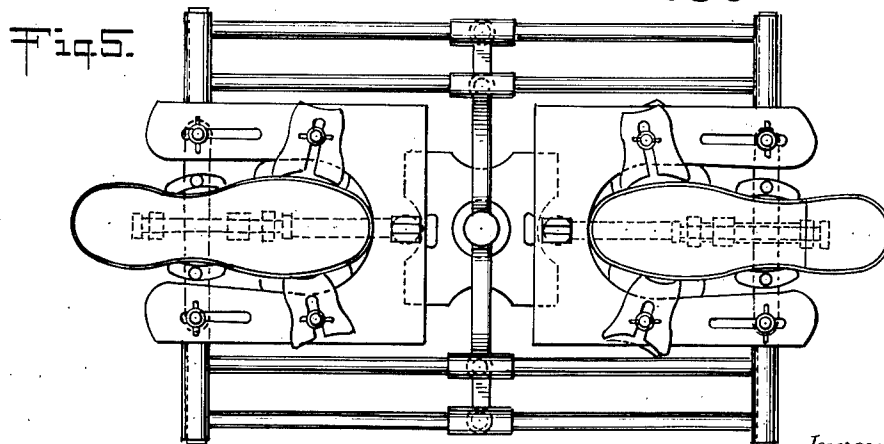
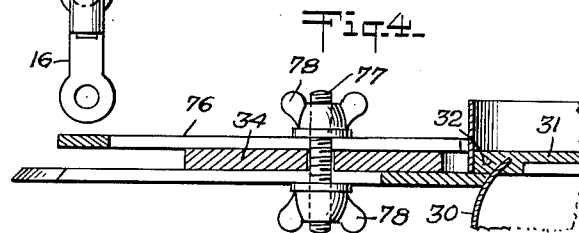
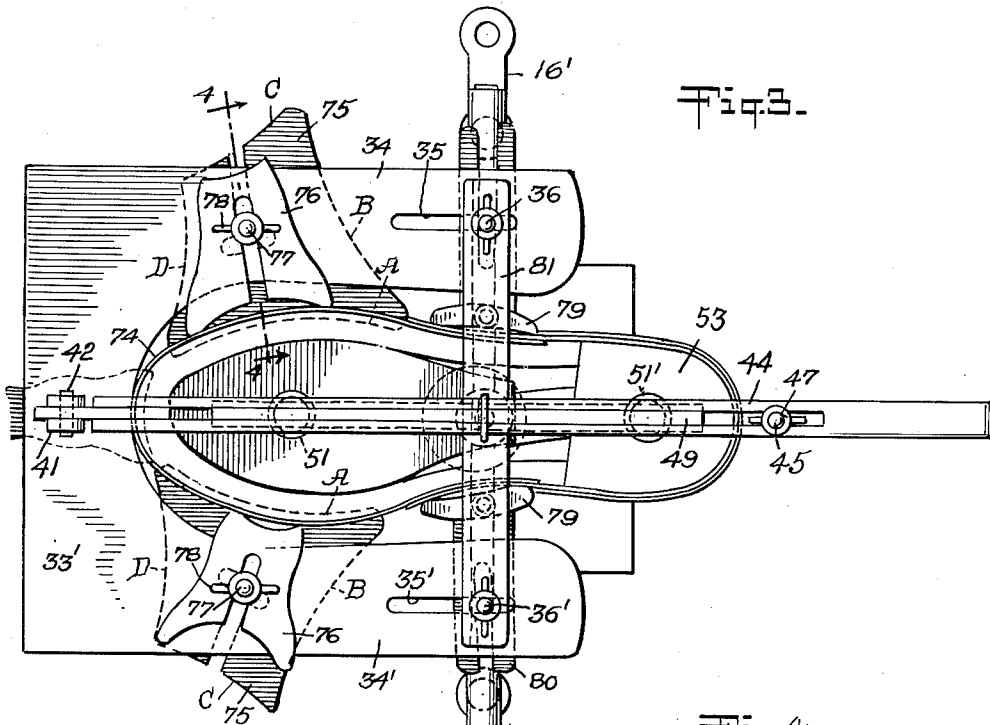
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UNITED STATES PATENT OFFICE

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SHOE SOLING APPARATUS

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Application October 18, 1949, Serial No. 121,937

9 Claims. (Cl. 18—17)

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This invention relates to new and useful improvements in devices for forming soles on shoes and especially relates to devices for forming composition soles on shoes, and constitutes a continuation in part of my co-pending application, Serial No. 670,740, filed May 18, 1946, and entitled "Shoe Last," now Patent No. 2,507,505.

A main object of this invention is to provide a simple, strong, efficient, and easily operable device whereby shoes may be mounted on a universally mounted support so that in operating on them, for the purpose of forming composition soles thereon, the support may be quickly and easily swivelled around to present the shoe in a plurality of positions to the workman.

A further object is to provide a simple and efficient and relatively economical device on which the shoe can be easily and quickly mounted to hold it firmly in operative position and condition for the reception of the composition sole by pouring the composition material into a mold which is formed around the shoe while on the support.

A still further object is to enable the mold to be easily and quickly and accurately adjusted with respect to the shoe welt and upper and held in this relation while the sole material is setting after being poured.

A still further object is to provide a simple and efficient device whereby the mold and its related parts may be easily adapted and adjusted, with respect to any shoe no matter what its size, so that in the matter of a few minutes, the same device may be adapted to firmly and efficiently hold shoes of all sizes.

Yet another object is to provide simple means whereby prior to forming a composition sole on the shoe, the heel and inner sole may be separately and preliminarily treated to dispose them in the proper planar position and relative position.

Further and more specific objects, features, and advantages will more clearly appear from a consideration of the detailed specification hereinafter set forth especially when taken in connection with the accompanying drawings which illustrate a present preferred form which the invention may assume and which form part of the specification.

In brief and general terms, the invention, among other things, provides a supporting device for a shoe and this support includes a main frame or pedestal comprising outstretched spaced arms on a standard and preferably mounted so that the arms can be swung about a vertical axis

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from a base surface such as the floor or a work table.

Pivoted within the outstretched arms of the main frame is a secondary frame pivoted on a horizontal axis and at one end adapted to support a shoe. On this end of the frame, an adjustable plate is mounted to partly surround the sides of the shoe and provided with adjustable clamping and supporting plates which hold the shoe upper and welt in position, as well as to hold in place a molding strip of flexible material which runs around the welt and the entire shoe, to form a recess into which fluid composition may be poured to set and harden therein to form a sole for the shoe.

The adjustable plate on top of the secondary frame has a three-point suspension, two of which is from the top of the secondary frame and a third is from the top of an adjustable leg dependent from the base of the plate and associated with the other end of the secondary frame so as to enable the operator to adjust the plate around the shoe to differing sizes of shoe. This leg has means thereon to limit its motion in one direction with respect to the main pedestal so that one preferred position for working on the shoe may be easily and quickly be achieved without any particular effort.

A further feature of the invention is to provide a spring pressure means to press on top of the shoe against the inner sole and the inner heel portion to assist in shaping them properly prior to the pouring of the sole composition and to permit effective mounting of the shoe on the work support and the proper shaping of it while on the support. This pressure means can be quickly applied and released and the distribution of the pressure may be varied along the shoe to suit it to shoes of different sizes and also different distorted conditions of the upper and inner soles and heels.

The preferred forms of the invention herein are illustrated in the drawings, of which:

Fig. 1 is a side elevation, with certain parts in section, of the improved machine;

Fig. 2 is a vertical transverse section taken on the line 2—2 of Fig. 1;

Fig. 3 is a plan view of the machine;

Fig. 4 is a vertical section taken on the line 4—4 of Fig. 3; and,

Fig. 5 is a plan view of a modified form of the machine in which the machine can support and handle a plurality of shoes to be treated.

Referring now merely to the specific forms of the device illustrated in the drawings and the

construction thereof, it is seen in Figure 1, that there is a base member 10 which can be screwed or bolted to a suitable surface or platform 11. Projecting upward from the top of the base 10 is a hollow standard sleeve 12 and projecting into said sleeve 12 is a stub shaft or stem 13 having an enlarged upper portion 14 adapted to rest on the top edge of the sleeve 12 and to be turned thereon at will. This stem 13 and the enlarged head 14, are integral with a frame member having a horizontally extending beam 15 and upwardly extending oppositely disposed arms 16 and 16' on the ends of said beam 15. Extending vertically upward from these arms 16 and 16', are adjustable rods or stems 17 and 17' having bearing sleeves 18 and 18' at their respective upper ends which have horizontal aligned axes.

Disposed to swing within the arms 16, 16', and rods 17, 17' is another frame formed of vertical spaced elements 19 and 19' having at their upper ends, horizontally outwardly extending stub shafts 20 and 20' projecting into the bearing sleeves 18 and 18' respectively.

The lower portion of the frame of which the rods 19, 19' are side elements, is formed of a cross beam 21 suitably connected at its ends to the lower ends of the rods 19, 19'. Along the upper edge of this cross beam 21 is adjustably disposed a clamping member 22, which at its lower edge, engages the beam 21 and also clamps between its members an upright rod or stem 23 the lower end of which is ball-shaped as at 24, to be gripped by the clamping device 22. At its upper end, this stem 23 is pinned between the free ends of a U-shaped metal strap 25, the intermediate portion of which is riveted to the narrow end of the sole plate 25' of the shoe last, as seen in Figure 1 and a shoe last block 26 which is more in detail shown and of the general form shown in my co-pending application, Serial No. 670,740, filed May 18, 1946, and entitled "Shoe Last," and of which this application is a continuation-in-part. This last includes generally as indicated, a toe block 27, a heel block 28 and a threaded adjustment shaft 29 interconnecting these blocks as described in said application. A shoe having an upper 30 disposed over the last with its innersole 31 facing upwardly and the last is adjusted to tightly grip it and be disposed therewithin. The sole has a usual welt portion 32 as seen most clearly in Figure 4. The clamping means 22 may be tightened by means of usual screws or bolts 33 as shown.

With the frame formed by the rods 19 disposed in a vertical plane as shown in Figure 1, and with the shoe supported horizontally on top of the stem 23 with the shoe last tightly in place, it becomes necessary to provide means around the welt 32 to form a mold for pouring composition material on top of the innersole 31. To this end, I dispose a U-shaped plate in a plane substantially that of the welt and innersole of the shoe and this plate has a base portion 33' and spaced limbs 34 and 34' extending therefrom along the sides of the shoes as seen particularly in Figure 3. The limbs are respectively provided with elongate slots 35 and 35' upward through which extend threaded stems 36 and 36' mounted on or connected in any suitable manner to the upper ends of the elements 19 and 19' and forming continuations thereof. The plate rests on shoulders formed on the elements 19 and 19' and is engaged on its upper side by wing nuts 37 and 37', to hold it in this position. The base portion 33' of this plate is held in proper position by reason of

the projection upwardly therethrough of another threaded stem 38 with nut 39 on the upper side of the plate, and a wing nut 40 on the lower side. At the top of the stem 38 is a yoke element 41 with a cross pivot pin 42 therein to receive the forked end 43 of a long lever 44, the other end of which has a slot therein to receive a threaded stem 45, the bottom of which is provided with a collar 46 surrounding the threaded shaft 29 of the shoe last above described. The upper end of the stem 45 is provided with a wing nut 47 so that the lever 44 can be adjusted upwardly or downwardly as may be desired.

The lever 44 has a central elongate slot 48 therein to receive a thin bar 49 having a transversely disposed bottom edge 50. Along the bottom of the bar 49 are disposed springs 51 and 51' bearing against the bottom of the bar at their top and bearing respectively against a metal plate 52 and the inner heel portion 53 of the shoe as shown in Figure 1. Underneath the metal plate 52, there is generally disposed a layer of soft rubber, such as sponge rubber 54. The bar 49 has an elongate slot 55 therein, in which rides a pin 56 fixed in the lever 44 and extending across the elongate slot 48 therein. This pin allows the bar 49 to be moved longitudinally with respect to the pivot point afforded by the pin 56 and thus distribute the variations in pressure of the lever 44 on the springs 51 and 51' as desired. The purpose of this spring arrangement is to so press on the inner sole 31 and the inner heel portion 53, that they may be pressed flat and even before any attempt is made to pour on a liquid composition sole. The pressure of these springs may be left on the parts thus under treatment for one or more hours after which, the lever pressure is released and the device is lifted out of the way for the pouring of the material in the manner to be now described.

The threaded stem 38 is anchored at its bottom in a lug 57 on a dependent leg 58. It is held in position thereon by means of nuts 59 and 60, as shown in Figure 1. Between the nut 59 on top of the lug 57 and the lug, there is disposed a slidable plate 61 slotted to be moved forward or backward and having a forward tapered face 62 to bear as desired against the top of the toe portion of the upper of the shoe, so as to help support the shoe in proper position, and it may be adjusted longitudinally to fit shoes of various sizes.

The dependent leg 58 has a bottom horizontally extending portion 63 the top of which passes through a notch 64 (Figure 2), in the cross member 21. A threaded shaft 65 passes through a threaded bore in the cross member 21 and is journaled in flanges 66 and 67 of the leg 58 and has a hand knob 68. The turning of the threaded shaft 65 will move the leg horizontally to adjust it and the mold supporting plate 33' with respect to the shoe as is clear. The leg 58 along its bottom portion, is provided with a slot 69 through which extends a bolt 70. This bolt, when tightened, is associated with straps 71 and 71' fastened to the bottom of the cross member 21 and disposed on either side of the horizontal portion of the leg 58. This will permit the leg 58 to be adjusted, and then this adjusted relation is fixed by tightening up on the bolt 70 to hold the leg and therefore, the plate 33' in proper relation for any given shoe. Along the bottom of the horizontal portion 63 of the leg 58, are disposed adjustable stop clamps 72. These clamps are adapted to abut an eccentric cam disc 73, which is adjustably disposed on top

of the mid portion of the main frame 15 midway between the limbs or legs 16 and 16'. Thus it will be seen that the secondary frame may be swung around the horizontal axis of the stub shafts 20 to invert the shoe at will and then can be moved back to the position shown in Figure 1, to present the bottom of the shoe upwardly in a predetermined position determined by the setting of the clamps 72 with respect to the disc 73.

With the mold-supporting plate shown in Figure 3, having a base portion 33' adjustable in a horizontal plane with respect to the shoe, the inner sole and welt are surrounded by one or more strips of flexible material 74 to form a wall surrounding the inner sole and heel thus resulting in a recess into which may be poured fluid composition to form a sole and heel when set. The limbs 34 and 34' of the plate 33' at the sides of the shoe, are provided with lower adjustable plates 75 and with upper adjustable plates 76. These respective plates are slotted to be slipped in position and to embrace a bolt 77 passing through the limbs of the plate 33' and with wing nuts 78 above and below the limbs to hold these plates in adjusted position. The lower plates 75 extend beneath the lower edge of the flexible strips to hold them in position and the upper plates 76 are adjusted to bear against the side of the strips to hold them in proper relation with respect to the inner sole and welt. The lower plates have four sides of different curvature so that these sides may be selectively used to be disposed with shoes of different shapes and sizes at will. The tapered face 62 of the plate 61 has connected thereto in any suitable manner, an elastic band 85 which, as shown in Figure 1, extends therefrom on each side of the shoe and passes around the flexible strip 74 at the bottom thereof, where it is disposed around the heel portion 53 of the shoe. This elastic connection permits this portion of the strip to be firmly held in place.

At the sides of the shoe elongated bearing plates 79 are provided and are supported on the inner ends of strips 80 adjustably disposed beneath the limbs 34 and 34' of the mold supporting plate, and are held in position by means of the wing nuts 37 and 37' previously mentioned.

In order to guide the lever 44 in its up and downward movement, there is connected thereto a cross bar 81 which is connected thereto by means of U-shaped straps 82 bolting the cross bar 81 to the underside of the lever 44, as shown in Figure 2. The ends of this bar 81 are bored to receive the upper ends of the threaded stems 36 and 36', so that as the lever is moved up and down, the cross bar will be guided on these stems in a controlled movement. Wing nuts 82 limit the upward movement of the bar 81.

In Figure 5, is shown in a schematic manner, the mounting of a pair of such formers on a single mounting, each one of which may be manipulated to swing around a horizontal axis and both to be swung as a unit around a central vertical axis.

In the operation of this simple and efficient device, it will be seen that it will enable a shoe to be held in position to be worked on and to be manipulated to present it with its sole portion down or up as desired, by merely turning the secondary frame on its axis in the main frame. In operating the device, the shoe is prepared by inserting the last therein to fit tightly therein and the stem from the last projects downwardly

and is clamped in the manner described to the clamping means associated with the cross member at the bottom of the secondary frame member. This therefore, will present the shoe with its inner sole and welt facing upwardly in a plane substantially flush with the upper end of the secondary frame and in a plane substantially the same as the mold supporting plate 33' which is adjustably mounted on the upper end of this secondary frame, through the intermediary of the dependent leg which can be adjusted by means of the threaded shaft associated between the cross member of the secondary frame and the lower horizontal portion of the dependent leg. This adjustment depends entirely upon the type and size of the shoe to be disposed at the top of the frame as must now be clear.

If the inner heel portion and the inner sole portion are somewhat out of shape and not disposed flat, it may be necessary to apply the lever 44 to exert pressure on these portions through the intermediary of the springs disposed under the lever in the manner heretofore described. This will permit these portions to be pressed out flat for a suitable length of time before the molding strips are applied around the inner sole to pour the liquid material into the mold chamber to form the sole and heel. After this suitable length of time, the lever 44 with its associated elements is raised and the mold supporting plate is adjusted to position with respect to the shoe inner sole and welt by turning the threaded shaft at the bottom of the dependent leg and associated with the cross member of the secondary frame. This will adjust the plate with respect to the inner sole and welt and will permit the adjustable elements on said plate to be adjusted to support the mold strips around the sole and welt and to bear against said strips to hold them in intimate contact with the inner sole and welt. This adjustment also applies to the elongate strip bearing elements at the side of the shoe. After all these adjustments are made, it is then that the material to form the sole and heel are poured into the mold recess, which is allowed to set after which the shoe can be removed.

It is therefore, seen that I have provided a main frame rotatable around one axis with a secondary frame supported therein rotatable around another axis at right angles to the first axis. The secondary frame supports a shoe with its sole presented in a plane substantially flush with the end of the frame and at right angles thereto, and the secondary frame also supports a mold-supporting plate at right angles to said end and in a plane substantially coincident with the plane of the sole and heel with means to adjust the mold-supporting plate with respect to the sides of the inner sole and the welt. Means are provided on the mold-supporting plate to support a mold strip around the welt and inner sole and to press it into proper and intimate contact with said inner sole and welt to form a proper recess for pouring liquid material into said recess or mold to set.

It is apparent that the shoe in the operative position may be even more firmly held by the forward movement of the plate 61, with the forward tapered face to bear against the outer toe portion of the shoe upper and that the adjustability of this plate will adapt the contact of this tapered portion to shoes of various sizes without any particular difficulty whatsoever.

While the invention has been described in de-

tail and with respect to the preferred forms shown in the drawings, it is not to be limited to such details and forms since many changes and modifications may be made in the invention without departing from the spirit and scope of the invention in its broadest aspects. Hence, it is intended to cover any and all forms and modifications of the invention which may come within the language or scope of any one or more of the appended claims.

What I claim as my invention, is:

1. In a device of the class described, a frame, said frame adapted to receive a shoe supported thereon at the top thereof with its sole portion facing upwardly, a mold-supporting plate on the frame adapted to be disposed around the sole, a pivotal lever operatively connected to said plate, said lever having an elongate slot therein, a bar adjustably pivoted within said slot, a slot in said bar, a pin on said lever which rides in the second mentioned slot, and springs disposed beneath said bar and adapted to bear upon the heel and sole portions of said shoe to flatten them into planar position, and means associated with said lever and frame to adjust the lever in a predetermined position to vary the pressure on said springs.

2. In a device of the class described, a frame, said frame adapted to receive a shoe supported thereon at the top thereof with its sole portion facing upwardly, a mold-supporting plate on the frame adapted to be disposed around the sole, adjustable rigid elements on the plate adapted to bear against the shoe, said elements being somewhat trapezoidal in outline with different curvatures to the four sides thereof whereby they may be adapted to conform to different curvatures of the sides of various shoes with which they may be related.

3. In a device of the class described, a main U-shaped frame with spaced limbs normally lying in a vertical plane and mounted to rotate around a vertical axis, a secondary frame disposed pivotally within the limbs of the main frame, and rotatable thereon on a horizontal axis, said secondary frame adapted to receive a shoe supported on and within the secondary frame with its sole portion disposed in a plane at right angles to the plane of the frame and coincident with the ends of the frame, a mold-supporting plate mounted on the top of the secondary frame and adapted to lie in a plane substantially coincident with the plane of the shoe sole and to partly surround the said sole, means to adjust the plate with respect to the top of the secondary frame, said means including a dependent leg extending from the plate to contact the lower end of said secondary frame, and means associated with the lower portion of said secondary frame and the lower end of said leg to adjust it with respect to said frame whereby the position of the plate with respect to the top of the frame and the sole of the shoe may be adjusted at will.

4. In a device of the class described, a main frame with upwardly extending spaced limbs, a secondary frame pivoted within said limbs around a horizontal axis, the upper end of said secondary frame being open and the lower end having a cross connecting element, said secondary frame adapted to receive a shoe disposed at the open end of the secondary frame with its sole portion at right angles to the plane of said frame, a member adapted for insertion within said shoe to hold it and extending to the cross

connecting element to support the shoe in position, a mold-supporting plate adjustable on the top of the secondary frame so that it is adapted to lie in a plane substantially coincident with the sole portion of the shoe, said plate being U-shaped and adapted to partly surround the front and sides of the shoe at the sole level, the limbs of the plate being supported from the top ends of said secondary frame, a dependent leg member connected at its top to the base of the plate, said leg member extending downwardly and then horizontally to a position adjacent the cross connecting element, and adjustable means on the lower end of said leg member and associated with the cross connecting member to adjust the leg with respect to the secondary frame whereby the plate may be adjusted with respect to the shoe.

5. In a device of the class described, a main frame with upwardly extending spaced limbs, a secondary frame pivoted within said limbs around a horizontal axis, the upper end of said secondary frame being open and the lower end having a cross connecting element, said secondary frame adapted to receive a shoe disposed at the open end of the secondary frame with its sole portion at right angles to the plane of said frame, a member adapted for insertion within said shoe to hold it and extending to the cross connecting element to support the shoe in position, a mold-supporting plate adjustable on the top of the secondary frame so that it is adapted to lie in a plane substantially coincident with the sole portion of the shoe, said plate being U-shaped and adapted to surround partly the front and sides of the shoe at the sole level, the limbs of the plate being supported from the top ends of said secondary frame, a dependent leg member connected at its top to the base of the plate, said leg member extending downwardly and then horizontally to a position adjacent the cross connecting element, and adjustable means on the lower end of said leg member and associated with the cross connecting member to adjust the leg with respect to the secondary frame whereby the plate may be adjusted with respect to the shoe, mold strips adapted for disposal around the sole portion and heel portion of the shoe, means on the plate adjustable to support the strips, and means on the plate adjustable to bear against the strips to hold them in conformity with the shape of the sole and heel portions.

6. In a device of the class described, a main U-shaped frame with spaced limbs normally lying in a vertical plane and mounted to rotate around a vertical axis, a secondary frame disposed pivotally within the limbs of the main frame and rotatable thereon on a horizontal axis, said secondary frame adapted to receive a shoe supported on and within the secondary frame with its sole portion disposed in a plane at right angles to the plane of said frame and coincident with the ends of the frame, a mold-supporting plate mounted adjustably on the top of the secondary frame and adapted to lie in a plane substantially coincident with the plane of the shoe sole and adapted to surround partly the said sole, and an adjustable tapered element supported in association with said plate and adapted to be moved into bearing relation with the outer toe portion of the shoe upper to support it in position.

7. In a device of the class described, a main frame with upwardly extending spaced limbs, a secondary frame pivoted within said limbs

around a horizontal axis, the upper end of said secondary frame being open and the lower end having a cross connecting element, said secondary frame adapted to receive a shoe disposed at the open end of the secondary frame with its sole portion at right angles to the plane of said frame, a member adapted to be positioned within said shoe to hold it and extending to the cross connecting element to support the shoe in position, a mold-supporting plate adjustable on the top of the secondary frame so that it is adapted to lie in a plane substantially coincident with the sole portion of the shoe, said plate being U-shaped and adapted to surround partly the front and sides of the shoe at the sole level, the limbs of the plate being supported from the top ends of said secondary frame, a dependent leg member connected at its top to the base of the plate, said leg member extending downwardly and then horizontally to a position adjacent the cross connecting element, and adjustable means on the lower end of said leg member and associated with the cross connecting member to adjust the leg with respect to the secondary frame whereby the plate may be adjusted with respect to the shoe, mold strips adapted for disposal around the sole portion and heel portion of the shoe, means on the plate adjustable to bear against the strips to hold them in conformity with the shape of the sole and heel portions, another adjustable plate adjustably mounted on the dependent leg member and having a tapered forward end which is adapted to be moved into bearing relation with the outer surface of the toe portion of the shoe upper to support this portion.

8. In a device of the class described, a main frame with upwardly extending spaced limbs, a secondary frame pivoted within said limbs around a horizontal axis, the upper end of said secondary frame being open and the lower end having a cross connecting element, said secondary frame adapted to receive a shoe disposed at the open end of the secondary frame with its sole portion at right angles to the plane of said frame, a member adapted to be positioned within said shoe to hold it and extending to the cross connecting element to support the shoe in position, a mold-supporting plate adjustable on the top of the secondary frame so that it is adapted to be in a plane substantially coincident with the sole portion of the shoe, said plate being U-shaped and adapted to surround partly the front and sides of the shoe at the sole level, the limbs of the plate being supported from the top ends of said secondary frame, a dependent leg member connected at its top to the base of the plate, said leg member extending downwardly and then horizontally to a position adjacent the cross connecting element, and adjustable means on the lower end of said leg member and associated with the cross connecting member to adjust the leg with respect to the secondary frame whereby the plate

may be adjusted with respect to the shoe, mold strips adapted for disposal around the sole portion and heel portion of the shoe, means on the plate adjustable to bear against the strips to hold them in conformity with the shape of the sole and heel portions, another adjustable plate adjustably mounted on the dependent leg member and having a tapered forward end which is adapted to be moved into bearing relation with the outer surface of the toe portion of the shoe upper to support this portion, and an elastic strip connection to the forward end of the last mentioned adjustable plate, such elastic strip connection adapted to extend along the sides of the shoe and to pass around the mold strip which is adapted to extend around the heel portion of the shoe to hold said mold strip resiliently in proper position.

9. In a device of the class described, a main U-shaped frame with spaced limbs normally lying in a vertical plane and mounted to rotate around a vertical axis, a secondary frame disposed pivotally within the limbs of the main frame and rotatable thereon on a horizontal axis, a sole plate disposed within said secondary frame, a clamping member adjustably mounted on the bottom of said secondary frame, an upright rod, one end of which is ball-shaped and adjustably received in the clamping member and the other end of which is connected to said sole plate, said secondary frame adapted to receive a shoe supported on said sole plate with its sole and heel portions facing upwardly, the alignment of the heel portion with relation to the sole portion being determined by adjustment of the rod and clamping member, a mold-supporting plate mounted on top of said secondary frame and adapted to surround partly the sole portion, and means associated with said mold-supporting plate and said secondary frame to adjust said mold-supporting plate with respect to said shoe.

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