

Dec. 20, 1955

J. D. CHANDLER ET AL

2,727,257

MACHINE FOR OPERATING ON SHOES

Filed June 1, 1953

7 Sheets-Sheet 1

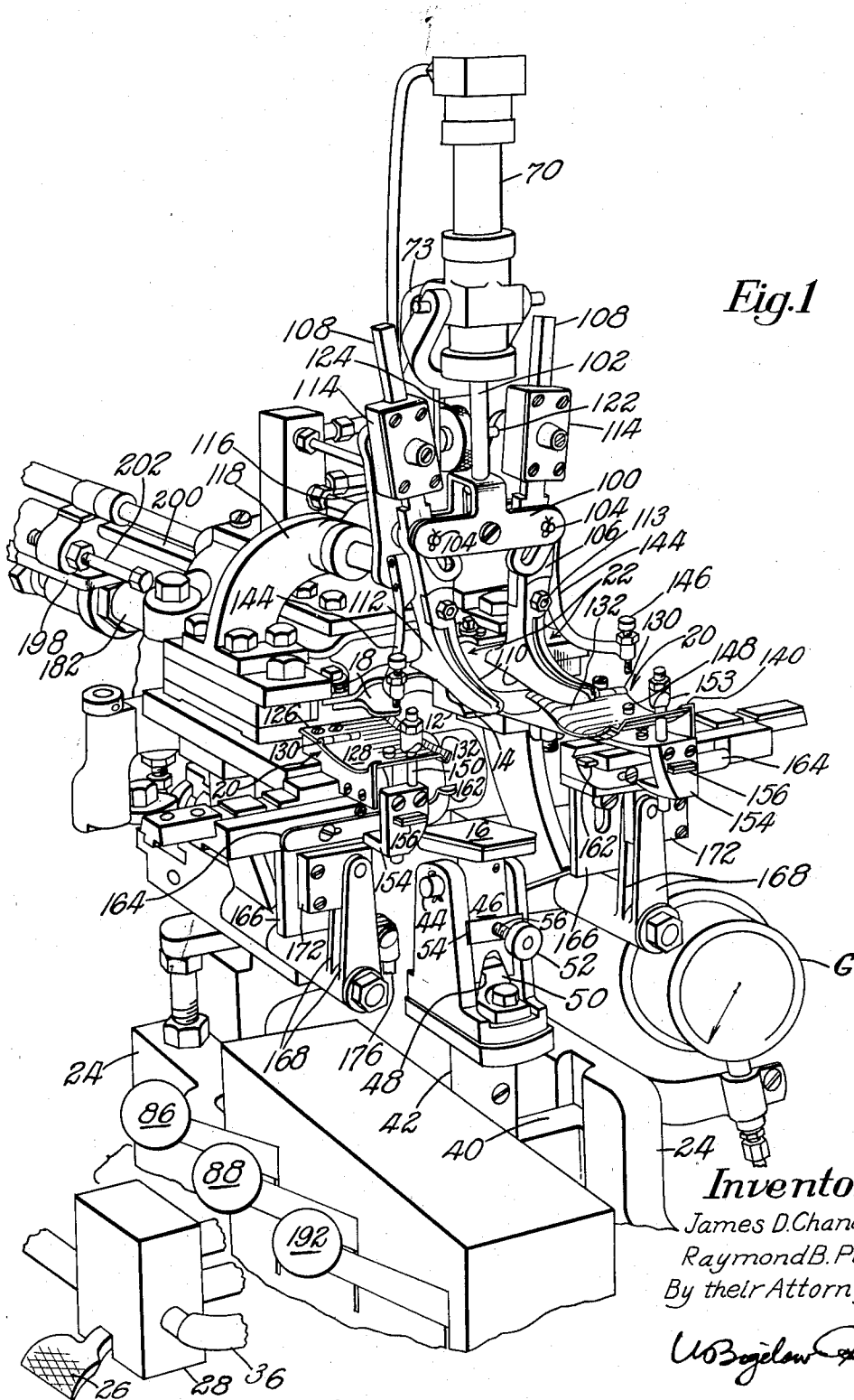


Fig. 1

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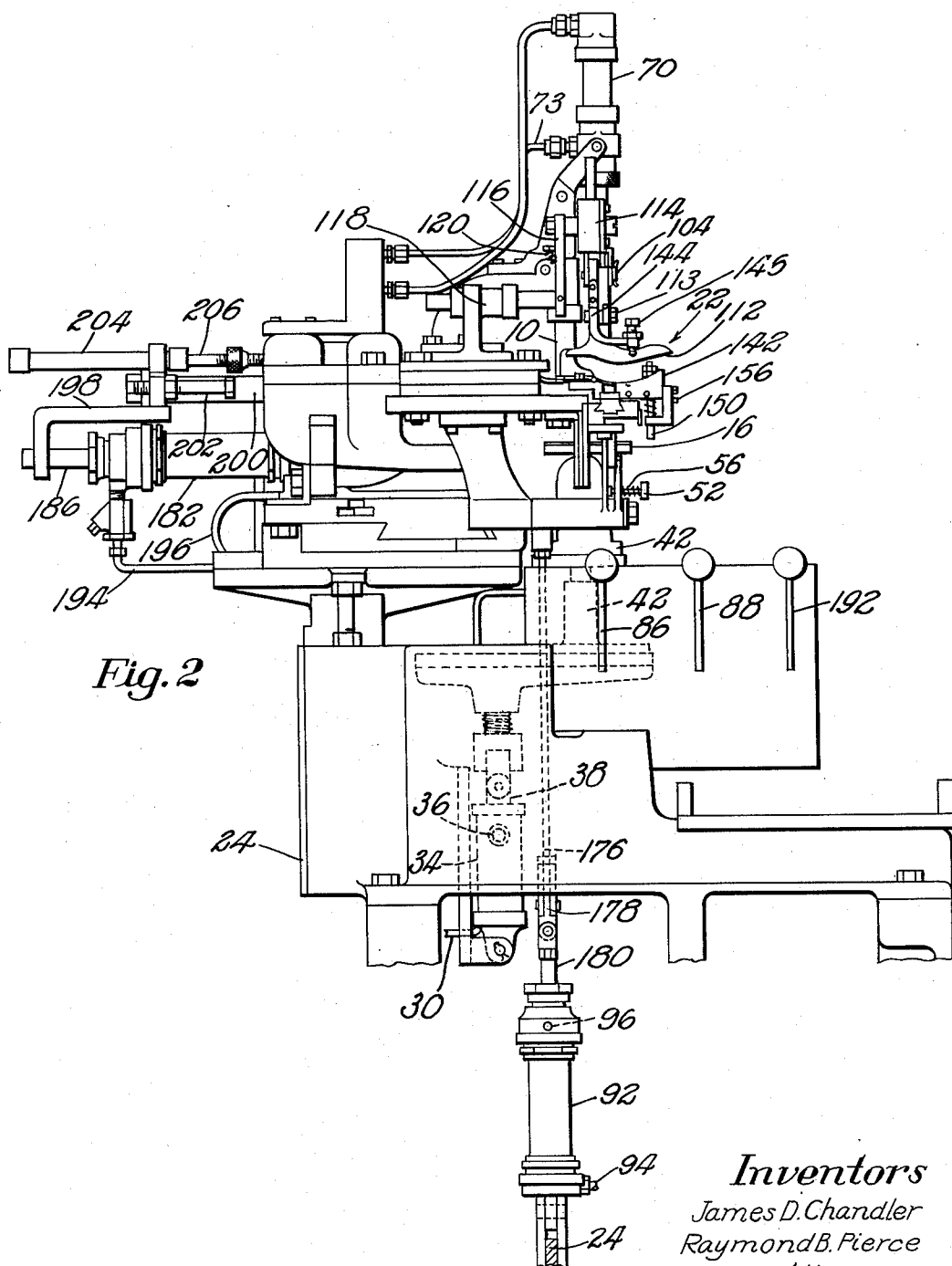
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7 Sheets-Sheet 3

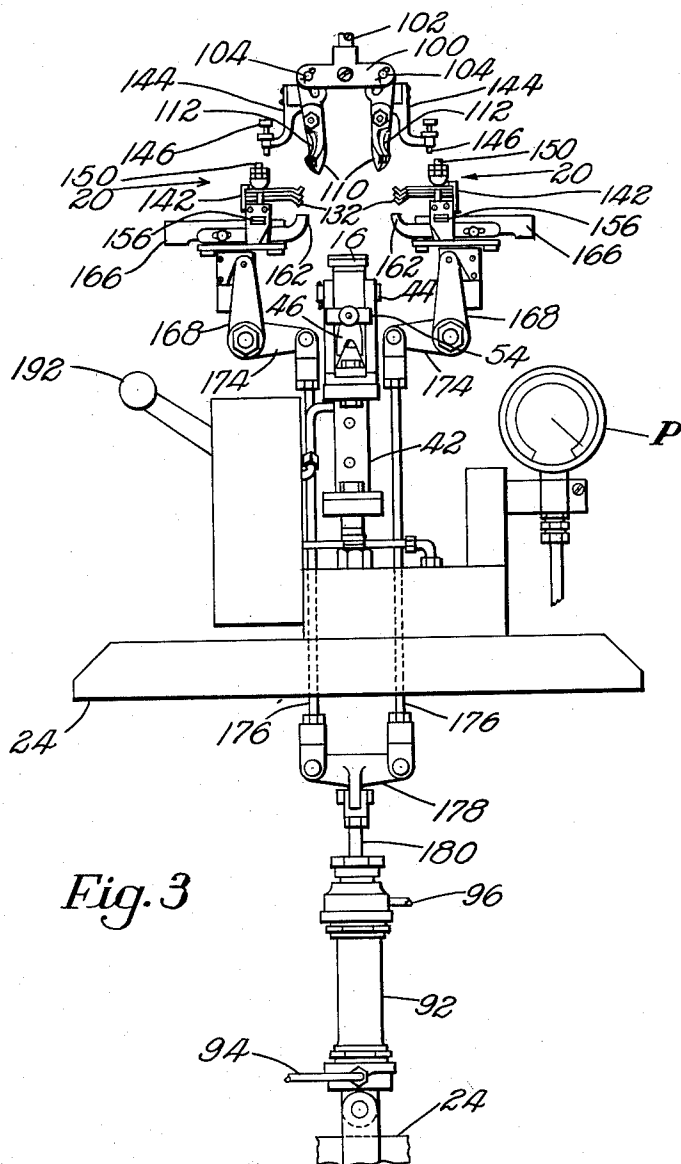


Fig. 3

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7 Sheets-Sheet 4

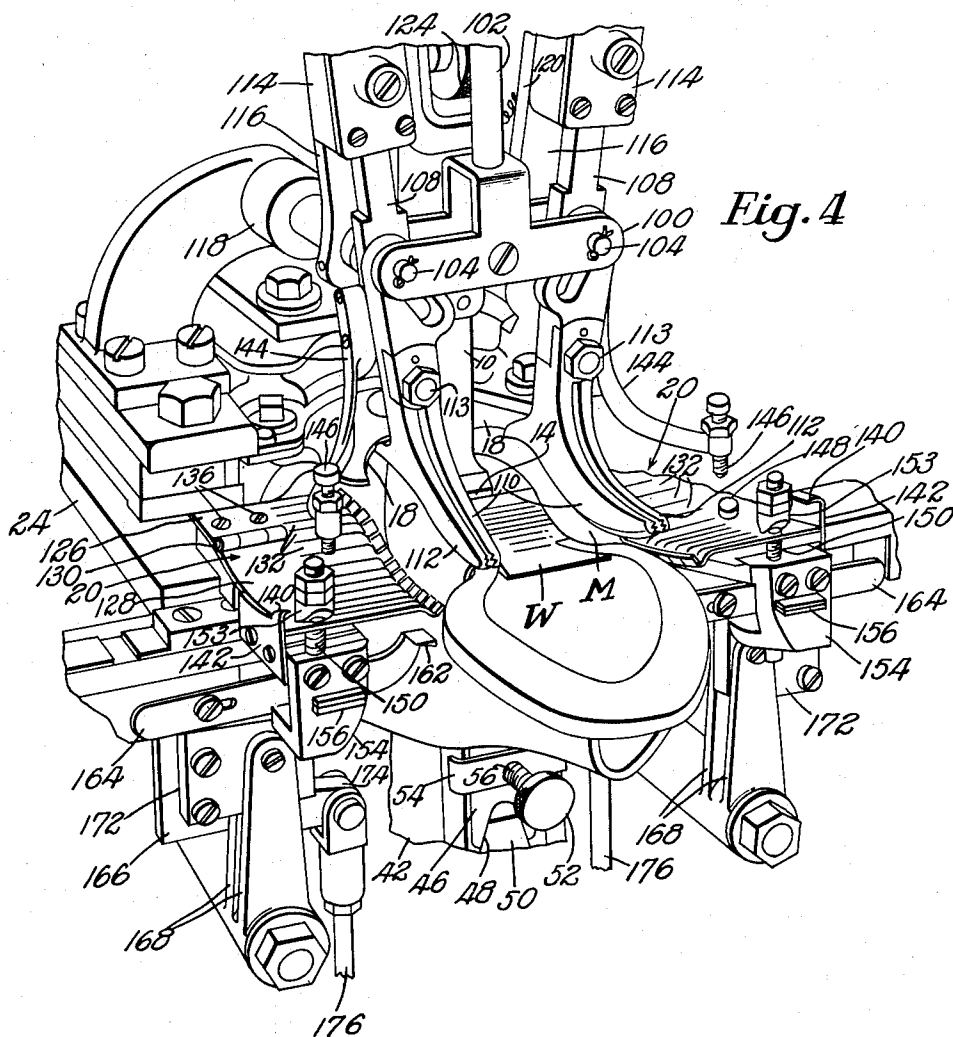


Fig. 4

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7 Sheets-Sheet 5

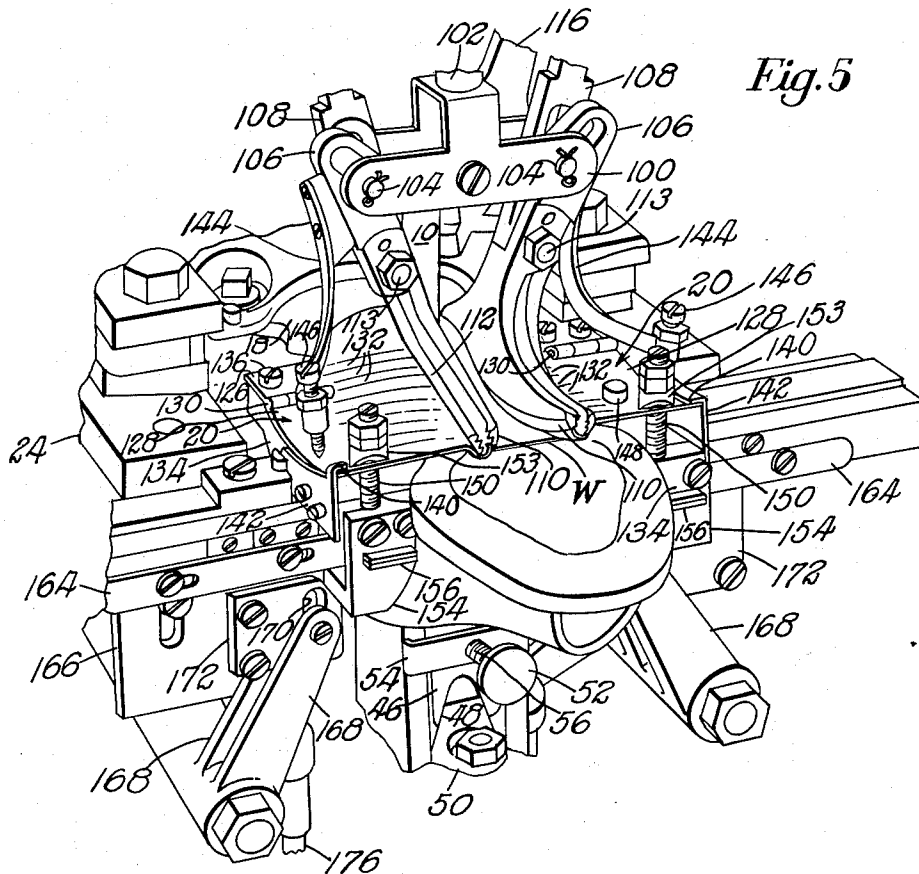


Fig. 5

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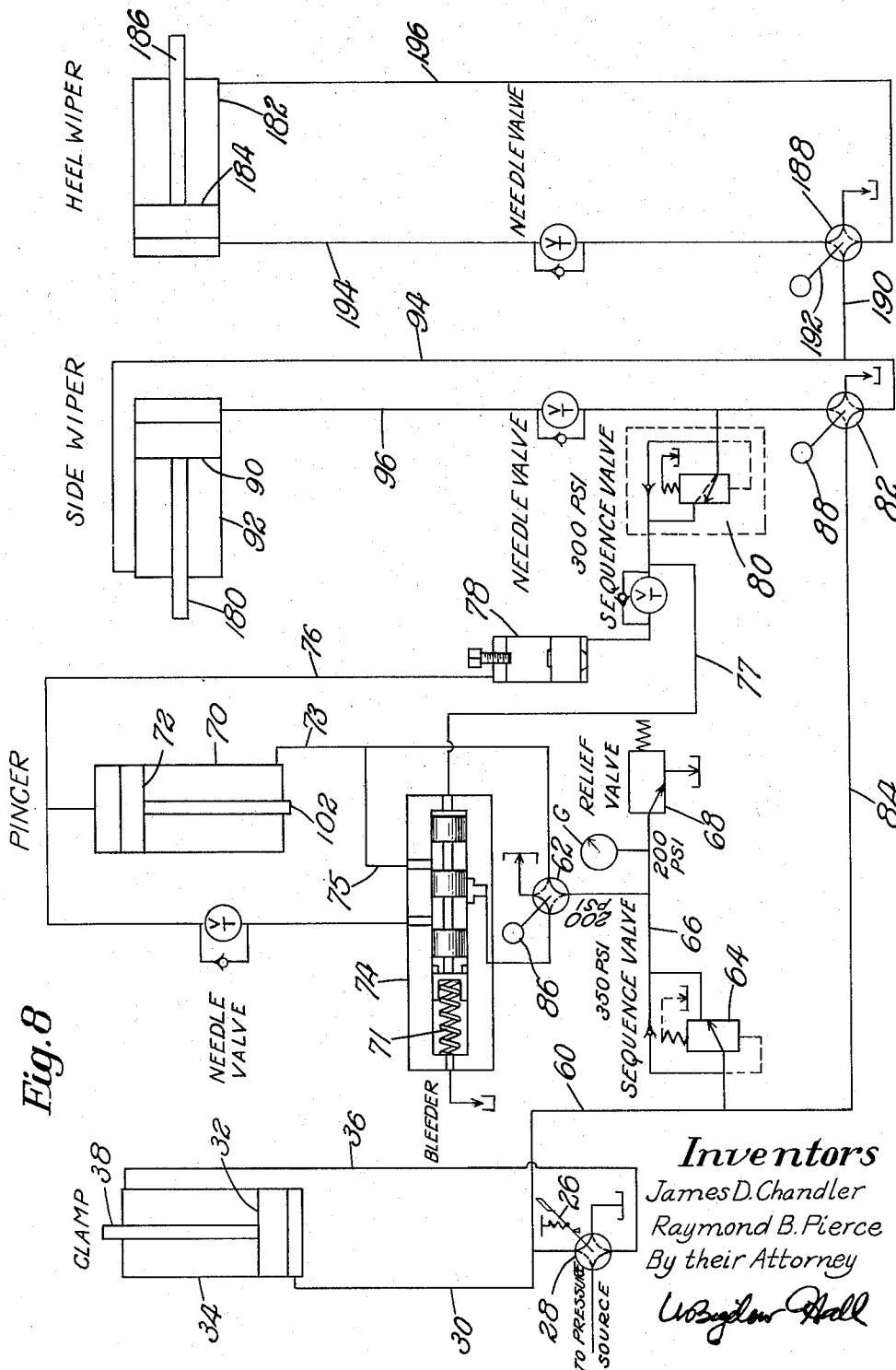
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7 Sheets-Sheet 7



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MACHINE FOR OPERATING ON SHOES

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Application June 1, 1953, Serial No. 358,634

14 Claims. (Cl. 12—1)

This invention relates to lasting machines, and more particularly to a machine for lasting the shank and heel end portions of a shoe. Although the invention is herein illustrated and described as embodied in a machine principally designed for "lasting" shoes of the platform type while off the last, it is to be understood that in many of its novel aspects the invention is not so limited in use but may well have application, for example, to the lasting of conventional types of shoes. It will further be understood that structural aspects of the invention are not limited to the particular machine construction herein disclosed.

As used herein the term "lasting", whether in quotation marks or not, is intended to refer generally to that operation or series of operations in the manufacture of footwear by means of which an upper or wrapper, including plies associated therewith if any, is drawn over a shape-imparting form such as a last and/or is caused to conform to a sole or heel member, such as a platform sole or wedge heel. Thus, in addition to being applicable to conventional lasting wherein the margin of an upper is tensioned and wiped over a last, the term "lasting" herein will convey a broader meaning understood by those skilled in the art and accordingly be construed, for example, to apply to the tensioning and wiping of cover material over a wedge heel or a platform sole.

A primary object of the invention is to provide an effective and easily operated machine having improved means for laying the lasting margin of a platform cover and/or the upper material of a shoe inwardly over the bottom of the shoe at the opposite sides of its shank and at the heel end. With this purpose in view, and as a feature of the invention, the illustrative machine is provided with a pair of articulate wiper members each having a portion constructed and arranged for relative adjustment about an axis extending widthwise of a shoe substantially to conform it to the contour of contiguous portions of a shoe bottom. In the illustrative machine shown, one of these wiper members is arranged for widthwise operation on one side of the shoe bottom and another is arranged for similar operation on the other side of the shoe bottom. More particularly, having operation on the wedge heel type of shoe in mind, each of the wipers comprises a first portion adapted to wipe upstanding marginal platform cover material inwardly over the heel portion of a wedge heel, and a second portion shaped to conform substantially to the heightwise curvature of the adjacent shank portion of the shoe bottom, the second portions being adjustable relatively to the first portions about a common axis extending widthwise of the shoe and then being movable widthwise with the first portions to wipe the upstanding marginal cover material inwardly over the shoe bottom in the portions forward of the heel. In this connection it is to be noted that in the production of wedge heels large runs of sizes of heels which are of different heights will have their shank portions formed by a rotary shank cutter which, for each style of shoe, will normally be of just one profile. The cutter is commonly cylindrical

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and of predetermined radius. Regardless of variations in height, the shank portions, sometimes known as "scoops" or "tunnels," of the different sized heels are formed by swinging or adjusting the cutter for the different sizes about the front edge of the heel portion of the wedge. Advantage is taken of these facts in that, in the machine shown, the pair of articulate wipers employed is readily detachable and, on occasion, substitute pairs of different heightwise curvature may be interchanged, their shank wiping portions being shaped heightwise to correspond to the curvature of the formed or cylindrical shank cutter which produced the wedge heels of the shoes to be lasted.

Means comprising a holddown clamp engageable with the wedge heel of a shoe to be lasted is afforded to hold the shoe, on or off its last (shown off the last in the drawings), in position to be operated upon. Conveniently to assure that a wedge heel shoe may be readily clamped in correct position with respect to the shank and heel end wiping means regardless of its size, style, or heel height, the front or heel breast edge of the heel portion of the wedge may be spotted in alinement with the front face of the holddown clamp, and the heel breast edge of the wedge is then in proper alinement with the widthwise hinge axes of the side or shank wipers. Moreover, the wiper members operative on the clamped heel portion, including a pair of heel extremity wipers, are positioned properly heightwise with respect to said holddown clamp.

Since the illustrative machine is largely intended for the lasting of wedge-heel type shoes it is also provided with a pair of grippers cooperative with the articulate wipers and movable heightwise for seizing and tensioning the lasting margin of platform cover or upper material of the stock to be lasted on opposite sides of the shoe bottom in its heel and shank areas. In the machine shown each gripper accordingly comprises a pair of cooperative jaws extending lengthwise of the shoe at the opposite sides of the heel and shank portions, the respective jaws of each pair being of novel curvature in that edges thereof have a general lengthwise and heightwise contour substantially the same as said heel and shank portions.

In the machine herein shown the shank wiping members are moved heightwise of the shoe away from its bottom face at the end of their inward wiping movements and are maintained in their elevated positions as they are moved reversely to their initial outward positions in order to avoid any danger of loosening the overwiped margin of the stock by engagement of the wipers therewith. As a further feature the invention provides means for automatically moving the shank wiper members heightwise of the shoe toward its bottom face and for variably determining the positions of the shank wipers relatively to the heel wipers and the bottom face of the shank portion of the shoe bottom before the heel and shank wipers begin their inward wiping movements. For this purpose, and since these shank wipers are to engage the tensioned cover or upper material beneath the grippers and above the curved shank surface of the wedge heel, mechanism herein shown as actuated by the grippers is arranged yieldingly to determine the operative level of both shank wiping members about their widthwise axes where they are held locked until their inward wiping movements have terminated and other novel means provided become operable to release them.

Another important object of the invention is to provide a simplified and easily controlled fluid pressure system for effectively operating the above-mentioned shoe engaging devices. To this end the shoe clamping means, grippers, side or shank wipers, and the heel extremity wipers of the machine herein disclosed are individually operated by hand-controlled valves respectively governing corresponding pistons in hydraulically interconnected

cylinders and several desirable safety features, herein-after mentioned, are thereby derived.

The above and other features of the invention, including novel combinations and arrangements of parts, will now be more particularly described in connection with an illustrative embodiment and with reference to the accompanying drawings, in which,

Fig. 1 is a perspective view of the illustrative lasting machine in starting position, portions of its base and a rearward extremity being broken away;

Fig. 2 is a view in left-hand side elevation of the machine shown in Fig. 1, its base being omitted;

Fig. 3 is a view in front elevation and somewhat schematic of the shank wipers and associated operating mechanism;

Fig. 4 is a perspective view, and on an enlarged scale of a portion of the machine shown in Fig. 1, a wedge heel type of shoe being shown clamped in position to be operated upon, and the relative positions of the operating parts of the machine being shown at that stage in the cycle when the shank wipers have been positioned heightwise in readiness for wiping and the grippers have moved to tension the stock of the lasting margin;

Fig. 5 is a view similar to Fig. 4 but showing the parts at a later stage in the lasting operation, namely after the inward wiping movement of the shank wipers and their release to elevated condition;

Fig. 6 is a view in side elevation of some of the shoe engaging parts as seen after shoe clamping and heightwise adjustment of the shank wiper preparatory to its operation, the shoe being shown in longitudinal section;

Fig. 7 is a detail view in side elevation, and on a larger scale than employed in Fig. 6, of the articulate side wipers in their rest positions and parts associated therewith, the latter being largely in section; and

Fig. 8 is a schematic diagram of the hydraulic control system of the machine, the parts being indicated in their initial rest or starting positions.

The machine illustrated in the drawings is a hydraulically powered heel and shank lasting machine and will be described as employed in operating on the prementioned lasting margin M upstanding from a slip-lasted shoe bottom, as best indicated in Fig. 6, around the heel end and in the shank portions, the shoe having a wedge heel W (Figs. 4, 6) and being off a last. The machine comprises, in its head portion, a fixed heel holddown or abutment 10 (Fig. 6) having a flat, corrugated wedge heel engaging surface 12 (Fig. 1) and a vertical widthwise-extending front face 14 (Fig. 4) the latter, serving as a work-positioning gage, to be referred to subsequently. The machine also comprises a shoe support 16 cooperative with the abutment 10, a pair of detachable heel end extremity wipers 18, 18 of conventional form arranged to operate rearwardly of the abutment 10, a pair of articulate side or shank wipers generally designated 20, 20 arranged to operate widthwise, respectively, on opposite sides of the shoe bottom, and a double pair of grippers generally designated 22, 22 movable heightwise of the shoe and widthwise of its bottom. These shoe-engaging instrumentalities are mounted in the head of a machine frame 24 which, in its base, affords a sump (not shown) containing a reservoir of fluid such as oil and a pump (not shown) for supplying a flow of said fluid under suitable pressure indicated by a gage P (Fig. 3) to pistons arranged to operate the respective instrumentalities as will be described.

Vertical movement of the support 16 to engage the inside of the shoe bottom on its insole or sock lining I (Fig. 6) and thus to clamp the wedge heel end against the abutment 10 in preparation for lasting is effected by depression of a treadle 26 (Fig. 1). The latter may normally be located near the floor at the front of the machine thereby conveniently to permit foot operation of a four-way valve 28 having line connection with the source of fluid pressure. In order properly to locate the inverted

shoe in the machine an operator grasps the forepart of the shoe and first spots its heel end manually with reference to the abutment 10, i. e., the face 14 is alined with the heel breast edge of the wedge heel with the surface 12 located substantially equidistant from the side edges of the heel. On depression of the treadle 26 to move the valve 28 to the dotted line condition indicated in Fig. 8 pressure fluid flows in a line 30 and is admitted to one side of a piston 32 fitted in a cylinder 34 (Figs. 2, 8) which is provided with an exhaust line 36. The piston 32 is accordingly moved upwardly with its piston rod 38 and a slide 40 (Fig. 1) connected thereto and arranged in guideways formed in the frame. Integral with the slide is a post 42 bifurcated at its upper end to receive a fulcrum pin 44 which extends widthwise through a bore of somewhat larger diameter in a stem 46 to which the support 16 is affixed. The latter is thus permitted to adapt its inclination about a widthwise axis to that of the spotted wedge heel W (or the heel cone of a last, if necessary) to be clamped thereby, the stem having an inverted V-portion 48 adapted to lock the self-adjusting support in clamping relation to a V-shaped wedge 50 bolted to the post. Until the stem is locked in shoe clamping relation to the wedge 50, a compression spring (not shown) in the latter tends to hold the stem in a semifloating condition facilitating its adjustment. To take up play and limit pivotal movement of the stem in one direction an adjusting bolt 52 extends through an arm 54 straddling the post, the bolt 52 being threaded into the stem 46 and receiving a compression spring 56 abutting the arm and the bolt head.

The shoe having been firmly clamped in operating position against the surface 12, fluid pressure builds up in a line 60 (Fig. 8) connected to a four-way pincer control valve 62 through a sequence valve 64 and a line 66, the latter ending in a relief valve 68. One purpose of the valves 64 and 68 is to afford means for varying the gripping pressure of the pincers or grippers 22, 22 to accord with the requirements for seizing different types of stock without marring them. Interposed between the gripper control valve 62 and one end of a cylinder 70 fitted with a piston 72 arranged to operate the grippers is a shuttle valve 74 having a function later to be explained, while leading from the same end of this cylinder is a line 76 which comprises a measuring cylinder 78 and a sequence valve 80 and is connected to one side of a four-way side or shank wiper-operating valve 82. The cylinder 70 is provided with an exhaust line 73 having a bleeder line 73 running to the shuttle valve 74 and the latter is also connected at one end by a line 77 with the line 76 for reasons subsequently mentioned. A line 84 connects the valve 82 with the line 60. The four-way valves 62 and 82 are respectively operated by conveniently located hand levers 86, 88 (Figs. 1, 2, 8). Further consideration will be given to the hydraulic system after the associated pincer and shank wiper mechanism operated thereby are described in more detail, it now merely being noted that a piston 90 fitted in a cylinder 92 is arranged to operate the shank wipers 20, 20, a line 94 connecting one side of the piston 90 with the line 84, and a line 96 connecting the other side of that piston to exhaust through the valve 82.

The mechanism herein used for controlling the opening and closing of the grippers 22, 22 is essentially as fully disclosed in United States Letters Patent No. 2,201,866, granted May 21, 1940, upon an application of R. H. Lawson, and will therefore be only briefly described here. A crosshead 100 (Fig. 1) actuated vertically by a piston rod 102 connected to the piston 72, carries at each of its ends a pin 104 (Figs. 1, 4, 5) (corresponding to Lawson's pin 280) engaging relatively inclined slots in cooperative jaw members 106, 108 at the lower ends of which are formed respectively serrated jaws 110, 112. The arrangement is such that during operation of the machine the pins 104, during the up and down movements of the actuating crosshead 100, move with relation to their respective jaw members 106, 108 to close or open the jaws, which are pivoted

together on pins 113, and then move the jaws away from or towards the shoe, the jaws being held from bodily movement while being closed or opened by the frictional engagement of a spring-pressed plunger (not shown, but corresponding to Lawson's spring-pressed plunger 286) in a housing 114 with an upward extension of the jaw member 108. To permit widthwise swinging movement of the jaw members 106, 108, each housing 114 is pivotally secured to the upper end of one arm of a bell crank lever 116, the other arm of which is rotatable in a bearing bracket 118 secured to the machine frame. A tension spring 120 (Fig. 2) connects each of the levers 116 with a central portion of the frame thereby tending normally to hold the pairs of grippers 22, 22 separated to an extent determined by endwise movement of screws 122 (Fig. 1) controlled by a thumbwheel 124 and engageable endwise with the housings 114. The jaws 110, 112 extend lengthwise over opposite side edges of the clamped shoe and are shaped to conform generally to the contour of the heel and shank portions thereof. The shank curvature of the respective grippers 22, 22 is preferably of a diameter equivalent to that of the largest circular cutter normally employed in forming wedge heels of the common styles since, for a purpose later explained, it is desired at one stage in the lasting operation to enable the forward portion of each set of jaws 110, 112 to act as a gage by contacting the forward edge portion of the wedge heel W.

The shank wipers 20, 20 each comprises a pair of articulate plates 126, 128 (Figs. 1, 4, 7) hinged about a common axis indicated at 130 and having flexible steel fingers 132 extending widthwise of the machine. The construction and arrangement of each side or shank wiper 20 as well as its associated mechanism being identical, it will suffice if description in this regard be limited to a single wiper. The articulated wiper is detachably secured to the upper part of a slide 134, screws 136 extending through the plate 126 for this purpose. The plate 126 and its fingers 132 are generally flat and adapted to overlie the flat heel portion of the wedge W (though it will be recognized in other instances that the plate 126 may have a heightwise curvature), whereas the plate 128 and its fingers have a heightwise curvature corresponding substantially to the shank curvature of the wedge, and their hinge axis at 130 is thus aligned with the face 14 (see Fig. 6) and adapted to correspond in relative position with the heel breast edge of the wedge. Inner portions of the fingers 132 are provided with upturned ends adapted to engage the cover or upper stock to be lasted without marring it. For normally holding the curved shank wiper plate 128 elevated it is engaged by a compression spring 138 (Fig. 7) seated in the slide 134, a projection 140 formed on a plate 142 secured to the slide being arranged to limit heightwise movement of the wiper plate in one direction (Figs. 1 and 5).

For automatically determining the heightwise operating position of the wiper plate 128 prior to widthwise movement of the wipers 20, 20 inwardly over the shoe bottom, an arm 144 affixed to a jaw member 108 is provided at its lower end with a threaded vertical bore for receiving an adjusting screw 146 adapted to engage a button 148 fast on the plate 128 and thereby swing the latter downwardly as the grippers move downwardly. The proper extent of such downward movement of the shank wipers is determined for a given wedge heel shoe bottom by the adjustable heightwise relation between the lower end of the screws 146 and the forward ends of the jaws 110, 112, the latter being limited in downward movement by their engagement with the forward portion of the clamped wedge heel W. It is normally desirable so to adjust the screws 146 that the inner ends of the fingers 132 of the plates 128, when depressed as described, will be deflected slightly upward and over the edge of the shoe on engaging the stock to be lasted. For holding the plate 128 at a depressed operating level during the wiping movement a locking device is provided comprising a post 150 ver-

tically extending through the plate 128 and the slide 134. A pin 152 (Fig. 7) mounted transversely in the post 150 and extending beneath the wiper plate 128 assures that the post 150 will be lowered therewith. A locknut 153 threaded on the upper end of the post and having a non-binding V-shaped surface engaging the plate above the pin 152 serves to support the post for upward movement with the plate. An L-shaped bracket 154 secured to the slide 134 supports a binder plate 156 having a bore 158 for receiving the slightly smaller-diametered post 150. A compression spring 160 on the post and abutting the bracket 154 and the plate 156 yieldingly urges the latter upwardly so that the walls of the bore 158 normally tend to bind with and cramp the post 150 and prevent its return upward movement. When the shank wiping has been completed and the shank wiper 20 is moved outwardly, the plate 128 is automatically released to its normal elevated position as influenced by the spring 138 by a stationary wedge shaped cam finger 162 (Fig. 4). The latter is arranged on the inner end of an arm 164 adjustably mounted on the frame 24, the finger 162 being adapted toward the end of the inward movement of the wiper 20 to cam the cramping end of the plate 156 downwardly sufficiently to release the post 150.

For carrying the wiper plates 126, 128 widthwise together each of the slides 134 is secured on the upper portion of a plate 166 accommodated in a laterally extending guideway formed in the frame. A pair of parallel upwardly extending arms 168, 168 (Fig. 5) of a bell crank fulcrumed on a bearing extending forwardly from the machine frame is arranged to carry a pin in a vertical slot 170 formed in a block 172 secured to the plate 166. A lower arm 174 (Fig. 3) of the bell crank lever has pivotal connection with an upper end of a rod 176 connected to an extremity of a cross-head 178. The latter is actuated heightwise to control side wiping movements by a piston rod 180 extending upwardly from the piston 90.

Resuming consideration of the hydraulic operating mechanism, that portion actuating the heel end extremity wipers 18, 18 will now be described. Referring to Figs. 2 and 8, a cylinder 182 affixed to the rear of the machine is fitted with a piston 184 and a piston rod 186. A valve 188 is connected to the valve 32 by a line 190 and, when moved by a hand control lever 192 (Figs. 1, 2 and 8) to the dotted position shown in Fig. 8, is effective to close the wipers 18, 18 over the heel end of the shoe by admitting pressure fluid into a line 194 connected to the cylinder 182. The latter is connected to exhaust by a line 196. As seen in Fig. 2, the pressure admitted via the line 194 moves the piston 184 and the rod 186 to the right. Accordingly, a link 193 fast on the rod 186 and secured to an end of a heel wiper-operating arm 200 shifts the latter endwise toward the shoe to operate the wipers 18, 18 in conventional manner over the heel end of the wedge heel and thus complete the lasting operation. Operation of the arm 200 and its wiper mechanism may be presumed to be similar, for example, to that of the wiper operating rod (designated 77) and associated parts fully disclosed in United States Letters Patent No. 1,018,477, issued February 27, 1912 to M. Brock. An adjustable stop screw 202 threaded into the link 193 is arranged to abut the frame and thus limits movement of the arm 200 toward the shoe. On moving the hand lever 192 to turn the valve 188 to the full-line position indicated in Fig. 8, pressure fluid admitted to the line 196 reverses the piston 184, its rod 186 and the link 193, the latter carrying a dashpot 204. A plunger 206 threaded in a bore in the frame cooperates with the dashpot to cushion reciprocation of the heel end wiper operating mechanism.

Successive steps in the operation of the machine to last the heel and shank portions of the wedge heel shoe will now be briefly reviewed. The inverted shoe is spotted with the leading edge of the heel end of the wedge W in line with shank wiper axes 130, 130 and this is done by

centrally positioning said heel end with respect to the face 14 as above stated. The shank wipers 20, 20 will have been selected for use having in mind that their heightwise curvature corresponds to that of the shanks of the shoes to be lasted. The operator then clamps the shoe in operating position by depressing the treadle 26 to shift the valve 28 to its dotted line position thereby causing the support 16 to be elevated by the piston 32 until the heel end of the wedge is engaged and held securely against the abutment surface 12. The lever 86 is then moved to shift the valve 62 to its dotted-line position shown. As the cylinder 70 is exhausted via the line 73, the piston 72 is displaced (downwardly in Fig. 8) to force the crosshead 100 downwardly until the grippers 22, 22 engage the forward portions of the wedge W, the sets of jaws 110, 112 opening prior to their descent. The screws 146 will have been adjusted heightwise so that as they reach their limit of descent with the jaws and are in engagement with the buttons 148, the shank wiper plates 128 are thus automatically depressed to the extent required for their fingers 132 subsequently to engage the lasting margin M and yieldingly press it downwardly on the shoe bottom. After the upturned ends of the fingers 132 are deflected upwardly and over the shank edges of the insole, the fingers will by their resilience wipe the cover or upper material snugly inward over the shoe bottom. During the subsequent inward wiping action the plates 128 and their fingers 132 will be held in their adjusted positions by the cramping action of the plates 156 on the posts 150 as above described, the fingers retaining their yieldability heightwise for the subsequent wiping operation only by reason of their flexibility. Now, to tension the heel cover on opposite sides of the shank wedge portion of the heel, the lever 86 is moved to shift the valve 62 to its solid-line position indicated in Fig. 8 and, in response to admission of fluid pressure to the line 73, the piston 72 elevates the crosshead 100 and acts in conjunction with the friction devices in the housings 114 first to close the gripper jaws 110, 112 on the stock and then to elevate them. The degree of tension is determined by the setting of the relief valve 68, the sequence valve 64 maintaining pressure in the line 84. A gage G (Figs. 1, 8) indicates the adjusted tension being used on different types of stock.

To cause the piston 90 to advance the adjusted shank wipers 20, 20 inwardly, the operator next shifts the valve 82 to its dotted-line position. Resultant downward movement of the rod 180 and the crosshead 178 effects pivotal movement of the bell crank arms 168 to carry the shank wiper-carrying plates 126, 128 inwardly on both sides of the shoe bottom. When the inward movements of the wiper fingers 132 are stopped or sufficiently slowed by engagement of their curved leading edges with the tensioned marginal cover material held by the grippers 110, 112, the latter yieldably swinging inwardly as urged by the wiper fingers, pressure in the line 96 builds up and operates the sequence valve 80, the latter being adjusted to open at a suitable pressure lower than the sequence valve 64. With the valve 80 open, fluid pressure in the line 77 is effective to shift the shuttle valve 74 from the position shown and against the resistance of a spring 71 (Fig. 8) thereon, the line 73 then permitting the cylinder 70 on one side of the piston 72 to be opened gradually to exhaust via the bleeder line 75 and trapping fluid on the other side of the piston 72. Thereafter the piston of the measuring cylinder 78 is displaced (upwardly as seen in Fig. 8) by the pressure increasing in the line 76 to admit, at a rate controlled by a needle valve, an adjustably measured volume of fluid into the cylinder 70 whereby its piston 72 is forced gradually to effect opening and release of the grippers 110, 112 from the tensioned stock and thereby allow the shank wipers to continue their inward wiping movement. Toward the end of the inward movement of the slide 134 the cam finger 162 engages and cams the plate 156 downward to release the post 150

from the walls of the bore 158 and thus permits the plate 128 to be raised by the spring 138. The precemented lasting margin having thus been tensioned and wiped inwardly on opposite sides of the bottom of the wedge W, the operator moves the hand lever 88 to return the valve 82 to its original (solid-line) position and thus retracts slides 134 with the shank wipers by means of the return movement of the piston 90. The line 96 then being open to exhaust, pressure in the lines 76 and 77 is permitted by check valves to be reduced and the spring 71 accordingly returns the shuttle valve to its original condition. With the line 75 thus cut off from exhaust, restoration of pressure in the line 73 again returns the grippers to their elevated position without adjustment of the hand lever 86. To complete the lasting operation the valve 188 is moved to the dotted line position shown to cause the piston 184 to advance the heel wiper operating arm 200 toward the shoe and thus close the wipers 18, 18 inwardly over the wedge W around the heel end. The piston 184 cannot be operated to actuate the wipers 18, 18 until the shank wipers 20, 20 have been retracted from the shoe by the just-mentioned return of the valve 82 to its solid-line position, pressure then being supplied to the line 190. By finally returning the valve 188 to solid-line position to retract the wipers 18, 18 and then permitting the depressed treadle 26 to rise so that the valve 28 is in its normal solid-line position, the piston 32 moves the support 16 from the shoe to release it from the machine and all parts are in their starting positions as shown in Fig. 1.

It will be noted that fluid under pressure is not available for operating the pistons 72, 90, and 184 until a shoe has been clamped in operating position and consequently the risk of an operator or a shoe being harmed by the premature or accidental operation of the several instrumentalities is considerably reduced. Also, advantageously, the pairs of jaws 110, 112 cannot be released from the tensioned lasting margin until the shank wiping fingers 132 have advanced to engage the tensioned lasting margin of the platform cover.

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

1. In a machine for operating on shoes of the wedge heel type, shoe supporting means, wipers adjacent to said supporting means for wiping the marginal portion of stock at the opposite sides of the heel end and shank portion of a shoe inwardly over its bottom face, said wipers each including two portions relatively adjustable heightwise of the shoe about an axis extending widthwise of the supported shoe to accommodate shoes having wedge heels of different heights, means for determining the adjusted position of said wiper portions by engagement with a surface of the shoe bottom, and means for imparting to said wipers their inward wiping movements.

2. In a lasting machine, hinged wipers at opposite sides of a shoe movable widthwise thereof to lay the lasting margin of stock to be lasted inwardly over the heel end and shank portions of the shoe bottom, said wipers having a common hinge axis extending widthwise of the shoe, one portion of each of said wipers being arranged and adapted to operate on the bottom of the heel end of the shoe and the other portion of each wiper having a heightwise curvature which substantially corresponds to that of the bottom of the adjacent shank portion of the shoe, means adjacent to said wipers for supporting the shoe to hold its heel breast edge substantially in alignment with said hinge axis, and means for swinging said other wiper portions heightwise about their axis and into operative level with respect to their adjacent shank portions.

3. In a lasting machine, a shoe support, a pair of coaxially hinged wipers spaced at opposite sides of a shoe on said support to be lasted and movable widthwise thereof, that portion of each of said wipers on

one side of their hinge axis being adapted to wipe inwardly the lasting margin of stock to be lasted over the bottom of the heel end of the shoe and that portion of each of said wipers on the other side of their axis being yieldingly swingable heightwise and curved heightwise substantially in accordance with the heightwise curvature of the shank area of the shoe bottom, a shoe clamping member engageable with the heel end of the shoe on said support to hold the shoe in fixed position relative to the hinge axis of said wipers, means acting on said curved wiper portions to swing them about said axis and into positions for wiping the shank area of the shoe bottom, and means for releasably holding said curved wiper portions at their respective adjusted levels during the wiping movements of said wipers.

4. In a lasting machine, means including a shoe positioning member engageable with the bottom of the heel end of a shoe to hold it in position to be operated upon, a pair of resilient, hinged wipers mounted one at each side of said means for wiping movement inwardly over the bottom of the shoe so held with their respective hinge axes aligned, a portion of each of said wipers being curved heightwise of the shoe substantially to conform to the heightwise curvature of the bottom of the shoe in the adjacent shank area, means adjacent to said wipers and operative prior to the inward wiping movement of the wipers and with reference to the adjacent shank areas of the positioned shoe for adjusting said curved wiper portions heightwise of the shoe about their hinge axis, and means for again effecting movement of said curved wiper portions heightwise of the shoe from their adjusted positions prior to their return movement outward from over the shoe bottom.

5. In a lasting machine, a pair of wipers spaced one at each side of a shoe for widthwise movement toward and away from one another, each of said wipers including two portions having a common hinge axis extending widthwise and respectively provided with a plurality of resilient fingers extending widthwise, the fingers of one portion of each wiper lying substantially in a plane and the fingers of the other portion of each wiper being individually flat but lying in a general heightwise curve corresponding substantially to the heightwise curvature of the bottom of the shank area of the shoe, means mounted for movement intermediate the wipers for supporting the shoe with its heel end lying substantially in the plane of the planar fingers and its heel breast edge extending in fixed relation to the hinge axis of the wipers, means cooperative with the margins of the shank area of the shoe bottom for variably determining the position of the fingers of said other wiper portions heightwise about their axis to accommodate shoes having different heightwise curvatures in their shank portions, and means for moving said wipers widthwise to cause said fingers as positioned to wipe inwardly the margins of the stock to be lasted and press it against the shoe bottom face of the heel and shank areas.

6. In a lasting machine, a pair of hinged wipers constructed and arranged with a common hinge axis, means for moving the wipers toward and away from one another, means including a gage intermediate said wipers for fixedly positioning a wedge heel shoe with its heel breast edge substantially in line with said axis, each of said wipers having one portion adapted to wipe inwardly over the heel end the lasting margin of stock to be lasted and upstanding heelwardly of said axis and another portion normally spaced heightwise from the level of the shank portion of the positioned shoe and of heightwise curvature corresponding substantially to that of the shank portion of the wedge of the shoe, means mounted for movement heightwise of the positioned shoe and cooperative with the toeward end of the wedge for adjusting said other wiper portions heightwise about said axis prior to their inward wiping movement over the shank portion of the wedge, and means

operating prior to the outward movement of said wipers for moving the adjusted wiper portions away from the bottom of the shoe to their normal heightwise positions.

7. In a lasting machine, a pair of hinged wipers spaced for widthwise movement and constructed and arranged with a common hinge axis extending widthwise, shoe clamping means intermediate said wipers and including a gage member engageable with the bottom of the heel end of a wedge heel type shoe to position its heel breast edge substantially in alignment with said hinge axis, each of said wipers having a plurality of resilient fingers extending widthwise for inward wiping movement over the shoe bottom and disposed toewardly of said axis in a heightwise curvature corresponding substantially to that of the shank portion of the bottom of the wedge heel of the shoe, means associated with each wiper and yieldingly urging said wiper fingers heightwise of their operating level and away from the shoe bottom, means engageable with the bottom of the shank of the wedge heel and operative to tension heightwise the lasting margin of the stock to be lasted, and means operatively connected to said stock tensioning means for releasably positioning the wiper fingers heightwise against the influence of said yielding means whereby the operating level of said fingers is variably determined prior to their inward wiping movement.

8. In a machine for lasting the sides of the heel and shank areas of a wedge heel shoe, a pair of wipers spaced widthwise thereof for wiping inwardly over its bottom face the margin of stock to be lasted, clamping means intermediate said wipers and engageable with the wedge heel of the shoe to hold it in fixed position to be operated upon, each of said wipers having a resilient portion relatively swingable heightwise of the shoe about an axis extending widthwise thereof and curved heightwise to correspond substantially to the heightwise curvature of the shank of the wedge heel, a pair of grippers respectively adjacent to the wipers and extending adjacent to the opposite side edges of the heel and shank areas of the wedge heel for seizing and tensioning heightwise the stock of the lasting margin to be lasted, each of said grippers being provided with jaws having a heightwise curvature substantially corresponding to that of the shank of the wedge heel of the clamped shoe and being adapted to engage the shank area near its toeward edge, and gage means actuated by each gripper for swinging said resilient wiper portions toward the level of the bottom of the adjacent shank area, the limit of such wiper swinging movement being determined by said engagement of the jaws with the wedge heel.

9. In a machine for lasting the sides of the heel and shank areas of a wedge heel shoe and around its heel end, a pair of heightwise curved shank wipers spaced apart widthwise of the shoe and having a common widthwise hinge axis, means mounted adjacent to said wipers for clamping the wedge heel of the shoe with its heel breast edge substantially in line with said axis and between said shank wipers, a pair of heel extremity wipers movably mounted adjacent to the shank wipers for wiping inwardly over the heel end the margin of stock to be lasted, fluid pressure operated means constructed and arranged to adjust said shank wipers heightwise about said axis relatively to the wedge heel, mechanism associated with said shank wiper adjusting means for tensioning heightwise the margins of stock to be lasted in the shank area, fluid pressure operated means for moving said shank wipers inwardly over the shoe bottom for wiping engagement with the tensioned marginal stock and then outwardly therefrom, and fluid pressure operated means operatively connected to said shank wiper moving means for operating said heel extremity wipers after the outward retraction of said shank wipers.

10. In a lasting machine having means for supporting a shoe, a gripper mounted adjacent to said shoe supporting means and provided with jaws adapted to be

opened before moving toward the bottom of said shoe and to be closed before moving heightwise to tension the lasting margin of stock to be lasted, a wiper adjacent to said jaws and movable widthwise to engage the tensioned lasting margin and wipe it inwardly over the shoe bottom, fluid pressure operated means for so moving the wiper, fluid pressure operated means operative at lower pressure than said wiper moving means for actuating said gripper to cause its jaws releasably to hold the lasting margin tensioned heightwise, and means including a fluid pressure controlled measuring valve connected to the wiper moving means for causing the gripper to effect release by its jaws as inward movement of the wiper is resisted by the tensioned stock, said last mentioned means being operatively connected to said gripper actuating means.

11. In a lasting machine having means for supporting a shoe and gripper means provided with jaws for seizing and tensioning heightwise the lasting margin of stock to be lasted, said jaws being adapted to be opened before moving toward the shoe bottom and to be closed before moving away therefrom, wiper means movable widthwise over the shoe bottom, a piston arranged in a power cylinder and operatively connected to said gripper means for moving said jaws toward and from the shoe bottom, another piston arranged in a power cylinder and operatively connected to said wiper means for moving it inwardly into wiping engagement with the marginal stock tensioned by said jaws, a source of fluid under pressure, control means for admitting fluid under pressure from said source to the first-mentioned piston for moving it in one direction to cause said jaws to seize and then tension the marginal stock, control means for admitting fluid under pressure from said source to said other piston for moving it to effect inward wiping movement of said wiper means, and means responsive to operation of the last-mentioned control means for moving said first piston in another direction to cause the jaws to release the tensioned stock to the wiping action of said wiper means.

12. In a lasting machine having means for supporting a shoe and gripper means provided with jaws for seizing and tensioning heightwise the lasting margin of stock to be lasted, said jaws being adapted to be opened before moving toward the shoe bottom and to be closed before moving away therefrom, wiper means movable widthwise over the shoe bottom, a piston arranged in a power cylinder and operatively connected to said gripper means for moving said jaws toward and from the shoe bottom, another piston arranged in a power cylinder and operatively connected to said wiper means for moving it inwardly into wiping engagement with the marginal stock tensioned by said jaws, a source of fluid under pressure, control means for admitting fluid under pressure from said source to the first-mentioned piston for moving it in one direction to cause said jaws to seize and then tension the marginal stock, control means for admitting fluid under pressure from said source to said other piston for moving it to effect inward wiping movement of said wiper means, and fluid pressure operated means for mov-

ing said first piston in another direction to cause the jaws to release the tensioned stock to the wiping action of said wiper means, said last-named means being responsive to the increased pressure resulting in said means for effecting movement of the wiper means when the latter is resisted by the tensioned stock.

13. In a lasting machine having means for supporting a shoe and gripper means provided with jaws for seizing and tensioning heightwise the lasting margin of stock to be lasted, said jaws being adapted to be opened before moving toward the shoe bottom and to be closed before moving away therefrom, wiper means movable widthwise over the shoe bottom, a piston arranged in a power cylinder and operatively connected to said gripper means for moving said jaws toward and from the shoe bottom, another piston arranged in a power cylinder and operatively connected to said wiper means for moving it inwardly into wiping engagement with the marginal stock tensioned by said jaws, a source of fluid under pressure, control means for admitting fluid under pressure from said source to the first-mentioned piston to move it in one direction to cause said jaws to seize and then tension the marginal stock, control means for admitting fluid under pressure from said source to said other piston to effect inward wiping movement of said wiper means, and fluid pressure operated means including a pressure responsive valve and a measuring valve interconnecting the last-mentioned control means operatively with the cylinder of said first-mentioned piston, said interconnecting means serving to move the first-mentioned piston in another direction to cause the jaws to release the tensioned stock, the rate of jaw releasing movement of said first-mentioned piston being controlled by said valves.

14. In a lasting machine for laying the lasting margin in the shank area of a wedge heel shoe inwardly and against the curved bottom of the wedge heel, a resilient wiper having a longitudinal curvature corresponding substantially to that of the wedge heel bottom and adapted yieldingly to be moved heightwise thereof, means engageable with the wiper and the wedge heel bottom to adjust them heightwise relatively to one another, means arranged for engagement with an end portion of the wiper for retaining it at its operating level as thus determined, means for moving the wiper widthwise to engage the lasting margin in the shank area and wipe it inwardly and against the curved wedge heel bottom, and means arranged to act on said wiper retaining means for releasing the wiper for movement from its operating level after its inward wiping movement.

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