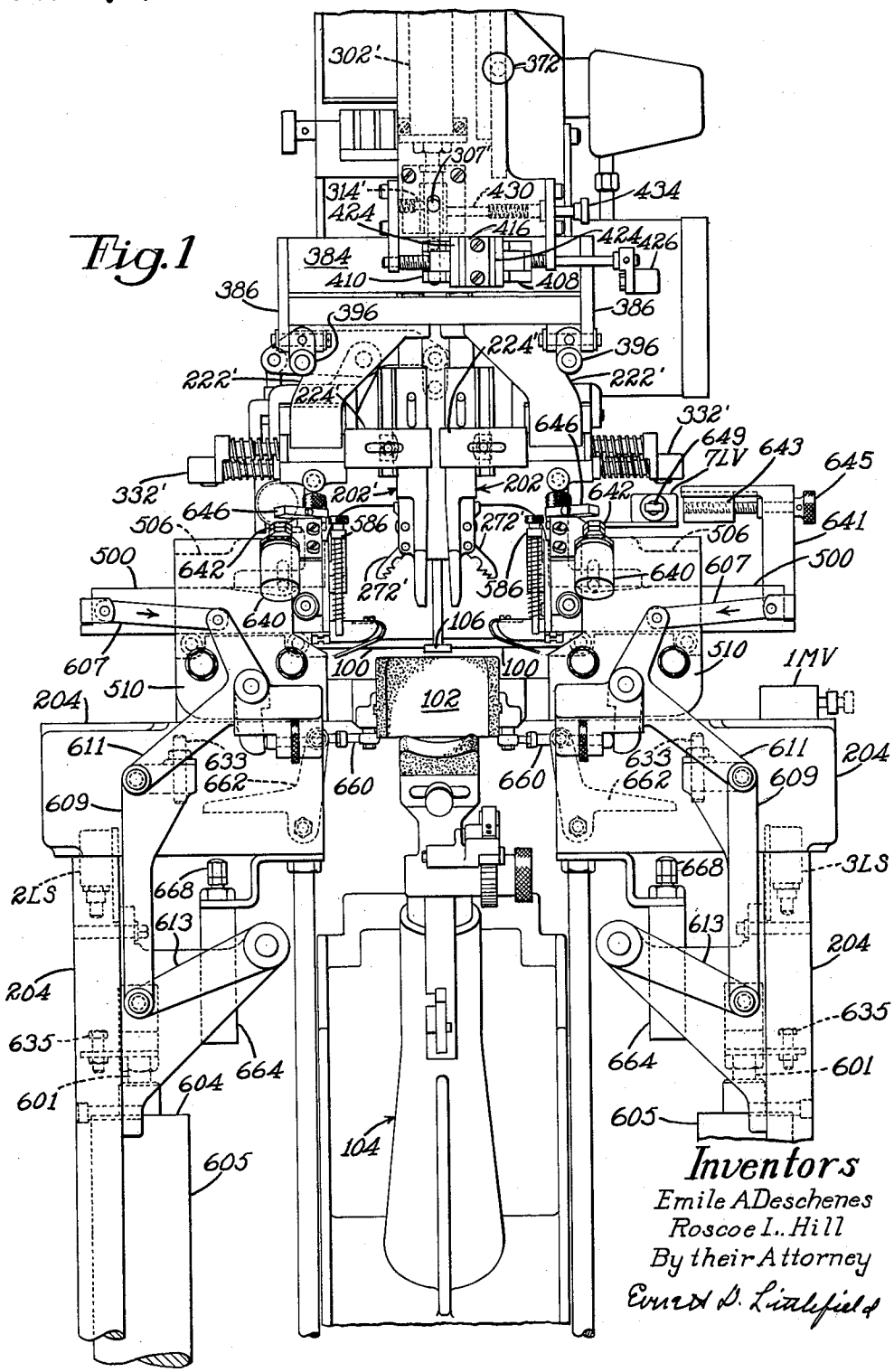
Oct. 8, 1963 E. A. DESCHENES ETAL 3,105,983

HEEL AND SHANK LASTING MACHINES

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Fig. 1



Inventors

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Roscoe L. Hill

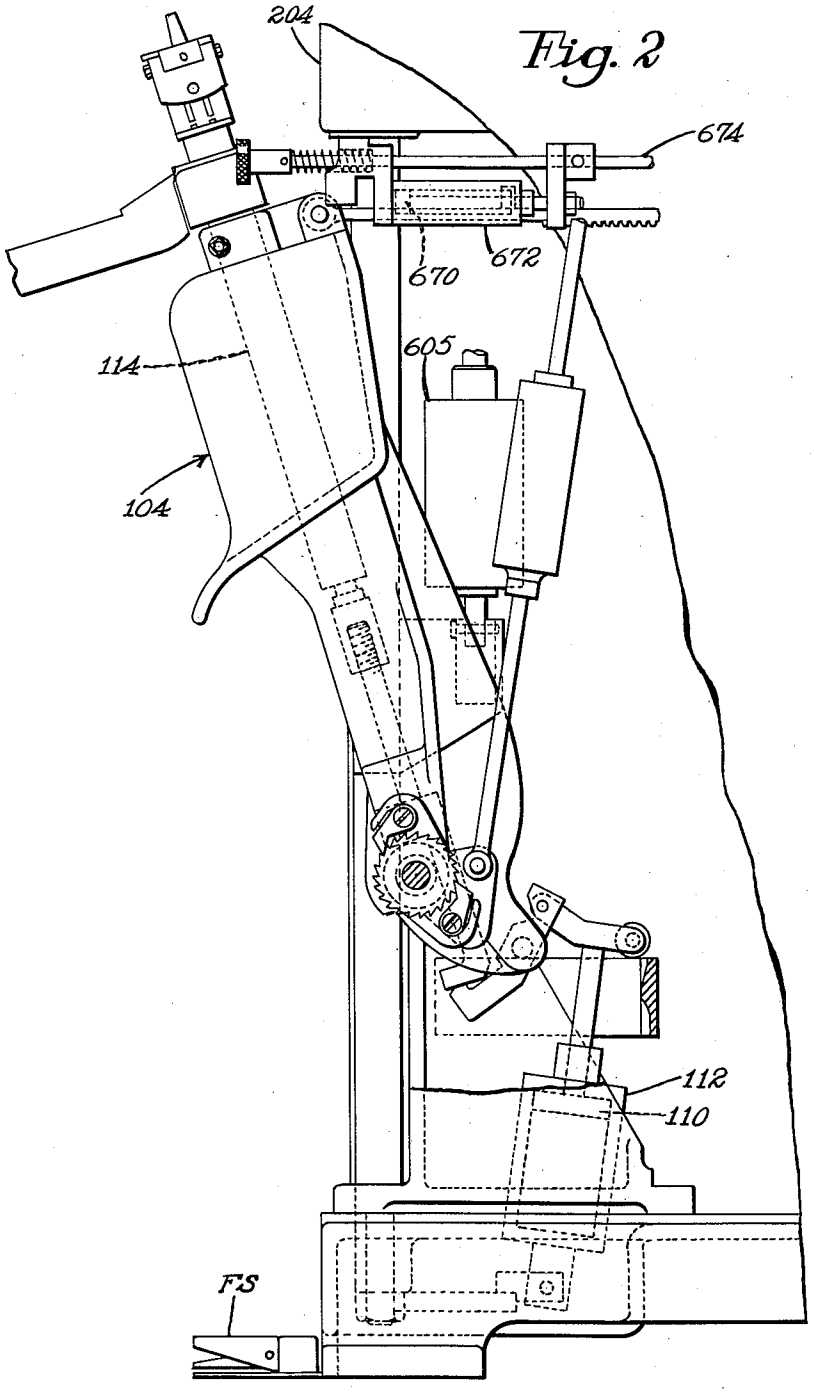
By their Attorney

Ernest D. Littlefield

HEEL AND SHANK LASTING MACHINES

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Fig. 2



HEEL AND SHANK LASTING MACHINES

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Fig. 4

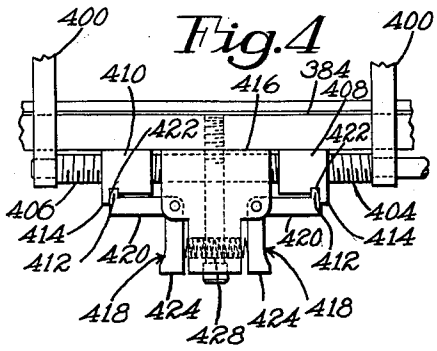
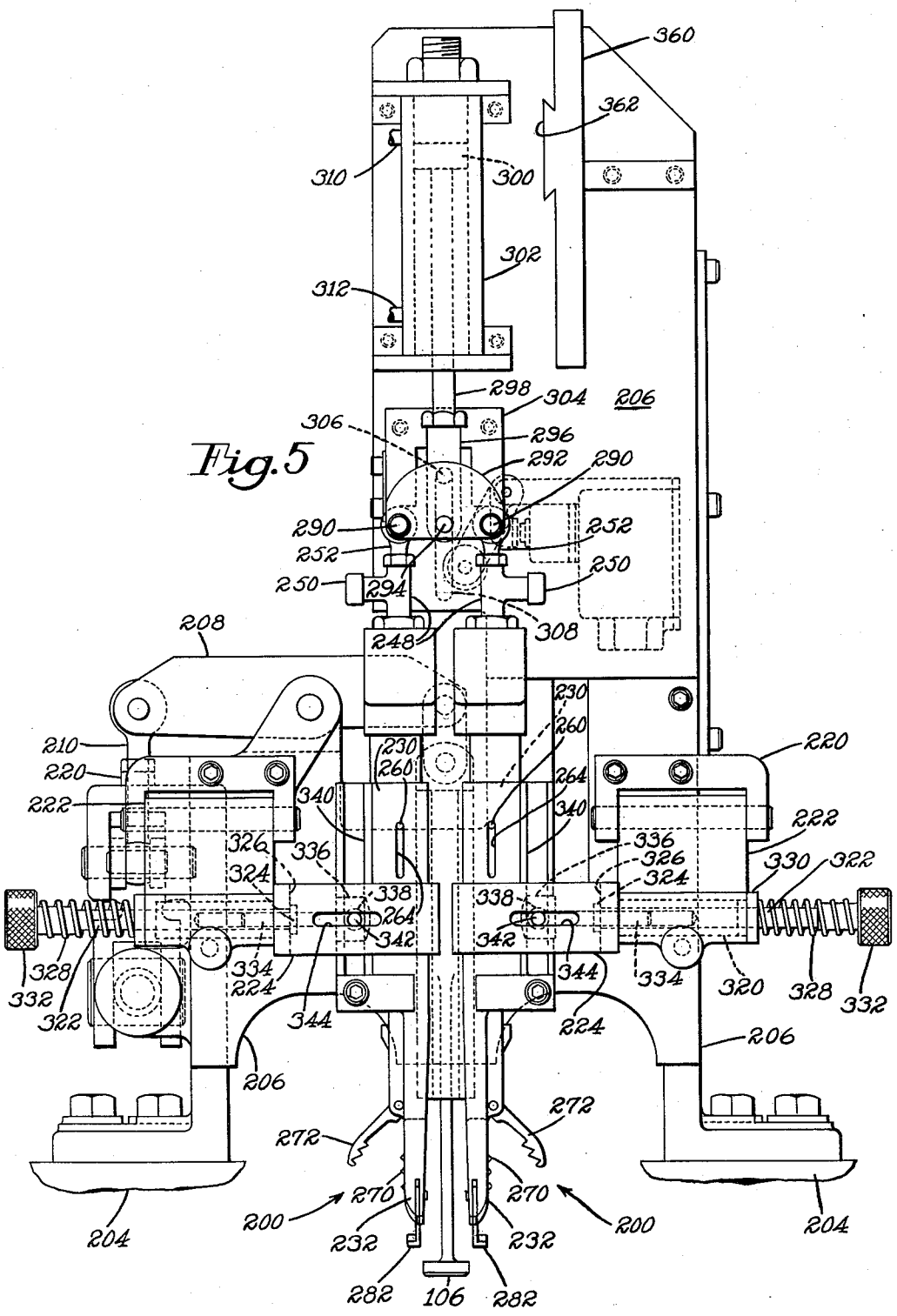


Fig. 3

HEEL AND SHANK LASTING MACHINES

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Fig. 5

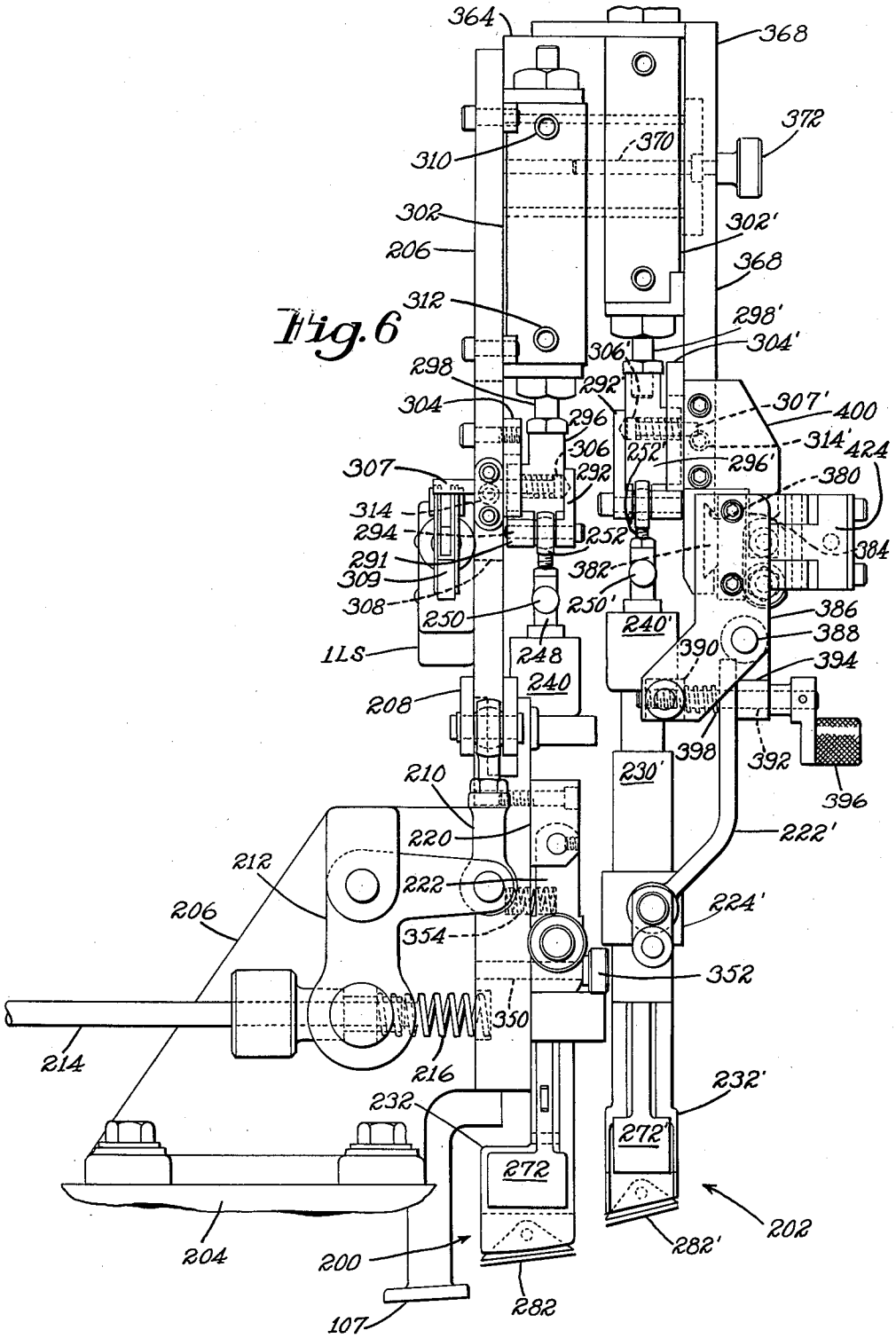


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HEEL AND SHANK LASTING MACHINES

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Fig. 6

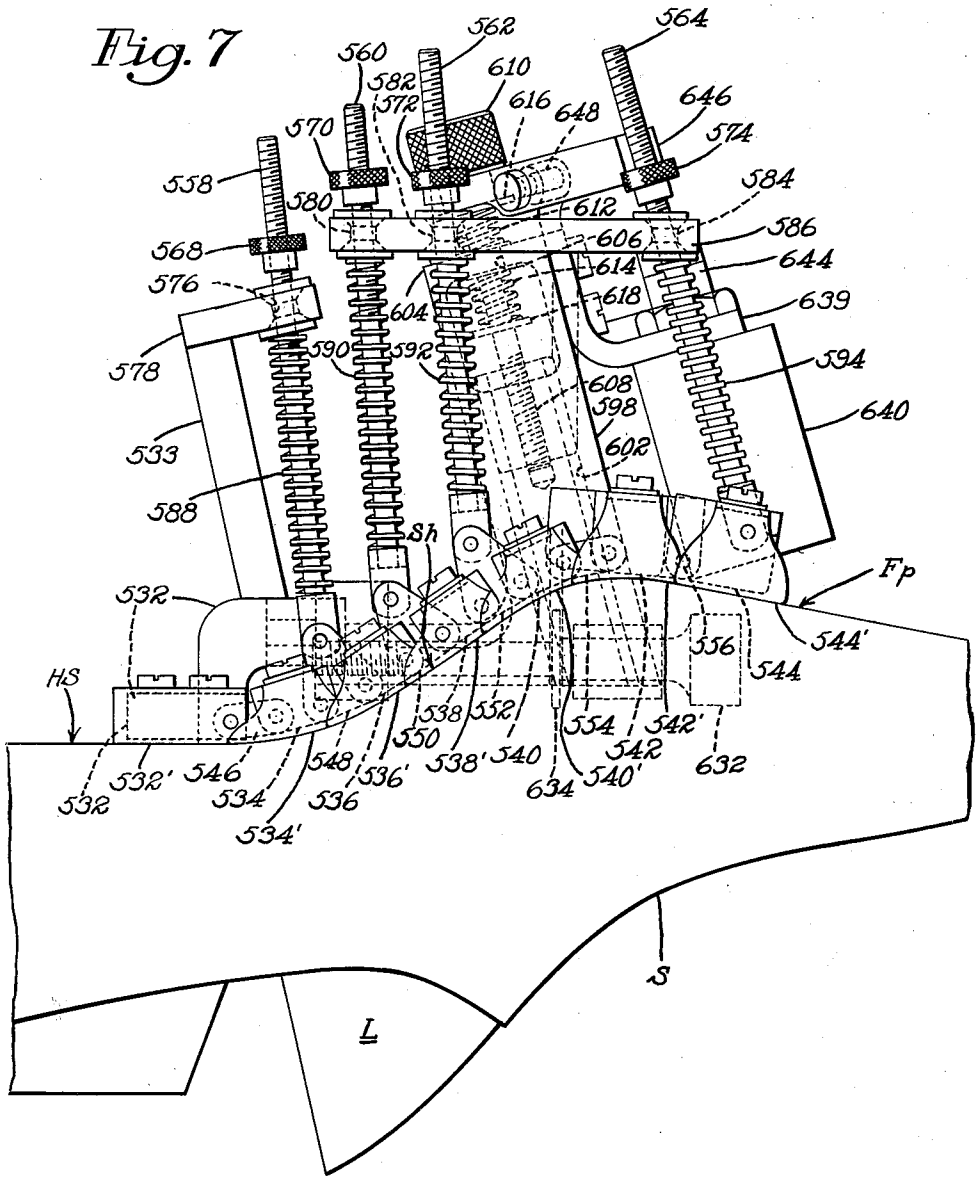


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HEEL AND SHANK LASTING MACHINES

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Fig. 7



HEEL AND SHANK LASTING MACHINES

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Fig. 9

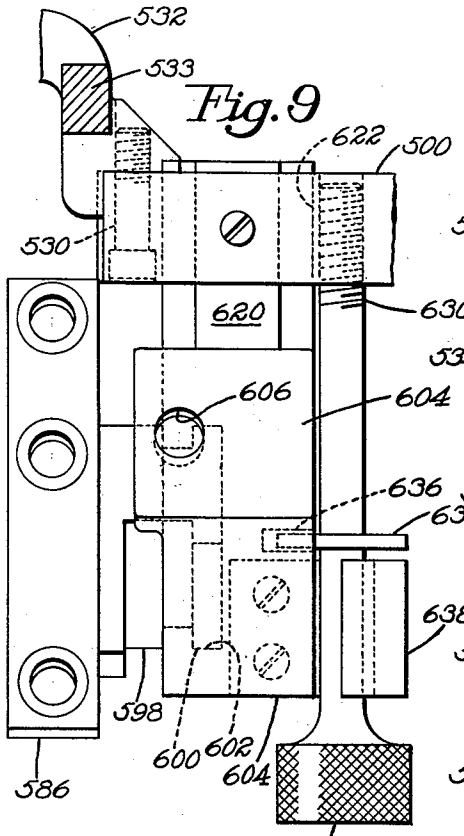


Fig. 8

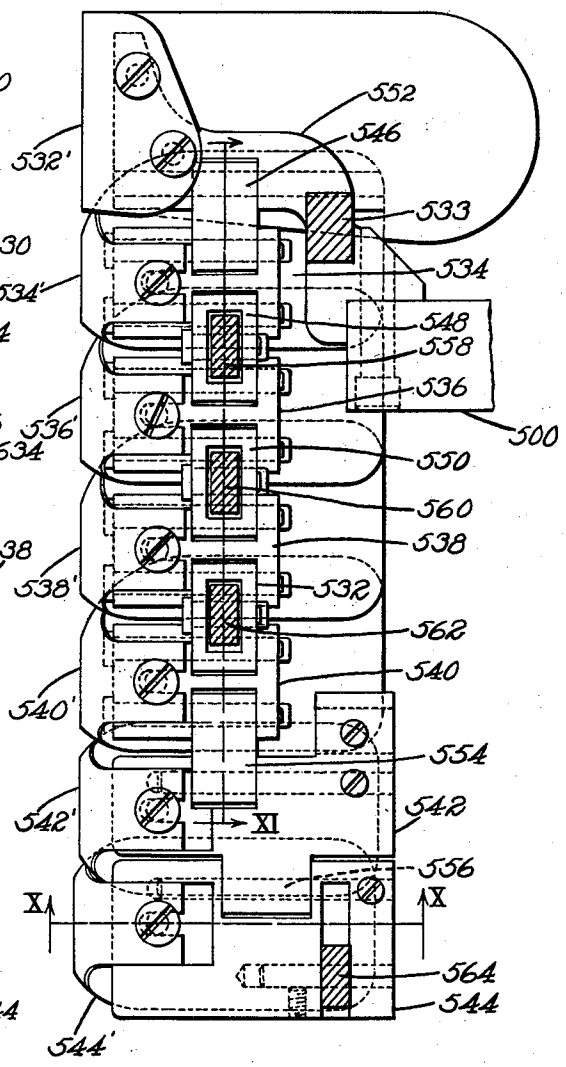


Fig. 10

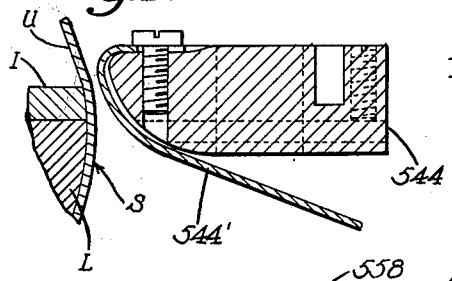
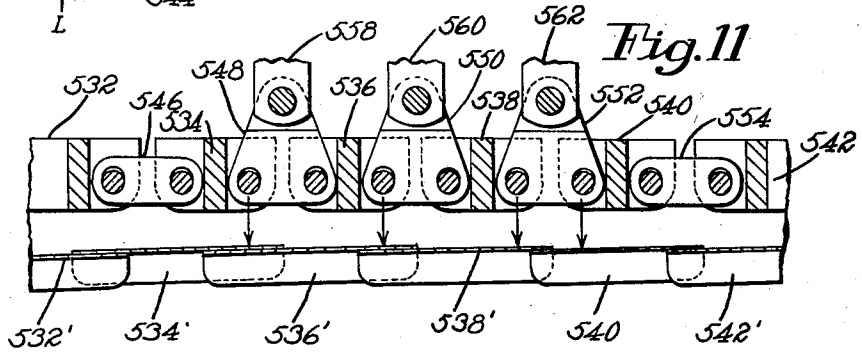


Fig. 11



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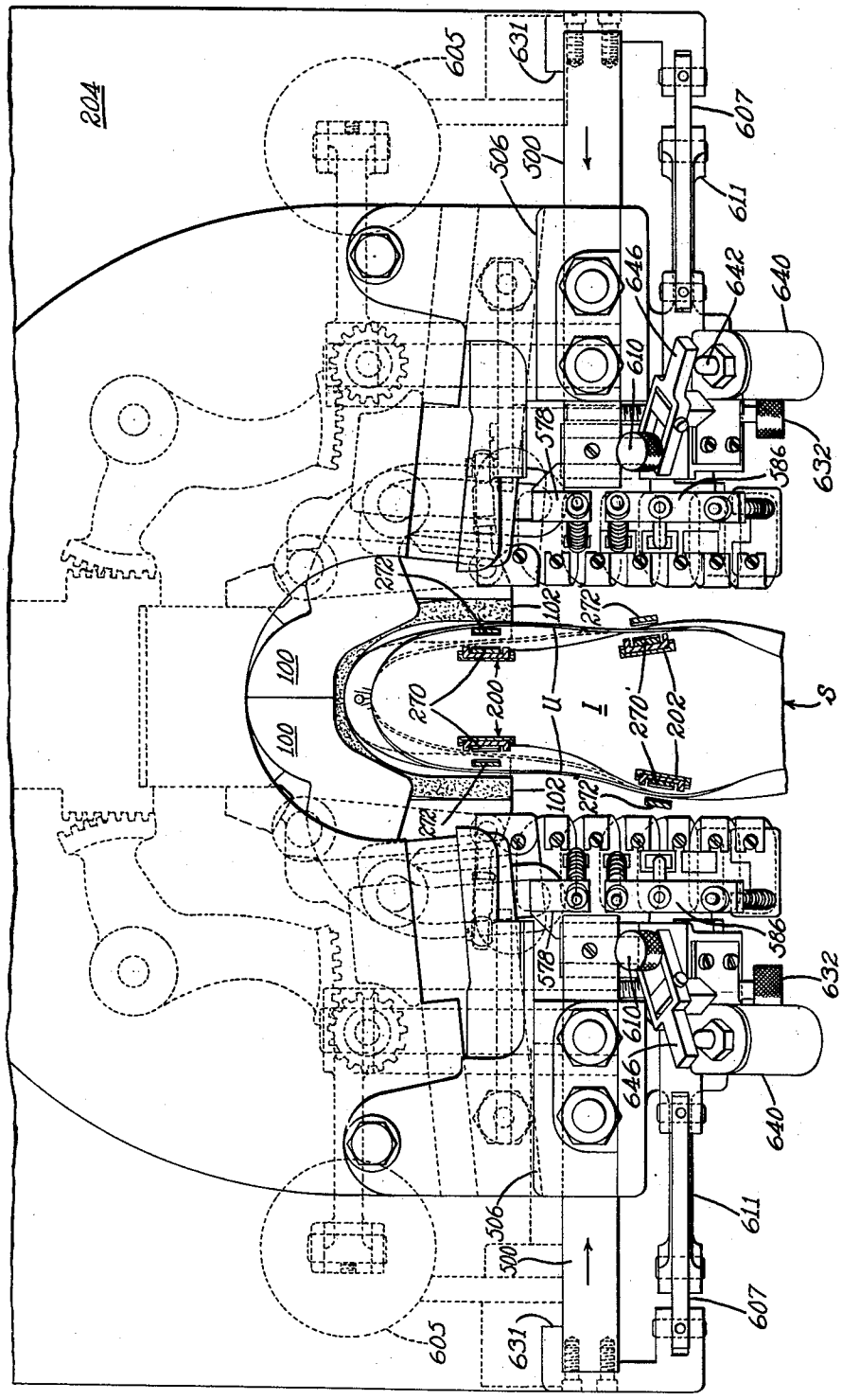


Fig. 12

Fig. 13

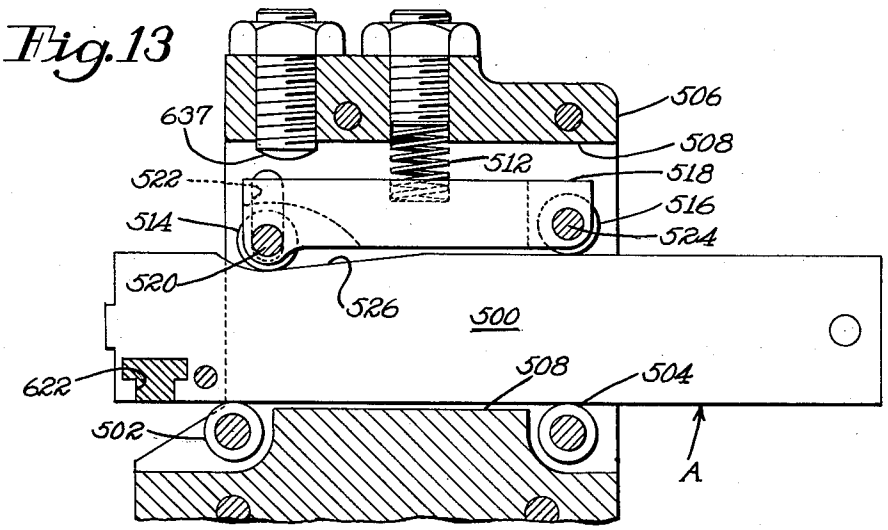


Fig. 14

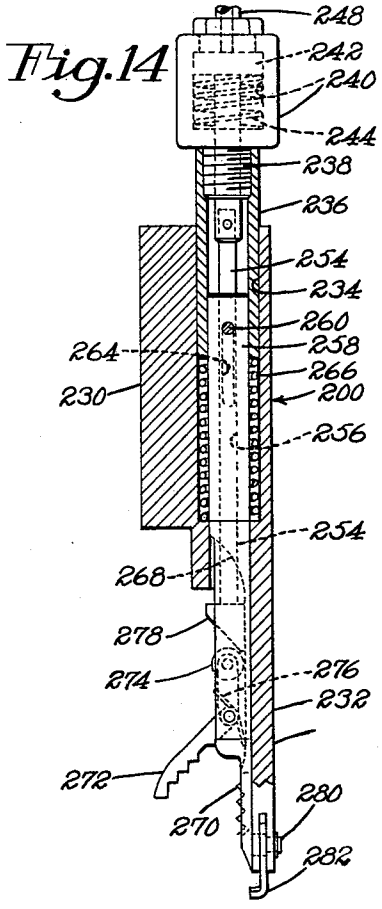
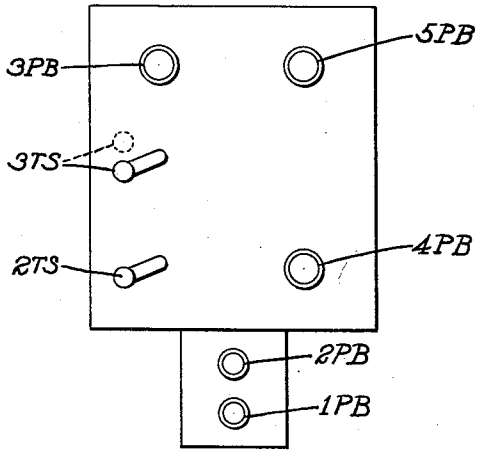


Fig. 15



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Fig. 16

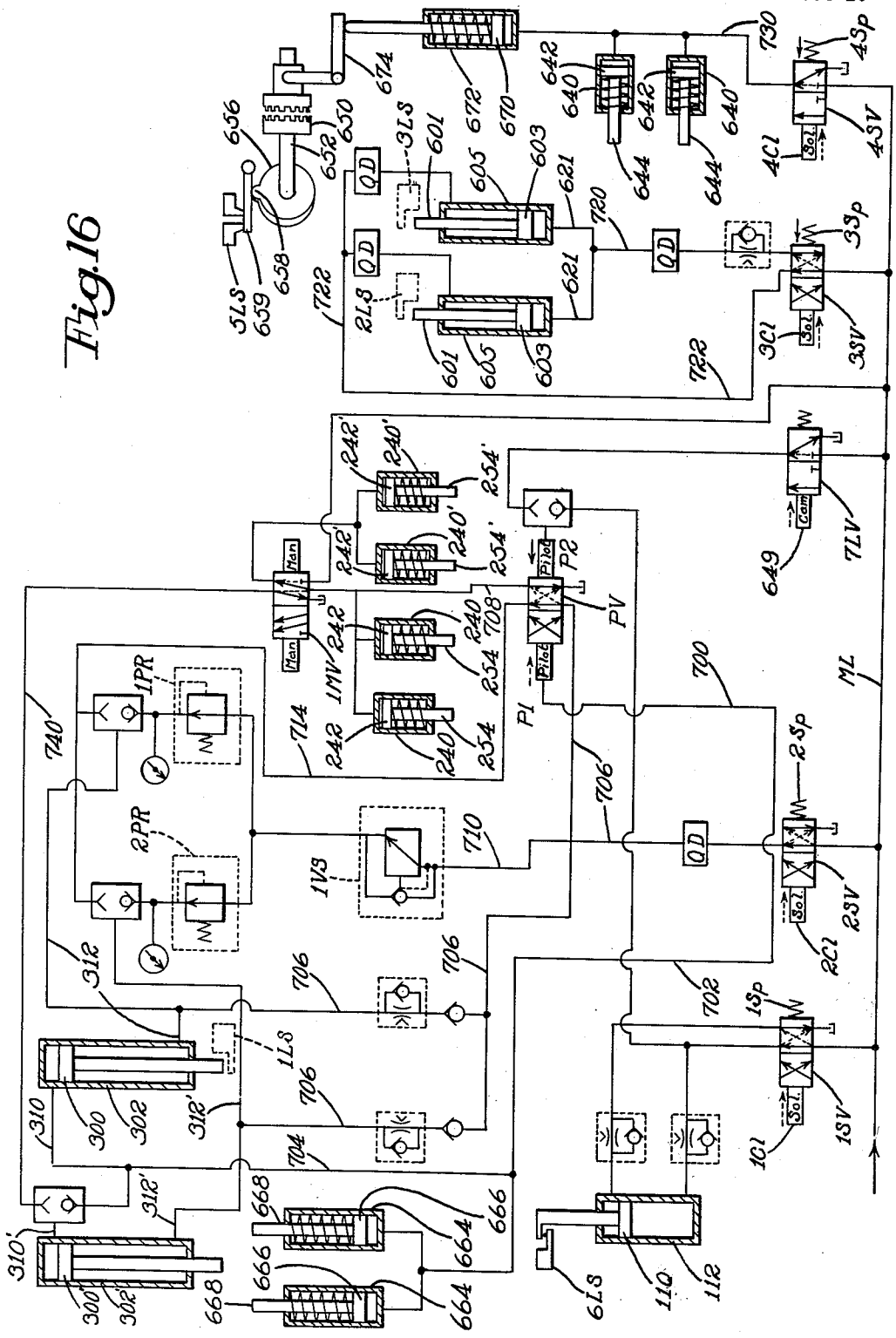
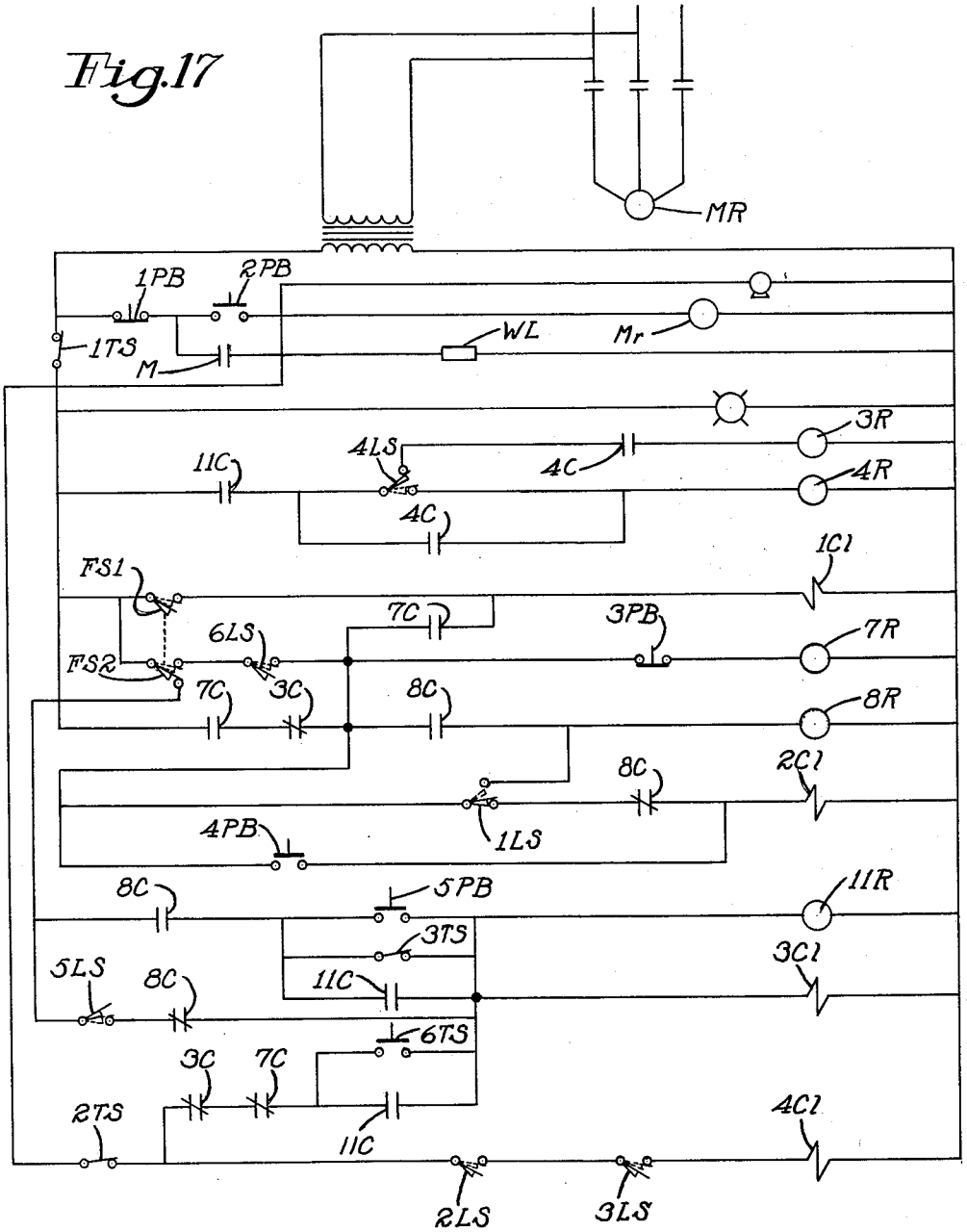


Fig.17


MR
1PB
2PB
1TS
M
WL
Mr
3R
4LS
4C
11C
4R
4C
1C1
FS1
7C
3PB
7R
6LS
FS2
7C
3C
8C
8R
8C
2C1
1LS
4PB
8C
5PB
11R
3TS
3C1
5LS
8C
11C
6TS
3C
7C
2TS
11C
4C1
2LS
3LS

United States Patent Office

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3,105,983

HEEL AND SHANK LASTING MACHINES

Emile A. Deschenes, Danvers, Mass., and Roscoe L. Hill, Norway, Maine, assignors to United Shoe Machinery Corporation, Boston, Mass., a corporation of New Jersey

Filed May 9, 1962, Ser. No. 193,415
39 Claims. (Cl. 12—10.1)

This invention relates to lasting machines, and more particularly is concerned with improvements in a machine for lasting the heel and shank portions of shoes of the type disclosed and claimed in a copending application for United States Letters Patent Serial No. 133,361, filed August 23, 1961, in the name of Adelbert W. Rockwell, Jr. It is to be understood, however, that in their broader aspects features of the invention are not necessarily limited to embodiment in a machine of that particular type or to the exact mechanical construction shown.

In the machine disclosed in the above-mentioned application, there are combined with the usual heel end lasting instrumentalities, including a support for a shoe on its last, a heel band, heel end wipers adapted to be actuated by power operated means through an automatic operating cycle, and a clutch for controlling the action of the power operated means, shank lasting instrumentalities comprising a pair of upper tensioning devices including grippers for tensioning the upper materials in two locations at the opposite sides of the shank portion of a shoe on the support, shank lasting wipers having flexible portions shaped to conform generally to the longitudinal curvature of the shank portion of the shoe and a relatively flat portion extending heelwardly beyond the toeward limit of action of the heel end wipers, and power operated means for actuating these shank lasting instrumentalities. In addition, in this prior machine, power operated means are provided for moving the shoe support from an inoperative position to an operative position, together with means including a member movable to two different control positions and adapted, when moved to the first position, to cause the support to be moved to operative position, and when moved to its second position, to cause the shank lasting instrumentalities to be actuated by their associated power operated means, and means responsive to the completion of the action of the shank lasting instrumentalities for actuating the above-mentioned control means, thus to initiate an automatic operating cycle of the heel end lasting instrumentalities.

In the above aforementioned prior machine, the upper tensioning grippers which are associated with the shank lasting instrumentalities are so located as to engage the upper materials at the opposite sides of the shank portion of the shoe being lasted about midway between the breast line and ball line of the shoe. While this arrangement has proved to be generally satisfactory, under some working conditions a tensioning of the upper materials at the opposite sides of the shank portion of the shoe in locations closer to the breast line and also in locations closer to the ball portion seem to be desirable. Accordingly, it is an object of this invention to extend the scope and improve the operation of a machine of the type here under consideration by the provision of a pair of upper tensioning devices having grippers for tensioning the upper at the opposite sides of the shank portion of the shoe in locations close to the breast line and another pair of upper tensioning devices having grippers for tensioning the upper materials at the opposite sides of the shoe in a location close to its ball portion. More particularly, and in accordance with a feature of the invention, the pair of upper tensioning devices provided for tensioning the upper adjacent to the ball portion of the shoe are mounted for adjusting movements in directions extending lengthwise of the shoe, both independently and together as a unit to accommodate shoes of different sizes, and means are provided for enabling the operator quickly and readily to shift this pair of upper tensioning devices in directions extending laterally of the shoe to accommodate right shoes and left shoes.

On the other hand, the machine may be called upon to last the heel and shank portions of shoes in which a tensioning of the upper materials in locations adjacent to the ball portion may not only be unnecessary but also actually undesirable. Thus, in accordance with still a further feature of the invention, means are provided for rendering the ball grippers inoperative to tension the upper materials either by preventing their descent from elevated and inoperative positions and/or by causing their jaws to remain closed. As in the prior machine, the upper tensioning devices of the herein illustrated machine each carry a shoe bottom engaging member which, when the grippers descend to operating position, and also during the action of the grippers to tension the upper materials, press yieldingly against the shoe bottom and serve as insole holddowns. Thus, in the herein illustrated machine, by permitting descent of the ball grippers while at the same time causing them to remain closed, the advantages of the aforementioned insole holddown action of the upper tensioning devices adjacent to the ball portion of the shoe may be retained.

When presented to a heel and shank lasting machine of the type here under consideration, the shoe will have already been pulled over and either toe lasted or, perhaps, toe and forepart lasted. Thus, the upper materials in the vicinity of the ball portion of the shoe will be in position to be seized quite readily by the ball grippers as they descend to operative position. However, the upper materials in the vicinity of the breast line of the shoe will usually be flared outwardly away from the opposite sides of the last and quite well out of the range of action of the breast line grippers as they descend. To avoid the necessity of the operator manually holding the upper materials in against the sides of the last in these locations, a somewhat dangerous procedure, the herein illustrated machine is, in accordance with still a further feature, provided with means for automatically accomplishing this result. More particularly, and as herein illustrated, the heel band of the heel seat lasting machine is utilized for this purpose, and means are provided for preliminarily closing the heel band around the heel end of the shoe immediately after the shoe support has been actuated to bring the shoe into operative position and just before the grippers are caused to descend and close at the beginning of the shank lasting operation.

A still further object of this invention is to provide improved means for wiping the lasting margin of the upper materials at the opposite sides of the shank portion of a shoe inwardly over and for pressing the lasting margin firmly against the bottom of the shoe. To this end, and in accordance with other features of the invention, the shank wipers of the herein illustrated machine each comprise a series of blocks which are joined together in articulated fashion by means of intermediate links and which carry resilient wiping members arranged in overlapping or shingled relation. Associated with the mentioned links are yieldable abutment members which may be adjusted, independently and in groups, in such ways as to accommodate different heel heights, as well as various shank contours. Preferably, and as herein illustrated, these improved shank wipers include additional articulated blocks provided with resilient wiping members and adapted to operate for a considerable distance toewardly of the ball portion of the shoe and into its forepart. In order to augment the action of these shank wiping units in pressing the overwiped lasting margin of

the upper materials against the bottom of the shoe, means are provided for moving them toward the bottom of the shoe both as a unit at the conclusion of their inward wiping action and also for causing separate portions thereof to apply additional pressure on the overlasted upper materials during the subsequent operation of the heel seat lasting instrumentalities.

The above and other objects and features, including improved means for controlling the operation of the shank lasting instrumentalities, will appear in the following detailed description of the preferred embodiment thereof which is illustrated in the accompanying drawings and will appear in the claims.

In the drawings,

FIG. 1 is a view in front elevation of a machine embodying the features of this invention;

FIG. 2 is a view in side elevation of a portion of the machine shown in FIG. 1;

FIG. 3 is a view in front elevation and at an enlarged scale of a pair of upper tensioning devices and associated mechanism forming a part of the machine;

FIG. 4 is a plan view of a portion of the upper tensioning mechanism shown in FIG. 3;

FIG. 5 is a view in front elevation of a second pair of upper tensioning devices forming a part of the machine;

FIG. 6 is a view in side elevation of the upper tensioning devices shown in FIGS. 3 and 5 of the drawings;

FIG. 7 is a view in side elevation of one of two shank wiping units with which the machine is shown in FIG. 1 is provided;

FIG. 8 is a plan view of the shank wiping unit shown in FIG. 7 with certain parts shown in horizontal section and others broken away;

FIG. 9 is a view in plan of another part of the shank wiping unit which is broken away in FIG. 8;

FIG. 10 is a view in vertical section substantially on line X—X of FIG. 8 and looking in the direction of the arrows;

FIG. 11 is a view in vertical section substantially on line XI—XI of FIG. 8 and looking in the direction of the arrows;

FIG. 12 is a plan view of a portion of the machine showing the shank wiping units and the heel end lasting wipers which are associated with the heel seat lasting machine to which the improved shank lasting instrumentalities of this invention are illustrated as applied;

FIG. 13 is a view in front elevation and with other parts in vertical section and showing guide and supporting means associated with one of the shank wiping units;

FIG. 14 is a view in vertical section showing the construction of one of the four upper tensioning devices which are associated with the shank lasting mechanism;

FIG. 15 is a diagrammatic showing of a switch box;

FIG. 16 is a diagrammatic drawing showing the fluid pressure system provided for operating the shoe supporting jack, the shank lasting units, and for initiating an automatic operating cycle of the heel seat lasting instrumentalities; and

FIG. 17 is an electrical diagram.

Referring to these drawings, the improvements of this invention are shown as applied to a heel seat lasting machine of the same type as that referred to in the opening paragraph of the specification of the above-mentioned copending application for United States Letters Patent, i.e., of the type disclosed in United States Letters Patent No. 1,583,044, issued May 4, 1926, in the name of Charles H. Hoyt, modified in some respects as shown in United States Letters Patent No. 1,770,976, issued July 22, 1930, in the name of Joseph Fausse, and provided with a power operated shoe supporting jack generally as disclosed in United States Letters Patent No. 3,005,216, issued October 24, 1961, in the name of Emile A. Deschenes.

In common with heel seat lasting machines of this type, the herein illustrated machine is provided with heel end wipers **100**, **100**, a heel band **102**, FIG. 12, and mechanism, not shown, for driving fastenings through openings in these wipers after they have been advanced and closed in an automatic operating cycle during which a shoe supported on a jack, indicated generally by the reference character **104**, FIGS. 1 and 2, is located in a heightwise direction by engagement with a holddown **106**, this automatic operating cycle being initiated in response to the tripping of a clutch, which, in accordance with the teaching of the invention of the aforementioned copending application, is effected in response to the completion of the operation of the shank lasting instrumentalities. As already suggested, the shoe supporting jack **104** is operated by power in a manner similar to that disclosed in United States Patent No. 3,005,216, the specific operating means herein illustrated, FIG. 2, being a piston **110** contained within a cylinder **112**, and the specific mechanism through which this piston operates first to swing the jack inwardly and then to move the jack post **114** thereof upwardly to bring the heel end of a shoe on the jack into engagement with the heel band **102** and in contact with the holddown **106** being similar to that shown in the mentioned patent to which reference may be made for details not set forth herein.

As in the machine of the prior copending application, there are applied to the heel seat lasting machine, shank lasting instrumentalities including means for tensioning the upper materials at the opposite sides of the shank portions of a shoe, i.e., from the breast line toewardly to the ball portion, together with means for thereafter wiping the lasting margin of the tensioned upper materials inwardly over and for pressing the lasting margin firmly against the bottom of the shoe along its shank portion and toewardly of the ball portion into the forepart. In accordance with the present invention, the means for tensioning the upper materials comprise a first pair of tensioning devices, indicated generally by the reference characters **200**, **200**, located in positions to act on the upper materials of a shoe in the vicinity of the breast line, see FIGS. 5 and 6, together with a second pair of upper tensioning devices, indicated generally by the reference characters **202**, **202**, located in positions to act upon the upper materials of the shoe in the vicinity of its ball portion, see FIGS. 3, 4 and 6.

Referring to FIGS. 5 and 6, there is mounted on a portion of a frame construction **204** a fabricated and vertically extending bracket member, indicated generally by the reference character **206**, on which the upper tensioning devices just mentioned are supported. This bracket member is also provided with suitable guideways in which the holddown **106** is mounted for vertical movement under the control of a cam associated with the heel seat lasting machine acting through a mechanical linkage including a lever **208**, link **210**, bell crank lever **212**, link **214**, and a compression spring **216**, FIG. 6. Secured to the lower front portion of the bracket member **206** are two hinge blocks **220**, **220** on which there are pivotally mounted two supporting arms **222**, **222**, FIG. 5. Mounted on the lower ends of each of these arms, in a manner to be explained below, is a bifurcated guide member **224** adapted to embrace an upper tensioning device **200** for guiding its heightwise movements. Except for matters of size and exact shape, all of the four upper tensioning devices are of substantially the same construction. Thus, a detailed description of one of these devices will be sufficient for all.

Turning to FIG. 14 of the drawings, each upper tensioning device comprises a body portion **230** which is of generally rectangular shape in cross section, and has a downwardly extending projecting portion **232**. Slidable within a bore **234**, formed in the body portion, is a tubular member **236** to the upper end of which is threaded the stem portion of a cylinder **240** containing a piston **242**, held yieldingly in the elevated position in which it is shown by a compression spring **244**. Threaded into the upper end of this cylinder is the lower portion of a T-fitting **248** provided with a lateral branch **250**, and an

upper end which is closed by an apertured link member 252, FIGS. 5 and 6. The piston 242 has an integrally formed piston rod which extends downwardly through a clearance bore in the stem portion 238 and into the tubular member 236 where it is connected to the upper end of a gripper closing rod 254 which is slidable within a longitudinal bore 256 formed in a plunger 258. The plunger 258 is secured to the lower portion of the tubular member 236 by means of two pins 260, only one of which is visible in FIG. 14, which project forwardly and rearwardly from the plunger, through holes in the tubular member 236 and out through slots 264 in the body portion 230 of the upper tensioning device, see FIGS. 5 and 14, a coil spring 266 normally holding the parts in the position shown in FIGS. 3, 5, 6 and 14. At its lower end, the plunger 258 is cut away to provide a recess 268 into which the rod 254 extends, and formed integrally with the plunger is a fixed gripper jaw 270. Pivotally mounted between the opposite sides of the recess 268 is a movable gripper jaw 272 provided with a tail portion carrying a roller 274. A leaf spring 276 normally holds the movable jaw in the open position in which it is shown in FIG. 14 and carried by the lower end of the operating rod 254 is a wedge-shaped gripper closing cam 278 which is adapted to swing the movable jaw 272 toward the fixed jaw 270 when the piston 242 is forced downwardly upon the admission of fluid under pressure to the cylinder 240 through the T-fitting 248. The downwardly extending projection 232 of the body portion 230 is utilized as an insole holddown, as will appear below, and in order to facilitate such use, there is pivotally mounted thereon, by means of a trunnion pin 280, an abutment member 282, the lower surface of which is preferably serrated, as shown in FIG. 6.

Referring to FIGS. 5 and 6, at their upper ends the links 252, 252 are each connected, by means including a ball and socket connection, a cross pin 290, and a clamping bar 291, to the lower corner of an equalizing lever 292 which is shaped as shown in FIG. 5, and which is pivotally mounted, by means of a pivot pin 294, on the lower portion of a supporting block 296. This supporting block is connected directly to the rod 298 of a piston 300, slidable in a cylinder 302, and projects rearwardly between the two downwardly extending arms of an inverted U-shaped plate 304, secured to the bracket member 206. A spring-pressed plunger 306, mounted in the block 296, cooperates with a conical recess in one side of the equalizing lever 292, thus to hold the lever frictionally in the leveled position in which it is shown in FIG. 5, and to which it will be returned, when the piston 300 is elevated, by the action of the lower end portions of the U-shaped plate 304 on the clamping bar 291. This spring-pressed plunger has an end portion 307 which extends rearwardly out through a vertically disposed slot 308 formed in the bracket member 206, and is adapted to engage an operating roller 309 and thus move a switch 1LS from the solid line to the dotted line position shown in FIG. 17. The cylinder 302 is mounted on the bracket member 206 and conduits 310, 312, through which operating fluid under pressure is admitted to and/or exhausted from the cylinder on the opposite sides of the piston 300, are connected to its upper and lower ends, see also FIG. 16. A spring-pressed plunger 314, FIG. 6, is mounted within a portion of the bracket 206 and is adapted to engage the rearwardly extending portion 307 of the plunger 306, thus to hold the piston 300 and parts connected thereto frictionally in the elevated positions in which they are shown when the fluid pressure system is shut off.

Each of the bifurcated guide members 224, referred to above, is provided with a cylindrical stem portion 320 which is rotatably mounted in a bore formed in the lower end of a supporting arm 222 and is adapted to embrace the body portion 230 of an upper tensioning device 200. Extending through a bore in the stem portion 320 is a shaft 322 having a shouldered end 324 which is held yieldingly against an abutment surface 326 on the guide member 224 by means of a coil spring 328 which is interposed between a washer 330 and a hand knob 332, secured to the other end of the shaft. The inner end of the shaft 322 is internally threaded and receives the threaded end of a rod 334 which is connected to a block 336. On its inner side, as viewed in FIG. 5, this block carries a roller 338, which rides in a groove 340 formed in the body portion 230 of an upper tensioning device, and on its outer side this block carries a pin 342 which projects outwardly through a slot 344 formed in the guide member 224. With the arrangement which has just been described, the two upper tensioning devices 200, 200, FIG. 5, may be initially adjusted by movements toward or away from each other, thus to position them properly with relation to shoes of different widths, by suitable manipulation of the hand knobs 332, 332, and these tensioning devices will be guided in their movements heightwise of the shoe by the guide members 224, 224 and rollers 338, 338 in the grooves 340, 340. However, each of these members can be moved inwardly against the yielding resistance of a spring 328, as, for example, when forced inwardly by the advancing shank wiping devices.

The upper tensioning devices 200, 200 may also be adjusted in directions extending lengthwise of the shoe for the purpose of locating them in a desired relation to the breast line of the shoe, in the following manner. As has already been pointed out, the arms 222 are each pivotally mounted on a hinge block 220. Passing through a clearance groove extending upwardly from the lower side of each of these arms is an adjusting screw 350 having a knurled head 352 and being threaded into a portion of the bracket member 206, FIG. 6. A compression spring 354, fitted in a recess in the bracket member, tends to bear against each of the arms 222, and thus tends to swing the arm away from the bracket member to the extent permitted by the adjusting screw 350. Accordingly, by a suitable manipulation of the adjusting screws 350, the arms 222, 222 may be swung to effect the aforementioned adjusting movements of the upper tensioning devices 200, 200 in directions extending lengthwise of the shoe.

As explained above, the upper tensioning devices 202, 202, which are adapted to operate in the vicinity of the ball line of the shoe, are constructed exactly, except for matters of size and shape, like the upper tensioning devices 200, 200. Thus, to avoid unnecessary repetition, the foregoing description will not be repeated, and corresponding elements of the tensioning devices 202, 202 will be identified with the same reference characters, with the addition of a prime mark (') in order to differentiate between the two upper tensioning devices when necessary in describing the operation of the machine as a whole. The upper tensioning devices 202, 202 are, however, supported on the bracket member 206 independently of the upper tensioning devices 200, 200, and have a rather wider capability of adjustment, as will presently appear.

Referring first to FIG. 5, there is mounted on and projecting forwardly from the bracket member 206 a supporting arm 360 which is formed with a dovetail guide 362. Slidably mounted on this guide is a slide 364, to the front edge of which there is secured, by means of screws 366, 366, FIG. 3, a downwardly extending supporting plate 368, see also FIG. 6. An adjusting screw 370 having a knurled hand knob 372 is provided for moving this slide along the guideway, thus to adjust the position of the plate 368 and other parts which are carried thereby and about to be described, forwardly and rearwardly of the machine, i.e., lengthwise of a shoe being lasted. Cut into the front face of the lower portion of the plate 368 is a horizontally disposed dovetail guideway 380, and slidable within this guideway is a dovetail guide 382 which is formed in the rear face of a crossbar 384, FIGS. 3 and 6.

Secured to each end of this crossbar is a bracket member 386 which extends downwardly and rearwardly, as shown in FIG. 6. Extending between these two bracket members is a fixed shaft 388 on which are pivotally mounted the two arms 222' and 222'. Threaded into trunnion blocks 390, 390 mounted on the lower rearmost corners of the bracket members 386, are shafts 392, 392, each of which projects through a clearance bore in another trunnion block 394 carried by one of the arms 222', and is provided with a hand crank 396. Interposed between the trunnion blocks 390, 390 and their associated arms 222', 222' are compression springs 398, 398. As will be apparent, by turning the hand cranks 396, 396, the arms 222', 222', and thus the upper tensioning devices 202, 202, which are associated therewith, may be swung about the axis of the shaft 388 and the upper tensioning devices adjusted lengthwise of a shoe being lasted and toward or away from the other upper tensioning devices 200, 200.

Secured to the opposite edges of the plate 368 are two other bracket members 400, 400, FIG. 3, shaped as shown in FIG. 6, and rotatably mounted in the lower corners of these two bracket members, and held against axial movement, is a shaft 402 provided with right and left-hand threaded portions 404, 406. Mounted on these threaded portions are two stop members 408, 410 each shaped to provide a groove 412 and a stop flange 414, see FIG. 4. Secured to the crossbar 384 is a block 416 to which there are pivotally mounted two L-shaped levers 418, each having a locking arm 420, provided with a lip 422 adapted to fit into a groove 412, and an operating arm 424. When the shaft 402 is rotated, by means of a hand crank 426, the stop members 408, 410 will be moved toward or away from each other.

When these stop members are in the positions in which they are shown in FIG. 4, the crossbar 384, and parts carried thereby, will be held in their mid position, i.e., with the upper tensioning devices 202, 202 spaced apart equal distances from the center line of the machine, see FIG. 3. After swinging the arms 424, 424 toward each other, against the resistance of a compression spring 428, FIG. 4, the stop members 408, 410, may be separated by rotation of the shaft 402 in the proper direction, by an amount equal to twice the distance it is desired to offset the upper tensioning devices from their centered positions. Upon release of the arms 424, 424, the block 416 and with it the crossbar 384 and parts carried thereby, including the upper tensioning devices 202, 202, may be shifted in one direction or the other until the end of one of the locking arms 420 engages the stop flange 414 on one of the stop members 408 or 410, the lip 422 now entering the groove 412 to lock the parts in this offset position. To shift the block and other parts to an offset position on the other side of center, the operator merely pushes on the lever arm 424 on the side opposite to the desired direction of movement, thus swinging the arm 420 to withdraw its lip 422 from the groove 412 and with continued pressure on the arm 424 the crossbar 384 and other parts will be shifted in the desired direction until the arm 420 on the other side of the block 416 engages the stop flange 414 on the other stop member 408 or 410. Thus, once the desired amount of offset needed to accommodate right and left shoes of a particular style has been determined and the stop members 408, 410 appropriately adjusted, the upper tensioning devices 202, 202 may be quickly and easily shifted from one offset position to the other.

Referring to FIG. 6, the piston rod 298' which is connected to the block 296' extends downwardly from a piston 300', see FIG. 16, within a cylinder 302' to which conduits 310' and 312' are connected. A forwardly extending portion 307' of the spring-pressed plunger 306' is arranged to extend into a vertically disposed slot 308' formed in the supporting plate 368 and a spring-pressed plunger 314' is provided for engaging this portion of the plunger, thus to hold the block 296' and the other parts which are carried thereby frictionally in the elevated positions in which they are shown when the fluid pressure system is shut off. For holding the block 296' and parts carried thereby positively in these elevated positions, as for example when it is desired to dispense with the action of the upper tensioning devices 202, 202 entirely, a stop pin 430 is provided and this pin is normally held in the retracted position in which it is shown in FIG. 3 by means of a compression spring 432. However, by pushing this pin to the left and rotating it a quarter of a turn, by means of hand knob 434, a cross pin 436 may be withdrawn from a recess and brought to bear against the side of the plate 400, thereby to hold this pin in operative position beneath the forwardly extending portion 307' of the spring-pressed plunger 306'.

Each of the shank wiping units is of the same construction and the one which is located on the right of the machine, as viewed from the front, is illustrated in detail in FIGS. 7–11 of the drawings. This shank wiping unit is mounted on the left-hand end of a slide member 500 which, as shown more particularly in FIG. 13, is supported for rectilinear movement on a pair of rollers 502, 504 mounted in a housing member 506. This housing member, which is provided with a clearance opening 508, and supported on a portion of the machine frame 204, is closed by a front cover member 510, FIG. 1. Pressed yieldingly against the upper surface of this slide member, by means of a compression spring 512, are two other rollers 514 and 516 mounted in a carriage 518, the first-mentioned roller by means of a cross shaft 520 which extends also into a guide slot 522 in the member 506, and the last-mentioned roller by means of a shaft 524 which is confined between a wall of the housing 506 and a wall of a cover member 510. On its upper surface the slide member is provided with an inclined cam surface 526 for a purpose that will presently appear.

Secured to the left-hand end of the slide member 500, by means including a screw 530, FIG. 9, is a wiper block 532 having formed integrally therewith an upstanding post 533, see also FIGS. 7 and 8. Connected to the wiper block 532, which may be referred to as a heel seat wiper block, are four shank wiper blocks 534, 536, 538 and 540, and two forepart wiper blocks 542, 544. As shown in FIGS. 8 and 11, the block 532 is connected to the block 534 by means of a link 546; the block 534 to the block 536 by a link 548; block 536 to the block 538 by a link 550; block 538 to block 540 by link 552, and block 540 to block 542 by link 554, while the block 542 is hinged to the block 544 by a pin 556. Secured to these blocks, and extending beneath these blocks and also between the interposed links, are a series of overlapped or shingled wiping plates, formed of flexible resilient metal, which are identified with the same reference characters as the block to which they are attached, followed by a prime mark (').

Connected to the links 548, 550 and 552, respectively, are adjusting rods 558, 560 and 562, while connected to the block 544 is a rod 564, these rods being threaded at their upper ends to receive adjusting nuts 568, 570, 572 and 574. The rod 558 projects through a clearance bore 576 formed in an offset upper end portion 578 of the above-mentioned post 533, while the rods 560, 562 and 564 project through similar clearance bores 580, 582 and 584 formed in an abutment member 586. Compression springs 588, 590, 592 and 594, respectively, surround these four rods and, as shown in FIG. 7, these springs bear, respectively, at their upper ends, against the end portion 578 of the post 533 and against the abutment member 586, and at their lower ends against suitable shoulders formed on these rods. The abutment member 586 is formed integrally with and extends outwardly from a supporting member 598 which is provided with a T-guide 600, FIG. 9, which is received within a T-slot 602 formed in an upwardly and rearwardly extending block 604.

Journaled within a bore 606, FIG. 9, formed in the

upper end of the block 604, is an adjusting screw 608, FIG. 7, the lower end of which is threaded into the member 598, while its upper end carries a knurled knob 610. This adjusting shaft is yieldingly held against axial movement in the bore 606 by means of compression springs 612, 614, interposed between collars 616 and 618 fastened to the adjusting screw and upper and lower surfaces on the top of the block 604. As will be apparent, by turning the screw 608, by means of the knob 610, the abutment member 586 may be moved upwardly or downwardly along a path which is inclined upwardly and to the left as viewed in FIG. 7. The block 604, in turn, has formed integrally therewith a rearwardly extending T-shaped guide 620 which is slidable within a T-slot 622 in the slide member 500, see also FIG. 13. Threaded into the slide member 500 is an adjusting screw 630 provided with an operating knob 632 and a thrust flange 634. This thrust flange fits into a notch 636, cut into the side of the block 604, and adjacent thereto the outer end of the adjusting screw is supported on this block by means of a bearing bracket 638. With this arrangement, the abutment member 586 may be moved forwardly or rearwardly, i.e., lengthwise of a shoe being lasted, by means of the adjusting screw 630.

Referring to FIG. 7, a shoe S being lasted is shown diagrammatically and in longitudinal profile and the shank wiping unit is illustrated as having wiped inwardly over the bottom of the shoe from the breast line portion of the heel seat Hs along the upwardly curving shank portion Sh, and forwardly beyond the break of the ball into the forepart, Fp, and is applying bed-down pressure to the bottom of the shoe so that the flexible resilient wiper plates are pressed upwardly against their respective wiper blocks. Also, each of the springs 588, 590, 592 and 594 have been compressed slightly and approximately to the same amount. Thus, when the shank wiping unit is subsequently withdrawn it will reassume a shape having a longitudinal contour generally corresponding to the longitudinal curvature of the shoe diagrammatically illustrated in FIG. 7 and with the several adjusting nuts 568, 570, 572 and 574, each in engagement with the upper sides either of the end portion 578 or of the abutment member 586. Now, to adjust the shank wiping unit to accommodate a shoe of the same general longitudinal contour but having a higher or a lower heel, the shank wiping unit comprising blocks 534, 536, 538, 540, 542 and 544 may, in effect, be swung about an axis extending transversely of the shoe and located approximately at the front edge of the wiper block 532, by suitable manipulation of the adjusting screw 608. On the other hand, when it is desired to alter the longitudinal contour of the wiping unit to some different shape, this can be done by suitable manipulation of the several adjusting nuts 568, 570, 572 and 574. By a combination of these two adjustments, i.e., by means of the adjusting screw 608 and/or by adjusting the adjusting nuts 568, 570, 572 and 574, substantially any contour usually encountered in the general run of shoes and last styles may be very closely approximated by the shank wiping unit and any slight deviation therefrom will, of course, be readily accommodated by the yielding of the springs 588, 590, 592 and 594, as well as by the flexibility in conformity of the shingled wiper plates 532', 534', 536', 538', 540', 542' and 544'.

The shank wiper units are advanced to wipe the lasting margin of the upper materials inwardly over the shoe bottom to press the lasting margin against the shoe bottom by fluid pressure operated means in the following manner. Referring to FIG. 1 of the drawings, each shank wiper unit supporting slide member 500 is connected to the piston rod 601 of a piston 603, FIG. 16, contained within a cylinder 605 by means of mechanism including links 607, 609, a bell crank lever 611 and a two-armed lever 613, journaled on a portion of the frame construction 204. The cylinders 605, 605 are each pivotally mounted at their lower ends on machine frame construction, as shown in FIGS. 1 and 2. When fluid under pressure is admitted to these cylinders, through conduits 621, 621 and a solenoid operated valve 3SV, FIG. 16, to the space below the pistons, these pistons will be elevated and the slide members 500, 500 moved in directions to carry the shank wiping units inwardly toward each other and toward the shoe to be lasted, see arrows, FIGS. 1, 12 and 13. On the other hand, when fluid under pressure is admitted to the other ends of these cylinders, through the valve 3SV, these slides and the shank wiping units carried thereby will be retracted to the positions in which they are shown in FIG. 1.

During the inward movement of each of the slide members 500, the rollers 514 ride upwardly along the inclined cam surface 526, formed on the upper surface of the slide member, thus swinging the carriage 518 in a counterclockwise direction, FIG. 13, about the axis of the shaft 524 and gradually compressing the spring 512. As each shank wiping unit first engages the shoe, the flexible wiper plates ride up over the edge of the shoe, thus causing the slide 500 to pivot about the roller 504 against the increasing resistance offered by the spring 512. The flexible wiper plates are also flexed from the position illustrated in FIGS. 10 and 11 upwardly until they lie closely adjacent to and/or substantially in contact with the lower surfaces of the wiper blocks and connecting links. Just before the inward movement of each slide member 500 and its shank wiping unit is terminated by the engagement of a stop abutment 631, FIG. 12, with the member 506, an adjustable abutment screw 633, carried by each link 609, FIG. 1, engages the lower edge of the slide member 500 and applies an upwardly directed force thereagainst in about the location indicated by the arrow "A" in FIG. 13. Also, two limit switches 2LS and 3LS, FIGS. 1, 15 and 16, are moved to closed positions by means of adjustable abutment screws 635, 635 carried by the piston rods 601, 601, FIG. 1.

With the shank wiping units exerting pressure downwardly against the bottom of the shoe, yieldingly through the action of springs 512, the application of this force first tends to swing the slide members 500, FIG. 13, in a counterclockwise direction about the shank wiping units as a fulcrum, thus further compressing the spring 512 and increasing the pressure of the shank wiping unit on the shoe bottom until the carriage 518 engages an adjustable stop screw 637, whereupon the slide member 500 is swung about this stop screw, acting as an unyielding fulcrum, by means of the piston 603 so that the shank wiping unit is pressed very firmly against the bottom of the shoe, thereby to apply bed-down pressure to the lasting margin of the upper materials previously wiped inwardly over the shoe bottom, and with the flexible wiping plates in engagement with the lower surfaces of the wiper blocks and links and with springs 588, 590, 592 and 594 compressed slightly, as indicated in FIG. 7. As will be apparent, this bed-down pressure is applied unyieldingly through the wiper blocks 532 and associated flexible wiping plates 532' and yielding through the other blocks and wiping plates, as permitted by the springs 588, 590, 592 and 594 and also by the spring 614.

During the operation of the heel seat lasting instrumentalities, however, the yieldability of the shank wiping blocks and plates associated with the abutment members 586 is eliminated and extra bed-down action thus provided in the following manner. Referring to FIGS. 1 and 7, there is mounted on each of the blocks 604, 604, referred to above, by means of a bracket 639, a cylinder 640 containing a piston 642 having an upwardly extending piston rod 644, see also FIG. 16. Each of these piston rods is in alinement with the outer end of a lever 646, pivotally mounted on the bracket 639 by means of a pin 648, FIG. 7, and has its other end bifurcated to embrace the upper portion of the adjusting screw 608, just beneath the knob 610, thus to engage the collar 616. When fluid under pressure is admitted to the cylinders

640, 640, beneath the pistons 642, 642, these pistons will be elevated into engagement with the outer ends of the levers 646, thus applying a positive downward force on the adjusting screws 608 and abutment members 586 and wholly eliminating the yielding action of springs 614. Accordingly, the wiper blocks and plates associated with these abutment members will now be urged against the shoe bottom more firmly and an increased bed-down action will be provided through these wiper blocks and plates. Secured to and extending upwardly from the outer end of the right-hand slide member 500, FIG. 1, is an L-shaped arm 641 on which a cam member 643 is mounted for longitudinal adjusting movement by means of a screw 645. Supported on a bracket adjacent to this cam member is a control valve 7LV having an operating plunger, see also FIG. 16, adapted to be engaged by this cam member during the inward movement of the slide member.

During the automatic operating cycle of the heel seat lasting instrumentalities which is initiated by the engagement of a single revolution clutch 650, diagrammatically illustrated in FIG. 16 of the drawings, and which causes a main cam shaft 652 to make a single turn, the heel band 102 is closed about the heel end of the shoe by means of mechanism similar to that disclosed in the above-mentioned patents to Hoyt and Fausse. In the herein illustrated machine, however, additional means are provided for closing the heel band around the heel end of the shoe previously to the operation of the shank lasting instrumentalities, thus causing the upper materials of the shoe, in the vicinity of the breast line, to be brought inwardly against the opposite sides of the last and located in positions to be readily seized by the two gripper jaws of the upper tensioning devices 200, 200 adapted to operate adjacent to the breast line of the shoe. For this purpose, the outer ends of the heel band supporting mechanism are connected by means of links 660, 660 to two bell-crank levers 662, 662, FIG. 1, pivotally mounted on the machine frame 204. Also supported on the frame of the machine are two cylinders 664, 664 each containing a piston 666, see FIG. 16, having a piston rod 668 which projects upwardly from its associated cylinder and in alinement with one arm of a bell-crank lever 662. As will presently appear, fluid under pressure is admitted to the cylinders 664, 664 just before the upper tensioning devices 200, 200 and 202, 202 are moved downwardly into position for their gripper jaws 270, 272 to close and seize the lasting margin of the upper materials. The pistons 666, 666 are thus elevated and the bell-crank levers 662, 662 swung in directions to close the heel band about the heel end of a shoe on the jack 104, which will have previously been operated to move the shoe inwardly against the heel band and upwardly into contact with the holddown 106. As the heel band is thus closed, the upper materials in the vicinity of the breast line will be moved inwardly at the opposite sides of the shoe into positions to be readily grasped by the gripper jaws of the upper tensioning devices 200, 200, see FIG. 12. In the vicinity of the ball portion of the shoe, as a result of the previous lasting of the forepart and/or toe portion of the shoe, the upper materials will already be in a suitable position to be grasped by the gripper jaws of the other upper tensioning devices 202, 202.

For tripping the clutch 650, refered to above, thus to initiate an automatic operating cycle of the heel seat lasting instrumentalities, an arrangement similar to that provided in the above-mentioned patent to Deschenes is utilized. Thus, a clutch tripping piston 670, contained within a cylinder 672, FIGS. 2 and 16, is operatively associated with a clutch tripping member 674 and a solenoid operated valve 4SV is provided for admitting fluid under pressure to this cylinder in response to the closing of the two limit switches 2LS and 3LS by the shank wiping unit operating pistons 603, 603 at the end of their operative strokes. Mounted on the main cam shaft 652 of the heel seat lasting machine is a switch operating cam 656, provided with a rise 658 which, when this shaft is at rest, at the beginning and conclusion of each automatic operating cycle of the heel seat lasting instrumentalities, acts through a lever 659 to hold two switches 4LS and 5LS in the solid-line positions in which they are shown in FIG. 17 of the drawings. Immediately upon the initiation of rotation of the main cam shaft, as a result of the tripping of the clutch 650, these two switches are permitted to move to the two dotted-line positions shown in FIG. 17.

The fluid pressure system and electrical circuitry provided for controlling the operation of the machine are, respectively, illustrated in conventional diagrammatic manner in FIGS. 16 and 17. Details of the exact piping arrangements used to connect the several operating cylinders to a main pressure line ML, through various valves mentioned above and/or referred to below, and of the particular electrical circuits, including conventional relays with their coils and contacts, valve solenoid coils, push button switches, etc., some of which have already been mentioned, and others which will be mentioned below, will be apparent to a person skilled in the art from these two figures, together with the following explanation.

A motor MR, adapted to drive the heel seat lasting machine, is set into operation in response to the pushing of a push button switch 2PB (relay M*r* and contact M) which also energizes the line to a work light WL, while the closing of a switch 1TS energizes the various control circuits. The motor is stopped by a push button switch 1PB. With a shoe to be heel and shank lasted mounted on the jack 104, the depression of a two-stage foot switch FS, see FIG. 2, to its first position, has the effect of moving a switch FS–1, FIG. 17, to the dotted-line position. This energizes the coil 1C*l* of a solenoid valve 1SV which is shifted against the resistance of a return spring 1S*p* to admit fluid under pressure from the main line ML to the space in cylinder 112 above the piston 110, causing the piston to move downwardly, and as a result of this downward movement the jack 104 will be swung inwardly and the jack post 114 elevated, in a manner explained in detail in the Deschenes patent referred to above, thus to move the heel end of the shoe into engagement with the heel band and to elevate it into engagement with the holddown 106. As is explained in the mentioned Deschenes patent, the jack post 114 is made in two parts which are telescoped together and yieldably separated by means of a spring. As a result of relative movement of these parts in response to pressure of the heel end of the shoe against a holddown, a switch 6LS diagrammatically illustrated in FIG. 16, which corresponds in function to the control valve 202 shown in FIG. 3 of the Deschenes patent, is closed.

Upon movement of the foot switch to its second position, which has the effect of moving a switch FS–2 to the dotted-line position shown in FIG. 17, a relay 7R is energized, as is also the coil 2C*l* of a solenoid valve 2SV. This valve is now shifted, against the resistance of its return spring 2S*p*, to a position to admit fluid under pressure from the main line ML to conduits 700, 702 and 704, thus applying pressure to pistons 666, 666 within the cylinders 664, 664 to close the heel band around the heel end of the shoe, and to the upper side of the pistons 300, 300′ through branch conduits 310, 310′, while the lower sides of these pistons are connected to exhaust through the conduits 312, 312′ a conduit 706 and a quick dump valve. Pistons 300, 300′ now move downwardly to bring the shoe bottom engaging members of the upper tensioning devices into engagement with the shoe. When the piston 300 completes its downward movement, switch 1LS is moved from the solid-line position to the dotted-line position, FIG. 17, thus energizing a relay 8R and deenergizing the solenoid 2C*l* of the valve 2SV which is now returned to its original position by the spring 2S*p*. Pressure is now admitted to a conduit 706 and through a pilot-oper-

ated valve PV, now shifted to the dotted-line position as a result of the previous admission of pressure fluid to its left-hand pilot P1, through the conduit **700**, to a conduit **708** which is connected to the cylinders **240**, **240** directly, and through a manually operable valve 1MV to the cylinders **240'**, **240'** when this manually operable valve is in the solid-line position in which it is shown. Conduit **706** is connected by way of a conduit **710** and a sequence valve 1VS to two pressure reducing valves 1PR and 2PR, connected respectively to conduits **312**, **312'**.

Thus, when pressure builds up in the cylinders **240**, **240**, **240'**, **240'**, after the jaws **272**, **272** and **272'** **272'** have closed on the lasting margin of the upper materials, sequence valve 1VS will open and operating fluid under regulated pressure will force the pistons **300**, **300'** upwardly, thus causing the grippers to apply a tensioning pull to the upper materials on the opposite sides of the shoe in the vicinity of the breast line and ball portion, the machine now, in effect, coming to a stop with the upper under tension. If he is satisfied with the condition of the upper, the operator now releases the foot switch FS, thus permitting switches FS–1 and FS–2 to return to the solid-line positions shown in FIG. 17. Switch 1LS had, of course, returned to its solid-line position as the piston **300** was elevated, but the coil 2C*l* of valve 2SV is still deenergized through contact 8C, which remains open, inasmuch as the relay 8R is still energized.

Accordingly, when the switch FS–2 is returned to its solid-line position, relay 11R will be energized, through a closed contact 8C, a toggle switch 3TS, now in the closed position shown, and coil 3C*l* of the solenoid valve 3SV will be energized through closed contact 11C. Valve 3SV is now shifted against the resistance of its return spring 3S*p*, to the dotted-line position, thus to admit fluid under pressure through a conduit **720**, conduits **621**, **621**, to the cylinders **605**, **605** beneath the piston **603** therein, while a conduit **722** leading to the cylinders above the mentioned pistons is connected to exhaust. The shank wiping units are now moved inwardly to wipe the lasting margin of the upper materials inwardly over the bottom of the shoe. As the slide **500**, which is located on the right-hand side of the machine as viewed in FIG. 1 moves inwardly, the cam block **643** acts on the plunger **649** of a control valve 7LV, thus shifting this valve to the dotted-line position, FIG. 16, and admitting fluid under pressure from the main line ML to the left-hand pilot P2 of the valve PV and returning this valve to the solid-line position of FIG. 16. Cylinders **240**, **240** and **240'**, **240'** will now be exhausted through the conduits **708** and the gripper jaws of the upper tensioning devices thus opened to release their grip on the lasting margin which is now wiped inwardly over the shoe bottom by the shank wiping units. Also, the pistons **300** and **300'** are now fully elevated by fluid under pressure from the main line through valve 2SV, conduit **706**, and a conduit **714**.

When the shank wiping units have completed their inward wiping movements, the limit switches 2LS and 3LS will be closed by the action of the abutment screws **635**, **635**, see also FIG. 1, thus energizing the coil 4C*l* of solenoid valve 4SV, if a clutch safety switch 2TS is in its normally closed position, which is now shifted against the action of its return spring 4S*p* to the dotted-line position, FIG. 16, in which fluid under pressure is admitted to a conduit **730** leading to the clutch-tripping cylinder **672** and also to the two cylinders **640**, **640** associated with the shank wiping units. The clutch **650** is now engaged and an automatic operating cycle of the heel seat lasting machine thus initiated. As the main cam shaft **652** of the heel seat lasting machine commences to turn, switches 4LS and 5LS will be moved to their dotted-line positions, FIG. 17, and these switches will be returned to their solid-line positions by the rise **658** when the cam shaft completes its single turn. When switch 4LS is thus returned to its solid-line position, a relay 3R is energized, while relays 4R, 7R, 8R and 11R are deenergized through the opening of a contact 3C. The shank wiping units now return so that switches 2LS and 3LS are again opened, and finally, as a result of the deenergizing of the relay 7R, the coil 1C*l* of the valve 1SV is deenergized, and this valve is shifted by its spring 1S*p* to its original solid-line position. The jack is now swung outwardly and the jack post lowered by fluid under pressure admitted to the lower portion of the cylinder **112**. The fluid pressure system and electrical circuits are now returned to their original conditions and the machine is reset for the next operating cycle.

With the switch 3TS in the closed position in which it is shown in FIG. 17, the machine is set for so-called "automatic" operation, i.e., the shank wiping units are automatically set into operation as a result of the release of the foot switch FS, after it has been depressed in two stages, thus to effect first, operation of the jack, and secondly, operation of the upper tensioning devices. If desired, however, for test purposes or other reasons, the machine may be set for a so-called "manual" operation by movement of the switch 3TS to open position. Now, when the foot switch FS is released, the upper will be held under tension by the upper tensioning devices, and in order to initiate operation of the shank wiping units, the operator energizes the relay 11R by means of a push button switch 5PB, whereupon the shank wiping units operate as before, and upon the closing of the switches 2LS and 3LS the automatic operating cycle of the heel seat lasting instrumentalities is initiated and completed as before. If he desires, the operator may deenergize the relay 7R by operating a push button switch 3PB, thus releasing the jack and the grippers of the upper tensioning devices, after which the foot switch FS must be fully depressed and released again to return the jack and to cause the grippers to again seize and tension the upper materials. Also, the operator may cause the grippers of the upper tensioning devices to release the upper materials by manually actuating the plunger **649** of the valve 7LV. After this has been done, the grippers may again be actuated by the operation of a push button switch 4PB. When it is desired to operate the heel seat lasting machine for the purpose of clearing tacks, the operator first actuates a heel pad release lever associated with the heel seat lasting machine, and then throws a toggle switch 6TS, thus causing the shank wiper units and heel seat lasting instrumentalities to operate in the usual manner without operating the jack or upper tensioning devices and without closing the heel band. For convenience the several operator controlled switches are mounted in switch boxes on the front of the machine, FIG. 15.

Referring to FIG. 16, the manually operable valve 1MV, referred to above, see also FIG. 1, is normally in the solid-line position shown, and when the valve is in this position, the gripper jaws of the upper tensioning devices are opened and closed in the manner described above. However, in operating on certain types of shoes, it may be desired to dispense with the action of the gripper jaws in the upper tensioning devices **202**, **202**, while still utilizing the action of these devices as holddown members. To do this, the valve 1MV is shifted to the dotted-line position, FIGS. 1 and 16, so that fluid under pressure from the main line ML is admitted to the cylinders **240'**, **240'**, thus causing the grippers jaws **272'**, **272'** to remain closed at all times. Now, a conduit **740**, leading from the upper portion of the cylinder **300'**, is disconnected from an exhaust port and is connected to the conduit **708**. Thus, the upper tensioning devices **202**, **202** remain in their lowered positions and serve as insole holdowns, while the grippers of the upper tensioning devices **200**, **200** are operated to tension the upper materials.

In using the above-described machine to last the heel and shank portions of a shoe, the operator places a shoe S, herein illustrated as comprising upper materials, indicated generally by the reference character U, assembled on a last L, together with an insole I, see FIGS. 10 and 12, on the jack **104** and, as a result of an initial depression

of the foot switch FS, FIG. 2; moves the switch FS–1 to the dotted-line position shown in FIG. 17, thus causing the jack to carry the shoe inwardly into the heel band 102 and upwardly against the holddown 106. A continued movement of the foot switch moves the switch FS–2 to the dotted-line position, FIG. 17, thus causing the upper tensioning devices 200, 200, 202, 202 to be operated so that their gripper jaws 270, 272 and 270', 272' descend, close on the upper materials, and then move upwardly to exert tensioning pulls thereon, while the abutment members 282, 282, 282', 282' exert yielding pressure on the insole, through the action of springs 266, to hold the insole down against the bottom of the last. As the gripper jaws of the upper tensioning devices descend, the heel band of the heel seat lasting machine is moved inwardly by the pistons 642, 642, thereby moving the upper materials into position to be readily engaged by the gripper jaws of the upper tensioning devices 200, 200 which operate adjacent to the breast line of the shoe, see FIG. 12.

With the upper materials thus held under tension by the grippers of the upper tensioning devices, the operator has an opportunity to inspect the shoe and to determine if the upper has been properly seized by the grippers and is otherwise in proper condition to be wiped inwardly by the shank wiping units. If he finds it so, he will continue the lasting operation by releasing the foot switch FS. Otherwise, he may cause the grippers to release the upper and the jack to return to its original position by actuating the push button 3PB, or he may merely release the upper by manually actuating the valve 7LV and then cause the grippers to again seize and tension the upper materials by actuating the push button 4PB. In case the push button 3PB is used, the initial steps in the lasting operation are repeated by a second depression of the foot switch FS. In any event, with the upper held under tension, either after the first or the second depression of the foot switch FS, with the switch 3TS, FIG. 17, set for automatic operation, upon release of the foot switch, the shank wiping units will be caused to move inwardly and wipe the lasting margin of the upper materials inwardly over and to press them against the bottom of the shoe.

As the shank wiping units thus move inwardly and take control of the upper materials, the gripper jaws are opened to release the upper materials as a result of the automatic actuation of the valve 7LV by cam member 643, FIG. 1, and at the conclusion of their inward wiping movements these shank wiping units, which will have previously been adjusted by means of the hand knobs 610, 630 and adjusting nuts 568, 570, 572 and 574, to a shape to conform generally to the contour of the shank and adjacent ball portion of the shoe being lasted, see FIG. 7, are pressed more firmly against the lasting margin as a result of the action of the abutment screws 633, 633 on the shank wiper carrying slide members 500, 500. Also, as the shank wiping units complete their inward movements, switches 2LS and 3LS are closed, thus initiating an automatic operating cycle of the heel seat lasting instrumentalities, including the heel band 102 and the heel end wipers 100, 100. At the same time, fluid under pressure will be admitted to the two cylinders 640, 640 so that those portions of each shank wiping unit which are associated with the abutment member 586, FIG. 7, become, in effect, unyieldingly supported on their associated slide member 500. Accordingly, when during the automatic operating cycle of the heel seat lasting instrumentalities, the jack 104 and shoe thereon are drawn forcibly inwardly, i.e., to the left as viewed in FIG. 7, each shank wiping unit is, in effect, rigidly supported on its slide member, except for the yieldability of the springs 588, 590, 592 and 594, and thus exerts increased pressure on the upper materials. At the conclusion of the operation of the heel seat lasting instrumentalities, the parts are returned to their original positions, as explained above.

When it is desired to dispense with the action of the gripper jaws of the upper tensioning devices 202, 202 which operate on the upper adjacent to the ball portion of the shoe, and at the same time to retain the insole holddown action of the abutment members 282', 282', the valve 1MV is shifted manually to the dotted-line position indicated in FIGS. 1 and 16. With the valve in this position, the lasting operation proceeds, as set forth above, with the exception that the jaws 270', 270', 272', 272' remain closed, while the upper tensioning devices 202, 202 descend, together with upper tensioning devices 200, 200, and exert yielding pressure on the insole, while the upper is tensioned by the gripper jaws of the upper tensioning devices 200, 200 and until the valve 7LV is actuated to cause the gripper jaws of the upper tensioning devices 200, 200 to open and release the stock, whereupon all of the tension devices are elevated out of the way of the advancing shank wiping units.

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 lasting the shank portion of a shoe, a support for a shoe on its last adapted to hold a shoe in predetermined position with the longitudinal center line of its heel end in alinement with the longitudinal center line of the machine, a first pair of upper tensioning devices arranged to operate in the vicinity of the breast line of the shoe and a second pair of upper tensioning devices arranged to operate in the vicinity of the ball portion of the shoe, each of said upper tensioning devices including a pair of upper gripping jaws and a member adapted to engage the insole of the shoe, a pair of shank wiping units for wiping the lasting margin of the tensioned upper materials inwardly over the shank portion of the shoe, means mounting said second pair of upper tensioning devices for sliding movement as a unit in directions extending laterally of the shoe being lasted to two different positions offset from the longitudinal center line of the machine to accommodate right and left shoes, and a pair of manually adjustable stop members for limiting such lateral movements of said upper gripping devices.

2. In a machine for lasting the shank portion of a shoe, a support for a shoe on its last adapted to hold a shoe in predetermined position with the longitudinal center line of its heel end in alinement with the longitudinal center line of the machine, a first pair of upper tensioning devices arranged to operate in the vicinity of the breast line of the shoe and a second pair of upper tensioning devices arranged to operate in the vicinity of the ball portion of the shoe, each of said upper tensioning devices including a pair of upper gripping jaws and a member adapted to engage the insole of the shoe, a pair of shank wiping units for wiping the lasting margin of the tensioned upper materials inwardly over the shank portion of the shoe, means mounting said second pair of upper tensioning devices for sliding movement as a unit in directions extending laterally of the shoe being lasted to two different positions offset from the longitudinal center line of the machine to accommodate right and left shoes, a pair of manually adjustable stop members for limiting such lateral movements of said upper gripping devices, and cooperating means associated with said stop members and said upper tensioning device mounting means for holding said upper tensioning devices in said offset positions.

3. In a machine for lasting the shank portion of a shoe, a support for a shoe on its last adapted to hold a shoe in predetermined position with the longitudinal center line of its heel end in alinement with the longitudinal center line of the machine, a first pair of upper tensioning devices arranged to operate in the vicinity of the breast line of the shoe and a second pair of upper tensioning devices arranged to operate in the vicinity of the ball portion of the shoe, each of said upper tensioning devices including a pair of upper gripping jaws and a member adapted to engage the insole of the shoe, a pair of shank wiping units

for wiping the lasting margin of the tensioned upper materials inwardly over the shank portion of the shoe, means including a slide for mounting said second pair of upper tensioning devices for movements as a unit in directions extending laterally of the shoe being lasted to one of two positions offset from the longitudinal center line of the machine to accommodate right or left shoes, and a pair of manually adjustable stop members for limiting such lateral movement of said upper gripping devices.

4. In a machine for lasting the shank portion of a shoe, a support for a shoe on its last adapted to hold a shoe in predetermined position with the longitudinal center line of its heel end in alinement with the longitudinal center line of the machine, a first pair of upper tensioning devices arranged to operate in the vicinity of the breast line of the shoe and a second pair of upper tensioning devices arranged to operate in the vicinity of the ball portion of the shoe, each of said upper tensioning devices including a pair of upper gripping jaws and a member adapted to engage the insole of the shoe, a pair of shank wiping units for wiping the lasting margin of the tensioned upper materials inwardly over the shank portion of the shoe, means including a slide for mounting said second pair of upper tensioning devices for movements as a unit in directions extending laterally of the shoe being lasted to one of two positions offset from the longitudinal center line of the machine to accommodate right or left shoes, a pair of manually adjustable stop members for limiting such lateral movements of said gripping devices, and cooperating means associated with said slide and said stop members for holding said upper tensioning devices in said offset positions.

5. In a machine for lasting the shank portion of a shoe, a support for a shoe on its last adapted to hold a shoe in predetermined position with the longitudinal center line of its heel end in alinement with the longitudinal center line of the machine, a first pair of upper tensioning devices arranged to operate in the vicinity of the breast line of the shoe and a second pair of upper tensioning devices arranged to operate in the vicinity of the ball portion of the shoe, each of said upper tensioning devices including a pair of upper gripping jaws and a member adapted to engage the insole of the shoe, a pair of shank wiping units for wiping the lasting margin of the tensioned upper materials inwardly over the shank portion of the shoe, means mounting said second pair of upper tensioning devices for sliding movements as a unit in directions extending laterally of the shoe being lasted to one of two positions offset from the longitudinal center line of the machine to accommodate right or left shoes, a pair of manually adjustable stop members for limiting such lateral movement of said upper gripping devices, cooperating means associated with said stop members and said upper tensioning device mounting means for holding said upper tensioning devices in said offset positions, and means associated with the holding means and responsive to pressure exerted thereon to move the slide in either direction for releasing said holding means.

6. In a machine for lasting the shank portions of shoes, a support for a shoe on its last, shank lasting instrumentalities including a first pair of upper tensioning devices adapted to operate in the vicinity of the breast line of a shoe on the support, and a second pair of upper tensioning devices adapted to operate in the vicinity of the ball portion of the shoe, each of said upper tensioning devices including a pair of normally open gripper jaws and a member for engaging the insole of the shoe and adapted to exert yielding pressure thereon when said upper tensioning device is moved toward the bottom of the shoe, means for moving said upper tensioning devices, together with their open gripper jaws toward the bottom of a shoe on the support, means for closing the gripper jaws of each of said devices thereby to seize the upper materials, means for thereafter moving the gripper jaws away from the shoe bottom thereby to exert tensioning pulls on the upper materials seized thereby, and control means associated with the gripper jaw closing means of said second pair of upper tensioning devices for rendering the gripper jaw closing means operative to hold the gripper jaws closed during the movement of said upper tensioning devices toward the shoe bottom and subsequent movement of the jaws away from the shoe bottom whereby the upper materials are not seized by the gripper jaws of said second pair of upper tensioning devices but the insole is held yieldingly against the last by the insole engaging members.

7. In a machine for lasting the shank portions of shoes, a support for a shoe on its last, shank lasting instrumentalities including a first pair of upper tensioning devices adapted to operate in the vicinity of the breast line of a shoe on the support, and a second pair of upper tensioning devices adapted to operate in the vicinity of the ball portion of the shoe, each of said upper tensioning devices including a pair of normally open gripper jaws and a member for engaging the insole of the shoe and adapted to exert yielding pressure thereon when said upper tensioning device is moved toward the bottom of the shoe, fluid pressure operated means for moving said upper tensioning devices together with their open gripper jaws toward the bottom of a shoe on the support, fluid pressure operated means for closing the gripper jaws of each of said devices thereby to seize the upper materials, fluid pressure operated means for thereafter moving the gripper jaws away from the shoe bottom thereby to exert tensioning pulls on the upper materials seized thereby, and control means associated with the gripper jaw closing means of said second pair of upper tensioning devices including a manually movable valve member for rendering the gripper jaw closing means operative to hold the gripper jaws closed during the movement of said upper tensioning devices toward the shoe bottom and subsequent movements of the jaws away from the shoe bottom, whereby the upper materials are not seized by the gripper jaws of said second pair of upper tensioning devices but the insole is held yieldingly against the last by the insole engaging members.

8. In a machine for lasting the shank portions of shoes, a support for a shoe on its last, shank lasting instrumentalities including a pair of upper tensioning devices adapted to operate in the vicinity of the breast line of a shoe on the support, each of said upper tensioning devices including a pair of normally open gripper jaws and a member for engaging the insole of the shoe and adapted to exert yielding pressure thereon when said upper tensioning device is moved toward the bottom of the shoe, means for moving said upper tensioning devices together with their open gripper jaws toward the bottom of a shoe on the support, means for closing the gripper jaws of each of said devices thereby to seize the upper materials, means for thereafter moving the gripper jaws away from the shoe bottom thereby to exert tensioning pulls on the upper materials seized thereby, and control means associated with the gripper jaw closing means of said pair of upper tensioning devices for rendering the gripper jaw closing means operative to hold the gripper jaws closed during the movement of said upper tensioning devices toward the shoe bottom and subsequent movement of the jaws away from the shoe bottom whereby the upper materials are not seized by the gripper jaws of said upper tensioning devices but the insole is held yieldingly against the last by the insole engaging members.

9. In a machine for lasting the shank portions of shoes, a support for a shoe on its last, shank lasting instrumentalities including a pair of upper tensioning devices adapted to operate in the vicinity of the breast line of a shoe on the support, each of said upper tensioning devices including a pair of normally open gripper jaws and a member for engaging the insole of the shoe and adapted to exert yielding pressure thereon when said upper ten-

sioning device is moved toward the bottom of the shoe, fluid pressure operated means for moving said upper tensioning devices together with their open gripper jaws toward the bottom of a shoe on the support, fluid pressure operated means for closing the gripper jaws of each of said devices thereby to seize the upper materials, fluid pressure operated means for thereafter moving the gripper jaws away from the shoe bottom thereby to exert tensioning pulls on the upper materials seized thereby, and control means associated with the gripper jaw closing means of said pair of upper tensioning devices including a manually movable valve member for rendering the gripper jaw closing means operative to hold the gripper jaws closed during the movement of said upper tensioning devices toward the shoe bottom and subsequent movement of the jaws away from the shoe bottom, whereby the upper materials are not seized by the gripper jaws of said upper tensioning devices but the insole is held yieldingly against the last by the insole engaging members.

10. In a machine for lasting the shank portions of shoes, a support for a shoe on its last, shank lasting instrumentalities including a pair of upper tensioning devices adapted to operate in the vicinity of the shank portion of the shoe, each of said upper tensioning devices including a pair of normally open gripper jaws and a member for engaging the insole of the shoe and adapted to exert yielding pressure thereon when said upper tensioning device is moved toward the bottom of the shoe, means for moving said upper tensioning devices together with their open gripper jaws toward the bottom of a shoe on the support, means for closing the gripper jaws of each of said devices thereby to seize the upper materials, means for thereafter moving the gripper jaws away from the shoe bottom thereby to exert tensioning pulls on the upper materials seized thereby, and control means associated with the gripper jaw closing means of said pair of upper tensioning devices for rendering the gripper jaw closing means operative to hold the gripper jaws closed during the movement of said upper tensioning devices toward the shoe bottom and subsequent movement of the jaws away from the shoe bottom, whereby the upper materials are not seized by the gripper jaws of said upper tensioning devices but the insole is held yieldingly against the last by the insole engaging members.

11. In a machine for lasting the shank portions of shoes, a support for a shoe on its last, shank lasting instrumentalities including a pair of upper tensioning devices adapted to operate in the vicinity of the shank portion of the shoe, each of said upper tensioning devices including a pair of normally open gripper jaws and a member for engaging the insole of the shoe and adapted to exert yielding pressure thereon when said upper tensioning device is moved toward the bottom of the shoe, fluid pressure operated means for moving said upper tensioning devices together with their open gripper jaws toward the bottom of a shoe on the support, fluid pressure operated means for closing the gripper jaws of each of said devices thereby to seize the upper materials, fluid pressure operated means for thereafter moving the gripper jaws away from the shoe bottom thereby to exert tensioning pulls on the upper materials seized thereby, and control means associated with the gripper jaw closing means of said pair of upper tensioning devices including a manually movable valve member for rendering the gripper jaw closing means operative to hold the gripper jaws closed during the movement of said upper tensioning devices toward the shoe bottom and subsequent movement of the jaws away from the shoe bottom, whereby the upper materials are not seized by the gripper jaws of said upper tensioning devices but the insole is held yieldingly against the last by the insole engaging members.

12. In a machine for lasting the heel and shank portions of a shoe, a support for a shoe on its last, heel end lasting instrumentalities, shank lasting instrumentalities including a pair of upper tensioning devices adapted to operate in the vicinity of the breast line of the shoe, said upper tensioning device each comprising a pair of normally open gripper jaws, means for moving the upper tensioning devices toward the bottom of a shoe on the support, means for closing the gripper jaws of each of said devices thereby to seize the upper materials, means for thereafter moving the gripper jaws away from the shoe bottom to exert tensioning pulls on the upper materials seized thereby, and means arranged to engage the upper materials at the opposite sides of the shoe in the vicinity of the breast line and operable in time relation to said upper tensioning devices for moving the upper materials inwardly toward the opposite sides of the last as the open gripper jaws of said upper tensioning devices are moved toward the shoe bottom and before these jaws are closed to seize the upper materials.

13. In a machine for lasting the heel and shank portions of a shoe, a support for a shoe on its last, heel end lasting instrumentalities, shank lasting instrumentalities including a pair of upper tensioning devices adapted to operate in the vicinity of the breast line of the shoe, said upper tensioning devices each comprising a pair of normally open gripper jaws, fluid pressure operated means for moving the upper tensioning devices toward the bottom of a shoe on the support, fluid pressure operated means for closing the gripper jaws of said devices thereby to seize the upper materials, fluid pressure operated means for thereafter moving the gripper jaws away from the shoe bottom to exert tensioning pulls on the upper materials seized thereby, and fluid pressure operated means arranged to engage the upper materials at the opposite sides of the shoe in the vicinity of the breast line and operable in time relation to said upper tensioning devices for moving the upper materials inwardly toward the opposite sides of the last as the open gripper jaws of said upper tensioning devices are moved downwardly toward the shoe bottom and before these jaws are closed to seize the upper materials.

14. In a machine for lasting the heel and shank portions of a shoe, a support for a shoe on its last, heel end lasting instrumentalities including a heel band and power operated means for causing the heel band to embrace the heel end of a shoe on the support during an automatic operating cycle of the heel end lasting instrumentalities, shank lasting instrumentalities including a pair of upper tensioning devices adapted to operate in the vicinity of the breast line of the shoe, said upper tensioning devices each comprising a pair of normally open gripper jaws, means for moving the upper tensioning devices toward the bottom of a shoe on the support, means for closing the gripper jaws of each of said devices thereby to seize the upper materials, means for thereafter moving the gripper jaws away from the shoe bottom to exert tensioning pulls on the upper materials seized thereby, and means for moving the end portions of the heel band inwardly toward the shoe and operable in time relation to said upper tensioning devices for moving the upper materials inwardly toward the opposite sides of the last as the open gripper jaws of said upper tensioning devices are moved toward the shoe bottom and before these jaws are closed to seize the upper mateirals.

15. In a machine for lasting the heel and shank portions of a shoe, a support for a shoe on its last, heel end lasting instrumentalities including a heel band and power operated means for causing the heel band to embrace the heel end of a shoe on the support during an automatic operating cycle of the heel and lasting instumentalities, shank lasting instrumentalities including a pair of upper tensioning devices adapted to operate in the vicinity of the breast line of the shoe, said upper tensioning devices each comprising a pair of normally open gripper jaws, fluid pressure operated means for moving the upper tensioning devices toward the bottom of a shoe on the support, fluid pressure operated means

for closing the gripper jaws of each of said devices thereby to seize the upper materials, fluid pressure operated means for thereafter moving the gripper jaws away from the shoe bottom to exert tensioning pulls on the upper materials seized thereby, and fluid pressure operated means for moving the end portions of the heel band inwardly toward the shoe and operable in time relation to said upper tensioning devices for moving the upper materials inwardly toward the opposite sides of the last as the open gripper jaws of said upper tensioning devices are moved toward the shoe bottom and before these jaws are closed to seize the upper materials.

16. In a machine for lasting the heel and shank portions of a shoe, a support for a shoe on its last, heel end lasting instrumentalities, shank lasting instrumentalities including a pair of upper tensioning devices, said upper tensioning devices each comprising a pair of normally open gripper jaws, means for moving the upper tensioning devices toward the bottom of a shoe on the support, means for closing the gripper jaws of each of said devices thereby to seize the upper materials, means for thereafter moving the gripper jaws away from the shoe bottom to exert tensioning pulls on the upper materials seized thereby, and means arranged to engage the upper materials at the opposite sides of the shoe and operable in time relation to said upper tensioning devices for moving the upper materials inwardly toward the opposite sides of the last as the open gripper jaws of said upper tensioning devices are moved toward the shoe bottom and before these jaws are closed to seize the upper materials.

17. In a machine for lasting the heel and shank portions of a shoe, a support for a shoe on its last, heel end lasting instrumentalities, shank lasting instrumentalities including a pair of upper tensioning devices, said upper tensioning devices each comprising a pair of normally open gripper jaws, fluid pressure operated means for moving the upper tensioning devices toward the bottom of a shoe on the support, fluid pressure operated means for closing the gripper jaws of each of said devices thereby to seize the upper materials, fluid pressure operated means for thereafter moving the gripper jaws away from the shoe bottom to exert tensioning pulls on the upper materials seized thereby, and fluid pressure operated means arranged to engage the upper materials at the opposite sides of the shoe and operable in time relation to said upper tensioning devices for moving the upper materials inwardly toward the opposite sides of the last as the open gripper jaws of said upper tensioning devices are moved toward the shoe bottom and before these jaws are closed to seize the upper materials.

18. In a machine for lasting the heel and shank portions of a shoe, a support for a shoe on its last, heel end lasting instrumentalities including a heel band and power operated means for causing the heel band to embrace the heel end of a shoe on the support during an automatic operating cycle of the heel end lasting instrumentalities, shank lasting instrumentalities including a pair of upper tensioning devices, said upper tensioning devices each comprising a pair of normally open gripper jaws, means for moving the upper tensioning devices toward the bottom of a shoe on the support, means for closing the gripper jaws of each of said devices thereby to seize the upper materials, means for thereafter moving the gripper jaws away from the shoe bottom to exert tensioning pulls on the upper materials seized thereby, and means for moving the end portion of the heel band inwardly toward the shoe and operable in time relation to said upper tensioning devices for moving the upper materials inwardly toward the opposite sides of the last as the open gripper jaws of said upper tensioning devices are moved toward the shoe bottom and before these jaws are closed to seize the upper materials.

19. In a machine for lasting the heel and shank portions of a shoe, a support for a shoe on its last, heel end lasting instrumentalities including a heel band and power operated means for causing the heel band to embrace the heel end of a shoe on the support during an automatic operating cycle of the heel end lasting instrumentalities, shank lasting instrumentalities including a pair of upper tensioning devices, said upper tensionng devices each comprising a pair of normally open gripper jaws, fluid pressure operated means for moving the upper tensioning devices toward the bottom of a shoe on the support, fluid pressure operated means for closing the gripper jaws of each of said devices thereby to seize the upper materials, fluid pressure operated means for thereafter moving the gripper jaws away from the shoe bottom to exert tensioning pulls on the upper materials seized thereby, and fluid pressure operated means for moving the end portions of the heel band inwardly toward the shoe and operable in time relation to said upper tensioning devices for moving the upper materials inwardly toward the opposite sides of the last as the open gripper jaws of said upper tensioning devices are moved toward the shoe bottom and before these jaws are closed to seize the upper materials.

20. In a machine for lasting the shank portions of shoes having a support for a shoe on its last, shank lasting instrumentalities including upper tensioning devices and a pair of shank wiping units, each of said shank wiping units comprising a supporting member and a shank wiper carried thereby, said supporting member being mounted for movement to carry the shank wiper toward the shank portion of a shoe on the support, a plurality of wiper blocks, one of said blocks being mounted directly on the supporting member while the others are articulated to said mentioned block and to each other in end-to-end relation by means of interposed links, and a plurality of flexible wiping plates carried by said wiper blocks.

21. In a machine for lasting the shank portions of shoes having a support for a shoe on its last, shank lasting instrumentalities including upper tensioning devices and a pair of shank wiping units, each of said shank wiping unts comprising a supportng member and a shank wiper carried thereby, said supporting member being mounted for movement to carry the shank wiper toward the shank portion of a shoe on the support, a plurality of wiper blocks, one of said blocks being mounted directly on the supporting member while the others are articulated to said mentioned block and to each other in end-to-end relation by means of interposed links, and a plurality of flexible wiping plates carried by said wiper blocks and arranged with their adjacent edges in overlapping relation.

22. In a machine for lasting the shank portions of shoes having a support for a shoe on its last, shank lasting instrumentalities including upper tensioning devices and a pair of shank wiping units, each of said shank wiping units comprsing a supporting member and a shank wiper carried thereby, said supporting member being mounted for movement to carry the shank wiper toward the shank portion of a shoe on the support, a plurality of wiper blocks, one of said blocks being mounted directly on the supporting member while the others are articulated to said mentioned block and to each other in end-to-end relation by means of interposed links, a plurality of flexible wiping plates carried by said wiper blocks, and manually adjustable means associated with said blocks and said supporting member for causing said blocks to assume and for yieldingly holding them in a shape generally conforming to the longitudinal curvature of the shank portion of a shoe to be lasted.

23. In a machine for lasting the shank portions of shoes having a support for a shoe on its last, shank lasting instrumentalities including upper tensioning devices and a pair of shank wiping units, each of said shank wiping units comprising a supporting member and a shank wiper carried thereby, said supporting member being mounted for movement to carry the shank wiper toward the shank portion of a shoe on the support, a

plurality of wiper blocks, one of said blocks being mounted directly on the supporting member while the others are articulated to said mentioned block and to each other in end-to-end relation by means of interposed links, a plurality of flexible wiping plates carried by said wiper blocks and arranged with their adjacent edges in overlapping relation, and manually adjustable means associated with said blocks and said supporting member for causing said blocks and associated wiping plates to assume and for yieldingly holding them in a shape generally conforming to the longitudinal curvature of the shank portion of a shoe to be lasted.

24. In a machine for lasting the shank portions of shoes having a support for a shoe on its last, shank lasting instrumentalities including upper tensioning devices and a pair of shank wiping units, each of said shank wiping units comprising a supporting member and a shank wiper carried thereby, said supporting member being mounted for movement to carry the shank wiper toward the shank portion of a shoe on the support, a plurality of wiper blocks, one of said blocks being mounted directly on the supporting member while the others are articulated to said mentioned block and to each other in end-to-end relation by means of interposed links, a plurality of flexible wiping plates carried by said wiper blocks, and manually adjustable means associated with said blocks and said supporting member for causing said blocks and associated wiping plates to assume and for yieldingly holding them in a shape generally conforming to the longitudinal curvature of the shank portion of a shoe to be lasted, said means including a plurality of abutment rods connected, respectively, to certain of the wiper blocks, abutment means associated with the supporting member, spring means surrounding each connecting rod and interposed between the abutment means and each said wiper block, and a hand nut threaded onto the rod and bearing on the opposite side of an abutment member.

25. In a machine for lasting the shank portions of shoes having a support for a shoe on its last, shank lasting instrumentalities including upper tensioning devices and a pair of shank wiping units, each of said shank wiping units comprising a supporting member and a shank wiper carried thereby, said supporting member being mounted for movement to carry the shank wiper toward the shank portion of a shoe on the support, a plurality of wiper blocks, one of said blocks being mounted directly on the supporting member while the others are articulated to said mentioned block and to each other in end-to-end relation by means of interposed links, a plurality of flexible wiping plates carried by said wiper blocks and arranged with their adjacent edges in overlapping relation, and manually adjustable means associated with said blocks and said supporting member for causing said blocks and associated wiping plates to assume and for yieldingly holding them in a shape generally conforming to the longitudinal curvature of the shank portion of a shoe to be lasted, said means including a plurality of rods connected, respectively, to certain of the wiper blocks, abutment means associated with the supporting member, spring means surrounding each connecting rod and interposed between one side of the abutment means and each of said wiper blocks, and a hand nut threaded onto the rod and bearing on the opposite side of the abutment means.

26. In a machine for lasting the shank portions of shoes having a support for a shoe on its last, shank lasting instrumentalities including upper tensioning devices and a pair of shank wiping units, each of said shank wiping units comprising a supporting member and a shank wiper carried thereby, said supporting member being mounted for movement to carry the shank wiper toward the shank portion of a shoe on the support, a plurality of wiper blocks, one of said blocks being mounted directly on the supporting member while the others are articulated to said mentioned block and to each other in end-to-end relation by means of interposed links, a plurality of flexible wiping plates carried by said wiper blocks, and manually adjustable means associated with said blocks and said suporting member for causing said blocks and associated wiping plates to assume and for yieldingly holding them in a shape generally conforming to the longitudinal curvature of the shank portion of a shoe to be lasted, said means including a plurality of rods connected, respectively, to certain of the wiper blocks, a first abutment member carried directly by said supporting member, a second abutment member mounted on the supporting member for adjusting movements in directions extending lengthwise and heightwise of the shoe being lasted, spring means surrounding each of said connecting rods and interposed between one surface of an abutment member and its associated wiper block, and a hand nut threaded onto each of said rods and bearing against the opposite surface of an abutment member, one of said connecting rods and its associated spring and hand nut being associated with the first-mentioned abutment member and the other of said connecting rods and their associated springs and hand nuts being associated with the second abutment member.

27. In a machine for lasting the shank portions of shoes having a support for a shoe on its last, shank lasting instrumentalities including upper tensioning devices and a pair of shank wiping units, each of said shank wiping units comprising a supporting member and a shank wiper carried thereby, said supporting member being mounted for movement to carry the shank wiper toward the shank portion of a shoe on the support, a plurality of wiper blocks, one of said blocks being mounted directly on the supporting member while the others are articulated to said mentioned block and to each other in end-to-end relation by means of interposed links, a plurality of flexible wiping plates carried by said wiper blocks and arranged with their adjacent edges in overlapping relation, and manually adjustable means associated with said blocks and said supporting members for causing said blocks and associated wiping plates to assume and for yieldingly holding them in a shape generally conforming to the longitudinal curvature of the shank portion of a shoe to be lasted, said means including a plurality of rods connected, respectively, to certain of the wiper blocks, a first abutment member carried directly by said supporting member, a second abutment member mounted on the supporting member for adjusting movements in directions extending lengthwise and heightwise of the shoe being lasted, spring means surrounding each of said connecting rods and interposed between one surface of an abutment member and its associated wiper block, and a hand nut threaded onto each of said rods and bearing against the opposite surface of an abutment member, one of said connecting rods and its associated spring and hand nut being associated with the first-mentioned abutment member and the other of said connecting rods and their associated springs and hand nuts being associated with the second abutment member.

28. In a machine for lasting the shank portion of a shoe having a support for a shoe on its last, shank lasting instrumentalities including a pair of shank wiping units, each of said shank wiping units comprising a supporting member and a shank wiper carried thereby, each of said supporting members being mounted for movement in a first direction to cause its associated shank wiper to wipe the upper materials inwardly over the bottom of the shank portion on one side of a shoe on the support, power operated means for thus moving said supporting members, each of said supporting members being also mounted for movement in a second direction to cause its associated shank wiper to press the upper materials against the bottom of the shoe, and means for effecting such movement of the supporting members in said second direction as their movements in the first direction are being completed.

29. In a machine for lasting the shank portion of a shoe having a support for a shoe on its last, shank lasting in-

strumentalities including a pair of shank wiping units, each of said shank wiping units comprising a supporting member and a shank wiper carried thereby, each of said supporting members being monuted for movement in a first direction to cause its associated shank wiper to wipe the upper materials inwardly over the bottom of the shank portion on one side of a shoe on the support, power operated means for thus moving said supporting members, each of said supporting members being also mounted for movement in a second direction to cause its associated shank wiper to press the upper materials against the bottom of the shoe, and means associated with said power operated means for effecting such movements of the supporting members in said second direction as their movements in the first direction are being completed.

30. In a machine for lasting the shank portion of a shoe having a support for a shoe on its last, shank lasting instrumentalities including a pair of shank wiping units, each of said shank wiping units comprising a supporting member and a shank wiper carried thereby, each of said supporting members being mounted for movement in a first direction to cause its associated shank wiper to wipe the upper materials inwardly over the bottom of the shank portion on one side of a shoe on the support, each of said supporting member mounting means comprising a pair of rollers on which said supporting member is mounted, means for engaging one side of the supporting member for yieldingly holding the other side of the supporting member against the rollers, and a fixed abutment member spaced from said first side of the supporting member, power operated means for thus moving said supporting members, and means for exerting a force on the supporting members in a direction to cause them first to move into engagement with their associated fixed abutment members and then to pivot thereabout in a direction to cause the shank wipers carried thereby to press the upper against the bottom of the shoe, as their movements inwardly over the shoe bottom are being completed.

31. In a machine for lasting the shank portion of a shoe having a support for a shoe on its last, shank lasting instrumentalities including a pair of shank wiping units, each of said shank wiping units comprising a supporting member and a shank wiper carried thereby, each of said supporting members being mounted for movement in a first direction to cause its associated shank wiper to wipe the upper materials inwardly over the bottom of the shank portion on one side of a shoe on the support, each of said supporting member mounting means comprising a pair of rollers on which said supporting member is mounted, means for engaging one side of the supporting member for yieldingly holding the other side of the supporting member against the rollers, and a fixed abutment member spaced from said first side of the supporting member, power operated means for thus moving said supporting members, and means associated with said power operated means for exerting a force on the supporting members in a direction to cause them first to move into engagement with their associated fixed abutment members and then to pivot thereabout in a direction to cause the shank wipers carried thereby to press the upper against the bottom of the shoe, as their movements inwardly over the shoe bottom are being completed.

32. In a machine for lasting the heel and shank portions of a shoe, a support for a shoe on its last, heel seat lasting instrumentalities including a heel band and heel end wipers, power operated means for actuating the heel end lasting instrumentalities in an automatic operating cycle, control means for said power operated means, shank lasting instrumentalities including a pair of shank wipers for wiping the lasting margin of the upper materials inwardly over the bottom of the shank portion of a shoe on the support, each of said shank wipers having portions adapted to yield heightwise of the shoe as the upper materials are wiped inwardly, and power operated means for causing said portions of the shank wipers to exert greater pressure on the upper materials after the upper materials have been wiped inwardly over the shoe bottom.

33. In a machine for lasting the heel and shank portions of a shoe, a support for a shoe on its last, heel seat lasting instrumentalities including a heel band and heel end wipers, power operated means for actuating the heel end lasting instrumentalities in an automatic operating cycle, control means for said power operated means, shank lasting instrumentalities including a pair of shank wipers for wiping the lasting margin of the upper materials inwardly over the bottom of the shank portion of a shoe on the support, each of said shank wipers having portions adapted to yield heightwise of the shoe as the upper materials are wiped inwardly, power operated means for causing said portions of the shank wipers to exert greater pressure on the upper materials after the upper materials have been wiped inwardly over the shoe bottom, and means responsive to the completion of operation of said shank wiping units to wipe the lasting margin of the upper inwardly over the shoe bottom for actuating the control means to initiate an automatic operating cycle of said heel end lasting instrumentalities and for initiating operation of said last-named power operated means.

34. In a machine for lasting the shank portions of a shoe, having a support for a shoe on its last and a pair of shank lasting units, each of said shank lasting units including a shank wiper, a supporting member for said shank wiper mounted for movement to cause the shank wiper to wipe the lasting margin of the upper materials inwardly over the shank portion of a shoe on the support, said shank wiper comprising a first portion connected directly to the supporting member and other portions mounted on the supporting member by means including a normally yieldable abutment member, and means carried by said supporting member and adapted to render said normally yieldable abutment member unyieldable thus to cause said other portions of the shank wiper to exert increased pressure on the upper materials after the upper materials have been wiped inwardly by both portions of the shank wiper.

35. In a machine for lasting the shank portions of a shoe, having a support for a shoe on its last and a pair of shank lasting units, each of said shank lasting units including a shank wiper, a supporting member for said shank wiper mounted for movement to cause the shank wiper to wipe the lasting margin of the upper materials inwardly over the shank portion of a shoe on the support, said shank wiper comprising a first portion connected directly to the supporting member and other portions mounted on the supporting member by means including a normally yieldable abutment member, power operated means carried by said supporting member and adapted to render said normally yieldable abutment member unyieldable thus to cause said other portion of the shank wiper to exert increased pressure on the upper materials after the upper materials have been wiped inwardly by both portions of the shank wiper.

36. In a machine for lasting the heel and shank portions of a shoe having a support for a shoe on its last mounted for movement from an inoperative position to an operative position, power operated means for moving the support to said operative position, shank lasting instrumentalities including grippers for first seizing the upper materials at the opposite sides of the shank portion of a shoe on the support and then exerting a tensioning pull thereon, power operated means for actuating said grippers, and wipers for wiping the lasting margin of the tensioned upper materials inwardly over the bottom of the shank portion of the shoe, power operated means for actuating said wipers, and control means including a member movable from an initial position to two other positions, successively, by the operator and then returnable automatically, upon release, to said initial position, said control means being adapted, when said control member is moved to said first position, to cause the first-

mentioned power operated means to move the support to operative position, when moved to said second position to cause said grippers to be operated by said second-named power operated means to seize and to tension the upper materials and, upon return to its initial position, to cause said wipers to be operated by said third power operated means to wipe the lasting margin of the tensioned upper inwardly over the bottom of the shoe.

37. In a machine for lasting the heel and shank portions of a shoe having a support for a shoe on its last mounted for movement from an inoperative position to an operative position, fluid pressure operated means for moving the support to said operative position, shank lasting instrumentalities including grippers for first seizing the upper materials at the opposite sides of the shank portion of a shoe on the support and then exerting a tensioning pull thereon, fluid pressure operated means for actuating said grippers, and wipers for wiping the lasting margin of the tensioned upper materials inwardly over the bottom of the shank portion of the shoe, fluid pressure operated means for actuating said wipers, and control means including a member movable from an initial position to two other positions, successively, by the operator and then returnable automatically, upon release, to said initial position, said control means being adapted, when said control member is moved to said first position, to cause the first-mentioned fluid pressure operated means to move the support to operative position, when moved to said second position to cause said grippers to be operated by said second-named fluid pressure operated means to seize and to tension the upper materials and, upon return to its initial position, to cause said wipers to be operated by said third fluid pressure operated means to wipe the lasting margin of the tensioned upper inwardly over the bottom of the shoe.

38. In a machine for lasting the heel and shank portions of a shoe having a support for a shoe on its last mounted for movement from an inoperative position to an operative position, power operated means for moving the support to said operative position, shank lasting instrumentalities including grippers for first seizing the upper materials at the opposite sides of the shank portion of a shoe on the support and then exerting a tensioning pull thereon, power operated means for actuating said grippers, and wipers for wiping the lasting margin of the tensioned upper materials inwardly over the bottom of the shank portion of the shoe, power operated means for actuating said wipers, and electrical control means including a member movable from an initial position to

two other positions, successively, by the operator and then returnable automatically, upon release, to said initial position, said control means being adapted, when said control member is moved to said first position, to cause the first-mentioned power operated means to move the support to operative position, when moved to said second position to cause said grippers to be operated by said second-named power operated means to seize and to tension the upper materials and, upon return to its initial position, to cause said wipers to be operated by said third power operated means to wipe the lasting margin of the tensioned upper inwardly over the bottom of the shoe.

39. In a machine for lasting the heel and shank portions of a shoe having a support for a shoe on its last mounted for movement from an inoperative position to an operative position, fluid pressure operated means for moving the support to said operative position, shank lasting instrumentalities including grippers for first seizing the upper materials at the opposite sides of the shank portion of a shoe on the support and then exerting a tensioning pull thereon, fluid pressure operated means for actuating said grippers, and wipers for wiping the lasting margin of the tensioned upper materials inwardly over the bottom of the shank portion of the shoe, fluid pressure operated means for actuating said wipers, and electrical control means including a member movable from an initial position to two other positions, successively, by the operator and then returnable automatically, upon release, to said initial position, said control means being adapted, when said control member is moved to said first position, to cause the first-mentioned fluid pressure operated means to move the support to operative position, when moved to said second position to cause said grippers to be operated by said second-named fluid pressure operated means to seize and to tension the upper materials and, upon return to its initial position, to cause said wipers to be operated by said third fluid pressure operated means to wipe the lasting margin of the tensioned upper inwardly over the bottom of the shoe.

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