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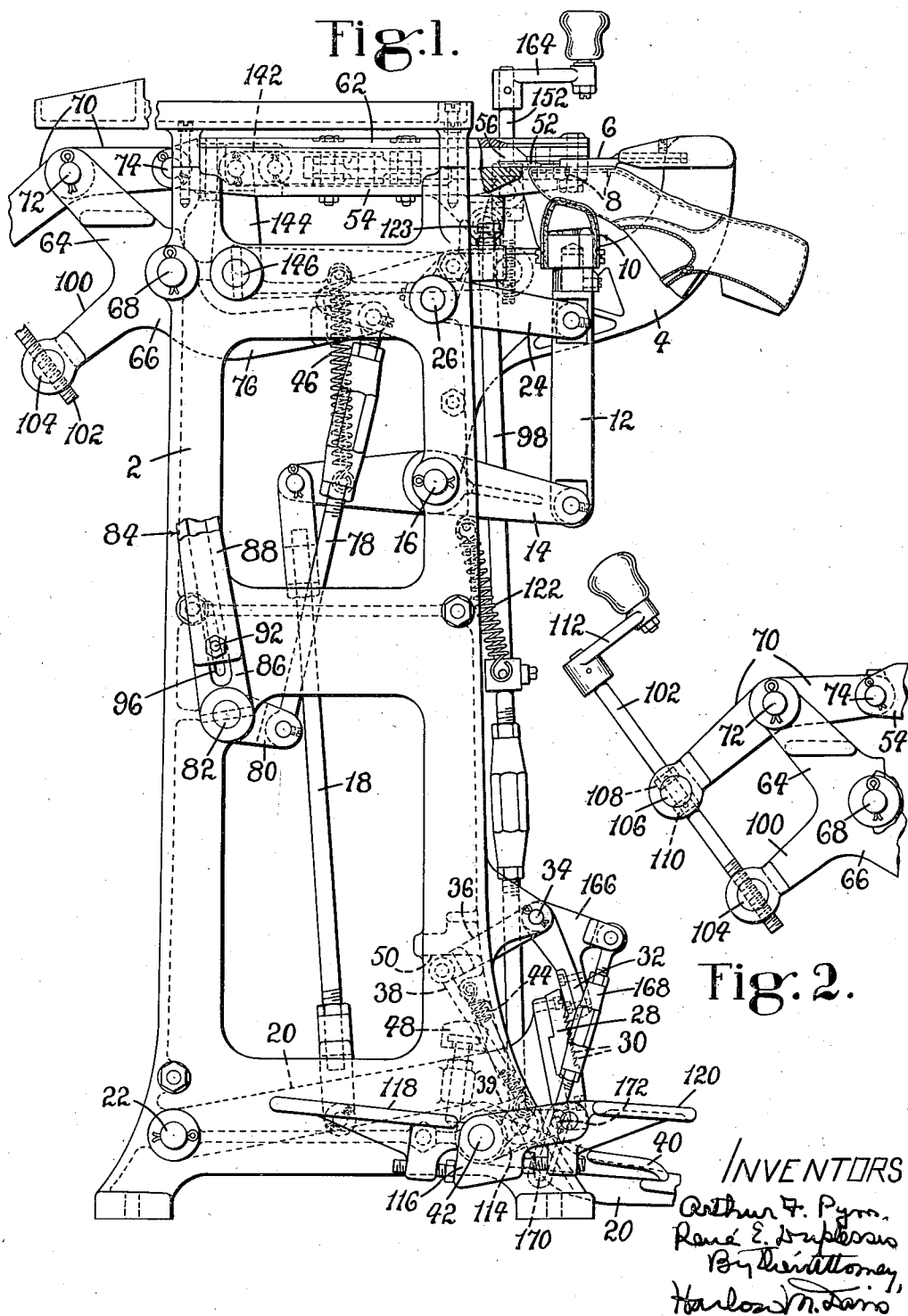
A. F. PYM ET AL

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LASTING MACHINE

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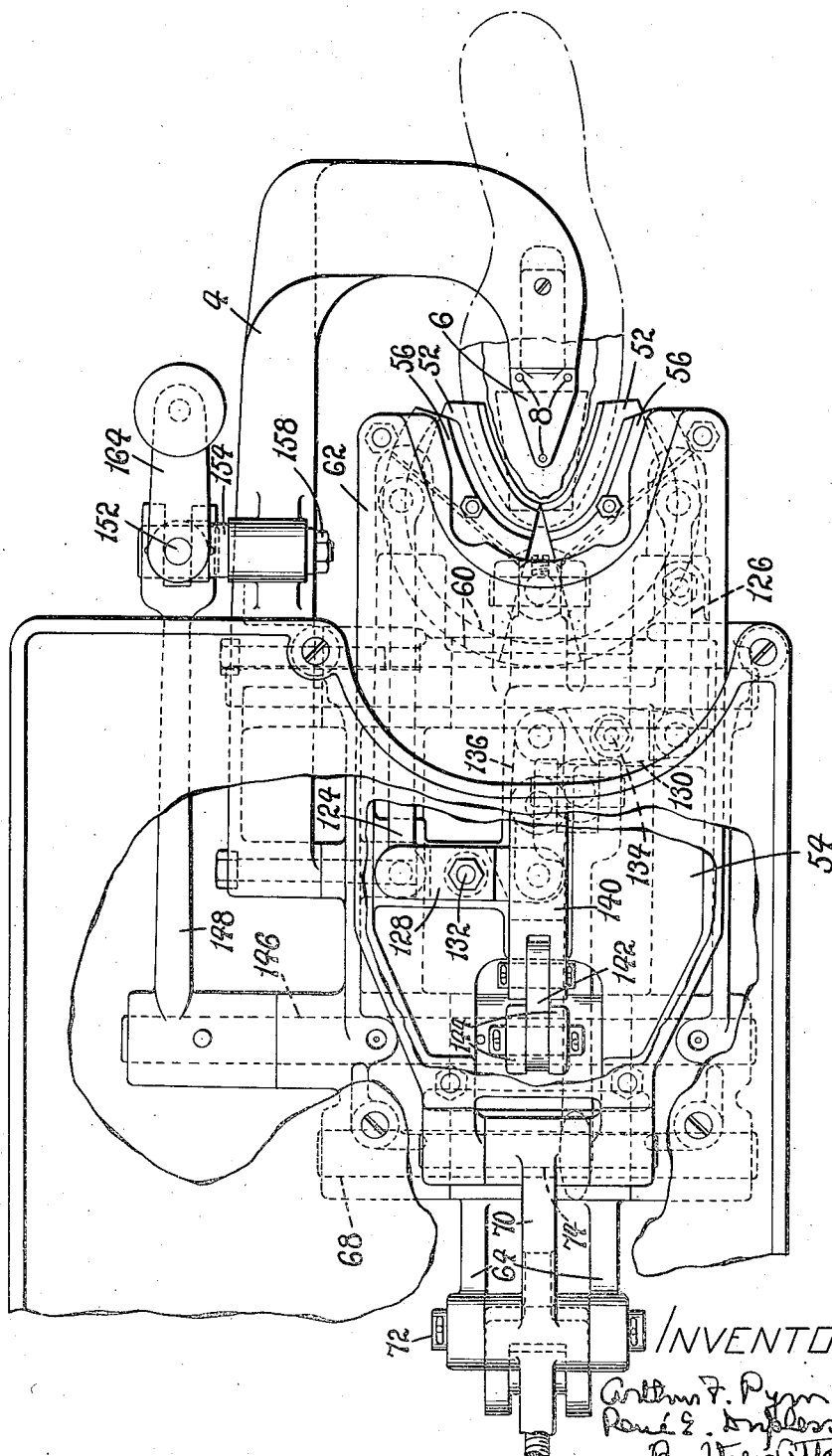
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LASTING MACHINE

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Fig. 3.



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LASTING MACHINE

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Fig. 4.

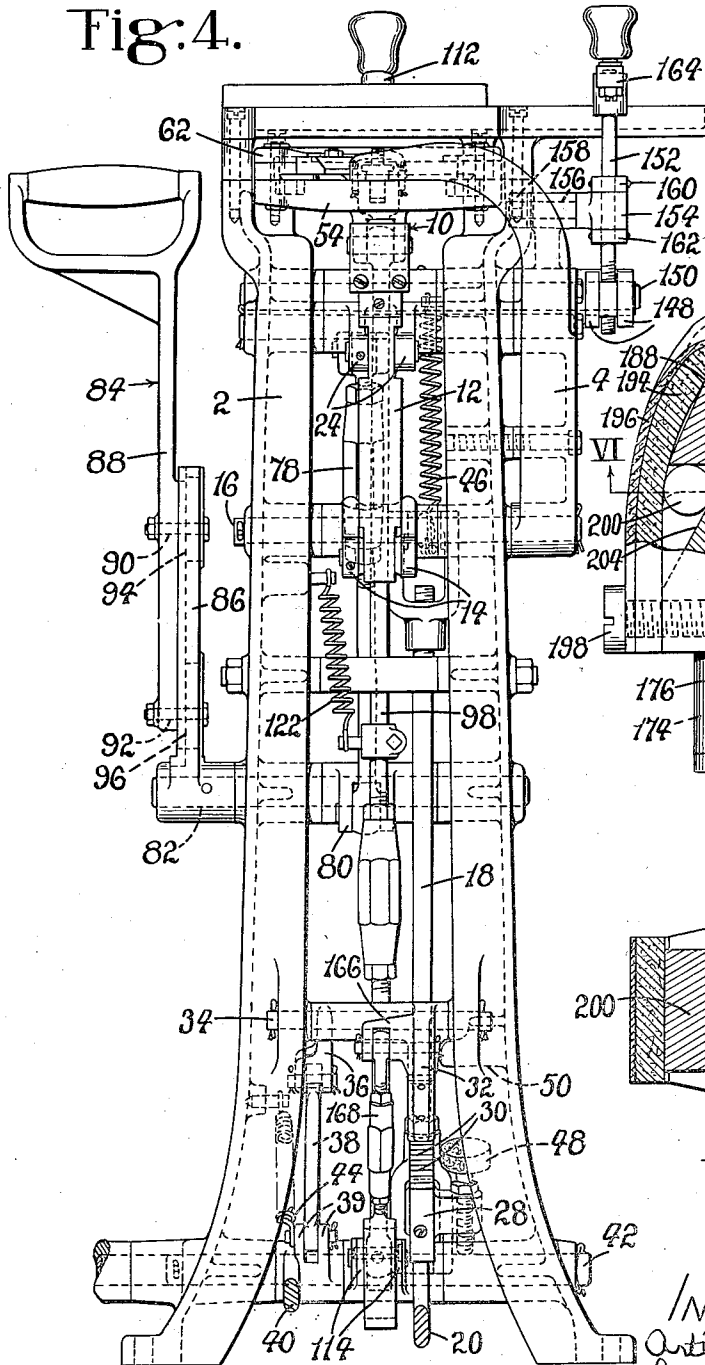


Fig. 5.

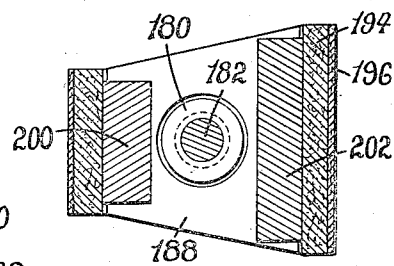
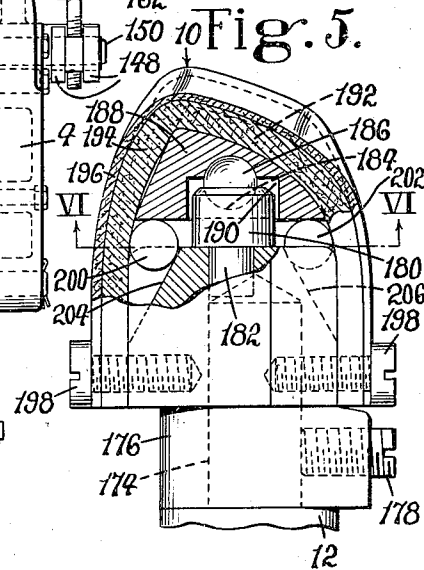


Fig. 6.

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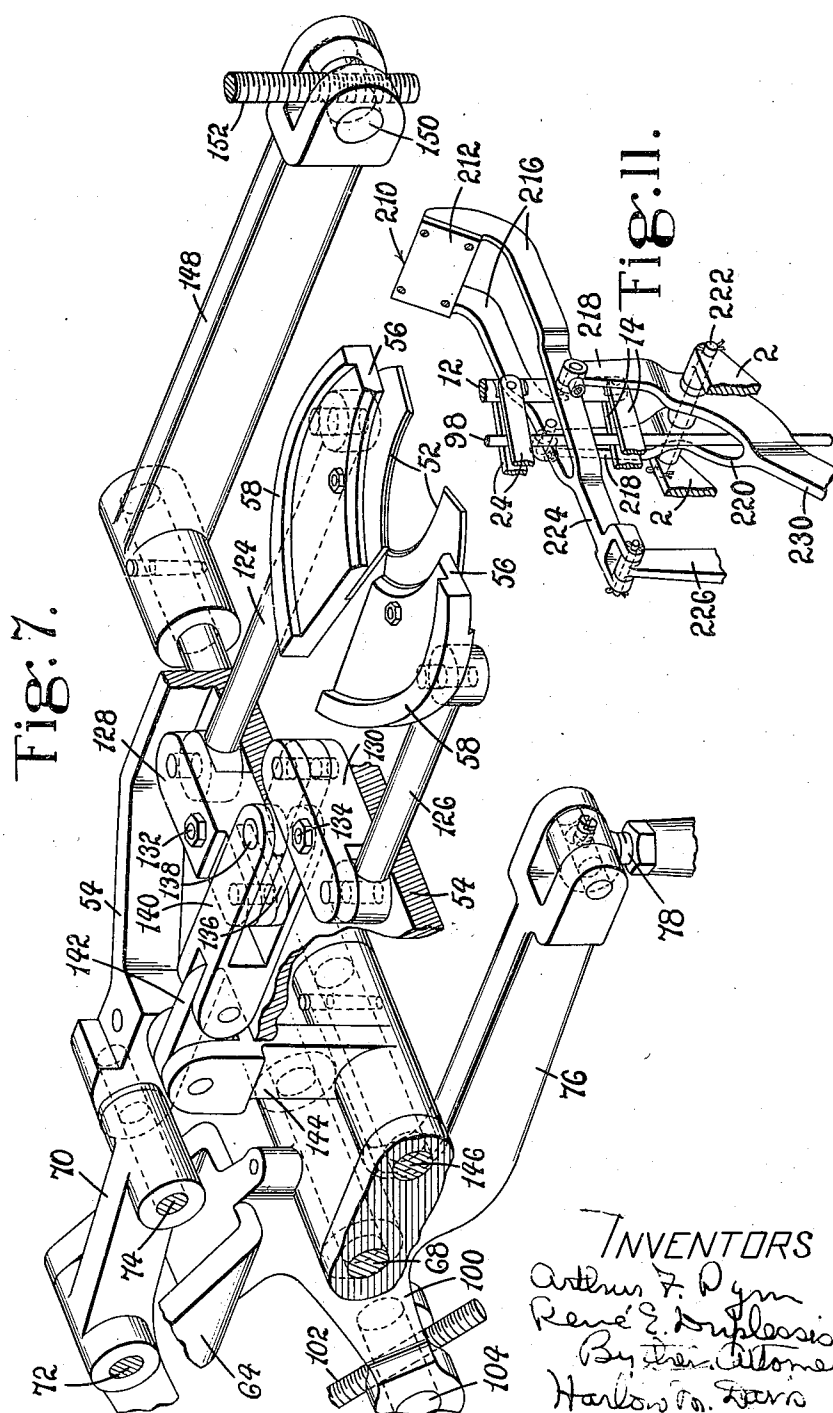
A. F. PYM ET AL

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LASTING MACHINE

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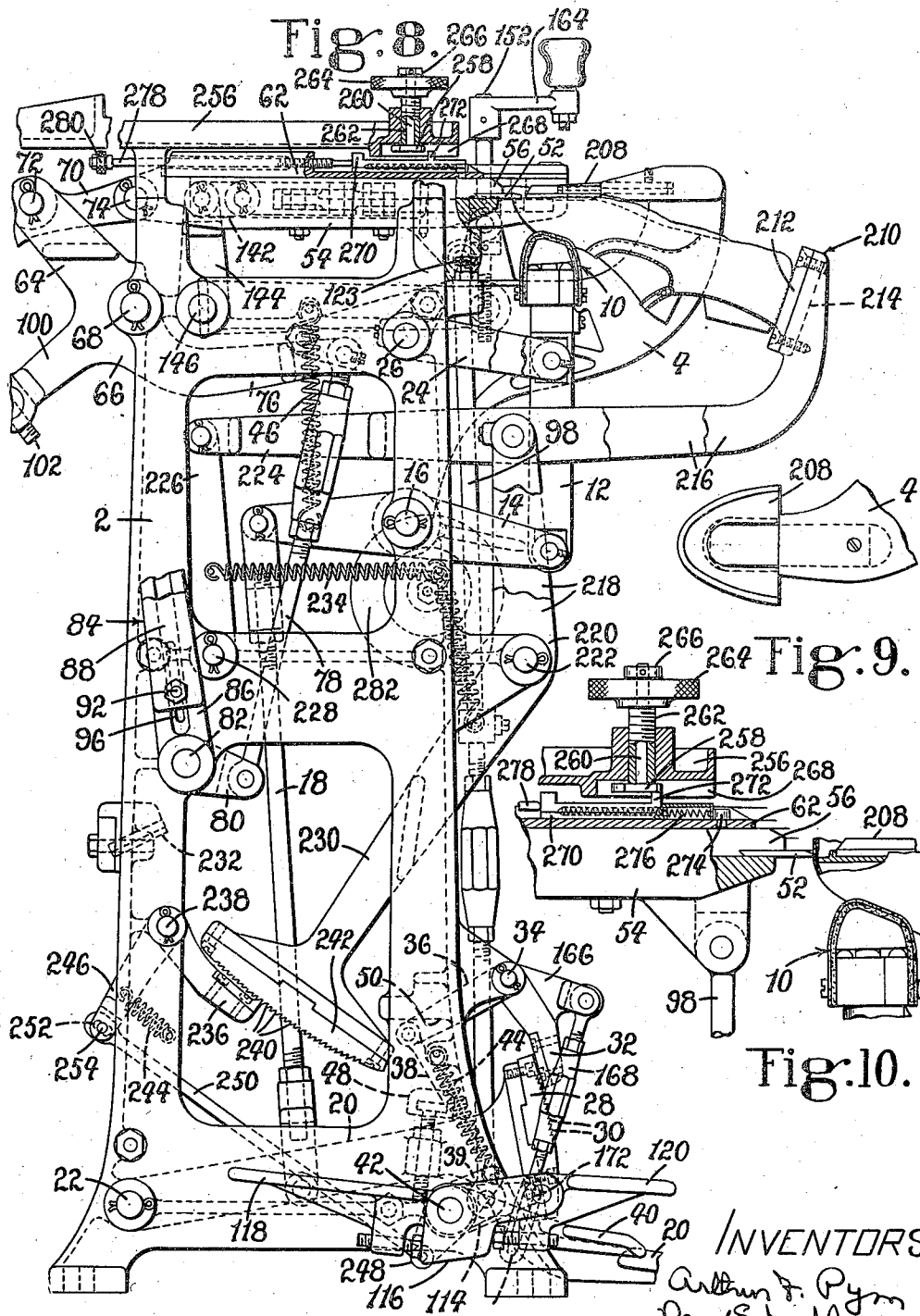
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LASTING MACHINE

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5 Sheets-Sheet 5



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2,146,762

LASTING MACHINE

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Application February 27, 1937, Serial No. 128,190

43 Claims. (Cl. 12—14)

This invention relates to lasting machines, and is herein illustrated as embodied in a machine for lasting the toe ends of shoes. It is to be understood, however, that in various novel aspects the invention is not limited to toe-lasting machines, but is applicable, for example, to machines for lasting the heel ends.

An object of the invention, among others, is to provide a machine adapted for convenient use by an operator to perform the lasting operation in a speedy and effective manner with but little effort on the operator's part. To this end, the construction herein shown comprises a wiper carrier provided with toe-lasting wipers and mounted on swinging supports which are located respectively at different distances from the shoe and are movable manually to advance and retract the wipers lengthwise of the shoe, together with a treadle arranged to act through one of the supports to swing the carrier and wipers heightwise of the shoe for "upwiping" the upper and for later pressing its margin upon the insole. For greater convenience and facility in operating the wiper carrier to advance and retract the wipers, there is provided for this purpose an upwardly extending hand lever mounted to swing about a horizontal axis and connected to one arm of another lever the other arm of which serves as one of the swinging supports for the carrier. There is further provided novel means for adjusting the wiper carrier by swinging it heightwise of the shoe about its connection with that one of its supports which is comparatively near the shoe, thereby tipping the wipers to positions best adapted for operating on shoes of different kinds.

In accordance with another feature, the invention provides novel means for closing the wipers laterally of the shoe in response to movement of the wiper carrier lengthwise of the shoe. As illustrated, such closing movements of the wipers are effected through levers extending laterally of the shoe and fulcrumed on the wiper carrier, the outer ends of the levers being connected by links to wiper holders on which the wipers are mounted and their inner ends being connected to a normally stationary crank arm, so that swinging movements of the levers in directions to close the wipers result from the movement of the wiper carrier. In the construction shown, moreover, mechanism is provided for preliminarily adjusting the wipers toward or from each other by swinging the normally stationary crank arm.

The invention further provides novel means

for limiting the wiping movement of the wipers heightwise of the shoe by stopping them when they are in proper position to wipe the margin of the upper inwardly over the insole, thus relieving the operator of the necessity for exercising any care in this respect. For this purpose, in the construction shown, a member supported on the wiper carrier is arranged to engage a normally stationary stop member, but is movable out of cooperative relation to this stop member as the carrier and wipers are thereafter advanced lengthwise of the shoe, so as to permit a further movement of the wipers in the direction to relieve their pressure on the margin of the upper before they are retracted from over the shoe bottom. In order not to interfere with such retractive movement of the wiper carrier and wipers after the relief of pressure on the upper, the above-mentioned member on the wiper carrier is not fixed thereon, but is yieldable upon lateral engagement of the stop member therewith.

To control the shoe in the lasting operation the machine herein shown is provided with a toe rest movable by a treadle into shoe-clamping position and with a device for locking it in that position, and in one form illustrated the machine has also a heel rest movable by the operator independently of the toe rest into engagement with the heel end of the shoe. Among the features of the invention are further to be recognized novel means for supporting the heel rest in such manner as to facilitate its movements into and out of operative position, a device arranged to cooperate in a novel manner with such supporting means to lock the heel rest in operative position, and novel means for unlocking the toe rest and the heel rest to permit their return to starting positions. As illustrated, the toe rest and the heel rest, if both are used, or the toe rest alone if the heel rest is omitted, may be unlocked by a treadle specially provided for that purpose or, alternatively, by means controlled by that treadle which the operator uses to impart to the wipers their movement heightwise of the shoe.

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

In the drawings,

Fig. 1 is a view in front elevation of a machine

in which the invention is embodied, with parts broken away;

Fig. 2 shows in front elevation a portion of the structure omitted from the upper left-hand side of Fig. 1;

Fig. 3 is a plan view of the machine with parts broken away;

Fig. 4 shows the machine in right-hand end elevation, also with certain parts broken away;

Fig. 5 is a view on an enlarged scale, partly in front elevation and partly in section, of a toe rest with which the machine is provided;

Fig. 6 is a section on the line VI—VI of Fig. 5;

Fig. 7 is a perspective view showing means provided for closing the wipers laterally of the shoe and for adjusting them toward or from each other;

Fig. 8 is a view similar to Fig. 1 showing certain modifications, including parts particularly adapted for use in operating on a welt shoe;

Fig. 9 is a plan view of a shoe-positioning device shown in Fig. 8;

Fig. 10 is a view partly in front elevation and partly in section of a portion of the structure shown in Fig. 8, with the parts in positions which they occupy after upwiping movement of the wipers heightwise of the shoe but prior to their movement inwardly over the insole; and

Fig. 11 is a perspective view of the heel rest shown in Fig. 8 and parts associated therewith.

With reference first to Figs. 1 to 7, inclusive, the machine comprises a frame 2 on the rear side of which there is secured a bracket 4 having fast thereon a plate 6 provided with three pins 8 arranged to extend through holes in an insole into sockets in the bottom of the forepart of a last to determine the position of the last and shoe relatively to toe-lasting wipers hereinafter described, in accordance with the method disclosed in United States Letters Patent No. 1,674,060, granted on June 19, 1928, upon an application of Arthur F. Pym. The shoe, which as illustrated is one of that type in which the margin of the upper in lasted position lies throughout its width in substantially parallel relation to the bottom of the last, is supported under the forepart by a toe rest 10, more particularly hereinafter described, this toe rest clamping the last against the ends of the pins 8. The toe rest 10 is supported upon the upper end of a vertical bar 12 pivotally mounted at its lower end on a bifurcated arm of a lever 14 fulcrumed on a rod 16 on the frame, the other arm of this lever being connected by a link 18 to a treadle 20 pivoted at 22 on the frame. Above the lever 14 the bar 12 is further controlled by a bifurcated link 24 pivoted on a rod 26 on the frame, this link being substantially parallel to the lever 14 and of substantially the same length as that arm of the lever to which the lower end of the bar 12 is connected. Accordingly depression of the treadle 20 serves to force the toe rest upwardly into clamping engagement with the shoe after the last and shoe have been mounted by the operator on the pins 8. In order to hold the toe rest in operative position there is secured to the treadle 20 a plate 28 provided with a plurality of ratchet teeth 30, and arranged to cooperate with these ratchet teeth is a locking pawl 32 pivotally mounted on a rod 34 on the frame and having integral therewith an arm 36 connected by a link 38 to a crank arm 39 integral with a treadle 40 mounted to swing about a shaft 42. A spring 44 connected at one end to the crank arm 39 and at its other end to the

frame holds the pawl 32 normally in position to cooperate with the ratchet teeth 30. Upon depression of the treadle 40 the pawl is swung away from the ratchet teeth to release the toe rest and permit it to be returned to its idle position. Such return of the toe rest is effected by a spring 46 connected at one end to the frame and at the other end to the lever 14. It will be understood that by the action of this spring the treadle 20 is swung upwardly. To limit such upward movement of the treadle and determine the normal position of the toe rest the treadle carries an adjustable stop or buffer 48 arranged to engage a shoulder 50 on the frame.

For lasting the toe end of the shoe there are provided a pair of wipers 52 supported on a wiper carrier 54. As shown in Fig. 7, these wipers are detachably secured to wiper holders 56 each provided with an upstanding rib 58, these ribs lying in a guideway 60 (Fig. 3) which is formed in a cover plate 62 on the wiper carrier 54 and is curved about an axis located substantially at the meeting point of the edges of the two wipers 52 to guide the wipers for swinging or closing movements laterally of the shoe. The wiper carrier 54 is mounted for movements lengthwise of the shoe on supports which are located respectively at different distances from the shoe and are mounted to swing lengthwise of the shoe, these supports constituting, in effect, a substantially parallel link arrangement. The support more remote from the shoe comprises an upwardly extending bifurcated arm 64 of a lever 66 mounted to swing about a rod 68 on the frame, the arm 64 having supported thereon a lever 70 adjustable as hereinafter described about a rod 72 on the arm and pivotally connected at one end by means of a pin 74 to the wiper carrier. The lever 66 has a second arm 76 at an angle to the arm 64 and extending under the wiper carrier toward the portion of the machine where the shoe is positioned, and the arm 76 is connected by a link 78 to a shore crank arm 80 fast on a horizontal shaft 82 mounted in a bearing in the frame. Also fast on this shaft is an upwardly extending hand lever 84 comprising an arm 86 pinned to the shaft and an arm 88 adjustably secured to the arm 86. The securing means comprises two bolts 90 and 92 extending through holes in the arm 88 and through slots 94 and 96 in the arm 86 so that the arm 88 may be adjusted upwardly or downwardly to suit the convenience of the operator. The other support for the wiper carrier comprises a link 98 pivotally connected to the carrier in a location under the wiper holders 56 and mounted at its lower end, as hereinafter described, for swinging movements lengthwise of the shoe. It will thus be seen that by swinging movement of the hand lever 84 about its horizontal axis the wiper carrier and the wipers are advanced or retracted lengthwise of the shoe and that these movements of the wipers may be easily effected by the operator by reason of the mounting of the wiper carrier on swinging supports. The hand lever 84 is arranged to be operated by the left hand of the operator who occupies a position substantially at the right-hand front corner of the machine (Fig. 1), and is more convenient for use than a horizontally swinging hand lever such as commonly provided heretofore in bed-lasting machines.

The left-hand end of the lever 70 (Fig. 2) is adjustably connected to a third arm 100 of the lever 66 by a rod 102 which is threaded at one

end in a pin 104 swiveled in the bifurcated end of the arm 100 and is rotatable in another pin 106 swiveled in the bifurcated end of the lever 70, the rod having two collars 108 and 110 fast thereon and engaging flat faces on the opposite sides of the pin 106. Fast on the upper end of the rod 102 is a crank arm 112 for turning it. It will thus be seen that by turning movement of the rod 102 the lever 70 may be adjusted about its fulcrum pin 72 to raise or lower the outer end of the wiper carrier, the carrier in such adjusting movement swinging about its pivotal connection with the link 98. In this manner the angular relation of the plane of the wipers 52 to the shoe and last may be varied to determine the amount of pressure applied by the wipers to the margin of the upper over the insole at the extreme end of the toe as compared with the pressure applied at the sides of the toe.

The link 98 is pivotally connected at its lower end to a crank arm 114 fast on the shaft 42 which is mounted to rock in bearings in the frame. Also fast on one end of this rock shaft is a double-acting treadle 116 of substantially the same construction as commonly used heretofore in bed-lasting machines and having arms 118 and 120 arranged to be controlled respectively by the forepart and the heel of the operator's foot. The weight of the wiper carrier and the parts thereon is partially counterbalanced by a spring 122 connected to the link 98 and to the frame. It will thus be seen that by means of the treadle 116 the wiper carrier 54 may be swung upwardly and downwardly about its pivotal connection 74 with the lever 70. By depressing the arm 118 of the double-acting treadle the operator raises the wipers for wiping the upper heightwise of the toe to the edge of the insole, and by depressing the arm 120 the wipers may be thereafter forced downward to press the margin of the upper firmly on the insole. In its idle position the wiper carrier rests on the head of a screw 123 threaded in the frame.

As the wipers are advanced lengthwise of the shoe by the movement of the wiper carrier 54 they are closed about the toe and inwardly over the shoe bottom by mechanism which operates in response to the movement of the wiper carrier. This mechanism comprises two links 124 and 126 (Fig. 7) pivotally connected respectively to the two wiper holders 56 and also pivotally connected respectively to the outer ends of two levers 128 and 130 arranged to extend laterally of the shoe and fulcrumed midway between their opposite ends on rods 132 and 134 on the wiper carrier 54. The inner ends of the two levers 128 and 130 are pivotally connected respectively to the opposite ends of an equalizing lever 136 fulcrumed midway between its ends on a pin 138 mounted in the bifurcated end of a link 140 supported on the carrier 54. The link 140 is connected by a link 142 to the upper end of a crank arm 144 which extends upwardly through an opening in the wiper carrier 54 and is fast on a rock shaft 146 mounted in bearings in the frame. Fast on the rear end of the rock shaft 146 is a lever 148 in the bifurcated end of which is mounted a pin 150, and threaded in this pin is the lower end of a rod 152 which is mounted to turn in a bearing formed in a member 154 (Fig. 4) on the bracket 4. The member 154 has a horizontal stem 156 mounted to turn in the bracket 4 and having on its end a nut 158 to hold it in place. Collars 160 and 162 fast on the rod 152 above and below the member 154 prevent lengthwise

movement of the rod. Fast on the upper end of the rod is a crank arm 164 for turning it. It will thus be seen that through the lever 148 the crank arm 144 is held normally stationary, and accordingly as the wiper carrier 54 is advanced lengthwise of the shoe, the levers 128 and 130 are swung in response to such movement of the carrier to impart closing movements to the wipers 52. Conversely, when the wiper carrier is retracted the levers are swung in directions to open the wipers. By turning the rod 152 the lever 148 may be swung to adjust the wipers as desired toward or from each other through swinging movement of the crank arm 144.

The machine is further so constructed that instead of using the treadle 40 to unlock the toe rest 10 after the operations on the shoe have been completed, the operator may unlock it by use of the double-acting treadle 116 while his foot is still on this treadle. For this purpose the pawl 32 has integral therewith an arm 166 to which is pivotally connected a downwardly extending link 168 provided at its lower end with an elongated slot 170. In this slot is a pin 172 mounted in the end of a bifurcated extension of the crank arm 114 to which the previously mentioned link 98 is connected. A lost-motion connection between the double-acting treadle 116 and the pawl 32 is thus provided, permitting the treadle to be used to raise the wipers for wiping the upper upwardly to the edge of the insole without affecting the pawl. After the wiping of the margin of the upper inwardly over the insole further movement of the treadle in the direction to raise the wipers causes the pin 172 to act through the link 168 to disconnect the pawl 32 from the ratchet teeth 30 and thus to release the toe rest. This relieves the operator of the necessity of removing his foot from the double-acting treadle prior to release of the toe rest, as would be necessary in order conveniently to depress the treadle 40.

The toe rest 10 is shown in detail in Figs. 5 and 6. The bar 12 at its upper end is provided with an upwardly extending stem 174 on which is secured a block 176 by means of a set screw 178. Supported on the upper end of the block 176 is a bearing member 180 having a reduced lower end 182 driven into an opening in the block. The member 180 is provided with a recess 184 of spherical contour in which is supported a ball 186, and mounted on this ball is a shoe-pressing member or block 188 which has a similarly curved recess to receive the upper portion of the ball in a location as near as possible to the shoe. The block 188 is provided with a recess 190 somewhat larger than the member 180, so that the block may tip in any direction to adjust itself to a right or a left shoe. The upper face 192 of this block is curved in approximate conformity to the curvature of the top of the forepart of a shoe supported on the toe rest, and applied tightly over the block is a flexible cover comprising a layer of felt 194 and an outer layer of leather 196, both fastened to the block 176 by screws 198. This cover assists by its frictional engagement with the block 188 in controlling the block and tends by its resiliency to return the block after the latter has been tipped. At opposite sides of the bearing member 180 in the direction of the length of the shoe the block 188, moreover, is arranged to engage two rolls 200 and 202 which are supported on inclined faces 204 and 206 formed on the block 176. These rolls are maintained normally in substantially horizontal positions near

the upper ends of the inclined faces and in contact with the lower face of the block 188 by the pressure of the flexible cover against them. Either roll, however, may be forced downwardly along the corresponding inclined face on the block 176 and may also be tipped more or less by pressure of the block 188 thereon as the block is tipped to adjust itself to a shoe. In such movement the roll is forced farther outward by the inclined face on which it rests and accordingly prevents any looseness in the flexible cover below the block 188. At the same time the other roll moves upwardly and inwardly along the corresponding inclined face in a direction to relax its pressure on the cover and accordingly counteracts any tendency for the cover at that side to be tightened by the tipping of the block 188, thus facilitating the movement of the block. Novel features of this toe rest are not claimed herein, but in Letters Patent No. 2,137,331, granted on November 22, 1938 on an application of P. E. Burby.

The manner of operation of the machine thus far described need be only briefly summarized. The last in the shoe to be operated upon and the insole being formed to receive the pins 8, the operator mounts the last and shoe on these pins and then forces the toe rest 10 up into clamping engagement with the shoe by depression of the treadle 20. The toe rest is then held in firm clamping engagement with the shoe by the pawl 32 in engagement with the teeth 30 on the treadle. The operator thereafter advances and closes the wipers about the toe by use of the hand lever 84 and raises them to wipe the upper upwardly to the edge of the insole by means of the double-acting treadle 116. If any adjustment of the wipers toward or from each other is necessary in order that they may properly fit the toe of the shoe, such adjustment is effected by use of the hand crank 164. After thus wiping the upper upwardly, the operator further advances and closes the wipers by the hand lever 84 to wipe the margin of the upper inwardly over the insole, and by moving the double-acting treadle reversely forces the wipers down to press the margin of the upper firmly upon the insole. If it is desired to vary relatively the pressures applied to the margin of the upper at the end and the sides of the toe, this may be done by movement of the hand crank 112. It will be understood that by proper manipulation of the lever 84 and the treadle 116 the overwiping operation of the wipers may be repeated as many times as desired, and likewise the upwiping operation which precedes the overwiping operation. The margin of the upper may be secured adhesively to the insole in a well-known manner, or may be secured by individual fastenings driven upon a partial retractive movement of the wipers. Having completed the toe-lasting operation, the operator raises the wipers far enough to avoid any outward wipe on the margin of the upper and then retracts them from over the shoe bottom and lowers them to their starting position. The wipers may, if desired, thus be raised far enough to cause the unlocking of the toe rest by the action of the treadle 116 on the pawl 32, thus releasing the shoe. Alternatively, the operator may unlock the toe rest by use of the treadle 40 after returning the wipers to starting position.

In Figs. 8, 9 and 10, which show certain modifications, parts which are identical with those hereinbefore described are designated by the same reference characters. For use more particularly in operating on welt shoes there is pro-

vided a shoe-positioning plate 208 formed to fit the inner face of the insole lip at the end and the sides of the toe, this plate being mounted on the arm 4 in place of the previously mentioned plate 6. It will be understood that this plate determines the position of the toe end of the shoe and that the shoe is clamped against it by the toe rest 10. To assist in supporting the shoe against lengthwise movement there is further provided a heel rest 210 comprising a felt shoe-engaging pad 212 fastened on a plate 214 which is straight widthwise of the shoe. The heel rest is supported on a carrier arranged to extend lengthwise of the shoe below the latter toward a location under the toe-lasting means, this carrier comprising a pair of arms 216 (Fig. 11) which are spaced apart widthwise of the shoe to provide room for a high upper, such as that of a boot. The right-hand ends of these arms are curved upwardly and are integral with the plate 214. In a location substantially under that portion of the wiper carrier 54 which supports the wiper holders 56 the arms 216 are pivotally supported on two upwardly extending arms 218 of a bifurcated lever 220 pivotally mounted on a rod 222 on the frame. In a location farther from the heel rest the two arms 216 merge in a single arm 224 which is pivotally supported at its end on a link 226 mounted on a rod 228 on the frame. The link 226 is substantially parallel to the arms 218, and these parts constitute, in effect, a parallel link support for the heel rest carrier as the latter is moved to carry the heel rest into or out of engagement with the heel end of the shoe. The two arms 218 of the lever 220 merge near the lower end of the lever in a single arm 230 which is arranged to engage an abutment 232 on the frame to limit movement of the heel rest 210 in a direction away from the shoe. A spring 234 connected to the link 226 and to the frame holds the heel rest normally in the position determined by this abutment. After clamping the forepart of the shoe against the plate 208 by the toe rest 10 through depression of the treadle 20, the operator pushes the heel rest into engagement with the heel-end face of the shoe against the resistance of the spring 234. The heel rest is locked in shoe-engaging position by means of a pawl 236 mounted on a rod 238 on the frame and co-operating with teeth 240 formed on a plate 242 fastened to the lower end of the arm 220. A spring 244 connected to the frame and to an arm 246 which is integral with the pawl 236 holds the pawl normally in position to cooperate with the ratchet teeth. The heel rest is released to permit its return to starting position by the same treadle 40 which releases the toe rest. For this purpose there is integral with the treadle 40 an arm 248 connected by a link 250 to the arm 246, so that when the treadle is depressed the pawl 236 is swung away from the ratchet teeth 240 substantially at the time when the pawl 32 is swung away from the teeth 30. There is, however, a lost-motion connection between the link 250 and the arm 246, comprising a slot 252 in the link and a pin 254 in the arm, to insure that the pawl 32 will not be withdrawn from the ratchet teeth 30 as the pawl 236 slips over the teeth 240 in the movement of the heel rest to operative position. It will be evident that the heel rest as well as the toe rest may be unlocked if desired by use of the double-acting treadle 116 through the action of the pin 172 on the link 168 as hereinbefore described, since the swinging of the treadle 40 which results from this action of the

pin on the link will cause the arm 248 to act through the link 250 to withdraw the pawl 236 from the teeth 240.

The machine shown in Fig. 8 is further provided with means for positively limiting the upwiping movement of the wipers when the latter are in proper position to wipe the margin of the upper inwardly over the insole, so that the operator will not have to exercise any care in determining where to stop the upward movement of the wiper carrier 54. For this purpose there is supported on a table 256 which is secured on the top of the frame over the wiper carrier a stop member comprising a plate 258 fast on the lower end of a spindle 260 which extends upwardly through a sleeve 262 threaded in a boss on the table 256. The sleeve 262 has at its upper end a hand wheel 264 for turning it, and fast on the spindle 260 above this hand wheel is a collar 266 to prevent relative lengthwise movement of the sleeve and the spindle. The plate 258 lies in a slot 268 extending lengthwise of the shoe in the table 256, and is accordingly prevented from turning when the sleeve 262 is turned to adjust the plate upwardly or downwardly. Mounted in a guideway extending lengthwise of the shoe in the cover plate 62 of the wiper carrier 54 is a slide 270 having thereon an upstanding lug 272 arranged to engage the stop plate 258 to limit the upwiping movement of the wipers, as illustrated in Fig. 10. Mounted in a recess in the slide 270 and abutting at one end against a stud 274 fast on the cover plate 62 is a spring 276 which tends to move the slide 270 toward the left and holds it normally against the end of a rod 278 which is threaded in the cover plate 62 and has on its left-hand end a knurled wheel 280 for turning it to adjust the slide 270. When the wiper carrier 54 is further advanced by the hand lever 84 to cause the wipers to wipe the upper over the insole, the lug 272 on the slide 270 is carried out from under the stop plate 258, as shown in Fig. 8. This permits further upward movement of the wiper carrier to lift the wipers before they are retracted from over the shoe bottom. In the subsequent retractive movement of the wiper carrier the lug 272 will engage the right-hand edge of the plate 258, whereupon the spring 276 will yield as the wiper carrier is further retracted. It will be understood that as soon as the wiper carrier is lowered far enough to withdraw the lug 272 from contact with the plate 258, the spring 276 will return the slide 270 to its normal position determined by adjustment of the rod 278.

The margin of the toe end of the upper of the welt shoe shown in Fig. 8 may be fastened in lasted position in the customary manner by use of a binder wire and anchor tacks, the machine having rotatably mounted on the frame a reel 282 supporting a coil of such binder wire.

It will be understood that the means above described for limiting the upwiping movement of the wipers, and likewise the heel rest 210 and its controlling mechanism, may, if desired, be applied to a machine for operating on a shoe of the type illustrated in Fig. 1.

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

1. In a lasting machine, the combination with shoe-positioning means, of end-lasting wipers, a wiper carrier supporting said wipers, supports for said wiper carrier located respectively at different distances from the shoe and mounted to

swing lengthwise of the shoe, manually operated means for moving the wiper carrier and wipers lengthwise of the shoe while swinging said supports, and a treadle arranged to act through one of said supports to swing the carrier and wipers heightwise of the shoe.

2. In a lasting machine, the combination with shoe-positioning means, of end-lasting wipers, a wiper carrier supporting said wipers, an arm supporting said wiper carrier in a location comparatively remote from the shoe and mounted to swing lengthwise of the shoe, a link supporting the wiper carrier in a location nearer the shoe, manually operated means arranged to act through said arm to move the wiper carrier and wipers lengthwise of the shoe while swinging said link, and a treadle arranged to act through said link to swing the carrier and wipers heightwise of the shoe.

3. In a lasting machine, the combination with shoe-positioning means, of end-lasting wipers, a wiper carrier supporting said wipers, a lever having an upwardly extending arm supporting said wiper carrier in a location comparatively remote from the shoe and another arm at an angle to said upwardly extending arm, a link supporting the wiper carrier in a location nearer the shoe, a hand lever connected to said other arm of the first-mentioned lever for moving the wiper carrier and wipers lengthwise of the shoe while swinging said link, and a treadle arranged to act through said link to swing the carrier and wipers heightwise of the shoe.

4. In a lasting machine, the combination with shoe-positioning means, of end-lasting wipers, a wiper carrier supporting said wipers, a lever having an upwardly extending arm supporting said wiper carrier in a location comparatively remote from the shoe and another arm at an angle to said upwardly extending arm, a link supporting the wiper carrier in a location nearer the shoe, an upwardly extending hand lever mounted for swinging movement about a substantially horizontal axis, connections between said hand lever and said other arm of the first-mentioned lever for moving the wiper carrier and wipers lengthwise of the shoe by the movement of the hand lever, and a treadle arranged to act through said link to swing the carrier and wipers heightwise of the shoe.

5. In a lasting machine, the combination with shoe-positioning means, of end-lasting wipers, a wiper carrier supporting said wipers, a lever fulcrumed between its opposite ends and having an upwardly extending arm supporting said wiper carrier in a location comparatively remote from the shoe and another arm at an angle to said upwardly extending arm, a link supporting the wiper carrier in a location nearer the shoe, an upwardly extending hand lever mounted for swinging movement about a substantially horizontal axis, connections between the lower end of said hand lever and said other arm of the first-mentioned lever for moving the wiper carrier and wipers lengthwise of the shoe by the hand lever, and means movable by the operator to swing the wiper carrier and wipers heightwise of the shoe relatively to said first-mentioned lever.

6. In a lasting machine, the combination with shoe-positioning means, of end-lasting wipers, a wiper carrier supporting said wipers and movable in directions lengthwise of the shoe, a lever fulcrumed between its opposite ends and having an upwardly extending arm connected to the

wiper carrier and another arm extending toward the portion of the machine where the shoe is positioned, a depending link connected to said other arm, a crank arm movable about a substantially horizontal axis and connected to the lower end of said link, an upwardly extending hand lever connected to said crank arm for moving the wiper carrier and wipers toward the shoe by downward movement of said link, and a treadle for moving the wiper carrier and wipers heightwise of the shoe.

7. In a lasting machine, the combination with shoe-positioning means, of end-lasting wipers, a wiper carrier supporting said wipers, supports for said wiper carrier mounted for swinging movements to advance and retract the wiper carrier and wipers lengthwise of the shoe, one of said supports being located comparatively near the shoe and the other more remote from the shoe lengthwise thereof, and means on said last-named support for adjusting said wiper carrier by swinging movement thereof heightwise of the shoe about an axis extending laterally of the shoe at its connection with the support located comparatively near the shoe.

8. In a lasting machine, the combination with shoe-positioning means, of end-lasting wipers, a wiper carrier supporting said wipers, supports for said wiper carrier mounted for swinging movements to advance and retract the wiper carrier and wipers lengthwise of the shoe, one of said supports being located comparatively near the shoe and the other being located more remote from the shoe lengthwise thereof and comprising a swinging arm, and a member supporting the wiper carrier on said arm and adjustable relatively to the arm to swing the carrier heightwise of the shoe relatively to the support located comparatively near the shoe.

9. In a lasting machine, the combination with shoe-positioning means, of end-lasting wipers, a wiper carrier supporting said wipers, supports for said wiper carrier mounted for swinging movements to advance and retract the wiper carrier and wipers lengthwise of the shoe, one of said supports being located comparatively near the shoe and the other being located more remote from the shoe lengthwise thereof and comprising a swinging arm, a lever supporting the wiper carrier on said arm, and means for adjusting said lever relatively to the arm to swing the wiper carrier heightwise of the shoe relatively to the support located comparatively near the shoe.

10. In a lasting machine, the combination with shoe-positioning means, of end-lasting wipers, a wiper carrier supporting said wipers and movable lengthwise of the shoe, wiper holders mounted on said wiper carrier for swinging movements laterally of the shoe, levers fulcrumed between their ends on said wiper carrier and arranged to extend laterally of the shoe, links pivotally connected to the outer ends of said levers and to said wiper holders, and normally stationary means arranged to act on the inner ends of said levers to cause them to swing and impart swinging movements to the wiper holders throughout the movement of the wiper carrier lengthwise of the shoe.

11. In a lasting machine, the combination with shoe-positioning means, of end-lasting wipers, a wiper carrier supporting said wipers and movable lengthwise of the shoe, wiper holders mounted on said wiper carrier for swinging movements laterally of the shoe, levers fulcrumed between their ends on said wiper carrier and arranged to

extend laterally of the shoe, links pivotally connected to the outer ends of said levers and to said wiper holders, a crank arm, means for holding said arm stationary during the movement of the wiper carrier lengthwise of the shoe, and connections between said crank arm and the inner ends of said levers to cause the levers to swing and impart swinging movements to the wiper holders in response to the movement of the wiper carrier.

12. In a lasting machine, the combination with shoe-positioning means, of end-lasting wipers, a wiper carrier movable lengthwise of the shoe and on which the wipers are supported for closing movements laterally of the shoe, levers fulcrumed between their ends on said wiper carrier and arranged to extend laterally of the shoe, connections between the outer ends of said levers and the wipers, a member arranged to remain substantially stationary as the wiper carrier is moved lengthwise of the shoe, and a lever fulcrumed midway between its opposite ends on said member and connected at its opposite ends respectively to the inner ends of said first-named levers to cause the closing of the wipers through the action of said member in response to the movement of the wiper carrier.

13. In a lasting machine, the combination with shoe-positioning means, of end-lasting wipers, a wiper carrier movable lengthwise of the shoe and on which the wipers are supported for closing movements laterally of the shoe, levers fulcrumed between their ends on said wiper carrier and arranged to extend laterally of the shoe, connections between the outer ends of said levers and the wipers, a crank arm mounted for swinging movements lengthwise of the shoe, means connecting said crank arm to the inner ends of said levers, and means for holding the crank arm stationary to cause the levers to swing and impart closing movements to the wipers in response to the movement of the wiper carrier, the crank arm being movable to adjust the wipers relatively to the wiper carrier.

14. In a lasting machine, the combination with shoe-positioning means, of end-lasting wipers, a wiper carrier movable lengthwise of the shoe and on which the wipers are supported for closing movements laterally of the shoe, levers fulcrumed on said wiper carrier and connected to the wipers, and normally stationary controlling means connected to said levers to cause them to swing and impart closing movements to the wipers in response to the movement of the wiper carrier, said controlling means being adjustable about an axis extending laterally of the shoe to adjust the wipers toward or from each other relatively to the wiper carrier.

15. In a lasting machine, the combination with shoe-positioning means, of end-lasting wipers, a wiper carrier movable lengthwise of the shoe and on which the wipers are supported for closing movements laterally of the shoe, levers fulcrumed on said wiper carrier and connected to the wipers, a crank arm mounted for swinging movements lengthwise of the shoe and connected to said levers, and means for swinging said crank arm to effect a preliminary adjustment of the wipers toward or from each other and for thereafter holding the crank arm stationary to cause the levers to swing and impart closing movements to the wipers in response to the movement of the wiper carrier.

16. In a lasting machine, the combination with shoe-positioning means, of end-lasting wipers, a

wiper carrier movable lengthwise of the shoe and on which the wipers are supported for closing movements laterally of the shoe, levers fulcrumed on said wiper carrier and connected to the wipers, a rock shaft movable about an axis extending laterally of the shoe, a crank arm fast on said rock shaft and connected to said levers, an adjusting lever also fast on said rock shaft for swinging said crank arm to effect a preliminary adjustment of the wipers toward or from each other, and means arranged to act on said adjusting lever to hold the crank arm stationary and thereby cause said first-named levers to swing and impart closing movements to the wipers in response to the movement of the wiper carrier.

17. In a lasting machine, the combination with shoe-positioning means, of end-lasting wipers, means for imparting to said wipers wiping movement heightwise of the shoe and thereafter movement inwardly over the shoe bottom, and mechanism arranged to limit the wiping movement of the wipers heightwise of the shoe but to be rendered inoperative thereafter by the movement of the wipers over the shoe bottom.

18. In a lasting machine, the combination with shoe-positioning means, of end-lasting wipers, means for imparting to said wipers wiping movement heightwise of the shoe and thereafter movement inwardly over the shoe bottom, and members arranged to engage each other to limit the wiping movement of the wipers heightwise of the shoe but to be disengaged from each other by the movement of the wipers over the shoe bottom.

19. In a lasting machine, the combination with shoe-positioning means, of end-lasting wipers, means for imparting to said wipers wiping movement heightwise of the shoe and thereafter movement inwardly over the shoe bottom, and members arranged to engage each other to limit the wiping movement of the wipers heightwise of the shoe, one of said members being movable heightwise of the shoe with the wipers into contact with the other member and being thereafter movable with the wipers out of cooperative relation to said other member as the wipers are moved inwardly over the shoe bottom to permit further movement of the wipers heightwise of the shoe while over the shoe bottom.

20. In a lasting machine, the combination with shoe-positioning means, of end-lasting wipers, means for imparting to said wipers wiping movement heightwise of the shoe and thereafter movement inwardly over the shoe bottom, and members arranged to engage each other to limit the wiping movement of the wipers heightwise of the shoe but to be disengaged from each other by the movement of the wipers over the shoe bottom to permit further movement of the wipers heightwise of the shoe while over the shoe bottom, one of said members being yieldable in response to pressure of the other member thereon upon retractive movement of the wipers from over the shoe bottom after their further movement heightwise of the shoe.

21. In a lasting machine, the combination with shoe-positioning means, of end-lasting wipers, a wiper carrier, means for moving said wiper carrier heightwise of the shoe with the wipers in wiping engagement with the shoe upper and for thereafter moving it lengthwise of the shoe to advance the wipers over the shoe bottom, a stop member, and means on the wiper carrier arranged to engage said stop member to limit the movement of the carrier heightwise of the shoe but to be carried thereafter out of cooperative

relation to the stop member by the movement of the carrier lengthwise of the shoe.

22. In a lasting machine, the combination with shoe-positioning means, of end-lasting wipers, a wiper carrier, means for moving said wiper carrier heightwise of the shoe with the wipers in wiping engagement with the shoe upper and for thereafter moving it lengthwise of the shoe to advance the wipers over the shoe bottom, a stop member, and a member on the wiper carrier movable into engagement with said stop member to limit the movement of the carrier heightwise of the shoe and movable out of cooperative relation to the stop member by the movement of the carrier lengthwise of the shoe to permit further movement of the carrier thereafter heightwise of the shoe, one of said members being yieldable in response to pressure of the other member thereon upon retractive movement of the carrier lengthwise of the shoe after its further movement heightwise of the shoe.

23. In a lasting machine, the combination with shoe-positioning means, of end-lasting wipers, a wiper carrier, means for moving said wiper carrier heightwise of the shoe with the wipers in wiping engagement with the shoe upper and for thereafter moving it lengthwise of the shoe to advance the wipers over the shoe bottom, a stop member, a device mounted on the wiper carrier for engaging said stop member to limit the movement of the carrier heightwise of the shoe and movable out of cooperative relation to the stop member by the movement of the carrier lengthwise of the shoe to permit further movement of the carrier thereafter heightwise of the shoe, said device being movable relatively to the wiper carrier in directions lengthwise of the shoe, and a spring tending thus to move the device in one direction and yieldable upon engagement of the device with the stop member as the wiper carrier is retracted lengthwise of the shoe after its further movement heightwise of the shoe.

24. In a lasting machine, the combination with means for positioning a shoe bottom upward, of end-lasting wipers, a wiper carrier upwardly movable to carry the wipers heightwise of the shoe and movable thereafter lengthwise of the shoe to advance the wipers over the shoe bottom, a table over the wiper carrier, a stop member supported on said table and adjustable heightwise of the shoe, and a member on the wiper carrier arranged to engage said stop member to limit the upward movement of the carrier and to be carried out of cooperative relation to the stop member by the movement of the carrier lengthwise of the shoe to permit thereafter further upward movement of the carrier, one of said members being yieldable upon engagement of the other member therewith as the wiper carrier is retracted lengthwise of the shoe after its further upward movement.

25. In a lasting machine, the combination with toe-lasting means, of a device constructed and arranged to engage the inner face of the lip of a welt shoe insole at the toe end to position the shoe relatively to said lasting means, a toe rest for clamping the shoe against said device, mechanism for moving said toe rest into clamping position, and a heel rest formed to engage only the heel end face of the shoe and movable independently of said mechanism into shoe-engaging position after the movement of the toe rest into clamping position.

26. In a lasting machine, the combination with toe-lasting means, of a device constructed and

arranged to engage the inner face of the lip of a welt shoe insole at the toe end to position the shoe relatively to said lasting means, a toe rest for clamping the shoe against said device, a treadle for moving said toe rest into clamping position, and a heel rest movable lengthwise of the shoe by the operator independently of said treadle into engagement with the heel end of the shoe after the clamping of the shoe by the toe rest.

27. In a lasting machine, the combination with toe-lasting means, of a support for the forepart of a shoe, a heel rest for engaging the heel end of the shoe, a heel rest carrier arranged to extend lengthwise of the shoe below the latter toward a location under the toe-lasting means, and supporting means for said heel rest carrier mounted for swinging movement lengthwise of the shoe to permit movement of the heel rest into or out of engagement with the shoe.

28. In a lasting machine, the combination with toe-lasting means, of a support for the forepart of a shoe, a heel rest for engaging the heel end of the shoe, a heel rest carrier arranged to extend lengthwise of the shoe below the latter toward a location under the toe-lasting means, and a plurality of members arranged to support said heel rest carrier respectively in different locations lengthwise of the shoe and mounted to swing lengthwise of the shoe to permit movement of the heel rest into or out of engagement with the shoe.

29. In a lasting machine, the combination with toe-lasting means, of a support for the forepart of a shoe, a heel rest for engaging the heel end of the shoe, a heel rest carrier arranged to extend lengthwise of the shoe below the latter toward a location under the toe-lasting means, a plurality of members arranged to support said heel rest carrier respectively in different locations lengthwise of the shoe and mounted to swing lengthwise of the shoe to permit movement of the heel rest into or out of engagement with the shoe, a spring tending to move the heel rest away from the shoe, and a device for holding the heel rest in shoe-engaging position against the resistance of said spring.

30. In a lasting machine, the combination with toe-lasting means, of a support for the forepart of a shoe, a heel rest for engaging the heel end of the shoe, a heel rest carrier arranged to extend lengthwise of the shoe below the latter toward a location under the toe-lasting means, a lever mounted for swinging movements lengthwise of the shoe and having an upwardly extending arm for supporting said heel rest carrier, a link arranged additionally to support said carrier in a different location lengthwise of the shoe and mounted to swing with said arm as the heel rest is carried into or out of engagement with the shoe, and means arranged to cooperate with another arm of said lever to hold the heel rest in shoe-engaging position.

31. In a lasting machine, the combination with toe-lasting means, of shoe-positioning means arranged to engage the forepart of a shoe, a heel rest for engaging the heel end of the shoe, a lever mounted for swinging movement lengthwise of the shoe and arranged to support said heel rest on one arm thereof, a link arranged additionally to support the heel rest in a different location lengthwise of the shoe and mounted to swing with said arm as the heel rest is moved into or out of engagement with the shoe, and a device arranged

to cooperate with another arm of said lever to lock the heel rest in shoe-engaging position.

32. In a lasting machine, the combination with toe-lasting means, of a support for a shoe positioned bottom upward, a heel rest for engaging the heel end of the shoe, a heel rest carrier arranged to extend lengthwise of the shoe below the latter toward a location under the toe-lasting means, said carrier comprising a pair of arms spaced apart widthwise of the shoe to provide clearance for a high upper, and members arranged to support said carrier respectively in different locations lengthwise of the shoe and mounted to swing lengthwise of the shoe to permit movement of the heel rest into or out of engagement with the shoe.

33. In a lasting machine, the combination with toe-lasting means, of a support for a shoe positioned bottom upward, a heel rest for engaging the heel end of the shoe, a heel rest carrier arranged to extend lengthwise of the shoe below the latter toward a location under the toe-lasting means, said carrier comprising a pair of arms spaced apart widthwise of the shoe to provide clearance for a high upper, and means located substantially under said toe-lasting means for supporting said carrier for movements lengthwise of the shoe.

34. In a lasting machine, the combination with toe-lasting means, of a shoe-positioning member arranged to engage the bottom of the forepart of a shoe, a toe rest movable to clamp the shoe against said member, a device for locking the toe rest in clamping position, a heel rest movable into engagement with the heel end of the shoe, a device for locking said heel rest in shoe-engaging position, and a member movable by the operator and common to both said locking devices to cause them to release the toe rest and the heel rest.

35. In a lasting machine, the combination with toe-lasting means, of a shoe-positioning member arranged to engage the bottom of the forepart of a shoe, a toe rest movable by the operator to clamp the shoe against said member, a pawl-and-ratchet device for locking the toe rest in clamping position, a heel rest movable by the operator into engagement with the heel end of the shoe, a pawl-and-ratchet device for locking said heel rest in shoe-engaging position, and a treadle arranged to control both said pawl-and-ratchet devices and movable to release the toe rest and the heel rest.

36. In a lasting machine, the combination with lasting means, of a member movable by the operator to operate said lasting means, shoe-clamping means movable to operative position independently of said member, and mechanism controlled by said member to cause said clamping means to release the shoe after the lasting operation.

37. In a lasting machine, the combination with lasting means, of a member movable by the operator to operate said lasting means, a shoe rest movable into and out of operative position, a device for locking the shoe rest in operative position, and mechanism controlled by said member for effecting release of the shoe rest by said locking device.

38. In a lasting machine, the combination with lasting means, of a member movable by the operator to operate said lasting means, a toe rest and a heel rest each movable into and out of operative position, means for locking said toe and heel rests in operative positions, and mechanism

controlled by said member for effecting release of the toe and heel rests by said locking means.

39. In a lasting machine, the combination with toe-lasting wipers, of a member movable by the operator in a direction to impart to said wipers wiping movement heightwise of the toe of a shoe, shoe-clamping means, and mechanism for effecting release of the shoe by said clamping means for further movement of said member in the same direction after the lasting operation.

40. In a lasting machine, the combination with toe-lasting wipers, of a member movable by the operator in a direction to impart to said wipers wiping movement heightwise of the toe of a shoe, a shoe rest movable into and out of operative position, a device for locking the shoe rest in operative position, and mechanism for rendering said locking device inoperative by further movement of said member in the same direction after the lasting operation.

41. In a lasting machine, the combination with toe-lasting wipers, of a member movable by the operator in a direction to impart to said wipers wiping movement heightwise of the toe of a shoe, a toe rest and a heel rest each movable into and out of operative position, devices for locking said toe and heel rests respectively in operative positions, and mechanism for rendering both said locking devices inoperative by further movement

of said member in the same direction after the lasting operation.

42. In a lasting machine, the combination with toe-lasting wipers arranged to operate on a shoe positioned bottom upward, of a treadle movable by the operator to raise said wipers for wiping the upper heightwise of the toe, a shoe rest movable into and out of operative position, a device for locking the shoe rest in operative position, and mechanism for operating said locking device to release the shoe rest by further movement of the treadle in the direction to raise the wipers after the lasting operation.

43. In a lasting machine, the combination with toe-lasting wipers arranged to operate on a shoe positioned bottom upward, of a treadle movable by the operator to raise said wipers for wiping the upper heightwise of the toe, a shoe rest movable into and out of operative position, a device for locking the shoe rest in operative position, and a lost-motion connection between said treadle and locking device to permit the wiping movement of the wipers heightwise of the toe without affecting the locking device but thereafter to operate said device to release the shoe rest by further movement of the treadle.

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