

Nov. 9, 1937.

A. F. PYM

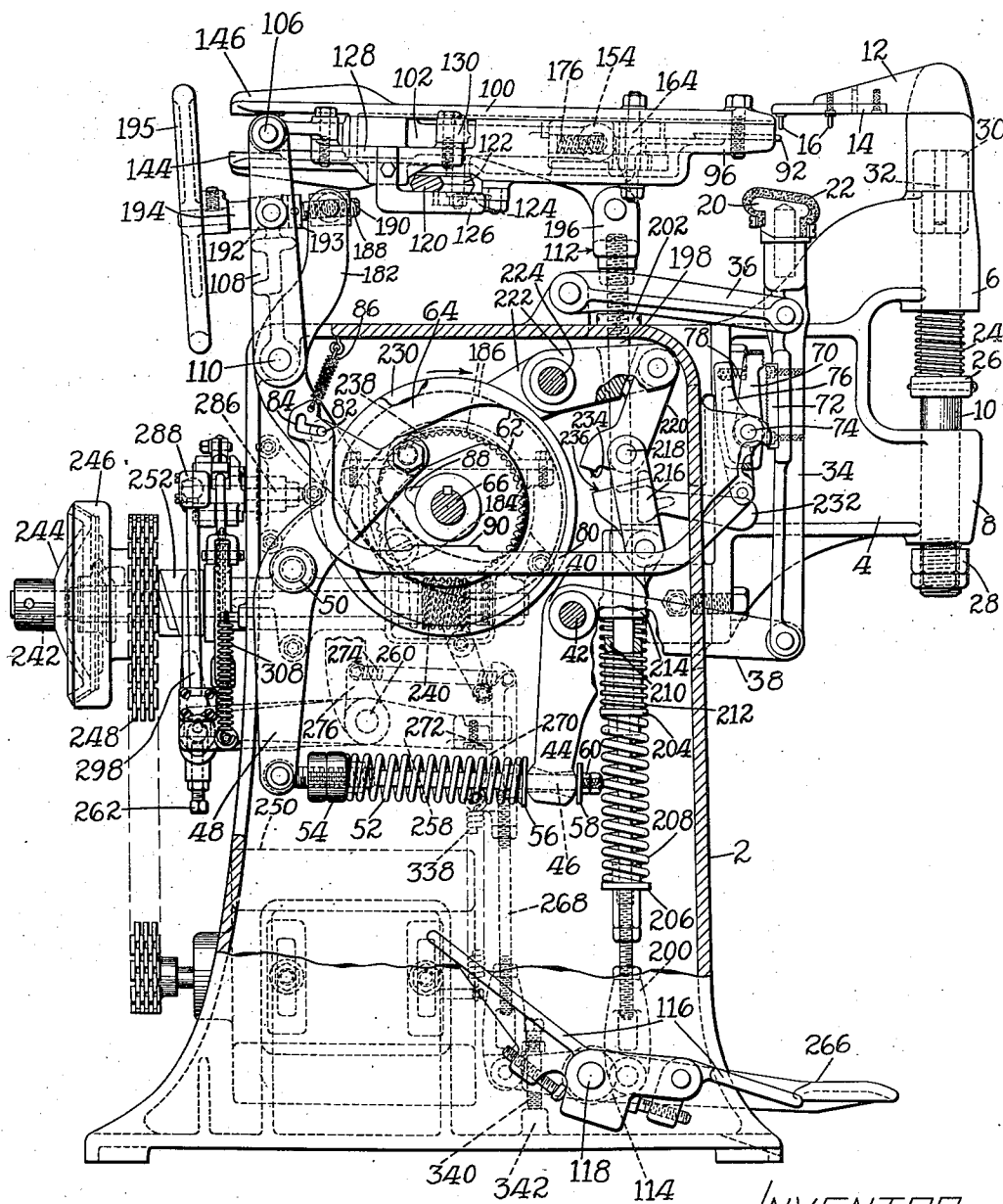
2,098,358

LASTING MACHINE

Filed July 3, 1936

4 Sheets-Sheet 1

Fig. 1.



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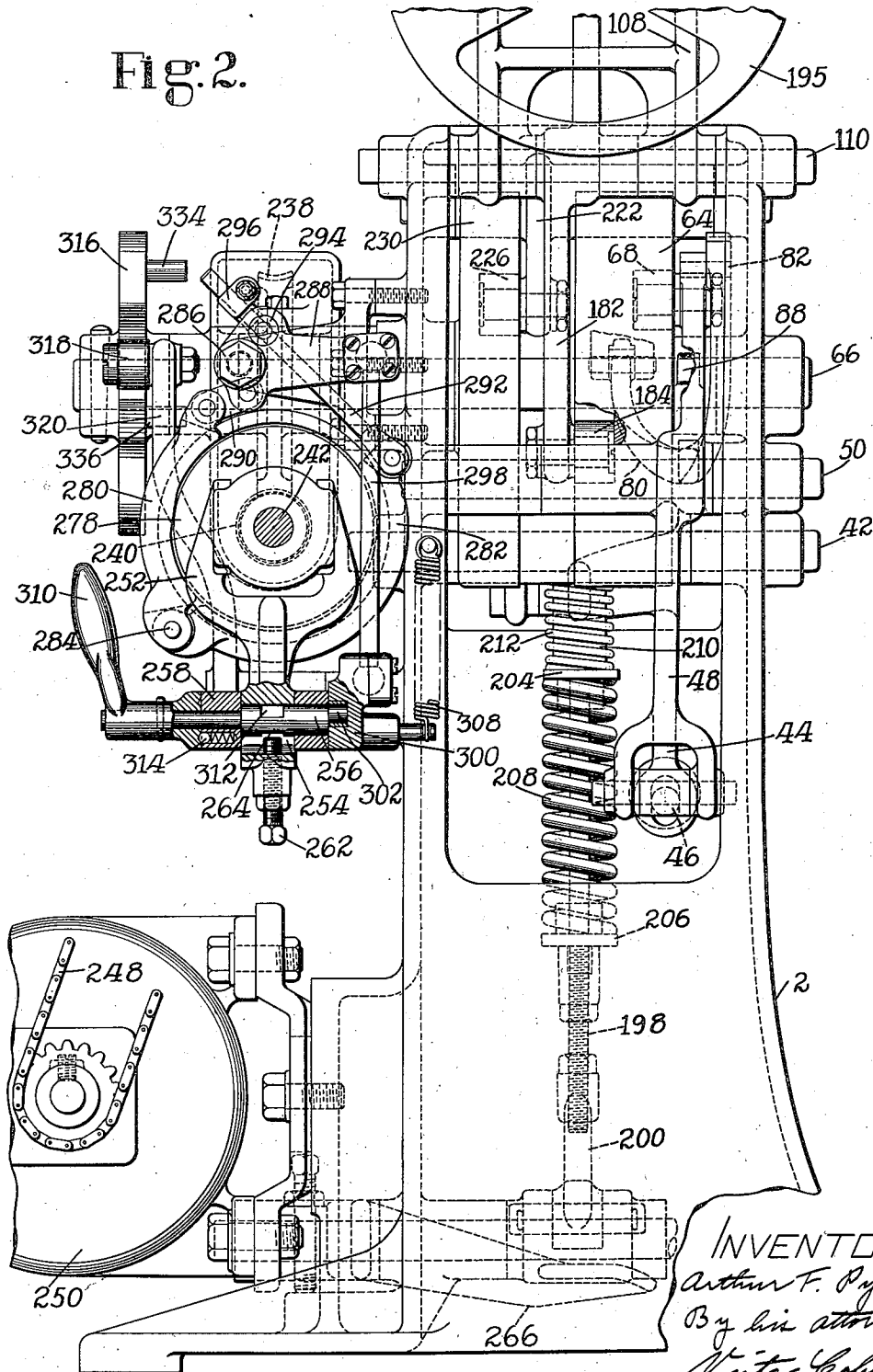
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LASTING MACHINE

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4 Sheets-Sheet 2

Fig. 2.



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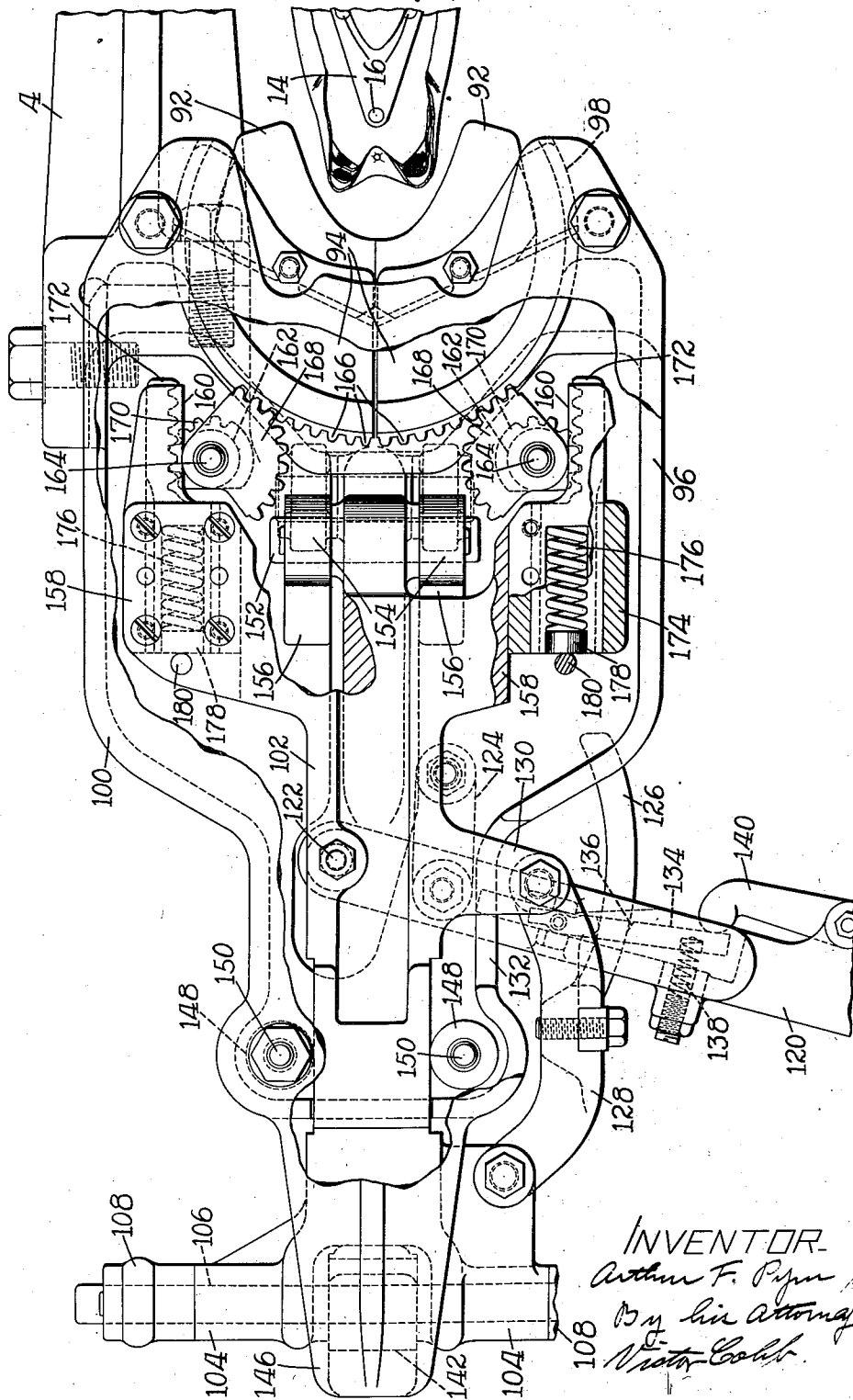
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LASTING MACHINE

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4 Sheets-Sheet 3

Fig. 3.



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LASTING MACHINE

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4 Sheets-Sheet 4

Fig. 7.

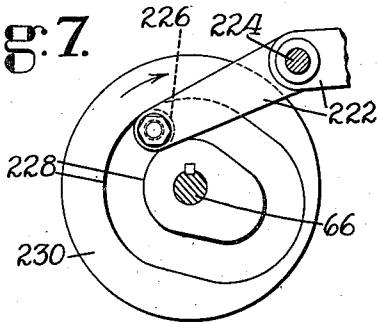


Fig. 8.

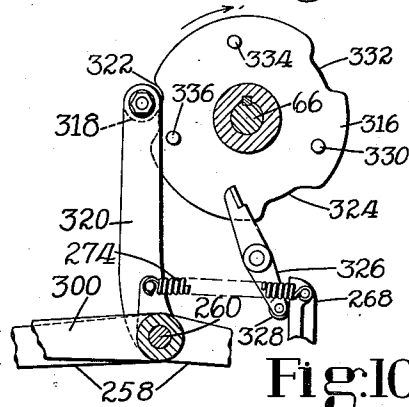


Fig. 9.

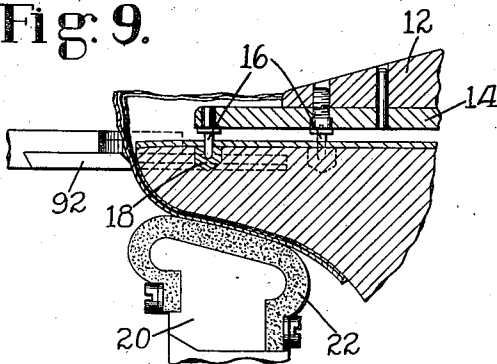


Fig. 10.

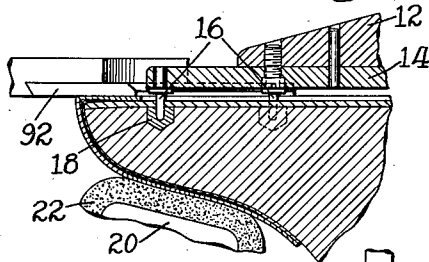


Fig. 4.

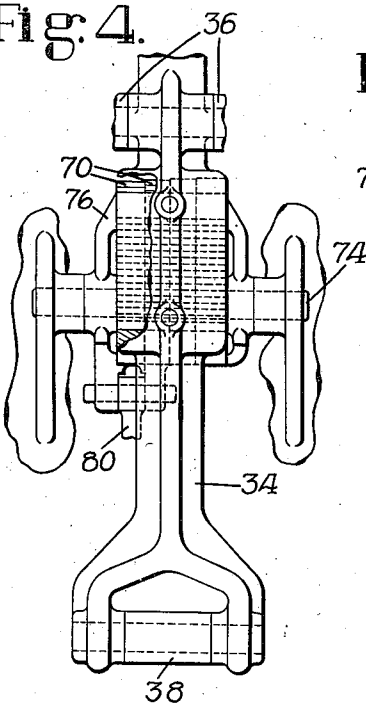


Fig. 5.

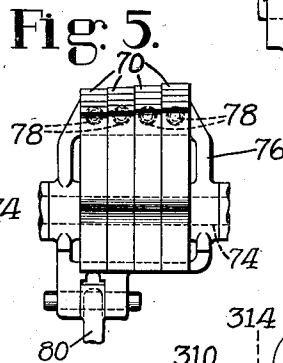
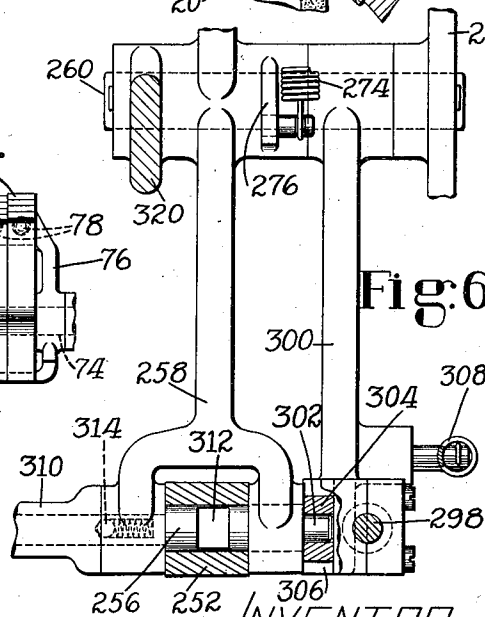


Fig. 6.



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UNITED STATES PATENT OFFICE

2,098,358

LASTING MACHINE

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Application July 3, 1936, Serial No. 88,819

23 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. The invention is further illustrated by reference to the lasting of shoes of a type in which the margin of the lasted upper extends throughout its width in generally parallel relation to the bottom of the last over an insole on the last, but it is to be understood that in various aspects it is not limited to means for lasting shoes of that particular type or to means for lasting the toe ends of shoes as distinguished, for example, from the heel ends.

Under some conditions, especially in toe-end lasting, it is advantageous for the operator of a lasting machine to have full control of the lasting means in the more critical portion, at least, of the lasting operation, so that the upper of each shoe may be subjected to such special treatment as observation may indicate to be desirable. The present invention, in one aspect, provides a machine affording such control of the lasting means and yet so constructed that a portion of the lasting operation for which no special skill is needed may be performed by power. For the purposes in view the construction herein shown comprises toe-lasting wipers which are movable by the operator to wipe the upper heightwise of the last and to wipe its margin inwardly over an insole on the last, but are thereafter movable by power automatically to apply compacting pressure to the overwiped margin of the upper, thus relieving the operator of the labor required to perform this portion of the lasting operation while also insuring adequate pressure on the margin of the upper in the lasting of each shoe and substantially the same pressure in lasting different shoes. The machine herein shown is further so constructed that the shoe is clamped and the wipers are advanced toward the toe by power from an initial retracted position preparatory to the lasting operation, this being done in the first stage of a cycle of operations of the power means which then comes automatically to a stop to permit the operator to operate the wipers as above described. When the power means is again started in operation the pressure is applied to the margin of the upper by the wipers, whereupon the power means comes to a stop a second time with the margin under pressure. In a third and final stage of the cycle the power-operated parts are moved reversely to release the shoe.

It may under some conditions be entirely practicable, and in fact preferable, for the operator himself to apply such compacting pressure as is

needed to the margin of the upper, as well as to perform other portions of the lasting operation as above described, and accordingly the invention further provides a construction such that means movable by the operator may be used to apply the pressure without resort to power-operated means also provided for that purpose. As illustrated, the means movable by the operator comprises a treadle connected to the wipers for moving them heightwise of the last, and the power-operated means comprises parts which may be set to act on the wipers through the treadle connections or may, at the will of the operator, be differently set to render them ineffective on the wipers in the power cycle.

Features of the invention are also to be recognized in a novel organization of wiper-supporting and operating means, the construction shown comprising a wiper carrier and a guide therefor pivotally mounted at one end to swing with the wiper carrier heightwise of the shoe and extending within the wiper carrier, the latter being movable lengthwise of the shoe relatively to the guide to advance the wipers over the bottom of the shoe. As further herein illustrated the wiper carrier is thus moved lengthwise of the shoe by a hand lever mounted on the swinging guide, and mechanism is provided for imparting to the wipers closing movements laterally of the shoe in response to the movement of the carrier by the hand lever.

The above and other features of the invention, including also novel means for controlling the shoe and 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 mainly in front elevation of a machine in which the invention is embodied, with parts broken away;

Fig. 2 is a view on an enlarged scale of the lower portion of the machine in left-hand side elevation, with parts broken away;

Fig. 3 is a plan view showing the toe wipers and a portion of the means for operating them, with parts broken away;

Fig. 4 shows mainly in right-hand side elevation a portion of mechanism provided for locking a toe rest for the shoe in shoe-supporting position;

Fig. 5 is a similar view of a portion of the structure shown in Fig. 4, with parts in front thereof omitted;

Fig. 6 is mainly a plan view of a portion of the starting and stopping mechanism for the power means;

Fig. 7 shows in front elevation a cam and a portion of a lever operated thereby for imparting downward upper-pressing movement to the wipers;

Fig. 8 shows in front elevation a portion of the means for bringing the machine automatically to a stop at different times; and

Figs. 9 and 10 are sectional views illustrating the relation of the wipers to the shoe respectively at the beginning of the upwiping operation and at the end of the overwiping operation.

The machine comprises a frame 2 on which there is secured a bracket 4 having upper and lower bearings 6 and 8 for a vertically movable rod 10. Fast on the upper end of this rod is an arm 12 to which is secured a plate 14 provided with three pins 16 arranged to extend through holes in the insole into sockets provided in metal bushings 18 (Fig. 9) in the last to determine the position of the last and shoe in accordance with the disclosure of United States Letters Patent No. 1,674,060, granted on June 19, 1928 upon an application of mine. After the work has been presented by the operator in the position determined by the pins 16 it is clamped against the pins by a toe rest 20 which is moved upwardly against the top of the forepart of the shoe and is locked against reverse downward movement as hereinafter described, the toe rest including a layer 22 of somewhat yieldable material such as rubber or felt to prevent damage to the shoe upper. In the construction herein shown the arm 12 is forced upwardly a short distance by the pressure of the toe rest on the shoe, the rod 10 moving upwardly with it against the resistance of a spring 24 located between the bearing 6 and a collar 26 fast on the rod and the movement being limited by engagement of a nut 28 on the rod with the bearing 8. The purpose of this is to insure that in case the toe end of the shoe should be depressed slightly by the downward pressure of the toe wipers on the shoe bottom, by reason of the yieldability of the part 22 of the toe rest, the pins 16 will nevertheless remain seated in the sockets in the metal bushings 18 in the last because of expansion of the spring 24. To prevent turning movement of the rod 10 and the arm 12 a lug 30 on the arm carries a pin 32 extending downwardly into a socket in the bearing 6. While the pins 16 thus afford convenient means adapted for use with suitably equipped lasts for positioning and holding the work, means of a different character may be used for this purpose if desired. For operating on welt shoes, for example, the arm 12 may be provided with a plate arranged to engage the bottom face of the insole and to determine the position of the shoe lengthwise and laterally by engaging the inner face of the lip of the insole.

The toe rest 20 is supported on the upper end of a bar 34 connected near its upper end by a link 36 to the frame 2 and supported at its lower end by a forwardly extending arm 38 of a bell-crank lever 40 mounted to swing about a rod 42 on the frame. The link 36 and the arm 38 are parallel to each other, so that the bar 34 is controlled by what is virtually a parallel link arrangement and therefore is kept substantially vertical during its upward or downward movement. The bell-crank lever 40 has a downwardly extending arm 44 through an opening in which extends a rod 46 pivotally connected at

its rear end to the lower end of a lever 48 mounted to swing about a rod 50 on the frame. A spring 52 on the rod 46 abuts at one end against a nut 54 threaded on the rod and at its other end against a washer 56 in contact with the arm 44 of the bell-crank lever 40. Another washer 58 engaged by a nut 60 on the rod 46 serves by contact with the arm 44 to limit expansion of the spring 52. It will thus be seen that by movement of the lower arm of the lever 48 toward the right the bell-crank lever 40 is swung in the direction to raise the toe rest 20, and that after the upward movement of the toe rest has been stopped by the shoe further movement of the lever 48 will serve to compress the spring 52, the rod 46 moving relatively to the arm 44. For operating the lever 48 there is provided a path cam 62 formed in one side of a cam wheel 64 fast on a shaft 66 operated as hereinafter described, the lever carrying a roll 68 (Fig. 2) engaged by the cam.

After the toe rest 20 has been forced upwardly against the shoe through the bar 34 it is desirable to lock the bar positively against downward movement under the pressure of the wipers on the shoe. For this purpose there are provided four pawls 70 (Figs. 1, 4 and 5) having teeth arranged in staggered relation for engagement with ratchet teeth formed on a plate 72 fast on the bar 34. The pawls 70 are mounted to swing about a rod 74 on the frame and they are controlled by a lever 76 also mounted on the rod 74. When the lever 76 is swung in a clockwise direction (Fig. 1) it acts through springs 78 interposed between it and the pawls 70 to swing the pawls into engagement with the ratchet plate 72, and when the lever is swung in the opposite direction it acts by positive engagement with tails on the pawls to swing them away from the ratchet plate. The lever 76 is controlled through a link 80 which is pivotally connected to its lower end and extends to the left and then upwardly close to one side of the upper arm of the lever 48. A pin 82 carried by this arm of the lever 48 extends into a slot 84 in the link 80, this slot having a substantially horizontal portion and an upwardly extending portion. By engaging the link at the right-hand end of the slot 84 the pin 82 serves initially to hold the pawls 70 out of engagement with the ratchet plate 72, as illustrated in Fig. 1. In operation the pin 82 is moved to the left along the slot 84 as the lever 48 is swung to force the toe rest against the shoe and arrives at the left-hand end of the slot substantially at the time when the toe rest engages the shoe. In the continued movement of the lever 48, whereby the spring 52 is compressed, the pin 82 acts through the link 80 to swing the pawls into engagement with the ratchet plate so that some one of the pawls will be in position to lock the bar 34 against downward movement. When the pin 82 is at the left-hand end of the slot 84 the link 80 is normally prevented from swinging downwardly, even though the upwardly extending portion of the slot is over the pin, by a spring 86 connected to the link and to the frame 2. Before the lever 48, however, begins its reverse movement to return the toe rest to starting position, the link 80 is swung downwardly about its connection with the lever 76, to cause the pin 82 to enter the upwardly extending portion of the slot 84, by a cam 88 formed on the hub of the cam wheel 64 and engaging a flat face 90 on the link. Accordingly, the lever 48 at the beginning of its reverse movement acts through the link 80 to retract the

pawls 70 so as to permit the lowering of the toe rest. After the pawls have been retracted from the ratchet plate 72 the cam 88 releases the link and permits it to be swung upwardly by the spring 86, so that in the continued movement of the lever 48 the pin 82 is returned to the right-hand end of the slot 84.

For wiping the toe end of the upper heightwise of the last and wiping its margin inwardly over an insole on the last there are provided wipers 92 detachably mounted on wiper holders 94 which are supported on a wiper carrier 96. The wiper holders have curved tongue-and-groove connections with the wiper carrier, as indicated at 98 (Fig. 3), whereby the holders and the wipers are guided for swinging or closing movements laterally of the shoe as they are advanced lengthwise of the shoe by movement of the wiper carrier. The wiper carrier 96 has a cover plate 100 fast on the top thereof, and extending forwardly within the carrier under the cover plate is a bar 102 which serves as a guide for the carrier in the movements of the latter lengthwise of the shoe. At its left-hand end the bar 102 has spaced bearing portions 104 pivotally mounted on a rod 106 which is supported in the upper end of a double link 108 pivotally mounted at its lower end on a rod 110 on the frame and controlled as hereinafter described. The wiper carrier 96 near its right-hand end is supported by a link 112 constructed as also more particularly hereinafter described and extending downwardly from it to a short crank arm 114 controlled by a double-acting treadle 116 which is mounted on a rod 118 on the frame 2. By movements of the treadle 116 the wiper carrier may be swung upwardly and downwardly with the guide bar 102 about the rod 106 to cause the wipers to wipe the upper heightwise of the last and later to press its overwiped margin down on the insole.

It will be understood that as the wiper carrier 96 is moved lengthwise of the shoe along the guide bar 102 the link 112 swings about its connection with the crank arm 114. For imparting such movement to the wiper carrier there is provided a hand lever 120 pivotally mounted at its rear end on the lower end of a bolt 122 in the guide bar 102 and connected by a link 124 to the wiper carrier underneath the latter. The hand lever 120 is further supported by the upper face of a curved bar 126 fast on a bracket 128 which is secured at its left-hand end to a portion of the bar 102 and at its right-hand end to an arm 130 extending forwardly from the bar 102 through an opening 132 in the wiper carrier 96. The curved bar 126 is also arranged to cooperate frictionally with an arm 134 pivotally mounted on the hand lever 120 to hold the hand lever against reverse movement toward the left after it has been moved toward the right to operate the wipers, as common in lasting machines of the bed type. The arm 134 is recessed at 136 to receive the bar 126 and is urged by a spring 138 in the direction to bind on the bar 126 and thereby prevent movement of the hand lever toward the left although permitting it to move toward the right. When the operator wishes to move the hand lever toward the left he releases it by well-known means not fully shown but including a lever 140 which by engaging the arm 134 swings the latter into position to release its grip on the bar 126.

To facilitate movements of the wiper carrier 96 by the hand lever 120 there are provided a plurality of rolls to minimize friction. Mounted on the rod 106 between the spaced bearing portions

104 of the bar 102 is a roll 142 arranged to be engaged underneath by an extension 144 of the wiper carrier 96 and to be engaged above by an extension 146 of the cover plate 100. Near its left-hand end the bar 102 is engaged on its opposite sides by rolls 148 mounted on studs 150 on the wiper carrier, and at its right-hand end the bar carries a pin 152 on which are mounted two rolls 154 arranged to engage flat faces 156 on the wiper carrier 96 underneath and similar faces on the cover plate 100 above. Near its right-hand end the bar 102 is provided with lateral extensions 158 on which are formed plane vertical faces 160 engaged by rolls 162 mounted to turn about studs 164 on the wiper carrier 96. It will thus be seen that anti-friction means is provided for supporting the wiper carrier against lateral thrust and against thrust in an upward or a downward direction.

The wiper holders 94 are operated to close the wipers laterally of the shoe by that movement of the wiper carrier 96 whereby the wipers are advanced lengthwise of the shoe. For this purpose the wiper holders are provided with teeth 166 engaged by gear sectors 168 which are mounted to turn about the studs 164 above the rolls 162 and are connected through sleeves thereon to other gear sectors 170 below the rolls, the rolls being mounted on the sleeves. The gear sectors 170 are in engagement with rack bars 172 mounted in blocks 174 secured to the lateral extensions 158 of the bar 102, the rack bars being movable in the blocks in directions lengthwise of the shoe. Normally, however, the rack bars are held against any such movement by springs 176 which bear at their right-hand ends against shoulders on the blocks 174 and at their left-hand ends against lugs 178 extending upwardly from the rack bars, and by pins 180 mounted in the extensions 158 of the bar 102 and engaging the lugs 178 on the opposite sides from the springs. Accordingly, as the wiper carrier 96 is moved toward the right by the hand lever 120 to advance the wipers lengthwise of the shoe the relatively stationary rack bars 172 cause the gear sectors 170, 168 to turn and thereby to swing the wiper holders 94 and close the wipers laterally of the shoe. In case either of the wipers encounters abnormal resistance to its closing movement before the wipers have been advanced as far as desired lengthwise of the shoe, the rack bar 172 connected to that wiper will move with the wiper carrier 96 against the resistance of its spring 176 so that no further closing movement of that wiper will take place as the wipers are further advanced.

In order to provide ample room to mount the last and shoe on the pins 16 it is desirable that the wipers 92 shall occupy initially a position well retracted from the pins. The wiper carrier 96 is accordingly controlled by power means which automatically advances it a short distance lengthwise of the shoe to carry the wipers from such an initial position into position to be thereafter advanced and closed by the hand lever 120. This power means comprises a lever 182 (Fig. 1) mounted to swing about the rod 110 with its upper arm connected to the double link 108 which, as previously described, supports the left-hand end of the guide bar 102 and the left-hand end of the wiper carrier 96. The lower arm of the lever 182 carries a roll 184 engaged by a path cam 186 formed in one side of the cam wheel 64. For connecting the upper arm of the lever 182 to

the link 108 there is provided a shaft 188 threaded at one end in a trunnion block 190 carried by the lever 182 and swiveled in another trunnion block 192 carried by the link 108. A collar 193 fast on the shaft 188 at one end of this trunnion block and an enlarged portion 194 of the shaft at the other end of the trunnion block cause any lengthwise movement of the shaft to be accompanied by swinging movement of the link 108. On the outer end of the shaft 188 is a hand wheel 195 for turning it to swing the link 108 relatively to the lever 182 and thereby to adjust the wiper carrier 96 preliminarily lengthwise of the shoe. The advance movement of the wiper carrier 96 effected by the lever 182 occurs upon the starting of the power operation of the machine substantially at the time when the toe rest 20 is moved upwardly to clamp the shoe, after which the machine comes to a stop to permit the operation of the wipers by the hand lever 120 and the treadle 116.

In operating, for example, upon shoes the uppers of which are made of comparatively heavy material it may be desirable to apply more downward compacting pressure to the overlaid margin of the upper than the operator can easily apply by use of the treadle 116. The machine is accordingly further provided with power means which at the will of the operator may be made to act through the link 112 to apply downward force to the wiper carrier 96 after the wipers have been operated to wipe the margin of the upper inwardly over the insole and while they are over the shoe bottom. The link 112 includes a member 196 pivotally connected to the wiper carrier 96 and in which is threaded the upper end of a rod 198 the lower end of which is threaded in another member 200 pivotally connected to the crank arm 114. A direct positive connection is thus provided between the wiper carrier and the treadle 116 for swinging the wiper carrier by the use of the treadle. A nut 202 threaded on the rod 198 near its upper end serves by engagement with the frame 2 to limit downward movement of the wiper carrier. The lower portion of the rod 198 is reduced in diameter to provide at the lower end of its larger portion a shoulder engaged by a thimble 204 slidably mounted on the lower portion of the rod, and between this thimble and another thimble 206 adjustably threaded on the rod is a compression spring 208. Slidably mounted on the larger portion of the rod 198 and abutting at its lower end against the thimble 204 is a sleeve 210, and surrounding this sleeve with its lower end in engagement with the thimble 204 is a comparatively light spring 212. The upper end of the spring 212 bears against a block 214 slidably mounted on the rod 198. Pivotally connected to the block 214 is one link 216 of a toggle, this link being pivotally connected by a pin 218 to another toggle link 220 which at its upper end is pivotally connected to one arm of a lever 222 mounted on a rod 224. The lever 222 has another arm which carries a roll 226 engaged by a path cam 228 (Fig. 7) formed in one side of a cam wheel 230 fast on the shaft 66. Extending to the right from the toggle link 216 is a handle 232. As the parts are shown in Fig. 1 the toggle is broken and is maintained in this broken condition by the spring 212 which supports the block 214 at a considerable distance above the upper end of the sleeve 210. When the operator raises the rod 198 by the treadle 116 to cause the wipers to wipe the upper heightwise of the last the springs 208 and 212 are, of course, moved upwardly with it,

and the block 214, with the toggle broken as above described, is further elevated through the spring 212, the two toggle links 216 and 220 swinging idly farther in a left-hand direction. It will be understood that the toggle still remains in a broken condition when the operator, after the overwiping operation, forces the wipers downwardly on the shoe bottom by the treadle, and such movement as the lever 222 thereafter receives from the cam 228 when the cam shaft 66 is again started in operation only results in swinging the toggle links idly in a left-hand direction.

If the operator desires that the wipers be operated by power to apply downward compacting pressure to the margin of the upper he forces the handle 232 downwardly prior to the use of the machine on a shoe and thereby swings the toggle links 216, 220 to the right to straighten the toggle, the block 214 being thereby forced downwardly against the resistance of the spring 212. The toggle links are, in fact, swung slightly beyond positions of parallelism so as to insure that the toggle will maintain its straightened condition until again broken by the operator, the swinging of the links being limited by engagement of a shoulder 234 on the link 220 with a shoulder 236 on the link 216. The block 214, although forced downwardly as above described, is still far enough above the upper end of the sleeve 210 to permit the operator to raise the rod 198 by the treadle 116 as far as necessary to wipe the upper heightwise of the last. It will be understood that the operator then advances and closes the wipers as usual to wipe the margin of the upper over the insole. When the lever 222 is thereafter operated by its cam it acts through the straightened toggle to force the block 214 downwardly, and this block acts through the sleeve 210, the thimble 204 and the spring 208 to apply downward force to the rod 198 and thereby to cause the wipers to apply heavy downward pressure to the margin of the upper, the spring 208 being compressed more or less in this operation.

The cam shaft 66 may be driven and controlled by any suitable means. In the construction shown there is fast on this shaft a worm gear 238 operated by a worm 240 fast on a shaft 242 at right angles to the shaft 66, the shaft 242 having fast on its left-hand end one member 244 of a cone clutch. Arranged to cooperate with the clutch member 244 is another clutch member 246 mounted to turn on and to slide lengthwise of the shaft 242, this clutch member being driven continuously through sprocket wheels and a chain 248 by an electric motor 250. The clutch member 246 is normally held out of contact with the member 244 by a spring (not shown) located between these members. To force the member 246 into clutching engagement with the member 244 there is provided a vertically movable forked wedge member 252 in the lower end of which there is a vertically elongated slot 254 (Fig. 2). Extending through this slot is a shaft 256 mounted in the forked left-hand end of a lever 258 which is mounted to swing about a rod 260 supported on the frame 2. Threaded in the lower end of the wedge member 252 is a screw 262 (Fig. 2) the upper end of which is arranged to enter a recess 264 in the shaft 256 when the left-hand arm of the lever 258 is swung downwardly, the wedge member 252 being then moved downwardly by contact of the shaft 256 with the end of the screw to start the power operation of the machine. The lever 258 is operated by a treadle 266 mounted on the rod 118 and from the left-

hand end of which a link 268 extends upwardly, this link carrying a plate 270 the upper edge of which is arranged normally to underlie a plate 272 on the right-hand arm of the lever 258. It will thus be seen that when the treadle is depressed the lever 258 is swung to start the machine as above described by the upward pressure of the plate 270 on the plate 272. A spring 274 connected to the upper end of the link 268 and to a short arm 276 on the hub of the lever 258 serves to hold the link 268 in the normal position illustrated in Fig. 1.

Fast on the shaft 242 is a brake drum 278 (Fig. 2) arranged to be engaged on its periphery by two brake shoes 280 and 282 pivotally connected together by a pin 284. Pivotally mounted on a stud 286 on the frame is a lever 288 connected at its left-hand end (Fig. 2) below the stud 286, by means of a link 290, to one end of the brake shoe 280. A link 292 is pivotally connected to one end of the other brake shoe 282 and extends through an opening in a pin 294 swiveled in the left-hand end of the lever 288 above the stud 286. A block 296 adjustably threaded on the link 292 near the upper end of the link is arranged to engage a flat face on the pin 294. It will thus be seen that when the right-hand end of the lever 288 (Fig. 2) is swung upwardly the brake shoes are forced against the brake drum to stop rotation of the shaft 242 and that when this end of the lever is moved downwardly the pressure of the brake shoes on the brake drum is relieved. The lever 288 is controlled through a link 298 by a lever 300 (Fig. 6) mounted to turn on the rod 260, this lever being adjustably connected to the lever 258 by a pin 302 eccentrically mounted on one end of the shaft 256 and rotatable in a block 304 which is slidably mounted in a slot 306 (Fig. 6) in the lever 300. It will thus be seen that when the lever 258 is operated as above described by the treadle 266 to start the machine the lever 300 is swung downwardly by it to release the brake, and that when the lever 258 is swung in the reverse direction to permit separation of the clutch members 244, 246 the lever 300 swings with it to apply the brake. Swinging movement of the levers 258 and 300 in this direction is effected by a spring 308 connected at its upper end to a pin on the frame and at its lower end to a pin on the lever 300.

It will be evident that when the lever 258 is swung in the direction to start the machine it does not become effective on the wedge member 252 until it has been moved far enough for the screw 262 to be engaged by the shaft 256 at the bottom of the recess 264 in the shaft. This insures that the brake will be released before the clutch is actuated. By means of a handle 310 fast on the shaft 256 the shaft may be turned through 180° to bring another deeper recess 312 therein opposite the screw 262 and by such turning of the shaft the lever 300 is swung downwardly relatively to the lever 258 to release the brake. Convenient means is thus afforded to permit manual movements, if desired, of the parts which are operated by power. Furthermore, by reason of the depth of the recess 312, when this recess is opposite the screw 262 the clutch will not be actuated to start the machine even though the treadle 266 should be depressed, the movement of the treadle being limited by contact with the floor. Insurance is thus afforded against any accidental starting of the machine. A spring-pressed ball 314 mounted in the lever 258 and arranged to enter one or the other of two depres-

sions in the hub of the handle 310 serves to maintain the shaft 256 yieldingly in either position to which it is moved by the handle.

After the machine has been started by depression of the treadle 266 it is brought automatically to a stop. For this purpose there is fast on the shaft 66 a stop cam 316 (Figs. 2 and 8) the periphery of which is in engagement with a roll 318 carried by an arm 320 extending upwardly from the hub of the lever 258. The roll 318 lies normally in a depression 322 in the cam 316, out of which depression it is carried by the movement of the lever 258 in the direction to start the machine. Thereafter the cam 316 maintains the lever 258 in the position to which it was moved by the treadle until a second depression 324 in the cam arrives opposite the roll 318, whereupon the spring 308 acts to swing the lever 258 in the direction to stop the machine. In order that the machine will be stopped even though the operator should continue to hold the treadle 266 depressed, there is further provided means for automatically swinging the link 268 to the right, as the parts are viewed in Fig. 1, to carry the plate 270 out from under the plate 272. This means comprises a lever 326 (Fig. 8) pivotally mounted on the frame and having at one end a roll 328 for engaging the link 268, the other end of the lever being located in the path of a pin 330 upon one side of the stop cam 316. It will be understood that shortly after the machine is started this pin swings the lever 326 for the purpose described and then passes beyond the end of the lever. The stop cam 316 has in its periphery also another depression 332 for bringing the machine to a stop a second time before the end of the cycle, as more particularly hereinafter explained, and it carries other pins 334 and 336 for operating the lever 326, as required at different times, in the same manner as the pin 330. When the operator releases the treadle 266 it is returned by a spring 338 (Fig. 1) connected to the link 268, its return movement being limited by contact of a stop screw 340 carried thereby with a boss 342 on the frame.

In the use of the machine the operator mounts a last and shoe on the pins 16 and depresses the treadle 266 to start the power operation of the machine. Upon the starting of the machine the toe rest 20 is raised to clamp the work against the pins 16 and is locked by the pawls 70, the arm 12 being forced upwardly a short distance by pressure of the toe rest on the shoe until the nut 28 engages the bearing 8. At substantially the same time the wiper carrier 96 is moved to carry the wipers 92 from their initial position toward the toe end of the shoe. Thereafter the machine comes to a stop as the recess 324 in the stop cam 316 arrives opposite the roll 318. By use of the hand lever 120 the operator then advances and closes the wipers about the toe below the edge of the shoe bottom as illustrated in Fig. 9, and while holding them against the upper by the hand lever he raises them by means of the treadle 116 to wipe the upper upwardly. By further movement of the hand lever the operator thereafter operates the wipers to wipe the margin of the upper inwardly over the insole, controlling them at the same time by the treadle 116 and, it may be, forcing them down more or less by the treadle. If an adhesive is to be used to secure the toe end of the upper to the insole, the wipers may then be withdrawn from over the shoe and the margins of the lining and the toe

box trimmed as is customary in lasting with adhesive, after which a suitable adhesive may be applied to the margin of the outer layer of the upper materials and to the insole. The operator then uses the wipers again to wipe the upper upwardly and to wipe its margin inwardly over the insole. If the character of the work is such that it is desirable to operate the wipers by power to press the margin of the upper down upon the insole, the operator will have used the handle 232 to straighten the toggle 216, 220 before presenting the shoe to the machine. With the wipers engaging the margin of the upper over the insole, as illustrated in Fig. 10, the treadle 266 is depressed a second time, whereupon the lever 222 acts through the spring 298 to force the wipers downward and thus to increase their pressure on the margin of the upper, the machine coming to a stop when the recess 332 in the stop cam 316 arrives opposite the roll 318. If power is not to be used to press the margin of the upper, the toggle 216, 220 is left in its broken condition and the wipers are forced down only by the operator through use of the treadle 116. Under these conditions, when the machine is started the second time, the lever 222 merely acts to swing the toggle links without effect on the wiper carrier 96. In either case a third depression of the treadle 266 results in return of the power-operated parts to their starting positions and release of the shoe. It will be understood that even if power is used to force the wipers downward, they may be forced downward more or less by the treadle before the power is applied.

If the upper materials are to be secured to the insole by driven fastenings, the operator may partially retract the wipers and drive such fastenings after wiping the margins of the several layers of upper materials over the insole and pressing them down by use of the treadle 116. The wipers may, if desired, then be moved farther inwardly by the hand lever and forced down by the power means upon the second starting of the machine if the parts are positioned for the use of such power means. If the downward pressure of the wipers on the shoe, either by the action of the treadle 116 or by power, should result at any time in any depression of the forepart of the shoe and last by reason, for example, of the yieldability of the rubber or felt portion 22 of the toe rest, the spring 24 expands to impart a corresponding downward movement to the arm 12 and thus to maintain the pins 16 seated in the sockets in the last.

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

1. In a lasting machine, wipers for wiping the margin of an upper inwardly over the bottom of a last around an end of the last, means movable by the operator thus to operate the wipers, and power-operated means comprising a cam-operated member for thereafter effecting relative movement of the wipers and the last heightwise of the last to cause the wipers to apply compacting pressure to the overwiped margin of the upper.

2. In a lasting machine, wipers for wiping the margin of an upper inwardly over the bottom of a last around an end of the last, means movable by the operator thus to operate the wipers, a power-driven shaft, means for starting said shaft in operation after the wipers have wiped the margin of the upper inwardly, and means ar-

ranged to be operated by said shaft independently of control by the operator after it has thus been started for effecting relative movement of the wipers and the last heightwise of the last to cause the wipers to apply compacting pressure to the overwiped margin of the upper.

3. In a lasting machine, wipers for wiping the margin of an upper inwardly over the bottom of a last around an end of the last, means movable by the operator thus to operate the wipers, a power-driven shaft, a clutch through which said shaft is operated, means for actuating said clutch to start the shaft in operation after the wipers have wiped the margin of the upper inwardly, means arranged to be operated by said shaft when thus started for effecting relative movement of the wipers and the last heightwise of the last to cause the wipers to apply compacting pressure to the overwiped margin of the upper, and automatic means for bringing the shaft to a stop with the wipers in such pressure-applying relation to the margin of the upper.

4. In a lasting machine, wipers for embracing an upper about an end of a last, a hand lever for advancing and closing the wipers to wipe the margin of the upper inwardly over an insole on the last, and a power-operated lever for thereafter moving the wipers heightwise of the last to press the margin of the upper on the insole.

5. In a lasting machine, wipers for embracing an upper about the toe end of a last, wiper-operating means movable by the operator to wipe the toe end of the upper heightwise of the last and to wipe its margin inwardly over an insole on the last, power-operated means for thereafter effecting relative movement of the wipers and the last heightwise of the last to cause the wipers to press the margin of the upper on the insole, and mechanism for starting and stopping said power-operated means.

6. In a lasting machine, wipers for embracing an upper about the toe end of a last, a treadle for operating the wipers to wipe the upper heightwise of the last, a hand lever for advancing and closing the wipers to wipe the margin of the upper inwardly over an insole on the last, a power-driven shaft, means for starting said shaft in operation after the wipers have wiped the margin of the upper inwardly, and means arranged to be operated by said shaft after it has thus been started for moving the wipers heightwise of the last to press the margin of the upper on the insole.

7. In a lasting machine, wipers for embracing an upper about an end of a last, power-operated means for clamping the last and shoe and for imparting to said wipers a bodily positioning movement toward the end of the last, means movable by the operator thereafter for advancing and closing said wipers to wipe the margin of the upper inwardly over the bottom of the last, and additional power-operated means for effecting relative movement of the wipers and the last heightwise of the last to cause the wipers to apply compacting pressure to the overwiped margin of the upper.

8. In a lasting machine, wipers for embracing an upper about an end of a last, a power-driven shaft, means for starting said shaft in operation, means arranged to be operated by said shaft when thus started to clamp the last and shoe and to impart to said wipers a bodily positioning movement toward the end of the last, automatic means for then bringing said shaft to a stop, means movable by the operator there-

after for operating the wipers to wipe the margin of the upper inwardly over the bottom of the last, and means arranged to be operated by said shaft when again started for effecting relative movement of the wipers and the last heightwise of the last to cause the wipers to apply compacting pressure to the overwiped margin of the upper.

9. In a lasting machine, wipers for embracing an upper about an end of a last, a power-driven shaft, means for starting said shaft a plurality of times to initiate different stages of a cycle of operations and for bringing it automatically to a stop at the end of each stage of the cycle, power-operated means for clamping the last and shoe in the first stage of the cycle, means movable by the operator for operating the wipers to wipe the margin of the upper inwardly over the bottom of the last after the first stage of the cycle, and power-operated means for effecting relative movement of the wipers and the last heightwise of the last to cause the wipers to apply compacting pressure to the overwiped margin of the upper in the second stage of the cycle, the power-operated parts being reversely movable to release the shoe in a third stage of the cycle.

10. In a lasting machine, wipers for embracing an upper about an end of a last, means movable by the operator for operating the wipers to wipe the margin of the upper inwardly over the bottom of the last and for also moving the wipers heightwise of the last to apply compacting pressure to the margin of the upper, power-operated means for effecting relative movement of the wipers and the last heightwise of the last also to apply compacting pressure to the margin of the upper, and mechanism for starting and stopping said power-operated means.

11. In a lasting machine, wipers for embracing an upper about an end of a last, means movable by the operator for advancing and closing the wipers to wipe the margin of the upper inwardly over the bottom of the last, additional means movable by the operator for effecting relative movement of the wipers and the last heightwise of the last to apply compacting pressure to the margin of the upper, and power-operated means for use only at the will of the operator to effect such relative movement of the wipers and the last.

12. In a lasting machine, wipers for embracing an upper about an end of a last, means movable by the operator for advancing and closing the wipers to wipe the margin of the upper inwardly over the bottom of the last, a treadle for moving the wipers heightwise of the last to apply compacting pressure to the margin of the upper, and power-operated means for use at the will of the operator to cause the wipers to apply such pressure to the upper.

13. In a lasting machine, wipers for embracing an upper about an end of a last, means movable by the operator for advancing and closing the wipers to wipe the margin of the upper inwardly over the bottom of the last, additional means movable by the operator for moving the wipers heightwise of the last to apply compacting pressure to the margin of the upper, a power-driven shaft, and mechanism arranged to be operated by said shaft also to move the wipers heightwise of the last to apply pressure to the upper, said mechanism being adjustable to render it either operative or inoperative to move the wipers when the shaft is operated.

14. In a lasting machine, wipers movable to wipe the margin of an upper inwardly over the bottom of a last around an end of the last, means movable by the operator for effecting relative movement of the wipers and the last heightwise of the last to apply compacting pressure to the margin of the upper, a power-driven shaft, and mechanism arranged to be operated by said shaft for also effecting such relative upper-pressing movement of the wipers and the last, said mechanism comprising a toggle arranged to be straightened by the operator to render the mechanism effective or broken to render it ineffective when the shaft is operated.

15. In a lasting machine, wipers movable to wipe the margin of an upper inwardly over the bottom of a last around an end of the last, a treadle, connections between said treadle and the wipers for moving the wipers heightwise of the last to apply compacting pressure to the margin of the upper, and power-operated mechanism arranged to act on the wipers through said treadle connections also to apply pressure to the margin of the upper, said mechanism comprising a toggle arranged to be straightened by the operator to render the mechanism effective on the wipers or broken to render it ineffective when the mechanism is operated.

16. In a lasting machine, wipers movable to wipe the margin of an upper inwardly over the bottom of a last around an end of the last, a treadle, connections between said treadle and the wipers for moving the wipers heightwise of the last to apply compacting pressure to the margin of the upper, a cam-operated lever movable after the wipers have wiped the margin of the upper inwardly over the bottom of the last, and a pair of toggle links arranged to transmit force from said lever to the treadle connections for also moving the wipers heightwise of the last to apply pressure to the upper when said links are in substantially parallel relation to each other, the links being movable at the will of the operator out of such parallel relation to cause them to be swung idly by said lever without operating the wipers.

17. In a lasting machine, wipers for embracing an upper about the toe end of a last, a hand lever for advancing and closing said wipers to wipe the margin of the upper inwardly over an insole on the last, a treadle, positive connections between said treadle and the wipers for operating the wipers to wipe the upper heightwise of the last and for also moving them reversely to press the overwiped margin of the upper upon the insole, and power-operated means arranged to act yieldingly on the wipers through said treadle connections to impart to the wipers such upper-pressing movement.

18. In a lasting machine, wipers for embracing an upper about an end of a last, a wiper carrier supporting said wipers, a guide for said wiper carrier comprising a bar pivotally mounted at one end for swinging movement with the wiper carrier in directions heightwise of the last and extending lengthwise of the last within the wiper carrier, said bar having also lateral extensions within the wiper carrier, means for moving the wiper carrier lengthwise of the last relatively to said bar to operate the wipers, and means connected to said lateral extensions for closing the wipers by the movement of the wiper carrier.

19. In a lasting machine, wipers for embracing an upper about an end of a last, a wiper carrier supporting said wipers, a guide for said wiper carrier pivotally mounted at one end for swinging

movement with the wiper carrier in directions heightwise of the last and extending within the wiper carrier, means for moving the wiper carrier lengthwise of the last relatively to said guide to advance the wipers over the bottom of the last, 5 rack bars mounted on said guide, and gear members on the wiper carrier controlled by said rack bars for imparting to the wipers closing movements widthwise of the last in response to the movement of the wiper carrier.

10 20. In a lasting machine, wipers for embracing an upper about the toe end of a last, a wiper carrier supporting said wipers and relatively to which the wipers are movable widthwise of the last, a guide for said wiper carrier pivotally 15 mounted for swinging movement with the wiper carrier to cause the wipers to wipe the upper heightwise of the last, manually operated means for moving the wiper carrier lengthwise of the last relatively to said guide to advance the wipers 20 over the bottom of the last, and rotatable members providing anti-friction bearings between the wiper carrier and said guide.

25 21. In a lasting machine, wipers for embracing an upper about the toe end of a last, a wiper carrier supporting said wipers, a guide for said wiper carrier pivotally mounted for swinging movement 30 with the wiper carrier to cause the wipers to wipe the upper heightwise of the last, said guide extending within the wiper carrier, a hand lever on said guide connected to the wiper carrier for moving the carrier lengthwise of the last relatively

to the guide to advance the wipers over the bottom of the last, and means for imparting to the wipers closing movements widthwise of the last in response to the movement of the wiper carrier.

22. In a lasting machine, the combination with 5 toe-lasting means, of a plurality of pins arranged to extend through an insole into sockets in the forepart of a last to position the last and shoe relatively to the toe-lasting means, a toe rest for clamping the last against said pins, and spring 10 means arranged to urge the pins in a direction heightwise of the last to hold them seated in the sockets in the last if the forepart of the last receives any heightwise movement in response to pressure on the shoe bottom in the lasting opera- 15 tion.

23. In a lasting machine, the combination with toe-lasting means, of a plurality of pins arranged to extend through an insole into sockets in the forepart of a last to position the last and shoe 20 relatively to the toe-lasting means, a toe rest movable to clamp the last against said pins, a support for the pins movable in a direction heightwise of the last in response to pressure of the toe rest on the shoe, means for positively limiting such 25 movement of the support, and a spring arranged to move said support reversely and thereby to hold the pins seated in the sockets in the last if the forepart of the last receives any heightwise movement in response to pressure on the shoe bottom 30 in the lasting operation.

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