M. BROCK.

LASTING MACHINE.

APPLICATION FILED OCT. 6, 1916.

1,390,755.

Patented Sept. 13, 1921.

6 SHEETS—SHEET 1.

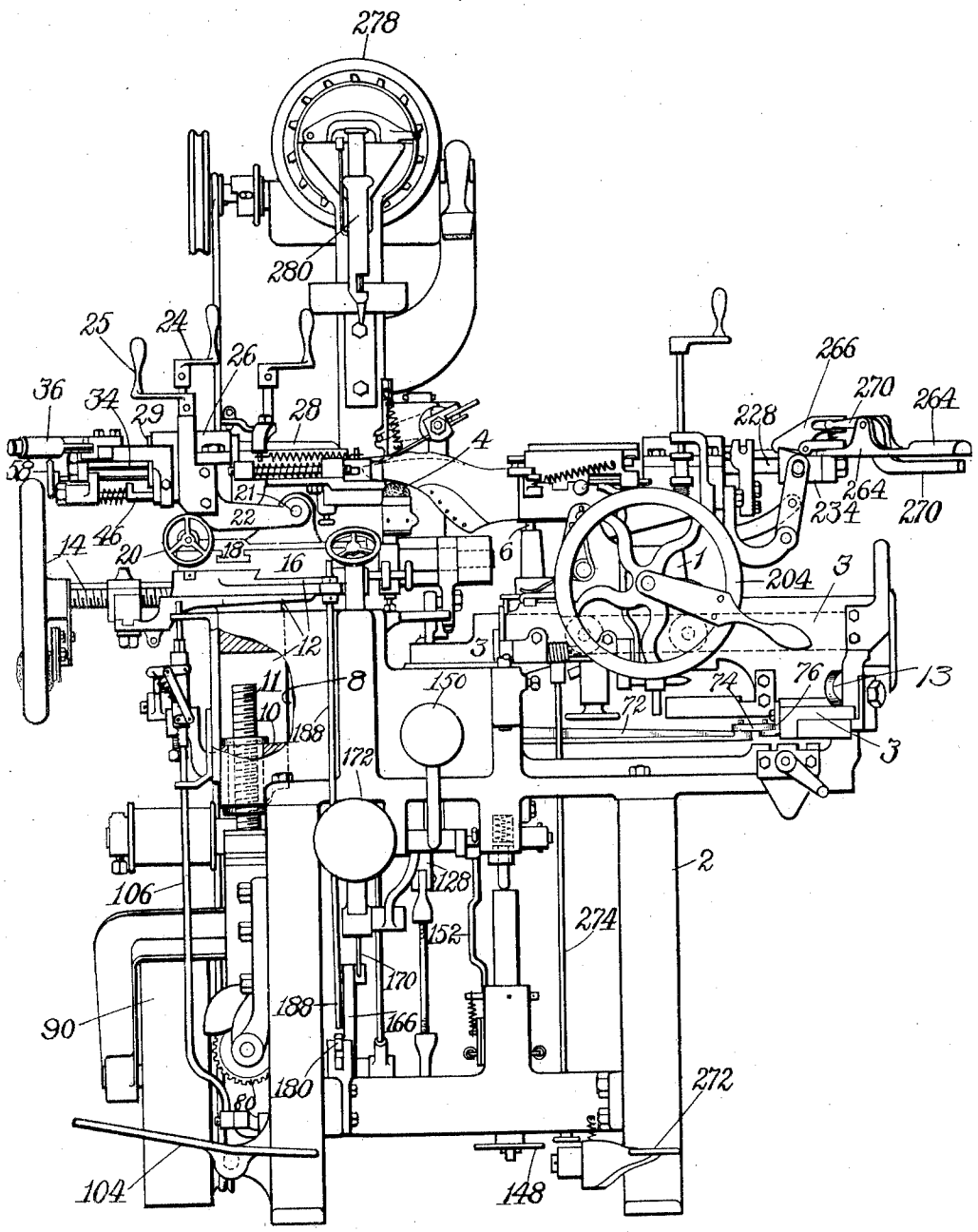


Fig. 1.

INVENTOR.

Matthias Brock

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6 SHEETS—SHEET 2.

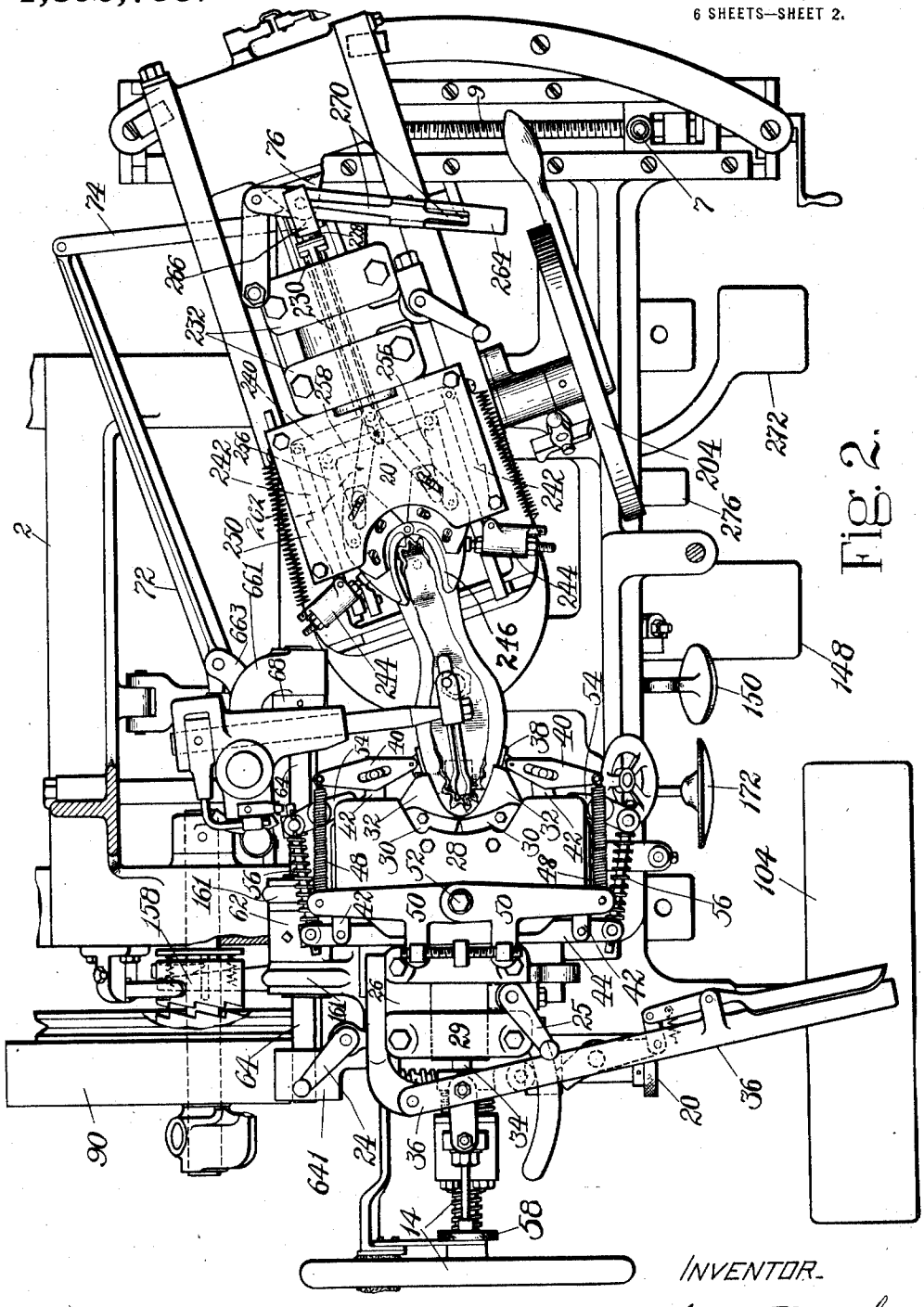


Fig. 2.

INVENTOR.

Marcellus Brock.

M. BROCK.

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2 SHEETS—SHEET 2.

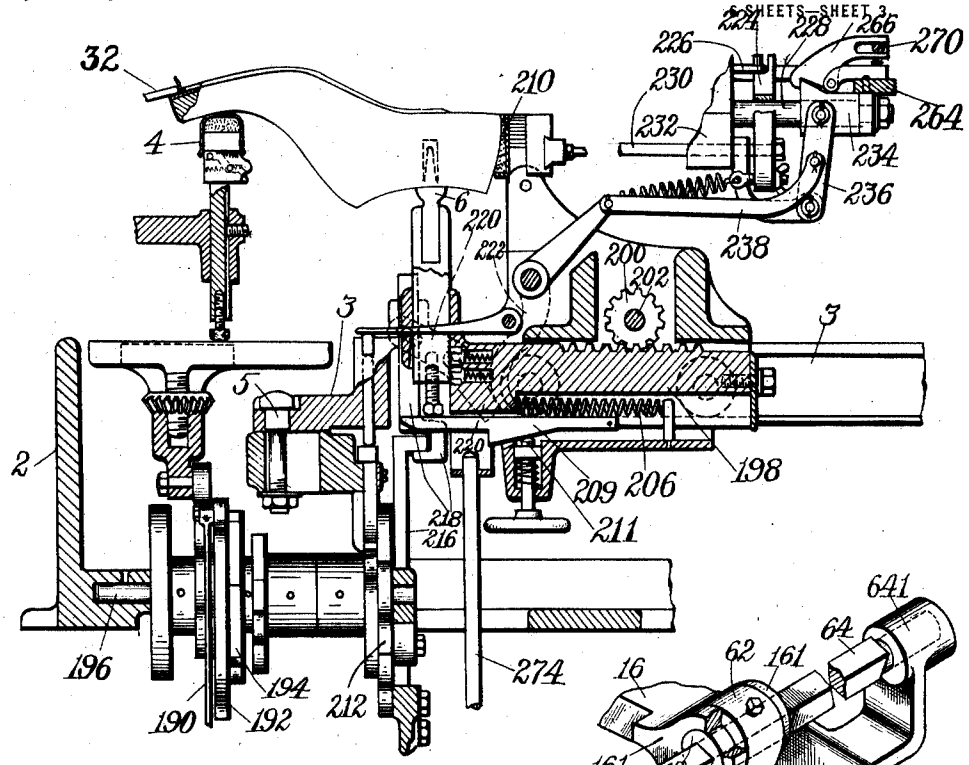


Fig. 3.

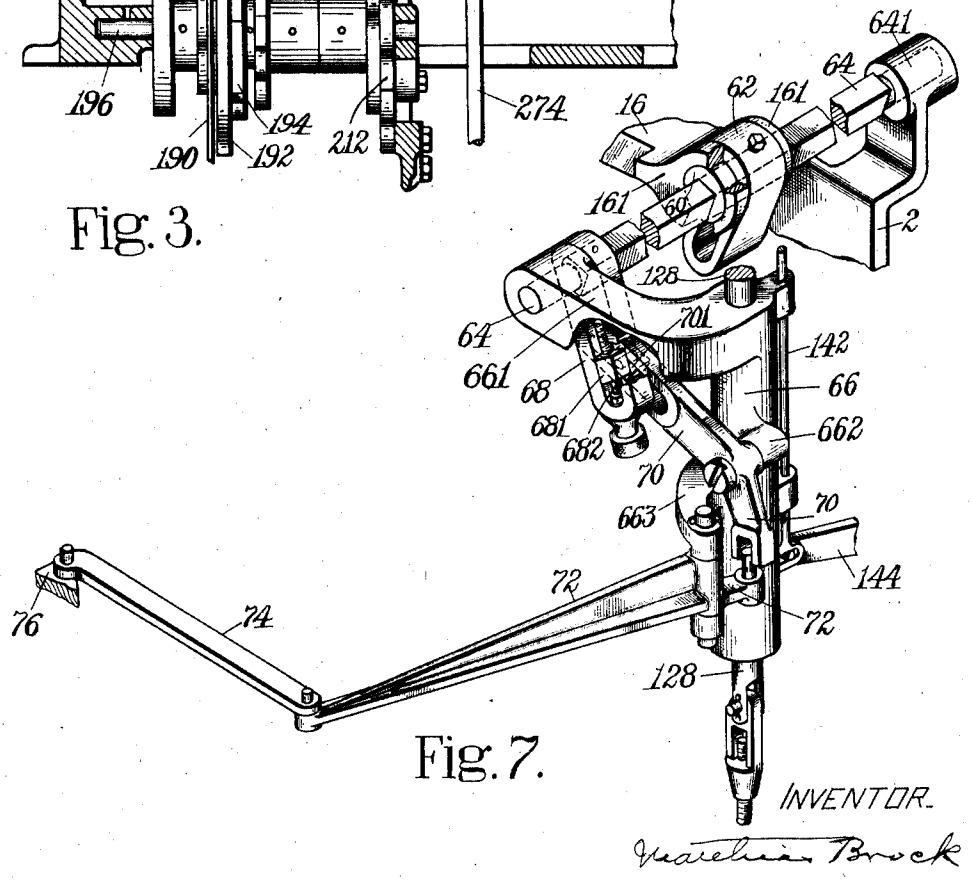


Fig. 7.

INVENTOR.

Mauritius Brock

M. BROCK.

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6 SHEETS—SHEET 4.

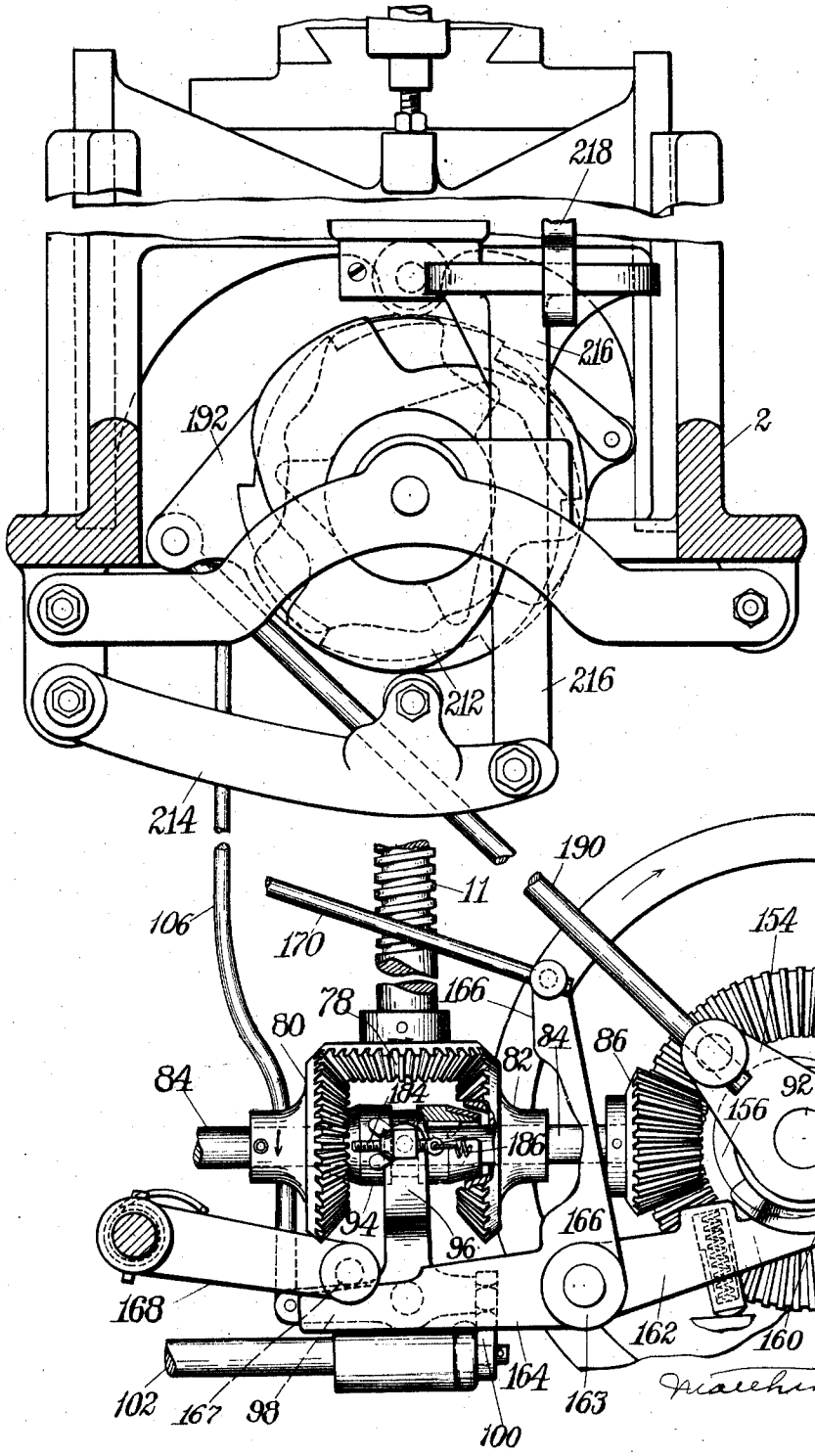


Fig. 4.

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6 SHEETS—SHEET 5.

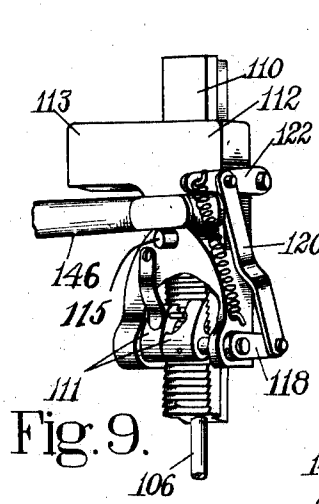


Fig. 9.

Fig. 5.

INVENTOR.

Maechicus Brock

M. BROCK.

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6 SHEETS—SHEET 6.

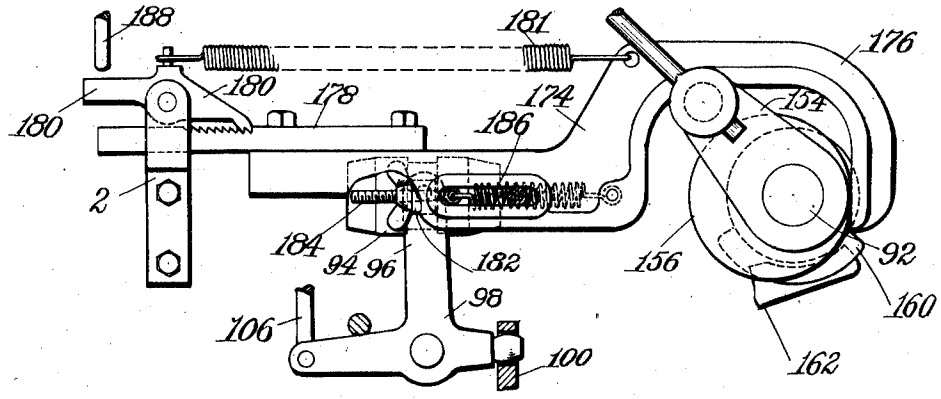


Fig. 6.

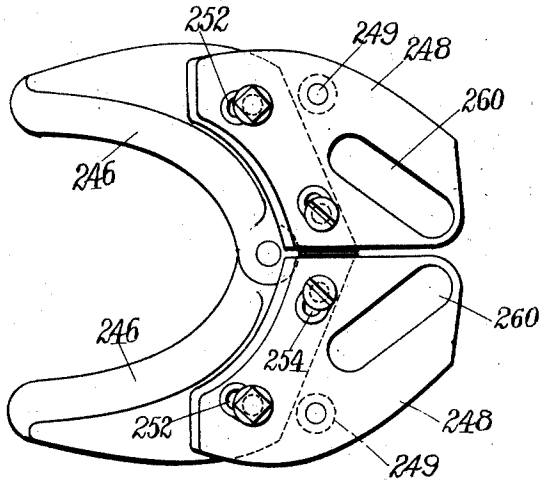


Fig. 8.

INVENTOR.

Marchias Brock

UNITED STATES PATENT OFFICE.

MATTHIAS BROCK, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

LASTING-MACHINE.

1,390,755. Specification of Letters Patent. Patented Sept. 13, 1921.

Application filed October 6, 1916. Serial No. 124,187.

To all whom it may concern:

Be it known that I, MATTHIAS BROCK, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Lasting-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to lasting machines and is herein illustrated in its application to a type of machine shown and described in United States Letters Patent No. 1,018,477, granted upon my application on Feb. 27, 1912. It is to be understood, however, that in many of its aspects the invention is not limited to machines of that particular type.

Among its objects the invention aims to relieve the operator of much of the labor which has been necessary heretofore in the operation of well-known commercial types of lasting machines, and by thus enabling the operator to concentrate his attention more fully upon the condition of the shoe materials in the course of the lasting operation, to improve the product while also eliminating unnecessary fatigue. With this and other objects in view, a feature of the invention consists in a novel organization wherein power is utilized to effect relative movement of end lasting means and a shoe in a direction transverse to the plane of the shoe bottom to perform, for example, what is commonly known as the "upwiping" of the upper around the end of the shoe. The construction shown comprises power means for raising the toe wipers to upwipe the upper around the toe, with manual means enabling the operator to hold the wipers closed effectively around the toe in the upwiping operation. The operator is thus not only relieved of the arduous labor of raising the wipers against the resistance of the shoe materials, but is also enabled to concentrate his attention upon the proper conformation of the wipers to the shoe under the degree of pressure required by the particular character of the materials in order to render the upwiping operation properly effective. Advantageously the illustrative construction provides, for the upwiping operation, a power shaft with a clutch control enabling the operator to stop the upwiping movement of the wipers at any point or to cause a reversal and a repetition of such movement. As a related feature, the invention also provides for the use of power means for effecting relative movement of the shoe and the wipers to compress the overwiped margin of the upper on the bottom of the last, the construction shown including a friction clutch control whereby relative slipping movement between parts of the clutch is availed of to insure both against undue compression of the shoe materials and against breakage of the machine. A further advantage of the illustrative construction is that the operator may control the force applied in the compression of the materials in accordance with the force which he uses in holding the parts of the clutch in engagement.

A further feature of the invention, as applied to a machine wherein the shoe and end embracing wipers are relatively movable in a direction transverse to the plane of the shoe bottom, for example to "unwipe" the upper, comprises novel means of control to stop such relative movement at a determinate point. The construction herein shown comprises controlling mechanism automatically operative to stop the power effected upwiping movement of the wipers in proper position for the subsequent overwiping operation. The invention thus marks a substantial and important improvement over prior constructions, wherein it has been necessary for the operator to rely upon the degree of resistance encountered by the wipers held manually against the shoe in the upwiping operation as an indication of the proper point to terminate such operation and begin the overwiping operation. This has required heretofore an undue concentration of the operator's attention in order to insure against undesirable reaction of the stock as a result of moving the wipers too far in the upwiping operation, and has frequently resulted in failure so to coördinate the upwiping and overwiping operations as to produce the best results in drawing and wiping the upper tightly over the outer edge of the sole or insole. Advantageously, in the illustrative embodiment of the invention, the upwiping movement of the wipers is

controlled by the shoe itself through the provision of stop mechanism the position of which is determined by engagement with the bottom face of the insole. Insurance is thus afforded that the movement of the wipers will be stopped at the required point irrespective of the height of the shoe or the thickness of the insole.

Another feature of the invention resides in a novel organization whereby operative movement over the shoe is imparted to end embracing wipers in time relation to the clamping of the end of the shoe, or to the jacking of the shoe. In its embodiment of this feature the construction shown comprises power means for jacking or clamping the shoe in a heel embracing band by moving the shoe toward the band and closing the band about the shoe, and for imparting substantially simultaneously to the heel seat wipers an operative movement inwardly over the shoe. The most difficult part of the heel lasting operation in the illustrative type of machine, wherein the upstanding marginal portions of the upper materials are "broken down" and wiped inwardly over the heel seat face of the last, is thus performed automatically by the power operating means, and on some shoes such movement of the wipers will suffice to shape the margin of the upper properly over the heel seat. In order to permit further operation of the wipers when required, the illustrative machine is also provided with means whereby the wipers may be disconnected from the power operating means and further operated manually.

In still other aspects, the invention aims to facilitate the return of parts of the machine to starting position following a lasting operation on the shoe. In this part of the invention a feature is to be recognized in a novel organization of means for effecting and controlling reverse relative movement of lasting means and the shoe. In its embodiment of this feature, the machine herein shown has power means for lowering the toe wipers at a determinate time in the power operation of the machine, the illustrative construction including also stop mechanism automatically operative to disconnect the wipers from the source of power and stop their movement at a determinate point. Still another feature comprises a novel organization whereby reverse relative movements of the toe and heel end lasting mechanisms and the shoe are effected in time relation. In the construction shown the toe lasting mechanism is lowered by power to its starting position as an incident to the unjacking of the shoe, thus effecting an important economy of time and effort on the part of the operator in the use of the illustrative type of machine.

It is a well-known condition in the shape of many modern lasts that the opposite side faces at the forepart slope in the same direction laterally of the last toward the edge of the last bottom, the direction of the slope in a right last being the reverse of that in the left last. Provision has accordingly been made heretofore for a component of relative movement between end embracing wipers and a shoe in a direction laterally of the shoe in the upwiping operation to insure effective pressure of the wipers against the shoe at the opposite sides of the forepart and to position the wipers properly for overpiping the upper at both sides of the shoe. A further feature of this invention consists in novel means of control to insure a proper component of relative lateral movement in operating on different shoes. In its embodiment of this feature the construction shown comprises controlling means for such lateral movement which is adjustable in accordance with the requirements of different shoes without special attention from the operator. More particularly, the construction herein shown comprises controlling means to determine the proper inclination of the path of upward movement of the toe wipers which is adjusted reversely for right and left shoes by the positioning movement of the heel lasting mechanism in accordance with the lateral "swing" of the respective shoes. By such means both the direction and the extent of the lateral component of the upwiping movement are determined in accordance with the requirements of each shoe.

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

In the drawings:

Figure 1 is a front elevation of a bed lasting machine of the described type, embodying the features of the present invention;

Fig. 2 is a top plan view of the machine, the tack hopper with its related parts being omitted;

Fig. 3 is a fragmentary longitudinal section through the machine showing particularly the jacking mechanism;

Fig. 4 is a view in end elevation on an enlarged scale showing the power driven shaft with its control and connections to the jacking cam;

Fig. 5 is a fragmentary perspective view, partly in section, of an end of the machine showing the power operated mechanism for the toe head and the jacking cam, and the sole hold-down with the automatic stop mechanism for the rising toe head coöperating with the hold-down and with the control for the power operated mechanism;

Fig. 6 is a view in elevation of the mech-

anism for automatically stopping power operated lowering movement of the toe head;

Fig. 7 is a fragmentary perspective view of the mechanism for effecting lateral wiping movement of the toe wipers, with the automatic reversing connections to the heel carriage;

Fig. 8 is a plan view of adjustable heel wiper plates; and

Fig. 9 is a detail of the stop block and its pawl control.

The frame 2 of the machine supports a toe lasting mechanism and a heel lasting mechanism between which are located the toe rest 4 and the heel rest 6. The heel lasting mechanism is carried by a frame 1 sliding longitudinally in ways in a carriage 3 which is connected pivotally with the frame by a pin 5 located beneath the last in a line at, or approximately at, the point of intersection of the median lines of the heel and forepart of the last. Preferably, the pin is adjustable longitudinally of the last in accordance with variations in said point of intersection in different lasts.

The carriage 3 with its heel lasting mechanism is movable freely about the pivot 5, the carriage sliding freely over the frame 2 and being supported by rolls 13, shown in Figs. 1 and 2, which travel on a curved track, the movement being limited by stops 7 (Fig. 2), adjustably mounted on a right and left threaded screw 9 at points equidistant from the middle line of the machine. The screw is provided with a crank for adjusting the two stops toward and from the middle of the machine. The stops serve to limit lateral swinging movement of the heel lasting mechanism and, when they have been adjusted into the right position for a right last, for example, they will be correctly located also for the left last and for all lasts of the same style. The carriage may be provided with a locking device such as a latch adapted to coöperate with either of the stops 7 as disclosed in my patent previously noted, so that the operator may, by a single movement, release the latch and move the heel lasting mechanism laterally about its pivot 5.

The toe lasting mechanism is carried by a head having a depending column 8 guided in the frame for vertical movement and having an offset interiorly threaded portion 10 coöperating with and supported by a power operated screw 11 by means of which the toe lasting mechanism is raised and lowered, as later explained.

The head of the column 8 supports a plate 12 which, with the superposed toe lasting mechanism, is adjustable longitudinally of the machine by a screw and hand wheel 14 for adaptation to shoes of different lengths, the operative position of the heel lasting mechanism lengthwise of the machine being constant and the toe lasting mechanism alone being lengthwise adjustable. Above the plate 12 is a second plate 16 (Fig. 1) which is automatically movable in a right line transversely of the machine and laterally of the last by means shown in Fig. 7 and which will be later described. The plate 16 has an undercut groove (Fig. 1) in which slides a correspondingly formed rib depending from a plate 18, said groove and rib being curved about a center which is located substantially under the end of the toe of the last when a shoe is in the machine. A screw rod (Fig. 1) having a hand wheel 20 effects and maintains adjustment of the plate 18 about the pivotal connection at said center.

From the superposed plate 18 rise projections to which is pivotally connected at 21 a tipping head 22 which is adjusted and maintained in adjusted position about said pivot 21 by a screw and hand crank 24 to adapt the toe lasting mechanism to the inclination of the forepart of the last bottom.

The tipping head 22 is formed in its upper face as a half sleeve, upon which fits a cap plate 26 having a complemental formation to present a long bearing extending lengthwise of the shoe. In this bearing is mounted the cylindrical stem 29 of the toe wiper carrying plate 28. This stem has a lug projecting through a slot in the bearing and engaged by a forked block which is movable by a screw and hand crank 25 for adjusting the toe wiper carrying plate about an axis extending lengthwise of the machine to adapt the wipers to the transverse inclination of the forepart of the last bottom. Within a horizontal guideway formed in the wiper carrying plate 28 are located cam plates 30 with which the wipers 32 are detachably connected, said cam plates having the usual cam slots therein (not shown) in which stand roller studs screwed to the carrying plate 28 and causing the wipers to close when they are advanced. Advancing movement of the wipers is effected through a plunger rod 34 operated by a hand lever 36.

Means hereinafter described are provided for lifting the toe head whereby the wipers, which will have been caused to embrace the toe portion of the last below the last bottom, may be caused to wipe up and mold the upper to the side faces of the toe portion of the last. After the wipers reach the plane of the shoe bottom, they are further advanced and closed to lay the upper materials inwardly over the innersole upon the last bottom. The general organization of the machine thus far discussed except for details related to novel features hereinafter described is, or may be, substantially the same as is fully shown and described in my said prior Patent No. 1,018,477, and need not be here further explained.

The machine as shown herein is provided with a toe embracing band and with wiping

mechanism corresponding generally in construction and operation to the toe embracing and wiping mechanism described and illustrated in detail in prior United States Letters Patent No. 1,284,870, granted upon my application on November 12, 1918, and accordingly these parts will only be described as to their essential features.

The toe embracing band 38 constitutes an outer close-fitting form or mold at the edge of the shoe bottom, while the wipers 32 are operating to compress the upper on the margin of the shoe bottom, whereby a sharply defined angular edge is provided at the junction of the side and bottom faces of the shoe. The band is mounted directly below the acting edge of the toe wipers 32 and comprises a supporting chain and a non-abrasive lining member. The chain is connected at its outer ends to transverse levers 40 which are fulcrumed on slide bars 42 mounted within the wiper carrying plate 28 for movement lengthwise of the machine. The ends of the slide bars 42 remote from the band are pivotally connected to a cross head 44 which is pivoted to constitute a closing pressure equalizer on the rear end of a slide 46 (Fig. 1). This slide 46 has a lost motion connection with the hand lever 36 by which the wipers are operated so that there is lost motion allowing the open wipers to be manipulated for embracing and upwiping an upper around the toe of a last without necessarily disturbing the band.

The free outer ends of the transverse levers 40 are connected by springs 48 to an equalizing bar 50 fulcrumed to the toe wiper carrying plate 28 at 52. The springs act through the levers to tension the sides of the band longitudinally of the last and cause the band snugly to embrace the toe of a shoe in the machine. They also act as relief springs to allow slide 46 and the bars 42 to complete the stroke given by the wiper operating lever 36 after the band has tightly gripped the shoe and can be closed no farther.

The slide bars 42 have cam faces or inclines on their outer edges which coöperate with stops 54 to wedge the end portions of the band inwardly for closing the band hard against the sides of the toe in response to forward movement of the slide bars and concurrently with the rearward pulling movement on the band ends. The stops 54 are formed as cams on the inner arms of levers which are fulcrumed to fixed lateral extensions of the plate 28 and the outer ends of these cam levers are engaged by springs 56 through which pressure is applied from the previously mentioned cross head 44 for holding the cams or wedge abutments to their work and tending to turn the cams in the direction to supplement the action of the inclines in forcing the end portions of the toe band inwardly. The friction of the relatively moving parts is such that under the action of the springs 48 and 56, the slide bars 42 hold the band hard closed against the shoe while the lost motion between the slide 46 and lever 36 is utilized in backing off the wipers to uncover the tacking line on a McKay shoe or to permit the toe wiring operation on a welt shoe.

The toe band is movably supported on a bracket which is formed to present a shelf upon which the middle portion of the lower edge of the band rests. This bracket, and therefore the toe band, is preferably supported for adjustment lengthwise of the machine and relatively to the wipers by a rod connected to the bracket and provided with a hand wheel 58 (Fig. 2).

The right and left sides of a last are both inclined toward that side of the shoe bottom which is outermost when the last is in upright position, or toward the right in a right shoe and toward the left in a left shoe. It is highly desirable to present the wipers at the plane of the shoe bottom in the same relation to the two sides of the toe so that when they are closed they will lay the upper into position to be fastened at the same distance from the edge and inside the sewing line on both sides of the toe of a McKay shoe, and will force the upper into the corner at the base of the sewing rib at both sides of a welt shoe.

According to the present invention, novel mechanism is provided for moving the wipers transversely of the machine and of the last in one direction for right shoes, while the wipers are being elevated to wipe the upper over the sides of the last, and in the reverse direction for left shoes. The plate 16 underlying plate 18 and overlying and having the transverse tongue and groove connection with plate 12 (see Fig. 1) is extended (Figs. 2 and 7) toward the rear of the machine where it is bifurcated and provided with inverted hook-shaped bearings 161 (Fig. 7) to support and journal a sleeve 60. A block 62 having an elongated slot therein is seated over this sleeve between the bearings and is fixed thereto as by a set screw so as to be rigid with the sleeve. The slot in the block is enlarged laterally at its upper end to form a seat for the sleeve and is of such length as to permit the maximum upward movement of the lasting plate 16. The lower part of the sleeve is channeled to receive a squared shaft 64 fitting snugly within the slot of the block for relative sliding movement. The sleeve channel coincides in width and alinement with the block slot below the sleeve seat and constitutes in effect a continuation of that portion of the slot in block 62 in which the squared shaft 64 may slide. The bearings have the opposite edges of their lower openings spaced

to permit substantial inclination of the block 62 without extending said edges into the line of the slot.

The ends of the squared shaft are reduced and rounded and mounted in journals formed by an extension 641 of the frame 2 and by an offset extension 661 at the upper end of a hollow standard 66 carrying a hold-down stem and certain operating parts later to be described. Adjacent to the journal 661, a slotted link 68 is mounted on and fixed to the squared shaft 64 and extends downwardly. A block 681 carried by an adjusting screw 682 is mounted in the slot of the block 68 and may be adjusted lengthwise thereof by the screw 682. This block is pivotally connected to a second block 701 mounted to slide in an elongated slot formed in the upper end of a bell crank lever 70 pivoted to an offset 662 of the standard 666 and having its lower end bifurcated to receive a pin upstanding from one end of a horizontal lever 72. This lever is pivoted on a bracket 663 of the standard and extends longitudinally of the machine and is connected by a link 74 to a bracket 76 on the carriage 3 on which the heel lasting mechanism is mounted, as shown in Figs. 1 and 2.

The opposite side faces of "straight" lasts are substantially the same with practically no inclination. The side faces of "crooked" lasts, however, are inclined. The squared shaft 64 may be adjusted so that with the heel carriage positioned in the longitudinal median line of the machine, its side or active faces will be substantially vertical. This adjustment may be secured by operating the screw 682 when the heel carriage is in central position. This screw will move the block 701 and the sides of the slot in bell crank lever 70 will operate as a wedge to swing the slotted link 68 to turn the squared shaft in its bearings.

It will be evident that when the toe lasting head, including plate 16 is moved vertically upward by the power operated mechanism, previously referred to, the slotted block 62 will be moved upwardly with it. As the block rises, the side faces of the squared shaft 64, when inclined from the perpendicular, will engage with the sides of the slot in the block 62 and by reason of their inclination, will act as a wedge against the block to force the block with its connected plate 16 and the toe lasting head transversely of the machine in the direction determined by the inclination of the side faces of the squared shaft.

This inclination is changed from a determinate angle to the perpendicular for a right shoe to an opposite and corresponding angle to the perpendicular for the left shoe (of a pair made on a crooked last) when the heel lasting mechanism is swung from the position it occupies for the right shoe to the opposite position for the corresponding left shoe, which is reached when the locking device carried by the carriage 3 of the heel lasting mechanism coöperates with the opposite stop 7. This reverse inclination of the squared shaft 64 obviously is effected through the connection of the link 74 with lever 72, movement of which operates the bell crank lever 70 and turns the squared shaft through the connections previously described. The amount of movement transmitted to the lever 72 and bell crank lever 70 will vary with the "swing" or crookedness of the last and will increase the inclination of the side faces of the squared shaft proportionately to the crookedness of the last. In other words, the more crooked the lasts, the greater will be the inclination to the vertical of the active faces of the squared shaft 64 and the amount of the transverse movement of the plate 16 and toe lasting head will be correspondingly increased to effect an upwiping movement with a proportionately increased component of lateral movement. The automatic adjustment of this inclination by movement of the heel carriage may be varied for a last of given swing through adjustment of the block 681, as described.

The lifting screw 11 for the toe lasting head previously referred to is in the form of a spindle having its upper portion, only, threaded, the spindle extending vertically downward and being journaled in a portion of the machine frame. It preferably carries a collar below its threaded portion (seen best in Fig. 5) having a thrust bearing on the upper end of the machine frame. At its lower end, it carries a downwardly facing beveled gear 78 attached to the screw spindle by a suitable collar and engaging opposite beveled gears 80 and 82 loosely mounted on a counter shaft 84, journaled at its forward end in the machine frame and carrying a pinion 86 at its rear end. This pinion is in mesh with a beveled gear 88 secured to the face of a pulley 90 continuously driven from a suitable source of power, such as the usual line shaft.

The opposed inner faces on the beveled gears 80 and 82 are formed with conical clutch faces and a sleeve 94 keyed to the shaft 84 between these beveled gears and continuously rotating with the shaft, is formed at its opposite ends with corresponding clutch surfaces and is arranged for sliding movement to and from neutral position and alternately to engage and rotate the beveled gear 80 to rotate the screw 11 in a direction to lift the toe lasting head, and to engage and rotate the beveled gear 82 to rotate the screw 11 in a reverse direction to lower the head.

The sleeve 94 is formed with a circumferential groove, into which extend pins

carried by the ends of an embracing yoke 96 formed as an extension from a controlling rock arm 98 pivoted to the frame and connected by a link 100 at its rear end to a crank arm at the rear end of a rock shaft 102 journaled in the machine frame and extending forwardly to the front of the machine where it is rigidly connected to a double acting treadle 104 at a point between its ends. Actuation of opposite ends of the treadle downwardly will connect the clutch sleeve 94 with opposite beveled gears 80 and 82 to alternately raise and lower the toe lasting head, and movement of the treadle to a substantially horizontal position (Fig. 1) will shift the sleeve 94 to neutral position. The friction clutch surfaces permit the driving mechanism to slip and prevent breakage when the predetermined pressure for which they are arranged has been applied in depressing the toe lasting head to "iron down" the overwiped upper materials on the thread face of the insole.

As I have previously stated, in the manually operated or manually controlled lifting movement of the toe lasting head, it is difficult, if not impossible accurately and uniformly to arrest upward movement of the lasting head with the wipers positioned in the proper plane relative to the insole, since the operative must coördinate the operation of the treadle to stop the movement of the head with the "feel" of the wipers which are being pressed against the sides of the shoe as the lasting head rises. To obviate this difficulty means are provided automatically to arrest upward movement of the head with the wipers in the proper plane for the particular shoe being lasted.

Accordingly, to the front end of the rock arm 98 is pivoted the lower end of a rod 106 extending upwardly through spaced brackets (Fig. 5) projecting from the frame. Above the lower bracket, a plate 110 is attached to the rod and has its outer face formed with downwardly inclining ratchet teeth. A channeled stop block 112 is mounted on the plate 110 for vertical sliding movement and is formed with an offset 113 positioned in vertical alinement with the upper end of a set screw or abutment 114 adjustably mounted in an extension 116 of the offset portion 10 of the toe lasting head 8. The block 112 carries pawls 111 (Fig. 9) mounted on the pivot pin of a rocking link 118 connected to a parallel link 122 by an upstanding cross bar 120 with a coiled spring anchored to block 112 and connected to the free end of link 122 and normally tending to swing the pawls 111 (Fig. 9) into engagement with the ratchet teeth.

The block 112 is supported and determinately positioned on the ratchet plate by the engagement of the forward end of a lever 146 under the free end of the upper link 122, releasing the pawls from the ratchet plate and permitting the block to be lifted and supported in desired position by said lever. The lever itself is operated determinately to position the block 112 by certain connections to a hold-down member 135 arranged to engage the sole of the shoe to be lasted, this member through said connections, and by movement to position of engagement with the sole, swinging the lever 146 determinately to position the stop block 112. The hold-down member 135 may be of any desired and suitable construction. For use with welt shoes, it will be of a construction to engage the curved lip of the insole as shown in Fig. 5 and in practice engages the lip at a point centrally of the toe of the shoe.

A spindle 128 is guided for vertical movement by the hollow standard 66 and is provided at its upper end with a head 130 (Fig. 5) having a transverse bore to receive a horizontally extending spindle 134 whose forward end has the hold-down member 135 clamped thereto, and whose inner end carries a rock arm 132 housed within a bifurcation of the head 130. One side of the head 130 is channeled to receive a vertically movable plate 136 having an outwardly extending bifurcated portion, within which is seated a pin 138 offset from the rock arm 132 and operating to slide the plate vertically when the shaft 134 is oscillated. A coiled spring operating against a pin at the top of the plate normally presses its bifurcated offset downwardly against the pin of the rock arm.

The base of the plate 136 is formed with a flange 140 formed on an arc concentric with the axis of the spindle 128 and engaged by the notched head of a vertically movable link 142. The arc-shaped flange permits the spindle 128 and its head and hold-down to be swung in an arc without disengaging the link from the plate 136. The lower end of link 142 is pivotally connected to one end of a lever 144 which is pivoted intermediate of its ends on the frame of the machine and has its forward end connected by a ball and socket joint with the rear arm of the lever 146, extending substantially at right angles thereto and journaled intermediate its ends on a stud projecting from the machine frame. The forward end of this lever 146, as previously stated, extends beneath the free end of link 122 controlling the pawls of the block 112.

In the raised position of the hold-down spindle 128, the outer end of the lever 146 is swung upwardly from the position shown in Fig. 5, sliding the block 112 upon the plate 110. When the hold-down spindle is pulled downwardly by a treadle 148 to bring the base of the hold-down against the insole this end of the lever is lowered and the block 112 slides downwardly with it. If the hold-down 135 is pressed downwardly sub-

sequently to engage its edge with the lip of the insole, for instance, additional downward movement is given to the block, or if the toe end of the shoe is upwardly inclined, the adjustment of the hold-down in conformity therewith may lift the block 112 to a slight extent. Under all conditions the plane of the toe end of the insole controls the position of the block 112 so that the block will occupy a position determined by the plane of the toe end of the insole of each particular shoe. To insure downward movement of the block 112, in case the bar should stick, a stud 115 projects from the block 112 below lever 146 (Fig. 9).

The offset 113 of the block is always in vertical alinement with the end of the set screw 114 carried by and moving upwardly with the toe lasting head, and the connections from the hold-down spindle to the block are so proportioned as to position the offset for engagement by the set screw 114 at that point in the rise of the lasting head when the wipers have reached approximately the plane of the last bottom. As soon as the set screw engages the offset, the block 112 is lifted from the end of the lever 146, its pawl at once engaging the ratchet of plate 110, lifting the plate and its rod 106 to rock the arm 98 and slide the clutch sleeve 94 to neutral position, automatically stopping upward movement of the head at the desired point. Accuracy in the time or point of clutch retraction may be assured by adjustment of the set screw 114 when the machine is first assembled and tested. The set screw also enables adjustment to be made at later dates to compensate for wear in the block actuating levers, etc. When the head 8 is lowered for a second upwiping movement, the block 112 slides down to its initial position of support by the end of lever 146.

The hold-down spindle and its connected parts are held locked in adjusted position by suitable means which may be released when desired to permit the spindle to be again elevated. The treadle connections, and the locking and releasing means, may, and as shown, conform substantially to the hold-down controlling and operating means shown in United States Letters Patent to Keyes, No. 1,120,822, granted December 15, 1914. Their specific construction, however, forms no part of the present invention. Briefly, the spindle 128 is pulled down against the resistance of a spring by a foot treadle 148 having a ratchet plate connected therewith, a locking pawl for the ratchet plate being released by pressure against a knee (or thigh) lever 150 connected by a rod 152 with the locking pawl, the spring thereupon elevating the hold-down.

The normally idle shaft 92 on which the pulley 90 is continuously and freely revoluble, extends lengthwise of the machine and is provided at its end with a crank arm 154 and adjacent to the crank arm with an eccentric 156. The shaft has a clutch sleeve 158 (Figs. 2 and 5) keyed thereto provided with a toothed clutch face and normally urged by coiled springs (Fig. 2) to engage its toothed clutch face with a similarly toothed clutch surface on the hub of the pulley 90. A rib 160 (Fig. 4) is formed on the periphery of the sleeve 158 and is inclined to act as a cam, against which normally bears an arm 162 rigid with and extending rearwardly from a hub 163 mounted on a spindle carried by the frame. This arm operates normally to hold the clutch sleeve out of engagement with the pulley.

A second rigid arm 164 projecting forwardly from the hub has its forward end normally depressed by a pin 167 offset from the rear end on a pivoted arm 168 journaled on a spindle at the forward end of the machine frame and normally pressed downwardly into engagement with the arm 164 by a spring. Between the front and rear arms 164, 162, a vertical crank arm 166 rises from the hub 163 and has its upper end pivotally connected to the rear end of a rod 170. The forward end of rod 170 is pivoted to the rear end of a lever 172 (Figs. 1 and 2) pivotally hung in a saddle depending from the frame and operable by knee pressure momentarily to depress the rear arm 162 and permit the clutch sleeve 158 to engage with the driving pulley and rotate the shaft 92 through one revolution. The knee lever is immediately released and the arm 168 operating against the front arm 164 of the hub 163 immediately elevates the rear arm 162 to engage the cam 160 and retract the clutch at the end of one revolution of the shaft 92.

At the base of the machine and extending transversely of the shaft 92 a bar 174 (Figs. 5 and 6) is guided for horizontal reciprocating movement and has its end formed as a yoke 176 to embrace the eccentric 156 with substantial clearance between one side of the embracing yoke and the eccentric. The forward end of the bar is provided with a plate 178 guided in the front of the machine frame and formed with a ratchet surface, with which a pawl at the rear end of a pivoted finger 180 coöperates. A coiled spring 181 is interposed between the yoke portion of the bar 174 and a pin upstanding from the central pivoted portion of the finger 180 and normally acts to hold the pawl end of the finger in engagement with the ratchet surface of the bar.

When the clutch is operated to rotate the shaft 92, the eccentric 156 will move the bar 174 rearwardly, in which position it will be held against return movement by the pawl

finger 180 when the finger is in position to coöperate with the teeth on the plate 178. The tension of the coiled spring 181 normally tends to return the bar to its forward position and is permitted to do so when the toe lasting head, in its return movement to lowered position after a toe lasting operation, has reached lowered position. The eccentric operated rearward movement of the bar tends to shift the clutch sleeve 94 in the direction to engage and rotate gear 82 to lower the toe lasting head as will be hereinafter explained. There are two rotations of the shaft 92 to each work cycle; the first occurs at the beginning of the cycle (when the lasting head is already lowered) to jack up the last and shoe, the pawl finger 180 at that time being ineffective to hold the bar 174, as will be explained and the second rotation is effected at the end of the cycle to release the last and shoe, and is effective to lower and in accordance with a portion of this invention, automatically to stop the toe head.

The yoke 96 operating the clutch sleeve 94 carries an adjustable screw 184 (Figs. 4 and 6) to which is anchored one end of a coiled spring 186, the forward end of the spring being anchored to the bar 174 adjacent to its yoke portion 176. Obviously, with the toe lasting head in its raised position and with the clutch sleeve 94 in neutral position, (Fig 4) at the end of the lasting operation, actuation of the knee lever 172 will cause the shaft 92 to be rotated and move the bar 174 rearwardly and will, through the spring connection 186, shift the clutch sleeve from a neutral position to a position where it engages and rotates the beveled gear 82 to lower the toe lasting head, the pawl 180 holding the yoke in rearwardly moved position against the tensioned spring 181.

When the toe lasting head approaches the limit of its downward movement, a rod 188 (Figs. 1, 5 and 6) having its upper end attached to the plate 12 of the toe lasting head and guided for vertical movement, engages the front end of the pawl finger 180 and lifts the pawl from engagement with the rack plate 178, whereupon the tensioned spring 181 will move the bar 174 toward the front of the machine and by relieving the tension of the spring connection 186, will permit the clutch sleeve to be moved from engagement with the gear 82 into neutral position. The pawl finger will thus be held in inoperative position until the toe lasting head is again raised.

The rotation of the crank arm 154 through the revolution of shaft 92 reciprocates a link 190 (Fig. 4) pivotally connected at its lower end to the crank arm, effecting an oscillation of a disk 192 carrying a driving dog engaging teeth formed on a ratchet wheel 194 to turn a cam shaft 196 on which said ratchet wheel is rigidly mounted. Actuation of the cam shaft 196 through the space of one tooth by the reciprocation of the driving link 190 is first effected when the last and shoe have been positioned upon the heel and toe rests and have been moved to engage the heel clamping band as previously described.

This first actuation of the cam shaft causes cams and connections operated thereby to jack the shoe and last upwardly and backwardly against the heel clamping band and to move the heel clamping band firmly to embrace and conform to the heel end of the last and automatically to operate the heel wipers. In this position the shoe and last is held while the toe and heel end lasting mechanisms are operated to wipe the marginal edges of the upper over the insole to which they are subsequently tacked. A second actuation of the cam shaft by operating the knee lever 172 is effected at the end of the lasting operation and results in lowering the toe rest, retracting the heel wiping mechanism and clamping band from the last and shoe and in moving the heel pin with the last and shoe forwardly out of the heel clamping band, at the same time lowering and stopping the toe head.

These cams and their operating connections need not be described in detail herein. As shown, they correspond with those described and illustrated in prior United States Letters Patent No. 1,018,477, previously referred to. Briefly, the heel lasting mechanism is movable with its frame lengthwise of the carriage 3 from a retracted position, which permits of the convenient mounting of the last on the last spindle 6 to a predetermined operative position which is maintained during the jacking and lasting operations by a latch carried by the heel lasting head which engages a projection on the side rail of carriage 3 (Fig. 1), and is automatically released by a cam mounted on said cam shaft 196 at the end of the lasting operation. The last spindle 6 is carried by a slide 198 (Fig. 3) which is movable lengthwise of the machine on the carriage 3 and relative to the heel lasting mechanism. For the purpose of effecting lengthwise movement of the slide, its upper face is racked and a pinion 200 carried by a shaft 202 is arranged to be operated by a hand wheel 204 (Figs. 1 and 2) to move the heel rest rearwardly toward the heel clamping band and lasting mechanism. A coiled spring 206 (Fig. 3) normally tends to move the heel rest 6 forwardly away from the heel band and lasting mechanism, and the hand wheel 204 is provided with a suitable pawl and ratchet mechanism to retain it in adjusted position. The pawl may be manually released but may be, and preferably is,

automatically released when the heel lasting mechanism is released at the end of the lasting operation so that the shoe is not pulled rearwardly to scrape and mar the toe by abrasion from the toe rest.

The automatic lifting of the toe rest is effected, as previously described, after the slide 198 has been moved rearwardly to engage the heel end of the shoe and last with the heel clamping band, indicated at 210, (Fig. 3) and to lift the heel end of the last and shoe through cam plate 209 and abutment screw 211 so as to present the bottom face of the shoe in the plane of the heel wiper plates. Actuation of the cam shaft to effect this jacking operation also and coincidently rotates a second cam 212 operating against a roll carried by a pivoted arm 214 (Fig. 4) which is in turn connected with a bar 216, and an angular lift rod 218 to a lever 220 (Fig. 3) whose lower end engages a second lever 222 fulcrumed in the carriage of the heel lasting mechanism.

This lever, as shown herein and in accordance with the construction of prior Patent No. 1,018,477, has a yielding spring connection to a sliding block 224 (Fig. 3) whose upper end is notched to receive the end of a rod 226 arranged in machines as heretofore constructed to effect a preliminary partial closing movement of the heel wipers. This rod, together with an actuating rod 228 for effecting bodily longitudinal movement of the wipers and causing them to close, and a heel clamp operating plunger 230 connected to the block 224, are guided for longitudinal movement through a head 232 of the heel end lasting mechanism. The rod 228 has a latching sleeve 234 mounted upon its rear end and formed with an abutment. From this sleeve an arm 236 depends and is pivotally mounted at its lower end on a bracket extending from the head. Between its ends it is connected by a link 238 with the end of the lever 222 operated through cam 212, so that, when said cam is actuated and the block 224 is moved as above explained movement is also imparted to the sleeve 234.

The specific construction of the clamping band may, and as shown, does correspond with the construction of the clamping band in my patent previously referred to, and the band is actuated by similar connections from the plunger 230, including an equalizer bar 240 (Fig. 2) to which the end of the plunger is pivoted, and links 242 extending from the ends of the bar and pivoted to levers 244, carrying the ends of the clamping band.

The heel wiping mechanism includes wiping members of novel construction (Fig. 8) comprising curved wiper plates 246 pivotally interconnected at their inner adjacent edges and secured to carrier plates 248, which are supported for horizontal movement in the lasting head 250. The wiper plates carry pairs of studs which extend upwardly through arcuate slots 252, 254 in each carrier plate, these slots, as shown, being formed as arcs having the pivot point of the wiper plates as a center. The plate-carried studs are engaged by clamping nuts located upon the upper face of the clamping plates, permitting the wipers independently to be adjusted relatively to their carrier plates to vary the contour of the wipers. Preferably, the under faces of the carrier plates 248 are undercut to receive the rear portions of the plates 246.

Adjacent to their outer forward ends the carrier plates 248, as in prior constructions, are apertured as at 249 to receive the pivots of wiper actuating links 256, whose rear ends are pivoted to an equalizing lever 258 to which the forward end of the actuating rod 228 is pivoted. The carriers are also provided with divergent slots 260 in which stand rollers carried at the forward end or ends of links 262 whose rear ends are pivoted to the rod 226. These rollers, as heretofore, have pins extending upwardly through cam slots formed in the upper plate of the lasting head 250 and extending at an angle to the slots 260 of the carrier plates, as shown in Fig. 2. When the cam 212 is operated to slide the block 224 forwardly, the rod 226 will move the links 262 forwardly, their roller pins being moved by the coöperating cam slots to urge the rollers against the sides of the slots 260 of the carrier plates and in a direction to effect what in prior machines has been a preliminary partial closing movement of the wiper plates, this movement alone not being sufficient to effect a full wiping movement of the plates inwardly, but merely serving to position the wipers at the edge of the heel seat and, through the actuating connections 256, 258 and rod 228, to swing a hand lever 264 to which the rear end of the rod 228 is connected toward the operator of the machine and within convenient reaching distance for subsequent operation of the wiper plates through this lever.

The present invention, as distinguished from earlier constructions, effects a complete wiping-over movement on the part of the wiper plates coincidently with and through the movement of the plunger 230 to clamp the heel band. Accordingly, I have provided the wiper actuating lever 264 with a spring-pressed latch 266 pivotally mounted upon a link carried by the lever and arranged normally to engage its hooked end over the projection on sleeve 234.

This latch, therefore, couples the wiper actuating rod 228 to the heel band clamping rod 230 through the connected lever 264, so that when the knee lever 172 and cam

212 are actuated, the shoe is jacked upwardly and backwardly; the heel band is clamped against the heel end of the shoe, and the heel wiper plates are given a full inward and forward wiping movement with the handle 264 positioned close to the operator for reverse backing-off movement and for successive wiping and backing-off movements until the edge of the upper is adequately formed over the heel seat of the shoe, after which the wipers are backed off sufficiently to permit the insertion of the lasting tacks.

To enable the wipers to be backed off and wiped in, independently of and without disturbing the heel clamping plunger 230, a curved latch releasing arm 270 (Figs. 1 and 2) is pivotally mounted on the wiper lever 264 with one end connected with the bifurcated rear end of latch 266 by a ball and socket joint and with its other end positioned adjacent to the end of lever 264 so that when the operator grasps the lever to operate the wipers, he likewise grasps and operates the arm 270 to release the latch.

Usually, during the lasting of the heel end of the shoe, the heel rest is lifted upwardly by a foot treadle 272 and a connected rod 274 to press the edges of the upper against the wiper plates so as to compact the over-worked upper material against the insole, the treadle being latched in upper compressing position and being subsequently released by actuation of an auxiliary foot treadle 276. The specific construction of these parts, however, has no relation to the present invention. As shown, they are intended to operate similarly to the last spindle operating treadle and latch releasing treadle of prior United States Patent No. 1,066,375, granted July 1, 1913.

After the edges of the upper have been wiped over and compacted, they are fastened to the insole, as previously described. As shown, the machine is equipped with a tack hopper 278 operated by a belt from a surface 91 of pulley 90 to feed tacks to a hand tacking tool as more fully described and illustrated by prior Patent No. 1,018,477.

In the use of the machine, the heel lasting carriage 3 is adjusted about its pivot 5, if necessary, to correspond with the swing of the shoe selected for lasting. This shoe with its last is then mounted on the last spindle 6, and the toe end of the shoe is centered between the toe wipers and the angular position of the shoe is adjusted, if necessary, to position the toe and heel wiping mechanisms symmetrically with relation to the longitudinal median lines of the forepart and heel part of the shoe and last. Then by means of the hand wheel 204 the heel post is moved rearwardly and upwardly to bring the heel end of the shoe against the heel clamping band 210 (as in Fig. 3) and in the plane of the heel wiper plates.

The workman then presses the knee lever 172 to throw in the one cycle clutch, and through the cam shaft, to effect the jacking operation previously described whereby the toe rest 4 is lifted to tip the shoe backwardly into the heel band and the heel band is closed and the heel wipers given a full wiping movement over the heel seat through cam 212 and the operating connections previously described, swinging the wiper operating lever 264 into position to be grasped by the workman. The shoe is now ready for the wiping operations at the toe and for additional wiping operations at the heel end. Before wiping, the hold-down is brought down against the insole and properly positioned relatively to its toe end.

In lasting some shoes the automatic or power effected closing of the heel wipers adequately shapes the upper materials over the heel seat end of the shoe and no further lasting of these materials is required prior to tacking them. Other shoes, however, comprise upper materials which are so resistant that a repetition of the movement of the wipers is required for the purpose of adequately shaping the heel seat. If such a shoe is being lasted, the workman will now swing the lever 264 backwardly and forwardly until the edge of the upper is wiped down and compacted on the heel seat of the shoe, the foot treadle 272 usually being depressed to elevate the last heel and compress the stock against the piper plates during this operation, and being subsequently released. The wiper plates are then partially backed off and lasting tacks are inserted to fasten the overworked upper to the insole.

The toe lasting head is in lowered position at the beginning of the lasting cycle. The wipers and toe clamping band, if a toe clamping band is employed, are adjusted to the lateral swing and vertical inclination of the toe, the holddown 135 is brought down into engagement with the toe end of the insole, the workman depresses one side of the double acting foot treadle 104 to cause the screw 11 to be turned in the direction to raise the toe lasting head 8, and presses the wiper lever 36 inwardly to hold the edges of the wipers against the sides of the toe of the shoe as the lasting head rises. This head will have a lateral component of movement as previously described conforming to the inclination of the side faces of the toe of the last so that the wipers will upwipe or conform the upper accurately to the side faces of the last. When the toe head reaches the point in its upward movement when the screw 114 engages the stop block offset 113, the clutch sleeve 94 will be

automatically shifted to neutral position, stopping further upward movement of the toe head and positioning the toe wipers in the plane of the insole. These wipers may be advanced and backed off as many times as desired to break down and wipe over the edges of the upper. Usually the treadle 104 will be reversely moved (the wipers having first been backed off to clear the shoe) to lower the toe head and then operated to raise the toe head for a second upwiping action, the stop block again arresting movement of the head with the wipers in the proper plane for wiping the edges of the upper over the insole. This operation may be repeated as many times as are necessary properly to upwipe and wipe over the upper.

I have found that some operators, after becoming experienced, find that the mechanism herein provided for arresting the upwiping movement at the proper point is unnecessary and that they can work advantageously without it. It will therefore be understood that the present invention is not limited to the inclusion of a stopping mechanism, except as definitely required by the claims.

The connections herein provided from the hold-down to the stop block 112 are arranged to arrest upward movement of the toe head with the wipers positioned to wipe the upper over the insole with the requisite degree of pressure to compact it. Usually, however, it is desirable to force the wipers downwardly upon the overwiped stock for compressing or ironing down the upper material to form a satisfactory surface upon which to attach the sole or welt of the shoe bottom. Mechanical arrangements have been provided by which the machine operator may augment the ironing down pressure which he was able to exert by the use of the double ended foot treadle shown in my prior patent. The present invention, however, relieves the operator from this fatiguing work by providing power driven mechanism for forcing the wipers downwardly upon the overwiped upper materials. This power movement is produced by depressing the heel or right hand end (Fig. 1) of the treadle 104, thus shifting the clutch sleeve 94 into position to drive bevel gear 82 and through screw 11 to cause the power to draw the toe lasting head downwardly. It will be noted that this wiper depressing or ironing down movement is transmitted through the friction clutch surface of sleeve 94 and gear 82. The force with which these friction surfaces are held together is regulated by the pressure which the operator applies to the heel end of the treadle. The friction surfaces are furthermore so designed that only a predetermined amount of ironing down pressure will be obtained before such surfaces will slip. This provision avoids danger of breaking the machine or injuring the shoe by excessive pressure.

When the edge of the upper at the toe end of the shoe has been properly wiped over and compacted, it is temporarily fastened to the insole, by wiring in the case of a welt shoe, and by tacking in the case of a McKay shoe. Then the knee lever 150 is operated to release the hold-down, and the heel rest treadle is released. The knee lever 172 is next operated to cause shaft 92 and cam shaft 196 to be rotated, lowering the toe rest, and releasing the latch of the heel lasting mechanism and the pressure against lever 222 so that the connected spring which has been under tension reacts to cause the heel band to open, the pressure of lever 222 against lever 220 also imparting an impulse to the heel lasting mechanism to move it bodily lengthwise of the carriage 3. Coincidently with the release of the latch of the heel lasting mechanism and through the same actuating mechanism, the latch on hand wheel 204 is released through suitable connections from said actuating mechanism so that the slide 198 and heel pin 6 with the last and shoe are held forwardly by the spring 206 while the heel lasting mechanism moves bodily away from the shoe and slide and lengthwise of the carriage 3. The connections from the actuating mechanism may conform (as shown in Figs. 1 and 3) to the connecting means illustrated and described in detail in Patent No. 1,188,616 of June 27, 1916, although other connections may be used if desired.

These unjacking actions all occur in an instant and the workman, without any attention to the machine, may remove the lasted shoe and reach for an unlasted shoe while the toe head is lowering. This lowering action is effected automatically when the knee lever is operated to free the last and shoe from the end lasting mechanism as just described. The treadling causes the shaft 92 to be rotated, causing eccentric 156 to move the yoke 176 rearwardly and through spring 186 to shift the clutch sleeve 94 to lower the toe head which is automatically stopped when the rod 188 raises pawl finger 180. The lowering and stopping of the toe head and the coincident release of the shoe and last from the heel end lasting means by a single actuation of a common power controlling means is particularly advantageous in that it obviates the necessity of backing off the toe wiping mechanism by the lever 36 and hand wheel 14 and the subsequent actuation of the treadle 104 to lower the toe head by power.

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

1. A machine of the class described hav-

ing, in combination, a last and shoe support, end embracing wipers constructed and arranged to embrace and wipe the upper at one end of a supported shoe over the lateral periphery of the last and over the edge of the shoe bottom, a power driven shaft, and operating connections from said shaft relatively to move the shoe support and wipers substantially perpendicularly to the plane of the shoe bottom to permit the wipers to be operated as described, said connections including a clutch member movable from a neutral position to a second position to cause said relative movement in one direction and movable to a third position for causing reverse relative movement.

2. A machine of the class described having, in combination, a last and shoe support, end embracing wipers constructed and arranged to embrace and wipe the upper at one end of a shoe over the edge of the shoe bottom, a power driven shaft, operating gearing relatively to move the shoe support and wipers substantially perpendicularly to the plane of the shoe bottom, an interposed clutch mechanism including a clutch member manually movable from a neutral position to a second position to cause said relative movement in one direction and to a third position to cause reverse relative movement, and means to operate the wipers during said relative movement.

3. A machine of the class described having, in combination, last and shoe supporting means, an end lasting mechanism supported for movement substantially perpendicularly to the plane of the shoe bottom and including end embracing wipers movable in a plane substantially parallel to the plane of the shoe bottom to embrace and wipe the upper at one end of the shoe over the bottom of the last, a power-driven shaft, and operating connections from said shaft to said end lasting mechanism to raise and to lower said mechanism and including manually operable controlling means to permit the operator to stop the movement of the lasting mechanism at any point.

4. A machine of the class described having, in combination, last and shoe supporting means, an end lasting mechanism supported for movement substantially perpendicularly to the plane of the shoe bottom and including end embracing wipers movable to embrace and wipe the upper at one end of the shoe over the bottom of the last, a power-driven shaft, gearing in connection with said shaft, operating connections from said gearing to said end lasting mechanism to raise and to lower said mechanism and including manually operable controlling means movable from a neutral position to different positions for raising and for lowering said end lasting mechanism, and means for operating said end wipers.

5. A machine of the class described having, in combination, a last and shoe support, end embracing wipers effective to embrace and wipe the upper at one end of a shoe over the bottom of the last and supported by a head mounted for movement substantially perpendicular to the plane of the shoe bottom, and a continuously rotating power shaft with connections to said head to raise and to lower the end wipers, said connections including an interposed clutch member with manually operable means for moving said member from neutral position to different positions for raising and for lowering said head and end wipers.

6. A machine of the class described having, in combination, a last and shoe support, end wipers effective to wipe the edges of the upper down over the bottom of the last and supported by a head mounted for movement substantially perpendicular to the plane of a supported shoe bottom, a continuously rotating power shaft with connections to said head to raise and to lower the end wipers, said connections including an interposed clutch member with treadle operated means for moving said member from neutral position to positions for raising and for lowering said head and end wipers, and hand operated means for holding the wipers against the sides of the upper as the head is raised to upwipe the upper over the side faces of the last and for advancing and retracting the wipers to wipe the upper down over the bottom of the last when the wipers are raised to the plane of the last bottom.

7. A machine of the class described having, in combination, a last and shoe support, end wipers effective to wipe the edges of the upper down over the bottom of the last at one end of the shoe and supported by a head mounted for movement substantially perpendicular to the plane of the bottom of a supported shoe, a continuously rotating power shaft, a jacking screw coöperating with said head, and gearing in connection with said shaft and said jacking screw to raise and lower said head and end wipers and including an interposed and manually controlled clutch element movable from a neutral position to positions for raising and for lowering said head and end wipers.

8. A machine of the class described having, in combination, a last and shoe support, end wipers effective to wipe the edges of the upper down over the bottom of the last at one end of the shoe and supported by a head mounted for vertical movement, a shaft, a continuously rotating pulley thereon, a counter shaft geared to and continuously rotated by said pulley, a jacking screw cooperating with said head, and gearing connecting said counter shaft with said jacking screw to raise and lower the head and end wipers and including an interposed manu-

ally controlled clutch element movable from a neutral position to positions for raising and lowering said head and wipers.

9. A machine of the class described having, in combination, a last and shoe support, end wipers effective to wipe the upper at one end of the shoe down over the bottom of the last and supported by a head mounted for vertical movement, a continuously rotating power shaft with connections to said head to raise and to lower the head, said connections including an interposed clutch member movable to different positions for causing said head to be raised and lowered, and a double acting treadle pivoted intermediate its ends with connections to said clutch member to move said member to positions to effect raising and lowering movements of said head and end wipers.

10. A machine of the class described having, in combination, a last and shoe support, end wipers effective to wipe down the edges of the upper at one end of the shoe over the bottom of the last and supported by a head mounted for vertical movement, a continuously rotating power shaft, a jacking screw coöperating with said head, gearing connecting said shaft with said jacking screw to raise and lower the head and end wipers and including an interposed clutch element movable from a neutral position to positions to connect said gearing with the rotating shaft to raise and to lower the head, and a double acting treadle with connections to said clutch element to move said element from neutral to active positions.

11. A machine of the class described having, in combination, a last and shoe support, an end lasting mechanism including end wipers effective by frictional engagement with the upper to wipe the upper at one end of a supported shoe over the lateral periphery of the last and over the bottom of the shoe, means for effecting relative movement of said support and lasting mechanism in a direction substantially perpendicular to the plane of the shoe bottom, and means automatically operative to arrest said relative movement prior to overwiping movement of the wipers and with said wipers in determinate relation to the plane of the bottom of the supported shoe.

12. A machine of the class described having, in combination, a last and shoe support, an end lasting mechanism including end wipers effective by frictional engagment with the upper to wipe the upper at one end of a supported shoe over the lateral periphery of the last and over the bottom of the shoe, power-operated means for effecting rellative movement of said support and lasting mechanism in a direction substantially perpendicular to the plane of the bottom of the supported shoe, and means automatically operative to arrest said power-effected relative movement prior to overwiping movement of the wipers and with the overwiping faces of the wipers substantially in the plane of the bottom of said shoe.

13. A machine of the class described having, in combination, a last and shoe support, an end lasting mechanism including end wipers effective to wipe the upper at one end of a supported shoe up and over the bottom of the shoe, means for effecting relative movement of said support and lasting mechanism in a direction substantially perpendicular to the plane of the bottom of a supported shoe, and means automatically operative to arrest said relative movement with the wipers positioned in a variable plane relatively to a shoe bottom predetermined by the elevation of the bottom of the particular shoe operated upon.

14. A machine of the class described having, in combination, a last and shoe support, an end lasting mechanism including end wipers effective by frictional engagement with the upper to wipe the upper at one end of a supported shoe up and over the bottom of the shoe, power operated means for moving said end lasting mechanism in a direction substantially perpendicular to the plane of the bottom of a supported shoe, and means controlled by the shoe automatically to arrest said movement of the lasting mechanism with the wipers positioned in a plane approximately coincident with the plane of the bottom of the shoe irrespective of the elevation at which the shoe is supported.

15. A machine of the class described having, in combination, a last and shoe support, an end lasting mechanism including end wipers effective to wipe the upper at one end of a supported shoe up and over the bottom of the shoe, power operated means for moving said end lasting mechanism in a direction substantially perpendicular to the plane of the bottom of a supported shoe, and means automatically to arrest said movement of the lasting mechanism with the wipers positioned in a plane approximately coincident with the plane of the bottom of the shoe irrespective of the elevation of the shoe, said arresting means being arranged for preliminary manually effected movement to a position predetermined by the elevation of the bottom of the particular shoe operated upon.

16. A machine of the class described having, in combination, a last and shoe support, end lasting mechanism including end wipers effective to wipe the upper at one end of the shoe over the bottom of the last, power means to move said end lasting mechanism in a direction substantially perpendicular to the plane of the bottom of the last, and means automatically operative to arrest the application of power producing said movement of the end lasting mechanism

with the end wipers determinately positioned relatively to the plane of the last bottom.

17. A machine of the class described having, in combination, a last and shoe support, end lasting mechanism including end wipers effective to wipe the upper at one end of the shoe over the bottom of the last, power means to move said end lasting mechanism and wipers in a direction substantially perpendicular to the plane of the last bottom, and mechanism constructed and arranged to coöperate with the supported shoe and said power means automatically to arrest the application of power producing said movement of the end lasting mechanism with its end wipers determinately positioned relatively to the plane of the bottom of the last.

18. A machine of the class described having, in combination, a last and shoe support, end lasting mechanism including end wipers effective to wipe the upper at one end of the shoe over the bottom of the last, power operated means to move the end lasting mechanism in a direction substantially perpendicular to the plane of the last bottom, manually operable controlling means, and mechanism coöperating with said manual controlling means automatically to operate said controlling means to arrest said movement of the lasting mechanism with the end wipers determinately positioned for wiping the edges of the upper over the bottom of the last.

19. A machine of the class described having, in combination, a last and shoe support, end lasting mechanism including end wipers effective to wipe the upper at one end of the shoe over the bottom of the last, power operated means to move said end lasting mechanism in a direction substantially perpendicular to the plane of the last bottom, a controlling member movable in directions to effect and to arrest said movement of said end lasting mechanism, and a stop member positioned in determinate relation to the plane of the bottom of the supported last and effective automatically to move said controlling member in a direction to arrest said movement of the end lasting mechanism with the end wipers determinately positioned relatively to the plane of the bottom of the supported last.

20. A machine of the class described having, in combination, a last and shoe support, end lasting mechanism including end wipers effective to wipe the upper at one end of the shoe over the bottom of the last, power operated means effective to move said end lasting mechanism in a direction substantially perpendicular to the plane of the last bottom, a controlling member movable in directions to move and to arrest said movement of said end lasting mechanism, a contact member arranged for manually effected movement to engage over the bottom of the supported last, and a stop member adjustably positioned by such movement and arranged automatically to move said controlling member to arrest said movement of the end lasting mechanism with the end wipers determinately positioned relatively to the plane of the bottom of the supported last.

21. A machine of the class described having, in combination, a last and shoe support, a vertically movable end lasting mechanism including end wipers effective to wipe the upper at one end of the shoe over the bottom of the last, power operated means effective to raise said end lasting mechanism, a controlling member movable in directions to raise and to arrest upward movement of said end lasting mechanism, manually operable means to move said controlling member in the direction to raise said end lasting mechanism, a contact member arranged for manually effected movement to engage over the bottom of the supported last, and a stop member adjustably positioned by such movement and arranged automatically to move said controlling member to arrest upward movement of the end lasting mechanism with the end wipers determinately positioned relatively to the plane of the bottom of the supported last.

22. A machine of the class described having, in combination, a last and shoe support, a vertically movable end lasting mechanism including end wipers effective to wipe the edges of the upper at one end of the shoe over the bottom of the insole, power operated means to raise the end lasting mechanism, a controlling member movable in directions to raise and to arrest upward movement of said end lasting mechanism, a hold-down member movable to contact with the bottom of the insole, and a coöperating stop member positioned by such movement in determinate relation to the plane of the insole bottom and arranged automatically to move said controlling member in a direction to arrest upward movement of the end lasting mechanism with its end wipers determinately positioned relatively to the plane of the bottom of the insole.

23. A machine of the class described having, in combination, a last and shoe support, a vertically movable end lasting mechanism including end wipers effective to wipe the edge of the upper at one end of the shoe over the bottom of the insole, power operated means to raise the end lasting mechanism, a controlling member movable in directions to raise and to arrest upward movement of the end lasting mechanism, and mechanism cooperating with the insoles of supported shoes and with said controlling member and variably conditioned by supported shoes with

the insoles at varying elevations automatically to arrest upward movement of the end lasting mechanism with the end wipers determinately positioned relatively to the plane of the bottom of the insole of the supported shoe.

24. A machine of the class described having, in combination, a last and shoe support, a vertically movable end lasting mechanism including end wipers to wipe the edge of the upper at one end of the shoe over the bottom of the insole, power operated means to raise the end lasting mechanism, a controlling member movable in directions to raise and to arrest upward movement of the end lasting mechanism, and mechanism coöperating with supported shoes and said controlling member and conditioned by the supported shoe automatically to move the controlling member in the direction and at the time to arrest upward movement of the end lasting mechanism with the end wipers determinately positioned relatively to the plane of the bottom of the insole of the supported shoe.

25. A machine of the class described having, in combination, a last and shoe support, a vertically movable end lasting mechanism including end wipers effective to wipe the upper at one end of the shoe over the bottom of the insole, power operated means effective to raise the end lasting mechanism, a controlling member movable in directions to raise and to arrest upward movement of the end lasting mechanism, and a stop member coöperating with said controlling member and positioned to be actuated through the rising end lasting mechanism to move the controlling member in the direction to arrest upward movement of the end lasting mechanism with its wipers determinately positioned relatively to the plane of the bottom of the insole of the supported shoe.

26. A machine of the class described having, in combination, a last and shoe support, a vertically movable end lasting mechanism including end wipers effective to wipe the upper at one end of the shoe over the bottom of the insole, power operated means effective to raise the end lasting mechanism, a controlling member movable in directions to raise and to arrest upward movement of the end lasting mechanism, and a stop member coöperating with said controlling member and adjustable to positions for actuation by the rising end lasting mechanism to move the controlling member in the direction to arrest upward movement of the end lasting mechanism with the wipers in substantially the same position relatively to the plane of the bottom of the insole of supported shoes of varying elevation.

27. A machine of the class described having, in combination, a last and shoe support, a vertically movable end lasting mechanism including end wipers effective to wipe the edges of the upper at one end of the shoe over the bottom of the insole, power operated means to raise the end lasting mechanism, a controlling member movable in directions to raise and to arrest upward movement of the end lasting mechanism, an abutment carried by and moving upwardly with the end lasting mechanism, and a stop member vertically alined with said abutment and operative by the abutment on the rising end lasting mechanism automatically to arrest further upward movement of said mechanism with its end wipers positioned in determinate relation to the plane of the bottom of the insole.

28. A machine of the class described having, in combination, a last and shoe support, a vertically movable end lasting mechanism including end wipers effective to wipe the edges of the upper at one end of the shoe over the bottom of the insole, power operated means to raise the end lasting mechanism, a controlling member movable in directions to raise and to arrest upward movement of the end lasting mechanism, an abutment carried by and moving upwardly with the end lasting mechanism, an actuating rod in operative connection with said controlling member, and a stop member vertically alined with said abutment constructed and arranged to be adjustably positioned, said stop member being connected to said rod and operable by the abutment on the rising end lasting mechanism automatically to move said controlling member to arrest further upward movement of said end lasting mechanism with its end wipers positioned in determinate relation to the plane of the bottom of the insole.

29. A machine of the class described having, in combination, a last and shoe support, a vertically movable end lasting mechanism including end wipers effective to wipe the edges of the upper at one end of the shoe over the bottom of the insole, power operated means to raise the end lasting mechanism, a controlling member movable in directions to raise and to arrest upward movement of the end lasting mechanism, an abutment carried by and moving upwardly with the end lasting mechanism, an actuating rod in operative connection with said controlling member, a stop member vertically alined with the abutment and adjustably mounted on said rod, and a hold-down member movable to contact with the bottom of the insole of the supported shoe with connections to said stop member to adjust said member on said rod for engagement by the abutment on the rising end lasting mechanism automatically to move the controlling member to arrest upward movement of the end lasting

mechanism when its wipers reach a plane substantially coincident with the plane of the bottom of the insole.

30. A machine of the class described having, in combination, a last and shoe support, a vertically movable end lasting mechanism including end wipers effective to wipe the edge of the upper at one end of the shoe over the bottom of the insole, means to raise the end lasting mechanism, a controlling member movable to disconnect said mechanism and said raising means, an abutment carried by and moving with said end lasting mechanism, a stop member supported in vertical alinement with said abutment, means to position said member in determinate relation to the plane of the bottom of the insole of the supported shoe, and connections between said stop member and said controlling member automatically operative by contact of the abutment with the stop member to move the controlling member in a direction to arrest upward movement of the end lasting mechanism with its wipers positioned in a plane in determinate relation to the plane of the insole bottom.

31. A lasting machine having lasting mechanism comprising toe embracing wipers and shoe holding means organized for relative movement to wipe the upper up the sides of the last and then to wipe the upper inwardly over the bottom of the last, combined with power mechanism for effecting the upwiping movement and a foot lever control capable of use to produce and to govern the extent of such movement.

32. A lasting machine having lasting mechanism comprising toe embracing wipers and shoe holding means organized for relative movement to enable the wipers to wipe the upper up the sides of the last and then to wipe the upper inwardly over the bottom of the last, combined with power mechanism for effecting said relative movement and means adapted to be positioned to terminate said relative movement at a variable point predetermined by the elevation of the bottom of the particular shoe operated upon.

33. A lasting machine having lasting mechanism comprising toe-embracing wipers and shoe holding means organized for relative movement to wipe the upper up the sides of the last through frictional engagement of the wipers with the upper and then to wipe the upper inwardly over the bottom of the last, combined with a power driven shaft and operating gearing, including a controlling clutch, for effecting the upwiping movement and treadle controlled means arranged for use to actuate the clutch to produce and to govern the extent of such upwiping movement.

34. A lasting machine having lasting mechanism comprising toe embracing wipers and shoe holding means organized for relative movement to enable the wipers to wipe the upper up the sides of the last and then to wipe the upper inwardly over the bottom of the last, combined with a power driven shaft and operating connections for effecting said relative movement, means for manually closing and opening the wipers around the shoe toe independently of the power mechanism, and manually operated clutch-means for the power mechanism, all organized for use to enable the wipers to be closed by hand and raised by power in embracing relation to the toe and then to permit the wipers to be opened by hand and lowered by power and then again closed by hand and raised by power for repeating the upwiping movement prior to an overwiping movement.

35. A lasting machine having, in combination, means for supporting a shoe, end embracing wipers, means for operating the wipers to work the upper materials into lasted position over the bottom of the shoe end, clutch controlled power driving mechanism for relatively moving the shoe supporting means and the wipers, and manually controlled means for reversing said power driving mechanism through said clutch at the will of the operator to move the wipers and the shoe supporting means relatively in the direction for applying ironing down pressure to the overwiped upper materials.

36. A toe lasting mechanism comprising toe embracing wipers and mounted for movement to cause the wipers to wipe the upper materials up the sides of the shoe and then permit the wipers to wipe the upper materials over the bottom of the toe, power driving mechanism, and connections through which the operator can cause said power driving mechanism to apply ironing down pressure to the overwiped upper materials and can regulate said pressure.

37. A lasting machine having, in combination, shoe supporting means, end lasting wipers, means to operate the wipers to lay the upper materials in lasted position over the bottom of a shoe end, power driving mechanism, a manually operated controller, and connections between said controller, the power mechanism, and the wipers by which to cause said mechanism to apply ironing down pressure the extent of which is automatically governed to prevent breakage.

38. A lasting machine having, in combination, last supporting means, end embracing wipers, means for moving the wipers to shape an upper about the side faces of the end portion of the last, means for relatively moving the wipers and the last laterally of the last in one direction when a shoe for one foot is being lasted, and means for automatically shifting the direction of said relative lateral movement when a shoe for the other foot is being lasted.

39. A lasting machine having, in combination, last and shoe supporting means, end embracing wipers, means for moving the wipers in directions transverse to the plane of the shoe bottom and laterally of the last, a swinging heel carriage, and means controlled by the right or left swing of the heel carriage for determining whether the lateral movement shall be toward the right or toward the left.

40. A machine of the class described having, in combination, a last and shoe support and toe and heel lasting mechanisms constructed and arranged for relative movements in succession laterally of a supported shoe, and means controlled by relative lateral movement of one of said lasting mechanisms and the shoe support for controlling the subsequent relative lateral movement of the other of said lasting mechanisms and said support.

41. A machine of the class described having, in combination, a last and shoe support, toe and heel lasting mechanisms mounted for movement laterally of a supported shoe, means arranged to be operatively positioned by the lateral movement of one of said lasting mechanisms for controlling the lateral movement of the other of said lasting mechanisms, and means for subsequently moving said other mechanism subject to such control.

42. A machine of the class described having, in combination, a last and shoe support, toe and heel lasting mechanisms mounted for movements at different respective times laterally of a supported shoe, and means controlled by lateral movement of one of said lasting mechanisms for controlling the direction of lateral movement of the other of said lasting mechanisms.

43. A machine of the class described having, in combination, a last and shoe support, toe and heel lasting mechanisms mounted for movements at different respective times laterally of a supported shoe, and means controlled by the lateral movement of one of said lasting mechanisms for controlling the extent of the subsequent lateral movement of the other of said lasting mechanisms.

44. A machine of the class described having, in combination, a last and shoe support, toe and heel lasting mechanisms mounted for movements at different respective times laterally of a supported shoe, and means arranged to be positioned by the lateral movement of one of said lasting mechanisms for controlling the direction and extent of lateral movement of the other of said lasting mechanisms.

45. A machine of the class described having, in combination, a last and shoe support, toe lasting mechanism mounted for movements in directions transverse to the plane of the bottom of a supported shoe and laterally of said shoe, heel lasting mechanism mounted for movement independently laterally of a supported shoe, and means controlled by the lateral movement of said heel lasting mechanism for controlling the lateral movement of the toe lasting mechanism.

46. A machine of the class described having, in combination, a last and shoe support and toe and heel lasting mechanisms constructed and arranged for relative movements in succession laterally of a supported shoe, and means controlled by the relative lateral movement of the heel lasting mechanism and the shoe support for controlling the subsequent relative lateral movement of the toe lasting mechanism and said support.

47. A machine of the class described having, in combination, a last and shoe support and toe wipers mounted for relative movements in directions transverse to the plane of the bottom of a supported shoe and laterally of the shoe, and means controlled by the swing of the last for effecting varying amounts of relative lateral movement dependent upon a given amount of said relative transverse movement.

48. A lasting machine having, in combination, a last and shoe support, toe wipers mounted for movements relatively to a supported shoe in directions transverse to the plane of the bottom of said shoe and laterally of the shoe, and means controlled by the swing of the last for effecting varying amounts of lateral movement of said wipers dependent upon a given amount of said transverse movement.

49. A lasting machine having, in combination, a last and shoe support, end lasting mechanism, means for moving said mechanism to shape a shoe upper about the side faces of an end portion of the last, means operative simultaneously for relatively moving said lasting mechanism and the last laterally of the last in one direction when a shoe for one foot is being lasted, lasting mechanism for the other end of the shoe, and means arranged to be operated by adjustment of said last named lasting mechanism for operating upon the other shoe of the pair to change the direction of said relative lateral movement when said other shoe is being lasted.

50. A lasting machine having, in combination, last and shoe supporting means, toe embracing wipers arranged for movement transversely of the plane of the bottom of a supported shoe and mounted for movement also laterally of the shoe, means for moving the wipers transversely of said plane, means for guiding the wipers in a path inclined to said plane, and means for varying the inclination of said path in accordance with the swing of the last.

51. A machine of the class described having, in combination, a last and shoe support, end wipers operative to engage the sides of the upper at one end of a shoe and to wipe the edges of the upper over the bottom of the last, mechanism to move the end wipers upwardly relatively to the shoe and last with a lateral component of movement automatically reversed in direction for right and left shoes to upwipe the upper over the sides of the last, and means to operate the wipers to wipe the edges of the upper over the bottom of the last.

52. A machine of the class described having, in combination, a last and shoe support, a vertically movable end lasting mechanism including end wipers operative to engage and upwipe the sides of the upper over the last as the end lasting mechanism is raised, means for raising the end lasting mechanism, and mechanism automatically to move the end wipers laterally relatively to the shoe and last in the direction of inclination of the side faces of the last during the upward movement of the end lasting mechanism, with means automatically to reverse the direction of lateral movement for right and left shoes and lasts.

53. A machine of the class described having, in combination, a last and shoe support, a heel end wiping mechanism, a toe end wiping mechanism, one of said end mechanisms being mounted for angular adjustment relatively to the other to conform to the reverse swing of right and left lasts and shoes, the other of said end wiping mechanisms being mounted for upward movement and having its wipers arranged to engage the sides of the shoe upper during said movement to upwipe the shoe upper over the sides of the last and subsequently to wipe the edges of the upper over the bottom of the last, and means to move the said other end wiping mechanism upwardly with a lateral component of movement, said means coöperating with the angularly adjustable end wiper mechanism to reverse the direction of said lateral movement for right and left shoes and lasts when said end wiper mechanism is correspondingly adjusted angularly for right and left shoes and lasts.

54. A machine of the class described having, in combination, a last and shoe support, a heel end lasting mechanism including heel seat wipers, a toe end lasting mechanism including toe wipers, said heel lasting mechanism being mounted for lateral movement relatively to the toe lasting mechanism to adjust the lasting mechanism to conform to the reverse swing of right and left shoes and lasts and said toe lasting mechanism being mounted for upward and downward movements and having its toe wipers arranged to be closed to engage the sides of the shoe upper during upward movement to upwipe the shoe upper over the sides of the last, and mechanism to effect upward movement of the toe lasting mechanism with a lateral component of movement to upwipe the upper over the sides of the last, said mechanism including means coöperating with the heel lasting mechanism to reverse the direction of lateral movement of the toe lasting mechanism for right and left shoes and lasts when the heel lasting mechanism is adjusted laterally for right and left shoes and lasts.

55. A machine of the class described having, in combination, a last and shoe support, a lasting mechanism for one end of the shoe including a vertically movable support and end wipers mounted on said support for lateral movement and arranged to be closed to engage the sides of the shoe upper during upward movement of the support to upwipe the shoe upper over the sides of the last, a second lasting mechanism for the opposite end of the shoe mounted for adjustment relatively to the first mentioned end lasting mechanism, mechanism to raise the first end lasting mechanism, and means coöperating with the end wipers of said first lasting mechanism to move the end wipers laterally during rising movement of said support and including connections to said second lasting mechanism effective to adjust said means when the second lasting mechanism is adjusted.

56. A machine of the class described having, in combination, a last and shoe support, a toe end lasting mechanism including a vertically movable support and toe wipers mounted on said support for relative lateral movement and arranged to be closed to engage the sides of the shoe upper during vertically upward movement of the support to upwipe the upper over the sides of the last, a heel end lasting mechanism mounted for angular adjustment relatively to the toe lasting mechanism to conform to the reverse swing of right and left shoes and lasts, mechanism to raise the toe lasting mechanism, and means coöperating with the toe wipers during upward movement of the support to move the toe wipers laterally relatively to the support and toe end of the shoe and including connections to the heel lasting mechanism to adjust said means for reversing the direction of lateral movement of the wipers for right and left shoes and lasts coincidently with the angular adjustment of the heel lasting mechanism to conform to the swing of right and left shoes and lasts.

57. A machine of the class described having, in combination, a last and shoe support, a lasting mechanism for one end of the shoe supported on a head mounted for

vertical movement and including end wipers carried by a base mounted on said head for lateral movement, adjustable guiding means coöperating with said base and effective to cause lateral movement of the base and wipers during upward movement of said head, a lasting mechanism for the other end of the shoe mounted for lateral adjustment relatively to the first lasting mechanism to conform to the swing of right and left shoes and lasts, and connections between said guiding means and said second lasting mechanism to adjust the guiding means to cause lateral movement of the wiper base in opposite directions when the second lasting mechanism is laterally adjusted to conform to the swing of right and left shoes and lasts.

58. A machine of the class described having, in combination, a last and shoe support, a lasting mechanism for one end of the shoe supported on a head mounted for vertical movement and including end wipers carried by a base mounted on said head for lateral sliding movement, a second lasting mechanism for the opposite end of the shoe mounted for angular adjusting movement to conform to the reverse swing of right and left shoes and lasts, a rigidly supported angularly adjustable guiding member, a coöperating guiding member carried by said wiper base to slide said wiper base laterally during rising movement of said head, and connections to said first guiding member from said second end lasting mechanism angularly to adjust said guiding member upon angular adjustment of said lasting mechanism.

59. A machine of the class described having, in combination, a last and shoe support, a toe end lasting mechanism supported on a head mounted for vertical movement and including toe wipers carried on a base mounted on and guided by said head for lateral sliding movement, a heel end lasting mechanism mounted for angular adjustment relatively to the toe lasting mechanism to conform to the reverse swing of right and left shoes and lasts, a slotted guide member pivotally carried by and moving upwardly with said wiper base, a guiding bar having parallel guiding faces engaging the slotted guide member mounted for axial adjusting movement and adapted to act against said guide member to slide said base laterally, and connections from said bar to said heel lasting mechanism effective upon angular adjustment of said mechanism to turn said bar and vary the angular inclination of its guiding faces.

60. A lasting machine having, in combination, last and shoe supporting means, toe embracing wipers mounted for movements in directions transverse to the plane of the bottom of a supported shoe and laterally of said shoe, and means controlled by the shoe for effecting varying amounts of lateral movement for a given amount of transverse movement.

61. A lasting machine having, in combination, last and shoe supporting means, toe embracing wipers arranged for movement substantially perpendicularly to the plane of the bottom of a supported shoe and mounted for bodily movement laterally of the shoe, means for moving the wipers perpendicularly, means for guiding the wipers in a path inclined to the perpendicular, and means for varying the inclination of said path in accordance with the swing of the last.

62. A lasting machine having, in combination, last and shoe supporting means, end embracing wipers, means for moving the wipers to shape an upper about the side faces of the end portion of the last, means for moving the wipers bodily laterally of the shoe while they are being moved to shape the upper to the side faces of the last, and means adjustable in accordance with the swing of the last for varying the amount of lateral movement given to the wipers.

63. A lasting machine having, in combination, last and shoe supporting means, end embracing wipers, means for raising the wipers to shape the upper about the side faces of the end portion of the last, means for relatively moving the wipers and last laterally of the last, a swinging heel carriage, and means controlled by the swinging of the carriage for determining the proportion of lateral movement of the wipers for a given upward movement.

64. A lasting machine having, in combination, last and shoe supporting means, end embracing wipers, means for raising the wipers to shape the upper about the side faces of the end portion of the last, means acting conjointly with the raising means for relatively moving the wipers and last laterally of the last, means adapted to be adjusted for right and left shoes in accordance with the swing of the last, means controlled by said adjustment for determining the amount of said relative lateral movement which will occur during the upward movement of the wipers, and means for varying that amount for a last of given swing.

65. A toe and heel lasting machine having, in combination, means for supporting and means for holding a shoe for the toe and heel lasting operations, mechanism for operating said supporting means to move the shoe relatively to the holding means and to operate the holding means to engage the shoe, heel lasting wipers, and connections from said mechanism to operate said wipers to shape the upper materials over the heel seat end

of the shoe automatically when the shoe supporting and holding means are so operated.

66. A toe and heel lasting machine having, in combination, means for supporting and means for holding a shoe for the toe and heel lasting operations, mechanism for operating said supporting means to move the shoe relatively to the holding means and to operate the holding means to engage the shoe, heel lasting wipers, and connections from said mechanism to operate said wipers to shape the upper materials over the heel seat end of the shoe automatically when the shoe supporting and holding means are so operated, said machine further comprising means adapted to be used optionally by the workman for additionally operating the heel seat wipers to shape the upper materials.

67. A machine of the class described having, in combination, a shoe and last support, an end lasting mechanism including shoe end clamping means and end wipers with an operating hand lever for the wipers, and mechanism operative to move a supported shoe relatively to the clamping means and to actuate the clamping means and coincidently to advance the wipers over the end of the last and to position the hand lever conveniently to the operator for further and manual actuation of the wipers.

68. A machine of the class described having, in combination, a shoe and last support, an end lasting mechanism including shoe end clamping means and end wipers with an operating hand lever for the wipers, and manually controlled power operated mechanism to move a supported shoe relatively to the clamping means and to actuate the clamping means and coincidently to advance the wipers over the end of the last and to position the hand lever conveniently to the operator for further and manual actuation of the wipers.

69. A machine of the class described having, in combination, a shoe and last support, an end lasting mechanism including shoe end clamping means and end wipers with an operating hand lever for the wipers, a power driven shaft, mechanism operable to actuate the clamping means and coincidently to advance the wipers over the end of the last and to position the hand lever conveniently to the operator for further and manual actuation of the wipers, with connections from said power shaft to said mechanism including a manually operable clutch to effect end clamping and wiper actuating movement of said mechanism.

70. A machine of the class described having, in combination, a shoe and last support, an end lasting mechanism including clamping means to embrace the shoe end and end wipers having an operating hand lever and wiper actuating connections, power operated mechanism to operate said clamping means to embrace and clamp the shoe end including a sliding member to actuate the clamping means, and means for latching the wiper actuating hand lever and said sliding member to effect a full actuating movement of the wipers and hand lever coincidently with power operation of the clamping means.

71. A machine of the class described having, in combination, a shoe and last support, an end lasting mechanism including clamping means to embrace the shoe end and end wipers having an operating hand lever and wiper actuating connections, power operated mechanism effective to operate said clamping means to embrace and clamp the shoe end including a sliding member to actuate the clamping means, and means for latching the wiper actuating hand lever and said sliding member to effect an actuating movement of the wipers and hand lever coincidently with power operation of the clamping means and to position said hand lever conveniently to the operator for further and manual operation of the wipers, with means on said hand lever for releasing said latching connection.

72. A machine of the class described having, in combination, a shoe and last support, an end lasting mechanism including a clamping band to embrace the shoe end and end wipers having an operating hand lever and wiper actuating connections, manually controlled power operated mechanism effective to actuate the clamping band to embrace the shoe end includng a sliding member to actuate the band, and a latch connecting the hand lever to said sliding member operative to effect actuating movement of the hand lever and wipers coincidently with power operated band clamping movement of said sliding member, with latch releasing means mounted on said hand lever in position to be operated by the hand in grasping the lever manually to actuate the wipers.

73. A machine of the class described having, in combination, last and shoe supporting means, an end lasting mechanism comprising shoe end clamping means and end lasting wipers arranged to be moved to and latched in operative relation to one end of the shoe, lasting mechanism for the other end of the shoe, and power operated means constructed and arranged to release said first named end lasting mechanism from the shoe after the lasting operation and in time relation to such release to cause the lasting mechanism for the other end of the shoe to return to starting position.

74. A machine of the class described having, in combination, last and shoe supporting means, an end lasting mechanism comprising shoe end clamping means and end lasting wipers movable into and out of op-

erative relation to one end of the shoe, means for retaining said end lasting mechanism in operative position, lasting mechanism for the other end of the shoe, a rotating power driven element, and clutch means for rendering said power driven element effective after the lasting operation to operate said retaining means and release said first named end lasting mechanism from the shoe and also to cause the other end lasting mechanism to return to starting position.

75. A machine of the class described having, in combination, a last and shoe support, an end lasting mechanism comprising shoe end clamping means and end lasting wipers movable into and out of operative relation to one end of the shoe, a latch for retaining said end lasting mechanism in operative position, means comprising a power driven cam shaft for operating said latch after the lasting operation to release said end lasting mechanism, lasting mechanism for the other end of the shoe, and power operated means for causing said last named lasting mechanism to return to starting position in time relation to the release of said first named lasting mechanism.

76. A machine of the class described having, in combination, a last and shoe support, an end lasting mechanism upwardly movable to lasting position, manually controlled power operated means to lower said end lasting mechanism, and mechanism coöperating with said power operated means arranged automatically to arrest power-operated downward movement of said end lasting mechanism.

77. A machine of the class described having, in combination, a last and shoe support, a vertically movable end lasting mechanism, power operated means to move said lasting mechanism upwardly to lasting position and to lower said lasting mechanism from lasting position, including manually controlled means to cause upward and downward movement of said lasting mechanism, and mechanism coöperating with said power-operated means arranged automatically to arrest power-operated downward movement of said lasting mechanism at a determinate point in said movement.

78. A machine of the class described having, in combination, a last and shoe support, a vertically movable end lasting mechanism, power operated means to move said lasting mechanism upwardly to lasting position and to lower it from lasting position including a controlling member movable from neutral position to positions for raising and lowering said lasting mechanism, and means constructed and arranged automatically to cause said controlling member to be moved from lowering to neutral position at a determinate point in the lowering movement of said end lasting mechanism.

79. A machine of the class described having, in combination, a last and shoe support, a vertically movable end lasting mechanism, power operated means to move said lasting mechanism upwardly to lasting position and to lower it from lasting position including a controlling member movable from neutral position to positions for raising and lowering said lasting mechanism, and mechanism to move said controlling member to the position to lower said end lasting mechanism and subsequently and automatically to cause said controlling member to be moved to neutral position to arrest downward movement of said lasting mechanism.

80. A machine of the class described having, in combination, a last and shoe support, a vertically movable end lasting mechanism with means to hold said support with its shoe and last in position to coöperate with said end lasting mechanism, power operated means to move said lasting mechanism upwardly to lasting position and to lower it from lasting position including a controlling member movable from neutral position to positions for raising and lowering said lasting mechanism, manually controlled power-operated mechanism to release and move said last and shoe support from said coöperative position and co-incidently to move said controlling member to the position to lower said end lasting mechanism, with means automatically to cause said controlling member to be moved to neutral position during lowering movement of said end lasting mechanism.

81. A machine of the class described having, in combination, a last and shoe support, a vertically movable end lasting mechanism, with means to latch said support with its shoe and last positioned to coöperate with the vertically movable end lasting mechanism, power operated means to move said end lasting mechanism upwardly to lasting position and to lower it from lasting position including a controlling member manually movable from neutral position to positions for raising and lowering said end lasting mechanism, power operated mechanism to release and move said support from said coöperative position and coincidentally to move said controlling member to the position to lower said lasting mechanism with a single manual control for said mechanism, and means coöperating with said power-operated mechanism during the descent of said lasting mechanism automatically to cause said controlling member to be moved to neutral position.

82. A machine of the class described having, in combination, a last and shoe support, end lasting means, power operated mechanism for relatively moving said lasting means and shoe support bodily substantially perpendicularly to the plane of the bottom

of a supported shoe in directions reversed in successive relative movements, and means operated by the relative movements of the lasting means and the shoe support for controlling said mechanism automatically to arrest said relative bodily movements at predetermined points.

83. A machine of the class described having, in combination, a last and shoe support, end lasting wipers, power operated mechanism for moving said wipers bodily in reverse directions substantially perpendicularly to the plane of the bottom of a supported shoe, and means coöperating with said mechanism automatically to arrest said bodily movement of the wipers at predetermined points in said reverse directions of movement.

84. A machine of the class described having, in combination, a support to hold a shoe for the toe lasting operation, toe lasting wipers, power operated mechanism for relatively and bodily moving said support and wipers substantially perpendicularly to the plane of the bottom of the toe portion of a supported shoe in directions reversed in successive relative movements, and means coöperating with said mechanism to arrest said relative bodily movements with the wipers positioned, respectively, in a plane approximately coincident with the plane of the toe portion of the shoe bottom and in a plane removed from the plane of said portion of the shoe bottom.

85. A machine of the class described having, in combination, a shoe support, toe lasting wipers normally positioned in a plane removed from the plane of the bottom of the toe of a supported shoe, means to close and open the wipers, power operated mechanism for moving said wipers substantially perpendicularly to said plane of the toe bottom to permit the wipers to close against the sides of the shoe toe to wipe the toe materials up the sides of and over the bottom of the shoe and for reversing said direction of movement to return the wipers in the direction of their initial position, and means coöperating with said mechanism automatically to arrest movement of the wipers in planes substantially alined with the toe bottom, and removed from the plane of said toe bottom, respectively.

86. A machine of the class described having, in combination, a last and shoe support, end lasting means, power operated mechanism for relatively moving said lasting means and shoe support bodily substantially perpendicularly to the plane of the bottom of a supported shoe in directions reversed in successive relative movements, and means coöperating with said mechanism automatically to stop said relative bodily movements at predetermined points, said power operated mechanism including a manually controlled means for reversing the direction of relative movement when said movement is automatically stopped.

87. A toe and heel lasting machine having, in combination, a toe post and a heel support to support a shoe for the toe and heel lasting operations, an abutment for the heel end of the shoe, power operated mechanism for raising the toe post to cramp the heel end of the shoe against said abutment, heel lasting wipers, and connections from said mechanism to operate said wipers to shape the upper materials over the heel seat end of the shoe automatically when the toe post is raised.

88. A lasting machine having, in combination, a toe post and a heel support to support a last and shoe, an abutment for the heel end of the shoe, power operated mechanism for raising the toe post to cramp the heel end of the shoe against said abutment, manually operable controlling means for said mechanism, heel lasting wipers, and connections from said power operated mechanism to operate said wipers to shape the upper materials over the heel seat end of the shoe automatically when the toe post is raised.

89. A toe and heel lasting machine having, in combination, means for supporting a last and shoe for the toe and heel lasting operations on the shoe, mechanism for operating said supporting means to move a supported shoe to position the shoe for the toe and heel lasting operations and for clamping the shoe in position for said operations, heel lasting wipers, and connections from said mechanism to operate said wipers to shape the upper materials over the heel seat end of the shoe automatically when said shoe supporting and clamping means are operated.

90. A machine of the class described having, in combination, last and shoe supporting means, an end lasting mechanism mounted for vertical movement and including end wipers movable to engage and wipe the upper materials at one end of the shoe over the bottom of the last, a power-driven shaft, and connections from said shaft to said end lasting mechanism operative to raise and to lower said lasting mechanism and including parts in frictional engagement and arranged for relative yield in response to abnormal resistance encountered by the wipers.

91. A machine of the class described having, in combination, last and shoe supporting means, an end lasting mechanism mounted for vertical movement and including end wipers to wipe the upper materials at one end of the shoe up over the sides of the last and over the bottom of the last, a power driven shaft, and connections from said shaft for raising and lowering said end lasting mechanism, said connections including a fric-

tion clutch element movable from neutral position to and from positions for raising and lowering said end lasting mechanism.

92. A machine of the class described having, in combination, last and shoe supporting means, an end lasting mechanism mounted for vertical movement and including lasting wipers to wipe the upper materials at one end of the shoe over the bottom of the last, a power-driven shaft, a jack screw for raising and lowering said end lasting mechanism, and reverse driving connections between said jack screw and said shaft including a friction clutch member carried by said shaft and movable from neutral position to positions to connect said reverse driving connections with said shaft.

93. In a machine of the class described, in combination, a last and shoe support, a cooperating end wiper mechanism comprising complemental wiper plates pivotally connected at their rear ends and mounted on complemental carrier plates for angular adjustment on said carrier plates about their point of pivotal connections, and operating connections to said carrier plates to swing said carrier plates to swing the wiper plates on their pivot toward and from each other and coincidently to move them bodily lengthwise of the shoe.

94. In a machine of the class described, in combination, a last and shoe support and an end lasting mechanism relatively movable into lasting position, said end lasting mechanism including complemental curved wiper plates pivotally connected at the inner edges of their rear ends and mounted on and connected to carrier plates for independent adjustment about said point of pivotal connection, and operating connections to said carrier plates to swing the wiper plates on their pivot toward and from each other and co-incidently to move them bodily lengthwise of the shoe.

95. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers, a power shaft, means arranged to be connected to said power shaft for effecting relative movement of said positioning means and wipers in a direction transverse to the plane of the shoe bottom for wiping the upper over the lateral periphery of the last, and controlling means to enable the operator to terminate said wiping operation at will.

96. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers, a power shaft, connections including a clutch between said shaft and the wipers for moving the wipers in a direction transverse to the plane of the shoe bottom to wipe the upper over the lateral periphery of the last, and manual means for actuating said clutch to initiate or to stop the movement of the wipers at the will of the operator.

97. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers, manual means to enable the operator to close said wipers inwardly and to hold them closed around the lateral periphery of the end of the shoe, and manually controlled power operated means for effecting relative movement of said positioning means and wipers in a direction transverse to the plane of the shoe bottom for wiping the upper over the lateral periphery of the last while the wipers are thus held.

98. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers, a power shaft, and manually controlled connections between said shaft and the wipers for moving said wipers over the lateral periphery of the last toward the edge of the shoe bottom in wiping engagement with the upper or to reverse their movement at the will of the operator.

99. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers, power means for effecting relative movement of said positioning means and wipers to cause the wipers to wipe the upper over the lateral periphery of the last toward the edge of the shoe bottom and for subsequently causing them to compress the shoe materials over the bottom of the last, and manual means for operating said wipers to wipe the margin of the upper inwardly over the bottom of the last prior to said compressing operation.

100. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers, means for operating said wipers to wipe the margin of the upper inwardly over the bottom of the last, and manually controlled power means for imparting to said wipers an indeterminate movement to compress the upper materials on the bottom of the last, said power means including a friction clutch the parts of which are arranged to slip relatively to prevent undue compression.

101. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers mounted for movement in a direction transverse to the plane of the shoe bottom, a screw shaft extending substantially in the direction of said movement of the wipers and connected to the wipers, and manually controlled power means for turning said screw shaft to impart said movement to the wipers.

102. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers mount-

ed for movement in a direction transverse to the plane of the shoe bottom, an operating shaft, a pair of oppositely facing beveled gears on said shaft, an intermediate gear connecting said beveled gears, a screw shaft extending from said intermediate gear and connected to the wipers, and a clutch member mounted between said beveled gears and movable to connect either of said gears alternatively to the operating shaft for moving the wipers in different directions.

103. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers mounted for movements in opposite directions transverse to the plane of the shoe bottom, a power shaft, manually controlled clutch means for connecting said shaft to the wipers to move them alternatively in said different directions at the will of the operator, and additional means for imparting to the wipers closing and opening movements.

104. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers, power operated means for effecting relative movement of said positioning means and wipers in a direction transverse to the plane of the shoe bottom, controlling means to enable the operator to start or stop said relative movement at will, and means for operating said controlling means to limit said movement irrespective of the operator's control.

105. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers, a power shaft, operating means arranged to be connected to said power shaft for effecting relative movement of said positioning means and wipers in a direction transverse to the plane of the shoe bottom, controlling means to enable the operator to connect said operating means to the power shaft or to disconnect it therefrom at will, and means automatically operative when a predetermined extent of relative movement of said positioning means and wipers has been effected to disconnect said operating means from the power shaft.

106. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers, power operated means for effecting relative movement of said positioning means and wipers in a direction transverse to the plane of the shoe bottom, and controlling means arranged to be positioned by the shoe for limiting said relative movement.

107. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers, power means for moving said wipers over the lateral periphery of the shoe toward the edge of the shoe bottom, means automatically operative to stop said wipers in position for wiping the upper inwardly over the shoe bottom, and means subsequently operative at the will of the operator to impart to the wipers said overwiping movement.

108. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers, power means for moving said wipers over the lateral periphery of the shoe toward the edge of the shoe bottom, and means controlled by engagement with the shoe for disconnecting the wipers from said power means.

109. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers, power means for moving said wipers over the lateral periphery of the shoe in a direction transverse to the plane of the shoe bottom, and stop mechanism arranged to be positioned by engagement with the bottom of the shoe to limit said movement of the wipers.

110. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers, a power shaft, operating means arranged to be connected to said power shaft to move the wipers over the lateral periphery of the shoe in a direction transverse to the plane of the shoe bottom, and stop mechanism arranged to be positioned by engagement with the shoe and to interrupt the connection between the power shaft and the wipers at a predetermined point.

111. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers, a power shaft, clutch means manually operable to connect said power shaft to the wipers for moving the wipers over the lateral periphery of the shoe toward the edge of the shoe bottom, and stop mechanism arranged to be positioned by engagement with the bottom of the shoe for operating said clutch means to stop the movement of the wipers at a predetermined point.

112. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers, means for effecting relative movement of said positioning means and wipers to wipe the upper over the lateral periphery of the last toward the edge of the shoe bottom, controlling means to cause said relative movement to be effected in a path inclined to the plane of the shoe bottom laterally of the shoe, and means arranged to be located in a position determined by the shoe for adjusting said controlling means to determine the inclination of said path.

113. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers, means for effecting relative movement of said posi-

tioning means and wipers to wipe the upper over the lateral periphery of the last toward the edge of the shoe bottom, controlling means to cause said relative movement to be effected in a path inclined to the plane of the shoe bottom laterally of the shoe, additional means adjustable to the shoe in accordance with the swing of the last, and connections between said last named means and said controlling means for determining the inclination of said path.

114. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers, means for moving said wipers to wipe the upper over the lateral periphery of the last toward the edge of the shoe bottom, controlling means to cause said movement of the wipers to be effected in a path inclined to the plane of the shoe bottom laterally of the shoe, and means arranged to be located in a position determined by the shoe in accordance with the swing of the last for adjusting said controlling means to determine the inclination of said path.

115. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers, means for moving said wipers to wipe the upper over the lateral periphery of the last toward the edge of the shoe bottom, controlling means to cause said movement of the wipers to be effected in a path inclined to the plane of the shoe bottom laterally of the shoe, means adjustable to the shoe in accordance with the swing of the last, and connections between said last-named means and the controlling means for adjusting said controlling means to reverse the inclination of said path for right and left shoes.

116. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers, means for moving said wipers to wipe the upper over the lateral periphery of the last toward the edge of the shoe bottom, controlling means to cause said movement of the wipers to be effected in a path inclined to the plane of the shoe bottom laterally of the shoe, lasting mechanism for the opposite end of the shoe adjustable to the shoe in accordance with the swing of the last, and connections between said lasting mechanism and said controlling means for determining the inclination of said path.

117. In a machine of the class described, the combination with last and shoe positioning means, of toe embracing wipers, means for operating said wipers to wipe the upper over the lateral periphery of the last toward the edge of the shoe bottom, controlling means to cause said movement of the wipers to be effected in a path inclined to the plane of the shoe bottom laterally of the shoe, heel lasting mechanism adjustable to the shoe in accordance with the swing of the last, and connections between said heel lasting mechanism and said controlling means for determining the inclination of the path of movement of the toe wipers and for reversing such inclination for right and left shoes.

118. In a machine of the class described, the combination with last and shoe positioning means, of a heel embracing band, means for operating said band to close it about the heel end of the shoe and for moving the shoe to seat it in the band, heel seat wipers, and connections between said wipers and the operating means for the band to close the wipers inwardly over the heel seat as the band is closed.

119. In a machine of the class described, the combination with last and shoe positioning means, of a band for embracing an end of the shoe, means for closing said band about the end of the shoe and for moving the shoe to seat it in the band, wipers mounted for advancing movement and for relative closing movement laterally of the shoe, and connections between said wipers and the operating means for the band to advance and close the wipers over the bottom of the last as the band is closed.

120. In a machine of the class described, the combination with last and shoe positioning means, of a band for embracing an end of the shoe, power operated means for closing said band about the end of the shoe and for moving the shoe to seat it in the band, wipers mounted for advancing movement and for relative closing movement laterally of the shoe, connections between said wipers and the operating means for the band to advance and close the wipers as the band is closed, and manual means to permit the operator to disconnect the wipers from said operating means and to impart to said wipers additional operative movement.

121. In a machine of the class described, the combination with last and shoe positioning means, of a band for embracing an end of the shoe, a power shaft, clutch means for connecting said band to the shaft to close the band about the end of the shoe, end embracing wipers, and connections to cause the power shaft to close the wipers over the shoe simultaneously with the closing of the band.

122. A machine of the class described having, in combination, last and shoe positioning means and heel lasting mechanism relatively movable to jack the shoe and position it for the toe lasting operation, power operated means for thus jacking the shoe and for subsequently unjacking the shoe, toe lasting mechanism movable to last the toe end of the shoe, and means automatically operative in time relation to the unjacking of the shoe to cause said toe lasting mechanism to return to starting position.

123. In a machine of the class described,

the combination with last and shoe positioning means, of heel lasting mechanism mounted for movement lengthwise of the shoe into operative position and including a heel embracing band for clamping the upper about the heel end of the last, a latch for retaining said heel lasting mechanism in operative position, toe lasting mechanism comprising wipers movable into and out of the plane of the bottom of the shoe, a power shaft, and connections arranged to be operated by said power shaft after the lasting operation to unlatch the heel lasting mechanism and to cause a return of the toe wipers from the plane of the shoe bottom to starting position.

124. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers mounted for movement in directions transverse to the plane of the shoe bottom into and out of position for overwiping movement, power operated means for moving the wipers reversely from such position after the overwiping operation has been completed, and means automatically operative in such reverse movement of the wipers to disconnect them from the source of power and stop such movement.

125. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers mounted for movement in directions transverse to the plane of the shoe bottom into and out of position for overwiping movement, power operated means including a clutch for moving the wipers reversely of their starting position after the overwiping operation has been performed, and stop mechanism arranged to be operated by such reverse movement of the wipers to disconnect said clutch and stop their movement.

126. A machine of the class described having, in combination, last and shoe positioning means and heel lasting mechanism relatively movable to jack the shoe and position it for the toe lasting operation, power operated means including a clutch arranged to be actuated successively at the will of the operator first to jack the shoe and later to unjack the shoe, toe lasting mechanism, additional means arranged to be operated independently between said successive actuations of the clutch to operate the toe lasting mechanism, and means automatically operative upon said second actuation of the clutch to render said additional means effective to return the toe lasting mechanism to its starting position.

127. A machine of the class described having, in combination, last and shoe positioning means and heel lasting mechanism relatively movable to jack the shoe and position it for the toe lasting operation, power operated means including a clutch arranged to be actuated successively at the will of the operator first to jack the shoe and later to unjack the shoe, toe lasting mechanism, power driven means including a second clutch manually operative independently between the successive actuations of the first clutch for imparting operative movement to the toe lasting mechanism, and connections to said second clutch for actuating it in time relation to the unjacking operation to cause the toe lasting mechanism to be returned to its starting position.

128. A machine of the class described having, in combination, last and shoe positioning means and heel lasting mechanism relatively movable to jack the shoe and position it for the toe lasting operation, power operated means including a clutch arranged to be actuated successively at the will of the operator first to jack the shoe and later to unjack the shoe, toe embracing wipers, additional power operated means arranged to be operated independently between said successive actuations of the clutch to move said wipers into a plane to permit them to wipe the upper inwardly over the shoe bottom, and means automatically operative following said second actuation of the clutch to cause the wipers to be returned by their operating means to starting position.

129. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers, power operated means arranged for operation at the will of the operator to move said wipers over the lateral periphery of the shoe to their overwiping plane, and means automatically operative at a determinate time in the operation of the machine to connect the wipers to the source of power and cause them to be moved reversely to starting position by said power operated means.

130. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers, power operated means for moving said wipers in a direction transverse to the plane of the shoe bottom, controlling means manually operable to render said power means effective to move the wipers, and mechanism connected to said controlling means and automatically operative at a determinate time in the operation of the machine to connect the wipers to the source of power and cause them to be moved reversely to their starting position.

131. In a machine of the class described, the combination with last and shoe positioning means, of heel end lasting mechanism, toe end lasting mechanism, power operated means for imparting operative movement to one of said end lasting mechanisms and subsequently to the other end lasting mechanism, and controlling mechanism for rendering said power means effective after the lasting operation to cause reverse move-

ments of said heel and toe end lasting mechanisms in time relation.

132. In a machine of the class described, the combination with last and shoe positioning means, of heel end lasting mechanism, toe end lasting mechanism, power operating means, controlling devices independently operable to render said power means effective to impart operative movements to said heel and toe end lasting mechanisms at different times, and power means for operating one of said controlling devices automatically subject to the manual operation of the other of said devices to cause reverse movement of one of said lasting mechanisms in time relation to reverse movement of the other of said mechanisms.

133. In a machine of the class described, the combination with last and shoe positioning means, of heel end lasting mechanism, toe end lasting mechanism, means for effecting relative movement of the shoe positioning means and the heel end lasting mechanism to jack the shoe and subsequently to unjack the shoe, means for moving the toe end lasting mechanism into operative relation to the shoe, and mechanism automatically operative as an incident to the unjacking of the shoe to cause a return movement of the toe end lasting mechanism.

134. In a machine of the class described, the combination with last and shoe positioning means, of end embracing wipers movable to wipe the margin of the upper inwardly over the bottom of the last, power operated means including a friction clutch for effecting relative movement of said last and shoe positioning means and the wipers in a direction transverse to the plane of the shoe bottom to compress the overwiped margin of the upper, and controlling mechanism constructed to enable the operator to control the force applied in compressing the margin of the upper in accordance with the degree of pressure whereby the parts of the friction clutch are held in engagement.

In testimony whereof I have signed my name to this specification.

MATTHIAS BROCK.

Corrections in Letters Patent No. 1,390,755.

It is hereby certified that in Letters Patent No. 1,390,755, granted September 13, 1921, upon the application of Matthias Brock, of Boston, Massachusetts, for an improvement in "Lasting-Machines," errors appear in the printed specification requiring correction as follows: Page 1, line 80, for the word "unwipe" read *upwipe;* page 2, line 78, for the word "overpiping" read *overwiping;* page 5, line 20, for the reference numeral "666" read *66;* page 10, line 100, for the word "piper" read *wiper;* page 14, line 10, claim 17, strike out the words "and wipers"; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 22d day of November, A. D., 1921.

[SEAL.]

WM. A. KINNAN,

Acting Commissioner of Patents.