

March 25, 1924.

E. BROTHERS

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UPPER SHAPING MACHINE

Original Filed July 28, 1916 2 Sheets-Sheet 1

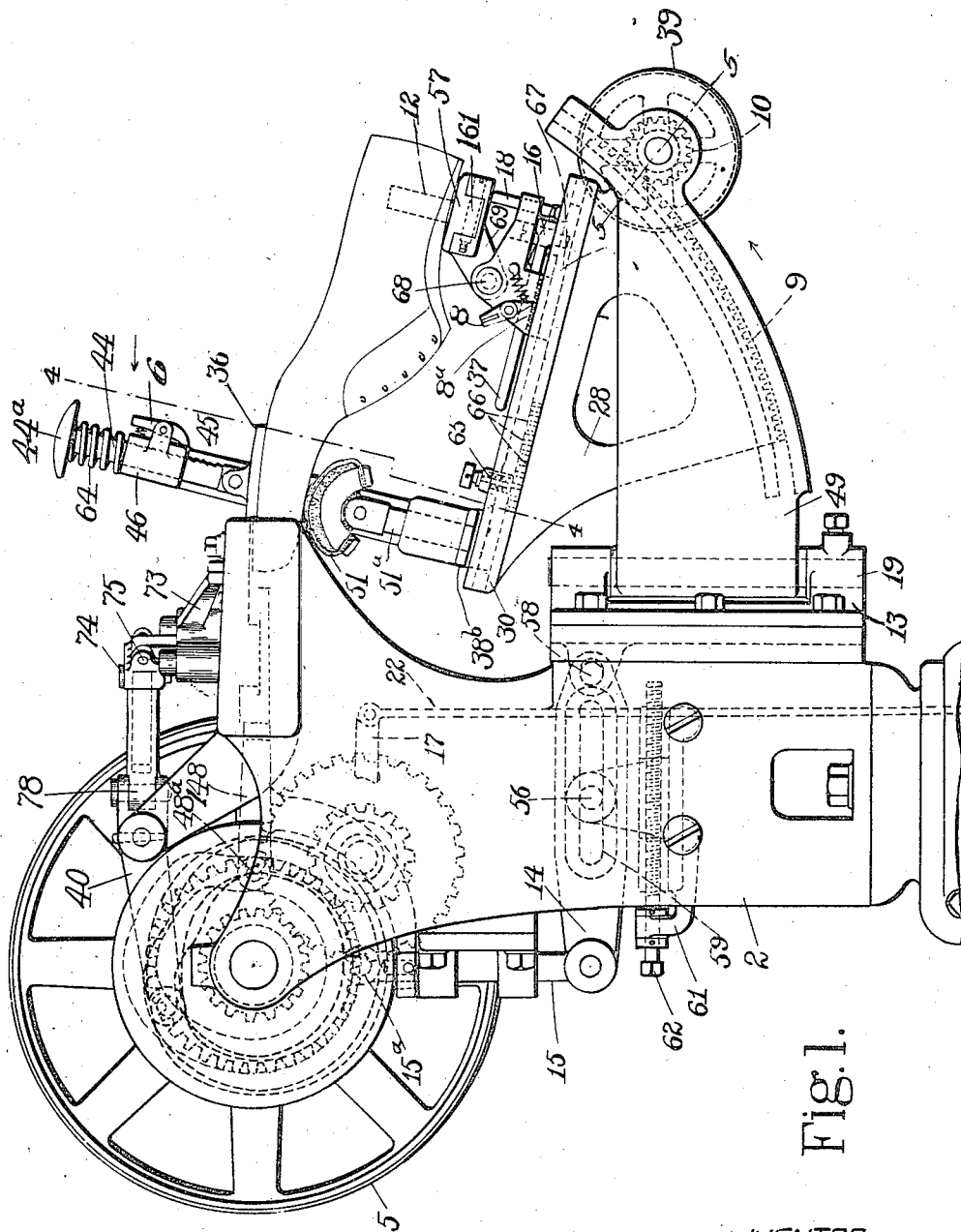


Fig. 1.

INVENTOR.

E. Brothers

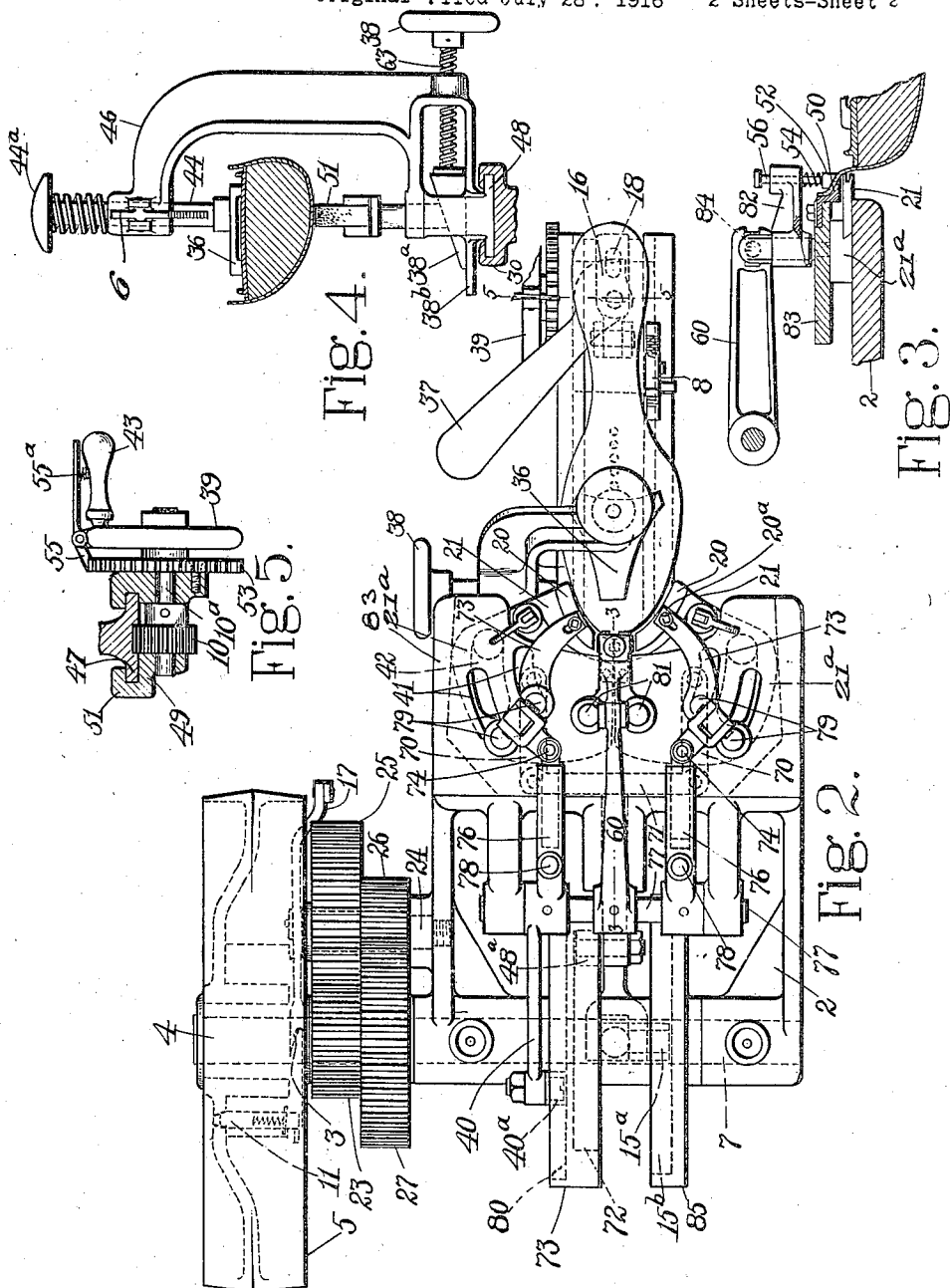
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Original Filed July 28, 1916 2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE.

ELI BROTHERS, OF LYNN, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

UPPER-SHAPING MACHINE.

Application filed July 28, 1916, Serial No. 111,946. Renewed February 16, 1922. Serial No. 537,121.

To all whom it may concern:

Be it known that I, ELI BROTHERS, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain Improvements in Upper-Shaping 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 machines for use in the manufacture of boots and shoes for shaping uppers over forms, and is herein shown as embodied in a machine for shaping the toe of an upper over a last.

Among its objects the invention has in view the provision of means for shaping uppers expeditiously and under such control as to conform the upper materials tightly and smoothly to the contour of the form with uniformly satisfactory results on different uppers. To these and other ends, important features of the invention are to be recognized in a novel organization of means for performing in succession different upper shaping operations on upper materials, the construction herein shown comprising means for clamping the marginal portion of an upper upon toe embracing wipers and for effecting relative movements in time relation between the form or last and the wipers and the clamping means to clamp and stretch the upper and to shape its margin inwardly over the bottom of the form. The illustrative embodiment of the invention comprises a power operated organization having means for clamping the upper and stretching it over the form and for wiping it inwardly over the bottom of the form in a continuous operation of the machine, the machine shown having power driven cams for imparting operative movements to the different instrumentalities in time relation.

Further features of the invention consist in a novel construction and arrangement of means for clamping and controlling the marginal portion of an upper, the construction shown comprising clamp members which are associated with the different respective wipers and are connected to the wipers to move inwardly with them in the overwiping operation, the machine illus-

trated having also power means for maintaining continuous control of said clamp members in the different positions of the wipers. The invention also provides a novel organization comprising different means for clamping the upper at the end of the toe and at the corners or sides of the toe, the construction shown comprising clamping means for the end of the toe which is independent of the wipers combined with clamp members which move inwardly with the wipers at the opposite sides of the end clamping means.

Still another feature of the invention consists in a novel organization of means for positioning the work in proper relation to the means which operates upon it, the construction shown comprising a jack having toe and heel supports with provision for effecting various adjustments to determine in different respects a proper relation between the forepart of the last and the toe embracing wipers.

These and other features of the invention, including important details of construction and combinations of parts, will be better understood from the following description when considered in connection with the accompanying drawing, in which,

Fig. 1 shows, in side elevation, a machine embodying the present invention;

Fig. 2 is a plan view of the machine;

Fig. 3 is a sectional, detail view, showing the toe end clamp and an adjacent portion of a wiper;

Fig. 4 is a detail view, partly in section, on the line 4—4, Fig. 1, and

Fig. 5 is a sectional detail view, on the line 5—5, Fig. 1.

The machine frame 2 carries suitable bearings for a power driving member or shaft 4, which carries a pulley 5 for receiving power through a belt from a convenient source of power. The pulley is loosely mounted on the shaft, but may be connected thereto by any suitable clutch, the clutch herein shown comprising a member fast on the shaft and having a locking pin 11 which is adapted to be withdrawn from locking engagement with the pulley by a wedge 3. This wedge is carried by a lever 17 which is connected by a rod 22 with a treadle, (not shown) and arranged so that when the operator steps on the treadle the wedge will be moved out of position where it holds the pin with-

drawn from engagement with a hole in the pulley, thereby permitting the pin to be moved into said hole by its spring to operatively connect the loose pulley with the shaft 4, thus starting the machine. When the operator steps off of the treadle the pin will be withdrawn by the wedge, and the pulley being thus disconnected from the shaft, the machine will stop.

- 10 The shaft 4 has fast thereon a gear 23 which is connected, through a train of speed-reducing gears 25, 26, 27, with a cam shaft 7, which latter rotates in bearings carried by the machine frame. The shaft 7 carries the cams which effect the several operations of the elements of the machine, as hereinafter described.

- The form over which the upper is shaped, comprising in the construction shown a last on which are assembled the parts of the shoe to be lasted, is positioned upon a jack, comprising a base portion 28, a toe rest 51, a clamp 36 and a heel rest 57. A bracket 49 is connected by a vertical pivot 19 with a slide 13, which is guided for vertical movements in suitable ways carried by the machine frame 2. The pivot 19 is arranged beneath the toe end of a shoe on the jack, and permits swinging of the jack to position the shoe laterally in proper angular relation to the wipers. The slide 13 is connected by a pivot 58 with one end of a lever 14, to the opposite end of which is connected one end of a link 15, carrying a cam roll 15^a. The cam roll runs in a cam groove 15^b in a cam 85 which is fast to the shaft 7. The lever 14 is provided with a slot 59 within which is movable a pin 56, carried by a bracket 61, which slides in ways in the frame, and to which is connected an adjusting screw 62. This screw has threaded engagement with the frame of the machine, and is rotatively connected with the bracket 61 so as to be capable of moving the bracket, thus adjusting the pin 56 in the slot 59, to thereby change the position of the fulcrum point of the lever for varying the amplitude of the vertical movements of the jack when the latter is raised and lowered, through the devices described.

- The upper face of the base 28 has a guideway 30 in which slides adjustably the flanged base 48 of a bracket 46 for supporting the toe rest and sole clamp. The toe rest 51 may be covered with felt, or other soft material, and is supported on a stem 51^a, which slides vertically in the base 48 and is supported upon a wedge 38^a (Fig. 4) which is supported for movement upon an extension 38^b of the base. The wedge has a screw stem 63, which is threaded to the bracket and is provided at its outer end with a hand wheel 38 for moving the wedge back and forth to adjust the elevation of the toe rest.

The upper portion of the bracket 46 is bored to receive a sliding stem 44, having at its upper end a head 44^a, and a plate 36 is pivotally connected with the lower end of the stem, being shaped as shown in Fig. 2, and arranged to bear upon the bottom of the shoe sole at the forepart of the shoe. A spiral spring 64 is confined between the bracket 46 and the head 44^a, and acts to lift the plate off of a shoe sole when permitted. The stem 44 is provided with ratchet teeth 45, and a locking pawl 6, pivotally supported between two spaced lugs projecting from the bracket 46, is spring-pressed into engagement with the teeth for holding the plate 36 down upon the sole of a shoe which is clamped thereby against the toe rest 51. The bracket 46, carrying the toe rest 51 and clamping plate 36, is bodily adjustable in the guideway 30 for properly locating the toe rest and clamp with reference to shoes of varying sizes. The guideway 30 is provided with a plurality of openings 66, and the base 48 of the bracket carries a spring-pressed pin 65 which may be made to engage in any one of the holes 66, thus holding the toe rest and clamp in different positions of adjustment in the guideway 30.

The heel rest or support 57 is provided with a flanged base 67 which slides, adjustably, in the guideway 30 to the rear of the bracket 46. The heel pin 12 is pivotally supported upon a horizontal pin 161 carried by the heel support 57, so that the heel pin may turn about an axis extending longitudinally of the last for adjusting the shoe bottom with a view to locating it in parallelism with the plane of the wipers. The heel pin is carried by a bracket 69 which is connected by a pivot 68, extending transversely of the last, with the base portion of the heel rest. A lever 37 is pivotally mounted in the base of the heel rest to swing in a plane parallel with the guideway 30, said lever having its short arm formed as a wedge or cam 16, and a pin 18, freely supported for movements in a guiding aperture in the base of the heel rest, extends from the upper surface of the wedge 16 to a lower face on the bracket 69. By swinging the lever 37 the wedge 16 acts through the pin 18 upon the bracket 69 carrying the heel pin 12, and tilts the shoe forwardly about the pivot 68, thus forcing the toe end of the shoe down upon the toe rest to jack the shoe.

The base portion of the heel rest is provided with a pivoted, spring-pressed pawl 8 which is arranged to engage the teeth of a rack 8^a along one side of the guideway 30, for adjustably maintaining the heel rest at different points along the guideway, to provide for shoes of different lengths.

The lower portion of the base 28 of the jack is constructed with flanges 47 which

are mounted to slide adjustably in a guideway 151 formed in the bracket 49. The flanged portion 47 and its guideway describe the arc of a circle whose center is located approximately at the toe end of a shoe when the same is supported on the jack, and between the flanges 47 is a rack 9 whose teeth mesh with a pinion 10 which is fastened to a stub shaft 10^a, carried by bearings in the bracket 49. The shaft 10^a is extended beyond its bearing on one side of the bracket, and a wheel 39, provided with a handle 43, is secured to the end of the shaft. A circular rack 53 is rigidly secured to the bracket 49 in a position adjacent to the wheel 39, the shaft 10^a passing through an aperture in the circular rack. A locking pawl 55, which is pivotally mounted upon the wheel 39, has an outer end portion extending parallel with, and closely adjacent to the handle 43, a spring 55^a being interposed between the handle and said end of the pawl and acting to normally hold the short end of the pawl in locking engagement with the teeth of the rack 53. In order to adjust the jack about a horizontal axis which is located approximately at the toe end of the last, and substantially parallel with the last bottom, the handle 43 is grasped, the pawl 55 disengaged from the rack 53, and the pinion 10 rotated, in either direction, thus effecting movement of the flanged portion of the base of the jack along the guideway 151, to swing the jack angularly for locating the tread face of the forepart of the shoe in lengthwise parallelism with the wipers. When the tread face of the shoe has been properly located relatively to the plane of the wipers the pawl 55 is released and permitted to re-engage the rack 53, to hold the jack with the shoe thereon in its desired position of adjustment.

The toe embracing wipers 21—21 of the machine are suitably supported on wiper holders 21^a for movements toward and from the forepart of a shoe located on the jack, and are connected by links 70 with a cross bar 71 to which latter is connected an actuating rod 148 provided with a cam roll 48^a which is located in a cam way or groove 72 formed in one face of a cam disk 73, which is fast on the cam shaft 7. The wiper holders are provided with curved guiding slots 42, which receive and are guided by stationary pins carried by a fixed part of the machine, in a manner common to wiper mechanisms of this type. Arranged at the corners of the toe are two clamping members or jaws 20, which are secured by clamping bolts 20^a for angular and bodily adjustments on the slotted ends of curved arms 73, located upon opposite sides of the center line of the machine, said arms being in turn connected through vertical pivots 74 and horizontal pivots 75 with sliding rods which

telescopically engage cooperating parts of two short arms 76 of a lever 40. This lever is fulcrumed upon a rod 77, journaled in two brackets which extend rigidly from the frame of the machine. The outer end portions of the enclosing members of the lever arms 76 are connected by vertical pivots 78 with their inner end portions at points located slightly beyond the fulcrum rod 77. The cover plate 83 over the wipers is provided, above each wiper holder, with two slots 41, 41, which are spaced apart a suitable distance and are arranged substantially parallel with the guiding slot 42 of the underlying wiper holder, and each arm 73 carrying an upper clamp 20, has sliding connection with two downwardly projecting pins 79 which are mounted on the wiper holders and are guided in the slots 41, 41, as the clamps are moved forward with the wiper plates during the advance of the latter over the shoe bottom, so that the clamps follow the direction of movement of the wipers. The rearwardly extending, power-operated arm of the lever 40 is provided with a cam roll 40^a which runs in a cam groove 80, formed in the outer face of the cam disk 73. Upon rotation of the cam disk, engagement of the cam groove 80 with the roll 40^a causes the lever 40 to rock upon the fulcrum 77 and depress the arms 76 of the lever, thus moving the clamping members 20 into clamping engagement with the upper on the wiper plates 21.

A lever arm 60 is fastened to the fulcrum rod 77 and located between the lever arms 76, 76. The outer end portion of the arm 60 is slotted to receive a yoke portion 84 of an arm 82 which is slidingly mounted on two pins 81 threaded in the cover plate 83, as shown in Fig. 3. The outer end of the arm 82 is perforated to receive a sliding pin 56, having at its upper end a head and provided at its lower end with a clamping block or member 52, and a spiral spring 54 is confined between the clamping member and the end of the arm 82, and acts to urge said member downwardly and into clamping relation to a cooperating surface upon a block 50 which is secured to the cover plate 83. The face of the block 50, and the co-operating face of the clamping member 52, are shaped as shown in Fig. 3, so as to clamp between them the outspread portion of a shoe upper located at the center of the toe end of the shoe, said faces being formed at an inclination.

The actuation of the lever 40, by the means described, not only effects a clamping of the upper at the corners of the toe through the clamping members 20, but additionally causes the actuation of the lever arm 60 to depress the clamping member 52 for gripping the upper between said member and the block 50, at the center of the

toe end. It will, furthermore, be observed that when the clamping members have engaged the upper at the corners and at the center of the toe, movement of said corner members with the wiper plates as the latter are advanced is permitted through the telescopic connections between the members and the lever arms 76, the center clamping members being restrained from advancing movement with the wipers. It is contemplated that the upper shall be clamped, while in an outspread condition, about the forepart of the last against the wipers at the two corners of the toe and against the block 50 at the center of the toe, prior to the advance of the wipers. When the wipers are advanced and closed over the edge of the innersole the marginal portion of the upper is pulled out more or less from between the members of the clamps, but sufficient resistance is offered by the clamps to the advance of the stock by the wipers to tension the stock to that extent necessary for removing all of the wrinkles, so that the upper will be pulled snugly about the toe end of the shoe, and will be made to conform truly to the curvature of the last.

In the use of the machine a last, having the usual shoe materials assembled thereon, is placed on the jack with the pin 12 located in the jack pin socket and the toe resting upon the toe rest 51, the toe and heel rests having been previously located at the proper points along the guideway 30, and secured in position thereon. In the preliminary adjustments of the shoe it may be turned suitably about the longitudinal pivot 161 to locate the shoe bottom in parallelism with the wipers. The lever 37 is then swung about its fulcrum, which causes the wedge to tilt the shoe about the pivot 68 and forces the toe portion of the shoe down upon the rest 51. The operator then releases the pawl 6 from engagement with the ratchet 45 and presses upon the button 44^a thereby forcing the plate 36 down upon the sole and clamping the shoe against the toe rest, the pawl being then released for locking the clamp. After the shoe is thus jacked, it may be swung angularly about a horizontal axis located at or near the end of the toe to position the shoe bottom in parallelism with the plane of the wipers, by rotating the wheel 39 through its handle 43, the jack being retained in its position of adjustment by the pawl 55. The jack carrying the shoe may also be swung about the vertical pivot 19, so as to bring the median line of the forepart of the shoe in line with the centre line of the machine, in order that the wipers may, when advanced, act evenly along both sides of the forepart. This adjustment is of special advantage when operating upon shoes made on right and left crooked lasts having different degrees of "swing," which

require corresponding changes in the position of the jack. After the shoe has been jacked, the marginal portion of the upper about the toe will be outspread over the wipers at the corners of the toe, and over the block 50 at the end of the toe, the wipers being then withdrawn. The machine will then be started by depressing the treadle, and the lever 40 will be actuated by its cam, causing a depression of the arms carrying the toe end and corner clamping members, which will clamp the outspread portion of the upper down upon the block 50, and the wipers. The link 15, roll 15^a and lever 14 will then, through the action of the cam groove 15^b, effect a depression of the jack and shoe, to stretch the upper and at the same time locate the tread face of the shoe bottom the proper distance below the wipers to permit the advance of the latter. Thereafter, through the cam groove 72, roll 48^a, rod 148, and their connections, the wipers will be advanced over the edge of the shoe sole and closed, the clamping members 20, 20, advancing and closing in with the wipers, as previously explained. In such operation the stock will be gradually pulled out from the clamping members, which will hold the stock back with just enough force to maintain it under continued tension during the wiping operation, so that all wrinkles will be removed, and the upper will be drawn closely and evenly over the toe end of the last. After the wipers have completed, or approximately completed, their inward movement, the jack will be lifted, through the devices described, to press the overwiped upper stock firmly against the under surface of the wipers, thus leveling or "ironing" the stock to remove the wrinkles which are commonly formed in the margin of the upper about the toe of a shoe in lasting. Following the elevation of the jack the clamps will be raised, and the machine will then be brought to rest to permit the lasted upper at the toe to be secured in position by the usual toe binding wire, in the case of a welt shoe, or by tacks, in the case of a McKay shoe.

In wiring the toe, the operator will pass the free end of the wire under the wipers to the right-hand side of the shoe, and anchor it to a tack. He will then take hold of the wire, for example, with pincers, and draw it into the angle between the lower face of the wipers and the underlying surface of the overwiped upper. The treadle of the machine will then be depressed which will cause the jack to lower the shoe and permit the operator to draw the binding wire into toe binding position, following which the free end of the wire will be anchored to a tack located on the left hand side of the shoe, the shoe being still firmly supported upon the jack. Thereafter, upon

further actuation of the clutch, the parts will be returned to starting position, and the shoe will then be removed from the jack.

Having 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 having, in combination, a shoe support, shoe end-embracing wipers, upper clamping means, and power-operated mechanism for operating said clamping means to clamp an outspread portion of a shoe upper against the wipers, to move the shoe support for stretching the clamped upper, to advance the wipers over the shoe and pull a portion of the stock out from between the clamping means and wipers, and to reversely move said support for pressing the over-wiped upper against the wipers.

2. A machine of the class described having, in combination, a shoe support, shoe end-embracing wipers, clamping means located at the corners and at the end of the toe, and power-operated mechanism for operating said means to clamp an outspread portion of an upper against the wipers at the corners of the toe and against a co-operating clamping member at the end of the toe, for then moving the shoe support to stretch the upper, and for thereafter advancing the wipers to pull a portion of the upper out from the clamping means and lay it over upon the sole margin.

3. A machine of the class described having, in combination, shoe form positioning means, end embracing wipers, a device for clamping the margin of an upper against the wipers, a power driving member, connections between said driving member and the form positioning means for moving the form in a direction to stretch the clamped upper while the wipers are held substantially stationary, and additional connections between said driving member and the wipers for operating them to wipe the upper inwardly over the form.

4. A machine of the class described having, in combination, shoe form positioning means, end embracing wipers, a device for clamping the margin of an upper against the wipers, a power driving member, connections between said member and the form positioning means and the clamping device for operating said device to clamp the upper and for moving the form relatively to the wipers first to stretch the clamped upper and at a later time in the cycle to compress the margin of the upper on the bottom of the form, and additional connections between said driving member and the wipers to move them inwardly to overwipe the upper after it has been thus stretched.

5. In a machine of the class described, the combination with shoe end-embracing wipers, of clamping members for engaging

an outspread portion of an upper at the corners of the toe and holding it against said wipers, cooperating opposed clamping members for engaging the upper at the center of the toe and clamping it independently of the wipers, power-operated mechanism for said clamping members constructed and arranged to permit the corner members to move with the wipers, and mechanism to advance and close the wipers for pulling a portion of the upper out from the clamping members and laying it over upon the shoe sole.

6. In a machine of the class described, the combination with shoe end-embracing wipers, of a plurality of clamping members for engaging an outspread portion of an upper at the toe end and at the corners of a shoe, mechanism for actuating said members, including a lever having a pair of arms each of which is connected through sliding and pivotal means with one of said corner members for permitting said members to move with the wipers as they advance, and means for actuating said wipers.

7. In a machine of the class described, the combination with shoe end-embracing wipers, of means for clamping a marginal portion of a shoe upper against said wipers, and a jack for positioning a shoe for the operation of said wipers thereon, said jack being constructed and arranged to engage the heel end portion of the last in the shoe and having provision for adjustment about a longitudinal axis substantially contiguous to the top of the last to locate the shoe bottom in parallelism with the plane of the wipers.

8. In a machine of the class described, the combination with shoe end-embracing wipers, of clamping members for pressing an outspread portion of an upper against said wipers at the corners of the toe and against a co-operating member at the end of the toe, a power-operated lever having arms provided with sliding and pivotal connections with the toe corner clamping members and an arm having connection with a toe end clamping member, and means for causing the corner clamping members to follow the paths of movement of the wipers as they are advanced and closed over the shoe.

9. In a machine of the class described, the combination with shoe end-embracing wipers and means for advancing and closing said wipers, of clamping jaws for pressing an upper against the wipers at the corners of the shoe toe supported for adjustment to position their edges in parallelism with the edges of said wipers, and means for securing said jaws in adjusted position.

10. In a machine of the class described, the combination with shoe end-embracing wipers and means for advancing and closing

said wipers, of clamping jaws for pressing an upper against the wipers at the corners of a shoe toe, supporting arms for said jaws, and means connecting said jaws and arms arranged to permit adjustment of the jaws relatively to the arms angularly and also bodily toward and from the adjacent edges of the wipers.

11. In a machine of the class described, the combination with wipers and operating means therefor, of means to clamp an outspread upper against the wipers, a shoe form support mounted for movement transverse to the plane of the wipers, power-operated mechanism for effecting said movements, and means to adjust the extent of said movements.

12. In a machine of the class described, the combination with wipers and operating means therefor, of means to clamp an outspread upper against the wipers, a shoe form support mounted for movements transverse to the plane of the wipers, power-operated mechanism including a lever for so moving said support, and means for adjusting the fulcrum of said lever to vary the extent of said movements.

13. In a machine of the class described, the combination with wipers and operating means therefor, of means to clamp an outspread upper against the wipers, a shoe support mounted for movement transverse to the plane of the wipers and constructed to permit adjustments of a shoe on said support angularly about different axes to locate the shoe bottom in parallelism with the plane of the wipers, and power-operated mechanism for moving said support to stretch the upper prior to the advance of the wipers.

14. In a machine of the class described, a shoe support comprising a base, a heel rest, a bracket adjustable on said base in directions lengthwise of the shoe independently of the heel rest, a toe rest fixed on said bracket against movement heightwise of the toe when the shoe is presented to the support, a clamp member carried by said bracket and movable heightwise of the toe to admit the shoe between it and the toe rest and to clamp the forepart of the shoe on the toe rest, and a device for holding said clamp member against such movement heightwise of the toe as to release the shoe.

15. A machine of the class described having, in combination, a shoe support having a base provided with a guideway, a bracket adjustable in the guideway and having a toe rest and a clamping plate for engaging the shoe sole opposite to the point of engagement of said rest with the shoe, and supporting means for said plate having provisions for adjustably locking the plate in clamping relation to a shoe.

16. A machine of the class described hav-

ing, in combination, a shoe support having a base provided with a flange having a rack formed as the segment of a circle whose center is located at or near the end of the toe of a shoe carried by said support, a manually-operated pinion meshing with said rack, and a segmental guideway for said flange.

17. A machine of the class described having, in combination, end-embracing wipers, a shoe support having a base adjustable about a transverse axis located approximately at the toe end of a shoe on said support, toe and heel rests on said base adjustable to position a shoe with its sole in parallelism with the plane of the wipers, means to clamp the shoe in adjusted position, and means for pivotally sustaining the support for movement about a vertical axis located approximately at the end of the toe.

18. A machine of the class described having, in combination, a shoe support comprising a base, a bracket thereon, a toe rest supported for movements on the bracket, a manually-operable wedge for adjusting the height of said toe rest, a sole clamp carried by an arm of said bracket and having means for adjustably locking it in clamping relation to a shoe on said toe rest, and a heel rest.

19. A machine of the class described having, in combination, a shoe support having a base, a toe rest sustained thereby, a heel rest comprising a member sustained by said base and a bracket connected with said member by a transverse pivot and carrying means for engaging a last, a lever having one arm provided with an inclined face, and a pin extending from said face to said bracket, said lever being constructed and arranged to move a shoe about said pivot and force the toe end down upon the toe rest.

20. An organized lasting machine having, in combination, wipers for lasting an end portion of a shoe, a support for the toe and heel ends of the shoe to position it in operative relation to the wipers, means for clamping an outspread portion of the upper against said wipers, and power operating mechanism for imparting in time relation predetermined relative upper stretching movements to the support and the wipers and clamp and predetermined relative lasting movements to the support and the wipers, substantially as described.

21. An organized lasting machine having, in combination, toe embracing wipers adapted for working the forepart of an upper into lasted position, means for holding the toe portion of a last and controlling its relation to the wipers, means for clamping an outspread portion of an upper against the wipers, and power operating mechanism for imparting in time relation predetermined

movement to the last support relatively to the wipers and clamping means for stretching the upper, predetermined relative movements longitudinally and transversely of the shoe to the wipers and the last for laying the upper over the shoe bottom while the clamping means permits the upper to be pulled under tension from between said means and the wipers, and for imparting relative movement to the wipers and the support for pressing the overwiped upper against the margin of the shoe sole.

22. An organized lasting machine having, in combination, toe embracing wipers, means for holding the forepart of a last and controlling its relation to the wipers, means for clamping an outspread portion of the forepart of an upper against said wipers, and power operating mechanism for imparting in time relation predetermined movement to the shoe holding means for stretching the clamped upper, to the wipers for laying the upper over the last bottom, and again to the shoe holding means for pressing the overwiped upper against the lower face of the wipers.

23. A toe lasting machine having, in combination, toe embracing wipers, means for holding a last and controlling the relation of the forepart of the last to the wipers, co-operating clamping members for gripping the outspread forepart of a shoe upper at the end of the toe, clamping members for clamping the upper against the wipers at the corners of the toe, and means for advancing and closing the wipers to pull the upper under tension from between the clamping members located at the end of the toe and from under the clamping members located at the corners of the toe.

24. A toe lasting machine having, in combination, toe embracing wipers and operating mechanism organized to advance the wipers over the toe end of a last and simultaneously to close the wipers over the corners of the toe of the last, and upper clamping means including members located at the end of the toe and restrained from partaking of the advance movement of the wipers and members located at the corners of the toe and mounted to permit them to partake of the lateral closing movement of the wipers.

25. A toe lasting machine having, in combination, toe embracing wipers and operating mechanism organized to advance the wipers over the toe end of a last and simultaneously to close the wipers over the corners of the toe of the last, upper clamping devices located to clamp the upper upon the wipers at the corners of the toe and pivoted independently of each other rearward of their front edges to permit their bodily movement with the wipers inwardly over the corners of the toe of the last, and means for

maintaining said clamping devices continuously in substantially uniform angular relation to the edges of the wipers.

26. A toe lasting machine having, in combination, toe embracing wipers mounted to advance over the toe end of a last and simultaneously to close over the corners of the toe of the last, upper clamping means comprising members located to co-operate with the wipers at the corners of the toe, swinging telescopic supports for said members to permit their movement with the wipers inwardly over the corners of the toe, and connected mechanism for operating the clamping means to clamp the upper and for thereafter moving the wipers inwardly over the bottom of the toe to pull the upper out from between the clamping means and wipers and lay it over upon the sole.

27. A machine of the class described having, in combination, means for operating upon the toe portion of a shoe, and means for holding the shoe and controlling the position of the toe of the shoe for the operation of said first-mentioned means comprising a base, a bracket extending from the base, and a toe rest and an adjustable clamping member carried by the bracket, said member being arranged to engage the sole face of the shoe opposite to the point of engagement of the toe rest with the shoe.

28. A machine of the class described having, in combination, means for operating upon the toe portion of a shoe, and means for holding the shoe and controlling the position of the toe of the shoe for the operation of said first-mentioned means comprising a base provided with a guideway, a bracket constructed to co-operate with the guideway and adjustable relatively to the base, and a toe rest and a clamping plate both operatively connected with the bracket and arranged for engaging respectively the lower and the upper faces of the shoe at points substantially opposite to each other, said connections including provision for adjustably locking the plate in clamping relation to the shoe.

29. A machine of the class described having, in combination, means for operating upon the toe portion of a shoe, and means for holding the shoe and controlling the position of the toe of the shoe for the operation of said first-mentioned means comprising a base provided with a flange and having a rack formed as the segment of a circle the center of which is located near the end of the toe of a shoe carried by the holding means, a manually operated pinion meshing with said rack, and a segmental guideway for said flange.

30. A machine of the class described having, in combination, means for operating upon the toe portion of a shoe, and means for holding the shoe and controlling the po-

sition of the toe of the shoe for the operation of said first-mentioned means comprising a base, a bracket thereon, a toe rest supported for movements on the bracket, a manually operable wedge for adjusting the height of the toe rest, a sole clamp carried by the bracket, and means for adjustably locking the clamp in operative relation to a shoe on the toe rest.

31. A machine of the class described having, in combination, means for operating upon the toe portion of a shoe, and means for holding the shoe and controlling the position of the toe of the shoe for the operation of said first-mentioned means comprising a base, a heel rest having a member sustained by said base, a bracket connected with said member by a transverse pivot, means carried by the bracket for engaging the last, a toe rest, a lever having an arm provided with an inclined face, and a pin extending from said face to said bracket, said lever being constructed and arranged to move a shoe about said pivot and force the toe end down upon the toe rest.

32. A machine of the class described having, in combination, means for operating upon the toe portion of a shoe, and means for holding the shoe and controlling the position of the toe of the shoe for the operation of said first-mentioned means comprising a bracket having a predeterminable relation to the means for operating on the shoe, a toe rest vertically movable on the bracket, an arm on the bracket extending laterally and then upwardly and terminating substantially over the toe rest, and a plate adjustable on the upper end of the arm toward and from the toe rest and adapted to co-operate with the toe rest in clamping the toe relatively to the means for operating on the toe.

33. A machine of the class described having, in combination, means for operating upon the toe portion of a shoe, and means for holding the shoe and controlling the position of the toe of the shoe for the operation of said first-mentioned means comprising a bracket having a predeterminable relation to the means for operating on the shoe, a toe rest vertically movable in the bracket, an arm on the bracket laterally extending and then upwardly and terminating substantially over the toe rest, a plate adjustable on the upper end of the arm toward and from the toe rest and adapted to co-operate with the toe rest in clamping the toe relatively to the means for operating on the toe, a wedge located in the bracket and under the toe rest, and means on said arm for effecting adjustment of the wedge to vary the elevation of the toe rest.

34. A machine of the class described having, in combination, shoe end embracing wipers, separate clamping members located

respectively at the centre and at the two corners of the toe, power-operated mechanism for actuating said members to clamp an outspread upper prior to the advance of the wipers, and mechanism for thereafter advancing the wipers to pull the upper out from said members and lay it over upon the shoe sole.

35. In a machine of the class described, the combination with shoe form positioning means, of toe embracing wipers relatively movable to wipe the toe of an upper inwardly over the form, means for clamping the marginal portion of the upper upon said wipers, and power driven means automatically operative, in a continuous operation of the machine, to effect relative movement of said wipers and clamping means to clamp the upper and thereafter to effect relative right line movement between said wipers and clamping means and the form to stretch the upper over the form.

36. In a machine of the class described, the combination with shoe form positioning means, of toe embracing wipers relatively movable to wipe the toe of an upper inwardly over the form, members for clamping the marginal portion of the upper upon said wipers, and power driven means automatically operative, in a continuous operation of the machine, to move said clamping members relatively to the wipers to clamp the upper and then to move the form relatively to said wipers and clamping members to stretch the upper over the form while holding the wipers against movement heightwise of the form.

37. In a machine of the class described, the combination with shoe form positioning means, of toe embracing wipers relatively movable to wipe the toe of an upper inwardly over the form, means for clamping the marginal portion of the upper upon said wipers, and power means automatically operative to effect in time relation to one another relative movements between the form and said wipers and clamping means to clamp the upper and stretch it over the form and then to wipe its marginal portion positively inward over the bottom of the form.

38. In a machine of the class described, the combination with shoe form positioning means, of toe embracing wipers relatively movable to wipe the toe of an upper inwardly over the form, means for clamping the marginal portion of the upper upon said wipers, and power driven means for imparting in time relation predetermined movement to the shoe form for stretching the clamped upper, to the wipers for wiping the upper inwardly over the form, and again to the form for pressing the upper against the wipers.

39. In a machine of the class described,

the combination with shoe form positioning means, of toe embracing wipers relatively movable to wipe the toe of an upper inwardly over the bottom of the form, power means automatically operative in a continuous operation of the machine, to clamp the marginal portion of the upper on the wipers and to effect relative movements between the form and the wipers to stretch the clamped upper over the form and to wipe the upper inwardly over the bottom of the form, and controlling means for bringing the machine to a stop with the wipers holding the upper in its overwiped position.

40. In a machine of the class described, the combination with toe embracing wipers relatively movable to wipe the toe of an upper inwardly over a form, of members for clamping the marginal portion of the upper upon said wipers, connections between said clamping members and wipers for moving said members inwardly with the wipers, and power means constructed and arranged to operate said clamping members to clamp the upper and thereafter to effect relative movement between the form and said clamping members and wipers to stretch the upper prior to the inward movement of the wipers over the form.

41. In a machine of the class described, the combination with toe embracing wipers relatively movable to wipe the toe of an upper inwardly over the bottom of a form, of members for clamping the marginal portion of the upper upon said wipers, connections between the clamping members and the wipers for moving said members inwardly with the wipers, a power driving member, operating connections between said driving member and the wipers, and operating connections between said driving member and the clamping members comprising parts relatively movable to permit the inward movement of said clamping members with the wipers while maintaining said members in continuous operative relation to the driving member.

42. In a machine of the class described, the combination with toe embracing wipers relatively movable to wipe an upper inwardly over a form, of members for clamping the marginal portion of the upper on said wipers, connections between said clamping members and the wipers for carrying said members inwardly with the wipers in fixed angular relation to the wipers, and power driven means for imparting operative movements to said clamping members and wipers at predetermined times in the cycle of the machine.

43. In a machine of the class described, the combination with toe embracing wipers, and wiper holders relatively movable to close the wipers inwardly over a form, of

upper clamping members carried by said wiper holders to close inwardly over the form with the wipers and arranged to clamp the marginal portion of an upper upon the wipers.

44. In a machine of the class described, the combination with toe embracing wipers, and wiper holders relatively movable to close the wipers inwardly over a form, of members for clamping the marginal portion of an upper on said wipers, and pins carried by said wiper holders and connected to said clamping members to move said members inwardly with the wipers in fixed angular relation to the wipers, said members being movable relatively to the pins into and out of clamping position.

45. In a machine of the class described, the combination with toe embracing wipers relatively movable to wipe the toe of an upper inwardly over a form, of members for clamping the marginal portion of the upper on said wipers, operating connections between said clamping members and the wipers for moving said members with the wipers, a power driven cam, and operating connections between said cam and the clamping members for controlling said members.

46. In a machine of the class described, the combination with shoe form positioning means, of toe embracing wipers relatively movable to wipe the toe of an upper inwardly over the form, means for clamping the marginal portion of the upper upon said wipers, and power driving means for imparting movements to said clamping means and to the form positioning means and the wipers comprising cams constructed and arranged to move the form to stretch the upper after the upper has been clamped, to operate the wipers to wipe the upper inwardly over the bottom of the form, and to cause the form to move toward the wipers for compressing the upper against the wipers.

47. In a machine of the class described, the combination with shoe form positioning means, of toe embracing wipers relatively movable to wipe the toe of an upper inwardly over the form, means for clamping the marginal portion of the upper on said wipers, and power driving means comprising cams associated respectively with the clamping means, the form positioning means and the wipers for operating said clamping means to clamp the upper and for thereafter moving the form to stretch the upper while the wipers are substantially stationary and then operating the wipers to wipe the upper inwardly over the form.

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

ELI BROTHERS.