March 9, 1937. W. T. B. ROBERTS 2,073,028

LASTING MACHINE

Filed June 27, 1935 2 Sheets-Sheet 1

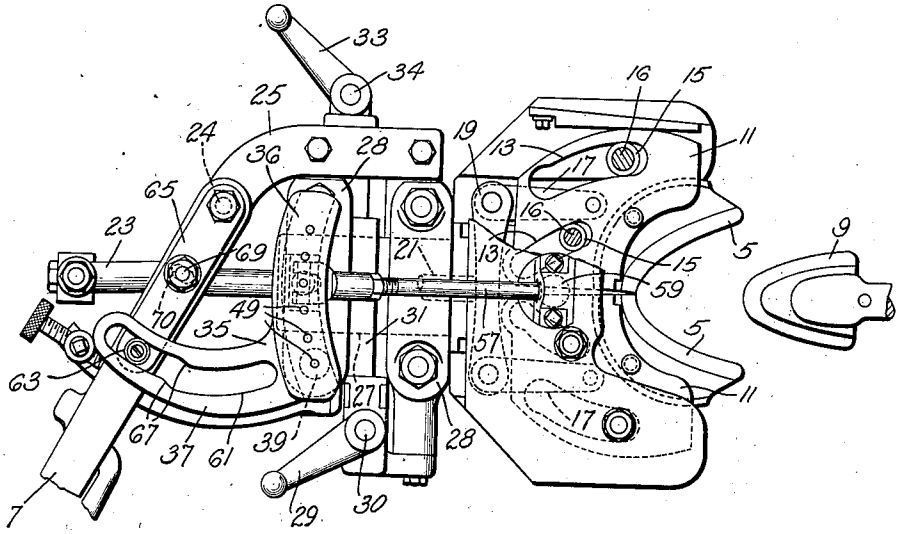


Fig. 1

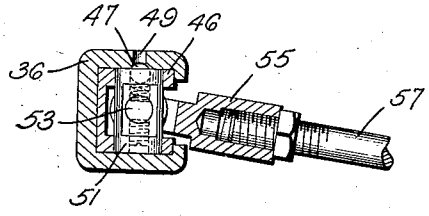


Fig. 4

Fig. 2

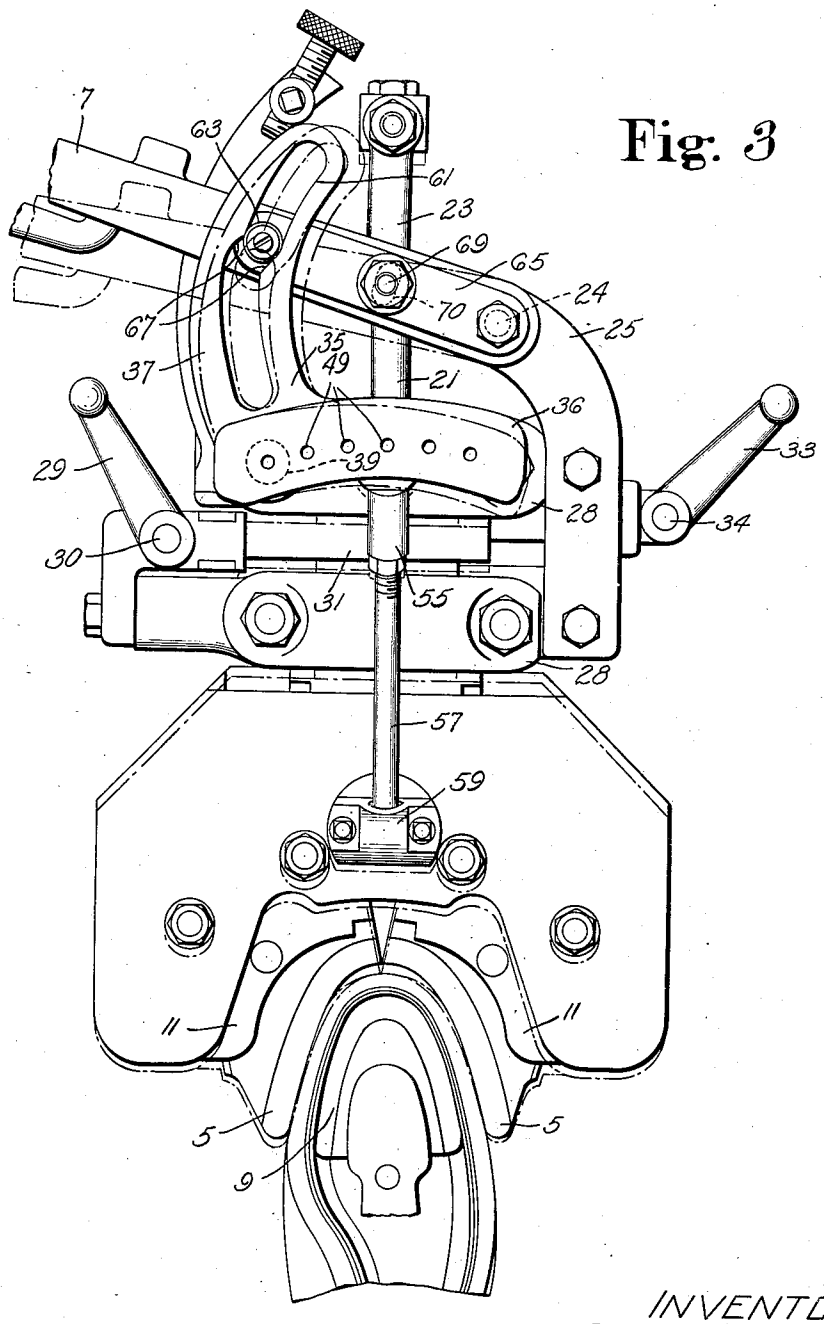
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Fig. 3



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2,073,028

LASTING MACHINE

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Application June 27, 1935, Serial No. 28,681
In Great Britain August 22, 1934

16 Claims. (Cl. 12—14)

This invention relates to lasting machines, and in some aspects more particularly to toe-lasting means in lasting machines of the bed type. Such machines commonly include toe wipers so controlled that by the movement of a hand lever they are advanced lengthwise of the last and are also closed inwardly widthwise of the last through distances proportional to the amount of their advancing movement. In practice it is customary first to wipe the toe end of the upper heightwise of the last after advancing and closing the wipers about the toe sufficiently to render their wiping edges effective in such an "upwiping" operation, and then to wipe the marginal portion of the upper inwardly over the bottom of the last by further advancing and closing movements of the wipers. Under some conditions, especially in operating on welt shoes, it is desirable to effect the upwiping operation with the edges of the wipers spaced farther from the toe-end face of the last than from the side faces of the last, in order to avoid any such lengthwise strain on the toe end of the upper as might distort the toe tip line. The wipers may accordingly be so positioned in the upwiping operation as not to press the upper with any substantial force against the extreme toe-end face of the last, although acting with effective pressure at the sides of the toe. In that case it is necessary for satisfactory results in wiping the upper thereafter inwardly over the bottom of the last to impart to the wipers a bodily advancing movement lengthwise of the last in addition to their normal advancing and closing movements above referred to as resulting from the operation of the hand lever, so that on welt work, for example, the margin of the upper will be pressed inward closely against the lip of the insole at the end of the toe as well as at the sides of the toe. Such additional advancing movement, in the operation of well-known bed-lasting machines in common use, is imparted to the wipers by means of a hand wheel operated independently of the above-mentioned hand lever, the hand wheel controlling means which supports and guides the wipers, as disclosed, for example, in United States Letters Patent No. 1,018,477, granted on February 27, 1912 upon an application of Matthias Brock.

The present invention provides wiper-operating means so constructed that the wipers, although used to wipe the upper heightwise of the last with but little, if any, pressure against the toe-end face of the last, as above described, will yet produce satisfactory results at the end as well as the sides of the toe in wiping the upper inwardly over the bottom of the last without special attention on the operator's part. For the purpose in view, the construction herein shown comprises mechanism operated by a hand lever for imparting to the wipers not only advancing and closing movements as heretofore in the use of such a lever, but also an additional advancing movement so that the portions of their wiping edges which are opposite the end face of the last in the upwiping operation will be in the proper position at the end of the overwiping operation. As herein illustrated, there is provided a bell-crank lever operated at a predetermined time by the hand lever to impart a short movement lengthwise of the last to a wiper holder having means thereon which determines the paths of the normal advancing and closing movements of the wipers, the bell-crank lever having in one arm thereof a cam slot in which lies an operating roll carried by the hand lever. By this means the wipers are caused to advance a short distance without any substantial closing movement. Preferably the additional advancing movement is thus imparted to the wipers substantially at the beginning of the movement of the hand lever for wiping the margin of the upper inwardly after the upwiping operation, so that the wipers will begin their overwiping action at the end of the toe at substantially the same time as at the sides of the toe. The construction shown, however, is further such that the time in the movement of the hand lever when the additional advancing movement is imparted to the wipers and also the amount of such additional movement may be varied.

The novel features of the invention will now be more particularly described by reference to the accompanying drawings and thereafter pointed out in the claims.

In the drawings,

Fig. 1 is a plan view, with parts broken away, of a portion of a lasting machine in which the invention is embodied;

Fig. 2 is a view of the same portion of the machine in front elevation, with parts broken away;

Fig. 3 is a plan view on an enlarged scale illustrating more fully, by reference to a shoe, how the toe wipers are operated; and

Fig. 4 is a vertical sectional view of certain parts hereinafter described.

The invention is herein illustrated as applied to a toe-lasting machine of the same general character as disclosed in United States Letters Patent No. 1,993,117, granted on March 5, 1935

upon an application of W. T. B. Roberts, although it is to be understood that the invention is applicable to lasting machines of various types, including machines of the type disclosed in the previously mentioned Letters Patent No. 1,018,477. The machine includes a vertically movable trunk 1 which supports, by means hereinafter described, a boxlike wiper holder 3 provided with a pair of toe-embracing wipers 5. It has also a hand lever 7 for advancing and closing the wipers, and shoe-positioning means, including an insole-engaging plate 9 and a toe rest 10 whereby the shoe is clamped and held and is moved lengthwise to a predetermined position for the toe-lasting operation, as fully disclosed in the above-mentioned Letters Patent No. 1,993,117. The wipers 5 are detachably secured to carrier plates or carriers 11 provided with cam slots 13 in which lie rolls 15 mounted on vertical studs 16 which are fast on the wiper holder 3. The carrier plates 11 are connected by links 17 to the opposite ends of a cross-bar 19 secured to the right-hand end of a horizontal sliding rod 21 the left-hand end of which is connected by a link 23 to the hand lever 7. The hand lever is pivotally mounted at its rear end on a vertical pin 24 secured to a bracket 25 which is fast on a head casting 26 on which the wiper holder 3 is directly supported. It will be understood that swinging movement of the hand lever 7 toward the right serves to advance the wipers 5 bodily lengthwise of the shoe and that as they are thus advanced they are so guided by the rolls 15 in the cam slots 13 that they receive swinging or closing movements widthwise of the shoe proportional to the amount of their advancing movement. Movement of the hand lever toward the left serves to retract the wipers lengthwise of the shoe and to open them.

As distinguished from the disclosure of Letters Patent No. 1,993,117, the wiper holder 3 in the construction herein shown is so mounted as to permit it to be moved a short distance, preferably about a quarter of an inch, in directions lengthwise of the shoe, and the holder is thus moved toward the right by the operation of the hand lever 7 to impart to the wipers an additional advancing movement lengthwise of the shoe. For this purpose the wiper holder 3 has a cylindrical sleeve 27 extending from it toward the left and mounted in bearings in the head casting 26, the sleeve being held in place in these bearings by bearing members 28 which are spaced apart along the sleeve and are bolted to the casting 26. For adjusting the wipers in proper relation to the bottom face of the toe end of the shoe the holder 3 can be turned about the axis of the sleeve 27 by rotation of a hand lever 29 secured on a threaded stem 30 which is mounted in a bracket on the casting 26 and is connected by means not herein shown to a ring 31 fast on the sleeve 27. Further to position the wipers in proper relation to the shoe the head casting 26 is adjustable about a transverse horizontal pivot 32 on the trunk 1 by rotation of a hand lever 33 fast on a threaded stem 34 supported in a lug on the casting 26 and mounted at its lower end in a trunnion (not shown) on the trunk 1.

The ring 31 secured to the sleeve 27 as above described is mounted between the two bearing members 28 and is of considerably less width than the space between these members to permit the movements of the sleeve and the wiper holder 3 lengthwise of the shoe. To effect these movements there is supported on the front end of the left-hand bearing member 28 a horizontal bell-crank lever 35 having a curved arm 36 which extends rearwardly in transverse relation to the axis of the sleeve 27 and a second curved arm 37 which extends toward the left in a direction lengthwise of the sleeve. The bell-crank lever 35 is mounted to swing about the axis of a cylindrical boss 39 projecting downwardly from it into a bearing formed in the member 28 and is held against upward movement by a stem 41 (Fig. 2) extending upwardly through a hollow stem 43 which is threaded in the bearing member 28 and has a head 44 on its lower end to assist in holding the bearing member in place. The stem 41 is threaded in the boss 39 and has nuts 45 on its lower end overlapping the head 44 of the stem 43. The rearwardly extending arm 36 of the bell-crank lever 35 is provided with a T-shaped groove in its right-hand side (Fig. 4) and within this groove is housed a U-shaped slide 46. This slide is normally held in a fixed position relatively to the arm 36 by a spring-pressed ball 47 carried by the slide and arranged to enter one or another of a plurality of curved recesses formed in the arm 36 at the lower ends of holes 49 in the arm. It will be understood that the slide 46 can be adjusted along the groove to position it at different distances from the axis of the bell-crank lever when sufficient pressure is exerted upon it to cause the ball 47 to ride out of the recess in which it lies.

The slide 46 has freely rotatable in it a short vertical pin 51 in which is secured a horizontal pin 53. A small bifurcated sleeve 55 is pivotally mounted on the pin 53, and threaded in this sleeve is a rod 57 which extends toward the right to a position over the wiper holder 3. The rod 57 has a ball-shaped right-hand end which is housed within a spherical cavity provided between the upper face of a block 58 fast on the wiper holder 3 and a cap plate 59 on the block. By this means the wiper holder 3 and the bell-crank lever 35 are coupled together, the rod 57 having universal joint connections at its opposite ends with the holder 3 and the arm 36 of the lever. The curved arm 36 is normally concentric with the ball joint connection between the rod 57 and the holder 3, so that adjustment of the slide 46 along its guideway in the arm will not affect the position of the bell-crank lever or of the wiper holder.

The arm 37 of the bell-crank lever 35 has therein a cam slot 61 in which lies a roll 63 carried by a plate 65 adjustably secured to the hand lever 7 as hereinafter described. The left-hand end portion of the cam slot 61 is curved about a center initially coincident with the axis of swinging movement of the lever 7, and about midway between its opposite ends this cam slot is curved sharply forward for a short distance, as indicated at 67. Accordingly, as the roll 63 passes this forwardly curved portion of the cam slot in the wiper-operating movement of the hand lever 7 it acts to swing the rearwardly extending arm 36 of the bell-crank lever toward the right and thus to move the wiper holder 3 with its guide rolls 15 also toward the right. The result of such advancing movement of the wiper holder 3 and the advancing movement of the wiper-operating rod 21 effected simultaneously by the movement of the hand lever 7 is to cause the wipers to advance bodily lengthwise of the shoe with but little, if any, closing movement toward each other. The farther the slide 46 is adjusted along the arm 36 away from the

axis of the bell-crank lever **35**, the greater will be the amount of such advancing movement of the wipers. The right-hand portion of the slot **61** is curved about a center coincident with the axis of movement of the hand lever **7** after the roll **63** has passed the forwardly inclined portion **67** of the slot, so that no further movement is then imparted to the bell-crank-lever.

The plate **65** which carries the roll **63** is mounted on the pin **24** about which the hand lever **7** swings and is secured to the lever by a bolt **69** which passes through a transverse slot **70** in the plate. It will thus be seen that the plate **65** may be adjusted to vary the position of the roll **63** relatively to the hand lever and thus to vary the time in the swinging movement of the lever when the roll acts to impart the swinging movement to the bell-crank lever **35**. The plate is preferably so adjusted that by the time the hand lever **7** has been swung toward the right far enough to bring the edges of the wipers into firm pressing engagement with the sides of the toe end of the shoe below the level of the shoe bottom preparatory to the upwiping operation, the roll **63** will have just reached the left-hand end of the forwardly curved portion **67** of the slot **61**. The roll is thus ready to impart the additional advancing movement to the wipers substantially at the beginning of the further operative movement of the hand lever after the upwiping operation. The slide **46** may, however, be adjusted along the arm **36** to a position over the boss **39**, in which case the movement of the bell-crank lever **35** will impart no movement to the wiper holder **3**, and accordingly the wipers will receive only such advancing and closing movements as are determined by the cam slots **13** and the rolls **15**.

Prior to use of the machine for lasting shoes of a given style and size the shoe-positioning means will have been so adjusted, as by movement of the threaded sleeve **165** shown in the above-mentioned Letters Patent No. 1,993,117, that in the upwiping operation the edges of the wipers will be spaced a substantial distance, for example a quarter of an inch, farther from the end face of the last than from the side faces of the last, as illustrated in Fig. 3, the edges of the wipers being spaced from the side faces only by the thickness of the upper materials. After such adjustment the operator positions and clamps the shoe in the manner disclosed in the above-mentioned Letters Patent, closes the wipers about the toe by movement of the hand lever **7** until the wipers bear firmly against the shoe at the sides of the toe below the level of the shoe bottom, and then raises the trunk **1** by the treadle provided for effecting the upwiping operation, controlling the margin of the upper by hand in this operation in the usual manner. At the end of the upwiping operation the operator moves the hand lever **7** farther to the right, whereupon the bell-crank lever **35** is immediately operated by the roll **63** to impart an advancing movement to the wiper holder **3** and its guide rolls **15** as the wipers are being operated by the rod **21**. The wipers are accordingly advanced bodily lengthwise of the shoe a distance corresponding substantially to the excess of clearance between their edges and the end face of the last over the clearance between their edges and the sides of the last in the upwiping operation. This brings their edges substantially adjacent to the edge of the shoe bottom at the end of the toe prior to the beginning of their closing movements over the shoe bottom, as indicated by the dot-and-dash line in Fig. 3. As the wipers are thereafter simultaneously advanced and closed by further movement of the hand lever to effect the overwiping operation they will bear on the upper with substantially equal efficiency at the end and sides of the toe and at the end of their overwiping movement will press the margin of the upper closely against the lip of the insole all around the toe. The toe portion of the upper will then be secured in lasted position in the usual manner, as by use of a binder wire fastened to the shoe with tacks. It will thus be seen that although the upper is wiped heightwise of the last without any substantial pressure against the end face of the last, for the purpose hereinbefore described, the wipers are nevertheless so controlled, without special attention on the part of the operator, that they wipe the upper inwardly over the insole all around the toe in the manner required for the best results.

The threaded rod **57** which connects the lever arm **36** to the wiper holder **3** as hereinbefore described, may, if desired, be rotated to vary the effective length of the connection between the lever arm and the wiper holder and thus to adjust the latter lengthwise of the shoe without substantially altering the relation of the wipers to each other.

It will be recognized that wiper-operating means such as herein disclosed may be utilized, if desired, for operating heel-lasting wipers as well as toe wipers.

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

1. In a lasting machine, wipers for embracing an upper about the toe end of a last, means for effecting relative movement of said wipers and the last to wipe the upper heightwise of the last with the edges of the wipers closer to the sides of the last than to the end face of the last, a wiper-operating member, and means for imparting to the wipers by the movement of said member, after the wiping of the upper heightwise of the last, advancing movement lengthwise of the last with substantially no closing movement widthwise of the last until the edges of the wipers are substantially as close to the edge of the shoe bottom at the end of the toe as at the sides of the toe and for then imparting to them by further movement of said member simultaneous advancing and closing movements to wipe the marginal portion of the upper inwardly over the shoe bottom at the end and the sides of the toe.

2. In a lasting machine, wipers for embracing an upper about the toe end of a last, means for effecting relative movement of said wipers and the last to wipe the upper heightwise of the last with the edges of the wipers closer to the sides of the last than to the end face of the last, a wiper-operating hand lever, and means for imparting to the wipers by the movement of said hand lever, after the wiping of the upper heightwise of the last, advancing movement lengthwise of the last while maintaining them in substantially the same relation to each other and for thereafter further advancing them by said hand lever while also imparting to them closing movement widthwise of the last.

3. In a lasting machine, wipers for embracing an upper about the toe end of a last, means for effecting relative movement of said wipers and the last to wipe the upper heightwise of the last

with the edges of the wipers closer to the sides of the last than to the end face of the last, a wiper-operating member, guiding means to cause the wipers when operated by said member to have components of movement both lengthwise and widthwise of the last, and mechanism for also operating said guiding means by the movement of said member, after the wiping of the upper heightwise of the last, to cause the wipers to receive a movement lengthwise of the last in addition to the components of movement determined by the guiding means.

4. In a lasting machine, wipers for embracing an upper about the toe end of a last, means for effecting relative movement of said wipers and the last to wipe the upper heightwise of the last with the edges of the wipers closer to the sides of the last than to the end face of the last, a wiper-operating hand lever, a wiper holder relatively to which the wipers are movable bodily lengthwise of the last and are at the same time movable also widthwise of the last by the movement of said hand lever, means on the wiper holder for determining the paths of such movement of the wipers, and means also operated by said hand lever for moving the wiper holder lengthwise of the last, after the wiping of the upper heightwise of the last, to cause the wipers to receive a movement lengthwise of the last in addition to their movement in the paths determined by the means on said holder.

5. In a lasting machine, wipers for embracing an upper about an end of a last, a member movable by the operator to operate said wipers, guiding means to cause the wipers when operated by said member to have components of movement both lengthwise and widthwise of the last while said guiding means is held against movement lengthwise of the last, and mechanism for also moving said guiding means lengthwise of the last by the movement of said member during a portion only of the wiper-operating movement of the member to cause the wipers to receive a movement lengthwise of the last in addition to the components of movement determined by the guiding means.

6. In a lasting machine, wipers for embracing an upper about an end of a last, a wiper holder relatively to which the wipers are movable bodily lengthwise of the last and are at the same time movable also widthwise of the last, means controlled by said wiper holder for determining the paths of such movement of the wipers, a hand lever, connections between said hand lever and the wipers for operating them, and additional connections between the hand lever and the wiper holder for moving the wiper holder lengthwise of the last during a portion only of the wiper-operating movement of the hand lever.

7. In a lasting machine, wipers for embracing an upper about an end of a last, a wiper holder relatively to which the wipers are movable both lengthwise and widthwise of the last, means controlled by said wiper holder for determining the paths of such movement of the wipers, the wiper holder also being mounted for movement lengthwise of the last, and a member movable by the operator both to move the wipers in said paths relatively to the wiper holder and also to move the wiper holder during a portion only of the wiper-operating movement of said member.

8. In a lasting machine, wipers for embracing an upper about an end of a last, wiper carriers supporting said wipers and having cam slots therein, a wiper holder relatively to which said wiper carriers are movable with the wipers, members on said wiper holder arranged to lie in said cam slots to determine the paths of such movement of the wiper carriers and the wipers, a hand lever connected to the wiper carriers for operating the wipers, and mechanism arranged to be operated by said hand lever for imparting to the wiper holder a movement lengthwise of the last during a portion only of the wiper-operating movement of the hand lever.

9. In a lasting machine, wipers for embracing an upper about an end of a last, a wiper holder, means controlled by said wiper holder for guiding the wipers for movement in predetermined paths lengthwise and widthwise of the last relatively to the wiper holder, a hand lever connected to the wipers for operating them, another lever connected to the wiper holder, and means for operating said other lever by the movement of the hand lever to impart to the wiper holder a movement lengthwise of the last during a portion only of the wiper-operating movement of the hand lever.

10. In a lasting machine, wipers for embracing an upper about an end of a last, a wiper holder, means controlled by said wiper holder for guiding the wipers for movement in predetermined paths relatively to the wiper holder, a hand lever connected to the wipers for operating them, a bell-crank lever, means connecting one arm of said bell-crank lever to the wiper holder, the other arm of said bell-crank lever having a cam slot therein, and a member carried by said hand lever and arranged to act in said cam slot to impart to the wiper holder through said bell-crank lever a movement lengthwise of the last during a portion only of the wiper-operating movement of the hand lever.

11. In a lasting machine, wipers for embracing an upper about an end of a last, a member movable by the operator to operate said wipers, means controlled by said member for advancing and closing the wipers during a portion of the movement of the member, and additional means separately operated by said member to cause the wipers to advance without any substantial closing movement during another portion of the movement of the member, said additional means being adjustable to vary the amount of such advance of the wipers without substantial closing movement.

12. In a lasting machine, wipers for embracing an upper about an end of a last, a wiper holder relatively to which the wipers are movable both lengthwise and widthwise of the last, means controlled by said wiper holder for determining the paths of such movement of the wipers, a member movable by the operator to operate the wipers, and mechanism arranged to be operated by said member for imparting to the wiper holder movement lengthwise of the last during a portion only of the movement of the member, said mechanism being adjustable to vary the amount of such movement of the wiper holder.

13. In a lasting machine, wipers for embracing an upper about an end of a last, a wiper holder relatively to which the wipers are movable both lengthwise and widthwise of the last, means controlled by said wiper holder for determining the paths of such movement of the wipers, a hand lever for operating the wipers, a bell-crank lever arranged to be operated by said hand lever, and a connection between one arm of said bell-crank lever and the wiper holder for moving the wiper holder also lengthwise of the last, said connection being adjustable along said arm to vary the

amount of such movement of the wiper holder.

14. In a lasting machine, wipers for embracing an upper about an end of a last, a wiper holder relatively to which the wipers are movable both lengthwise and widthwise of the last, means controlled by said wiper holder for determining the paths of such movement of the wipers, a member movable by the operator to operate the wipers, and mechanism arranged to be operated by said member for imparting to the wiper holder movement lengthwise of the last, said mechanism being adjustable at will to eliminate such movement of the wiper holder.

15. In a lasting machine, wipers for embracing an upper about an end of a last, a member movable by the operator to operate said wipers, and means controlled by said member for advancing and closing the wipers during a portion of the movement of the member and for advancing them without any substantial closing movement during another portion of the movement of the member, said means being adjustable to vary the time in the movement of said member when the wipers are thus advanced relatively to the time when they are advanced and closed.

16. In a lasting machine, wipers for embracing an upper about an end of a last, a wiper holder relatively to which the wipers are movable both lengthwise and widthwise of the last, means controlled by said wiper holder for determining the paths of such movement of the wipers, a hand lever connected to the wipers for operating them, another lever connected to the wiper holder and having a cam slot therein, and a member carried by said hand lever and arranged to act in said cam slot to impart to the wiper holder through said other lever a movement lengthwise of the last during a portion only of the wiper-operating movement of the hand lever, said member being adjustable relatively to the hand lever to vary the time in the movement of the hand lever when said other lever is operated.

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