Aug. 1, 1944. B. JORGENSEN 2,354,685

LASTING MACHINE

Filed Jan. 16, 1943 2 Sheets-Sheet 1

Fig. 1.

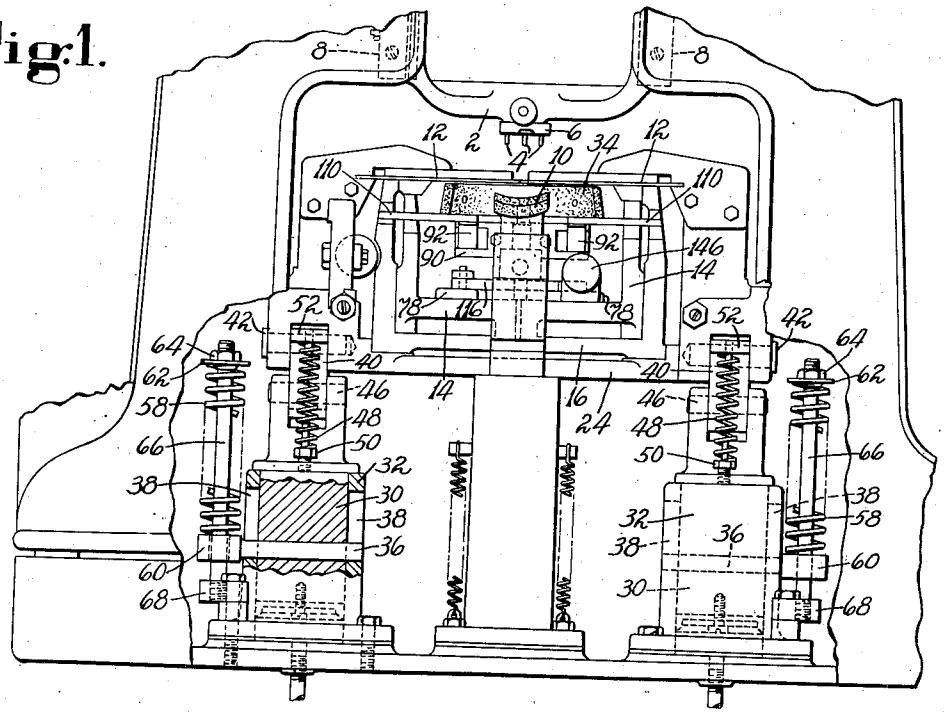


Fig. 2.

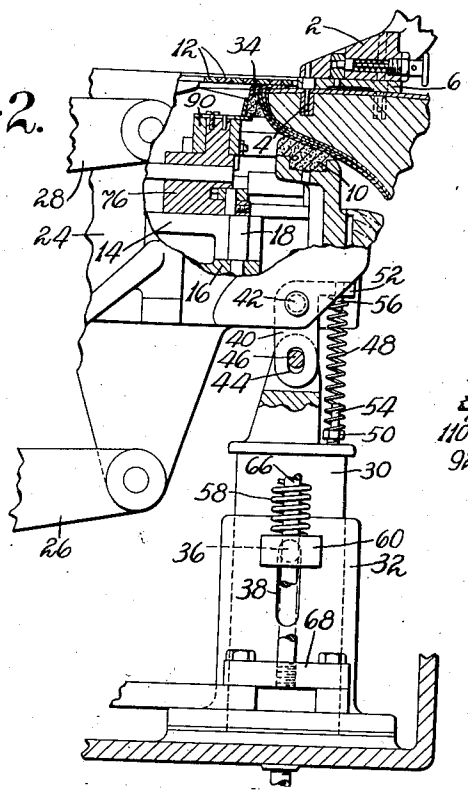
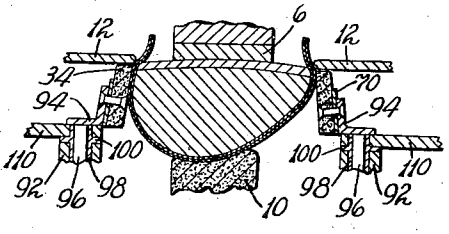


Fig. 3.



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Aug. 1, 1944. B. JORGENSEN 2,354,685

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Filed Jan. 16, 1943 2 Sheets-Sheet 2

Fig. 4.

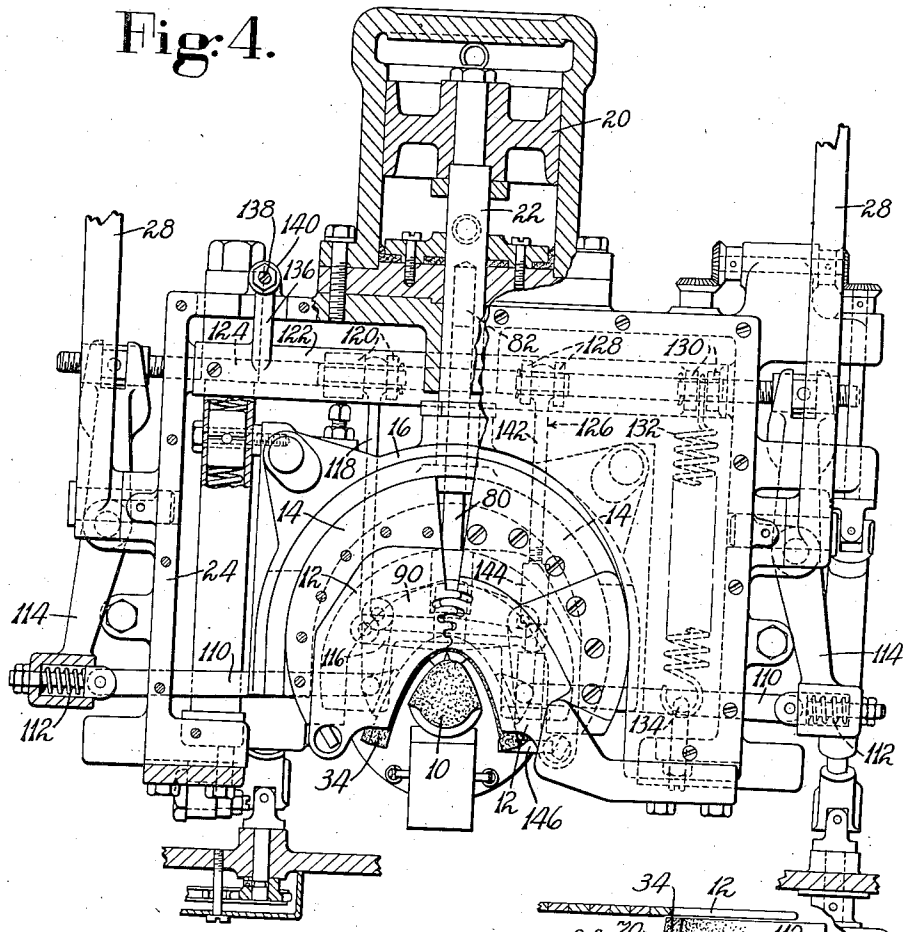


Fig. 5.

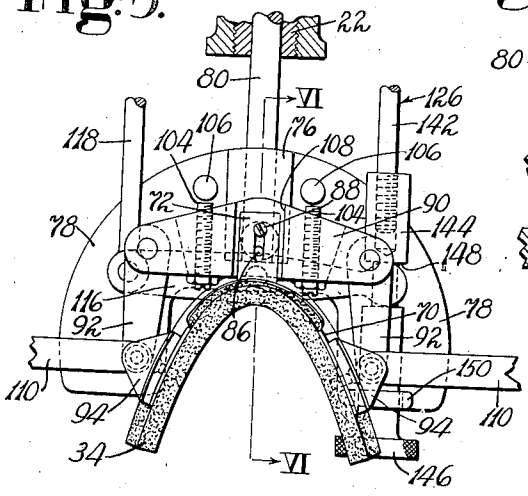
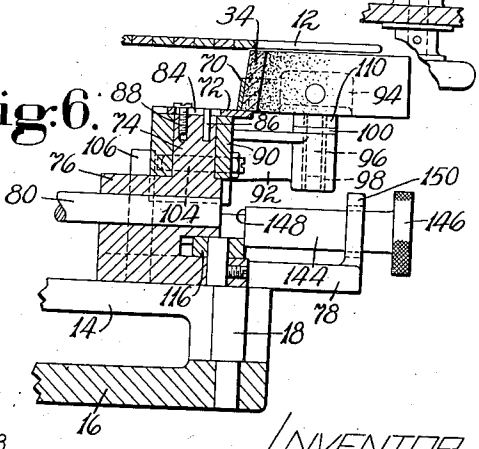


Fig. 6.



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UNITED STATES PATENT OFFICE

2,354,685

LASTING MACHINE

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Application January 16, 1943, Serial No. 472,557

8 Claims. (Cl. 12—14)

This invention relates to lasting machines, and is herein illustrated as applied to a machine constructed generally as disclosed in United States Letters Patent No. 2,324,509, granted on July 20, 1943, on an application of mine, which machine it is an object of the invention to improve in certain respects. It is to be understood, however, that the invention is not limited in its applicability to that particular machine.

In the machine shown in the above-mentioned Letters Patent a last having an upper and an insole thereon is positioned bottom upward by means adjustable in directions heightwise of the last to determine variably in that respect the position of the last. The margin of the upper about the toe end of the last is wiped inwardly over the insole by wipers carried by a wiper support which is moved upwardly to bring them into position for thus operating on the upper, and associated with the wipers on the wiper support is a substantially U-shaped flexible toe former arranged to embrace the upper around the toe end of the last and to wipe it heightwise of the last in response to the upward movement of the support. The wiper support is thus moved upwardly by fluid-operated means, and its upward movement is limited by stop mechanism which thereafter confines the wipers to movements in a plane in wiping the margin of the upper inwardly over the insole.

The construction above described has been used with very good results under various conditions. An object of this invention, however, is to obtain still better results, especially when the bottom of the toe end of the last has a pronounced convex curvature. For the purpose in view the construction herein shown is such that after the wiper support has been moved upwardly to carry the wipers into position for wiping the margin of the upper inwardly over the insole, it is free to move still farther upwardly against the resistance of gravity alone in response to pressure of the margin of the upper on the wipers in the overwiping operation. This permits the wipers in their inward movements to follow the convex curvature of the bottom of the last without increase of pressure on the margin of the upper, and accordingly permits the machine to be so adjusted that the wipers apply to the upper at the extreme edge of the shoe bottom greater wiping pressure than would otherwise be practicable. It also prevents the wipers from acting with too much force on the gathered margin of the upper at a distance from the edge of the shoe bottom, especially if the upper is comparatively thick. Freedom for such further upward movement of the wiper support is afforded, in the construction shown, by pin-and-slot connections between it and members which are moved upwardly by fluid-operated pistons to raise the support prior to the overwiping operation of the wipers. Since the weight of the wiper support and of the parts thereon is substantial and might cause the wipers in some instances to apply too much pressure to the margin of the upper in wiping it inwardly, springs are provided for partially counterbalancing this weight, the springs being supported by the fluid-operated pistons.

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

In the drawings,

Fig. 1 is a view in front elevation of a portion of the machine shown in the previously mentioned Letters Patent as modified for purposes of the present invention, a portion of the structure being broken away;

Fig. 2 is a view partly in right-hand side elevation and partly in section of the structure shown in Fig. 1, with the parts in the positions which they occupy when the wipers are at the ends of their inward wiping movements over the insole.

Fig. 3 is a view in vertical section widthwise of the shoe illustrating the relation of the wipers to the shoe as they begin to wipe the margin of the upper inwardly over the insole;

Fig. 4 is a plan view, with parts broken away, showing the wipers and the toe former and portions of their operating and controlling mechanisms;

Fig. 5 is a plan view of the toe former and of a portion of its controlling mechanism on a larger scale than Fig. 4; and

Fig. 6 is a section on the line VI—VI of Fig. 5, showing also one of the wipers.

As in the machine shown and described in the previously mentioned Letters Patent, the construction herein shown includes a shoe-positioning device 2 against which the shoe is presented by the operator bottom upward, this device being provided with a plurality of pins 4 arranged to extend through holes in the toe end of the insole into holes in the bottom of the last and with a plate 6 arranged to engage the bottom face of the insole to determine the position of the shoe heightwise in the lasting operation. The shoe-positioning device 2 is adjustable vertically along guideways 8 in the frame of the machine to vary

as desired the height at which the bottom of the toe end of the shoe is positioned. Immediately after the starting of the power operation of the machine the shoe is clamped against the plate 6 by an upwardly movable toe rest 10 which thereafter supports it against downward movement during the lasting operation.

For wiping the margin of the upper about the toe end of the last inwardly over the insole there are provided wipers 12 secured to wiper holders 14 (Fig. 4) which are mounted for swinging movements along guideways on a wiper carrier 16 about the axis of a pin 18 (Fig. 6) on the carrier to close the wipers inwardly over the shoe bottom widthwise of the shoe as the wiper carrier is operated to advance them lengthwise of the shoe. Such operative movement is imparted to the wiper carrier by a fluid-operated piston 20 connected to the carrier by a piston rod 22. Wiper-closing movements are imparted to the wiper holders 14 in response to the movement of the wiper carrier lengthwise of the shoe by mechanism not herein shown in detail but fully disclosed in the previously mentioned Letters Patent. The wiper carrier 16 and its operating means are supported by a casting 24, which may be termed a wiper support, and this casting is supported on parallel links 26 and 28 for upward and downward movements. It is moved upwardly to carry the wipers 12 into position for wiping the margin of the upper inwardly over the insole by a pair of fluid-operated pistons 30 vertically movable in cylinders 32 secured to a portion of the frame of the machine, and in response to such upward movement of the casting 24 a substantially U-shaped flexible toe former 34, supported by the casting as hereinafter described, wipes the upper around the toe end of the last heightwise of the last preparatory to the wiping of its margin inwardly over the insole by the wipers 12. As thus far described the construction herein shown is substantially like that disclosed in the previously mentioned Letters Patent.

The upward movement of the wiper-supporting casting 24 has been limited heretofore by stops into engagement with which it was carried, and accordingly the wipers 12 have been confined to movements in a plane in wiping the margin of the upper inwardly over the insole. For purposes of this invention such stops are dispensed with and stop mechanism is provided instead for limiting directly the upward movements of the pistons 30. This stop mechanism comprises a pin 36 carried by each piston and extending through slots 38 in the corresponding cylinder 32, the pin being arranged to engage the cylinder at the upper ends of the slots to stop the upward movement of the piston. The pistons 30 are connected to the wiper-supporting casting 24 by links 40 pivotally mounted on pins 42 in the casting and provided at their lower ends with slots 44 (Fig. 2) through which extend pins 46 mounted in upward extensions of the pistons. During the upward movements of the pistons 30 the pins 46 engage the links at the upper ends of the slots 44 for raising the casting 24 and the wipers to the position determined by engagement of the pins 36 with the cylinders 32 at the upper ends of the slots 38. The wipers are thus moved upwardly into position for wiping the margin of the upper inwardly over the insole, the proper relation between the wipers and the shoe when the wipers are in this position being determined by vertical adjustment of the shoe-positioning device 2. When the wipers are thereafter operated to wipe the margin of the upper inwardly over the insole the casting 24 and the parts supported thereon are free to move farther upwardly against the resistance of gravity in response to pressure of the margin of the upper on the wipers by reason of the slots 44 in the links 40, as illustrated in Fig. 2. This permits the wipers to follow the convex curvature of the bottom of the toe end of the last, when the last has such a curvature, and therefore permits the shoe-positioning device 2 to be so adjusted as to cause the wipers to apply greater pressure to the upper as they begin to wipe it inwardly over the extreme edge of the insole (Fig. 3) than would be possible if the wipers were confined to movements in a plane. Since the casting 24 and the parts thereon are thus upwardly movable against the resistance of gravity alone, there is no increase of pressure of the wipers on the upper during their inward movements by reason of the curvature of the bottom of the last. The provision for upward movement of the wipers also prevents them from acting too severely on the portions of the margin of the upper around the end of the toe where gathers or folds are most likely to form in the overwiping operation. Since the weight of the casting 24 and the parts thereon is substantial, the machine is further provided with means for partially counterbalancing this weight, in order to prevent the wipers, in operating on some kinds of upper materials, from applying too much pressure to the margin of the upper. This means comprises springs 48 seated on the heads of screws 50 which are threaded in the pistons 30 and bearing at their upper ends on lugs 52 extending forwardly from the upper ends of the links 40. The springs are held in place by pins 54 extending upwardly from the screws 50 and by pins 56 extending downwardly from the lugs 52. Associated also with the pistons 30 are springs 58 which are compressed by the upward movements of the pistons and act through the pistons on the casting 24 to increase the downward pressure of the wipers on the overwiped margin of the upper when the pistons are released from the pressure of the operating fluid in the cylinders 32, as they are at a predetermined time in the operation of the machine. The springs 58 are seated at their lower ends on enlarged end portions 60 of the pins 36, and bear at their upper ends on washers 62 confined by nuts 64 on rods 66 which extend downwardly through the springs and through openings in the end portions 60, the rods being threaded at their lower ends in bars 68 secured in fixed relation to the cylinders 32.

The substantially U-shaped flexible toe former 34, previously referred to as also movable upwardly by the wiper-supporting casting 24 to wipe the upper heightwise of the last, preferably comprises a band of molded hard leather to the outer face of which is riveted a thin steel plate 70 (Figs. 5 and 6). Underlying this plate and the intermediate portion of the leather band is a small plate 72 mounted on the upper end of a stud 74 which extends upwardly from a block 76 resting on plane upper faces of the wiper holders 14. The block is provided with flanges 78 extending laterally and forwardly therefrom and also resting on the upper faces of the wiper holders, and it may be moved along these faces with the toe former in directions lengthwise of the shoe, as hereinafter described. In such movements the block is guided by means of a rod 80 which is fast therein and is slidingly

movable in a bore 82 (Fig. 4) in the piston rod 22. The plate 72 has a slot 84 therein through which extend a pin 86 and a screw 88 mounted in the stud 74, the head of the screw being arranged to hold the plate in proper adjusted relation to the stud. It will be evident that the plate 72, on which the intermediate portion of the toe former rests, permits that portion of the toe former to be moved relatively to its supporting block 76 in any direction in a plane parallel to the wipers 12.

Pivotally mounted midway between its opposite ends on the stud 74 is a crossbar 90, and pivotally connected to the ends of this crossbar are forwardly extending links 92 pivotally connected at their front ends to angular members 94 secured to the portions of the toe former which are opposite the sides of the toe end of the shoe. The pivotal connections between the links 92 and the members 94 comprise pins 96 (Figs. 3 and 6) extending downwardly from the members into bushings 98 in the links, the bushings having between their upper and lower ends flanges 100 which rest on the tops of the links. The crossbar 90 is free to swing about the stud 74 to permit the toe former, in response to pressure of the shoe thereon, to adjust itself angularly to the toe end of the shoe. Such swinging movements of the crossbar are adjustably limited by screws 104 which are threaded therein and are arranged to engage pins 106 extending upwardly from the flanges 78 of the block 76. The plate 72 lies in a slot 108 (Fig. 5) in the crossbar 90 which is wider than the plate to permit the swinging movements of the crossbar.

Also pivotally connected to the members 94 are links 110 arranged to extend laterally of the shoe, the inner ends of these links being mounted on the bushings 98 as illustrated in Fig. 6. The outer ends of the links 110 are controlled by springs 112 mounted in sockets in the front ends of levers 114, as in the construction shown in the previously mentioned Letters Patent. The springs 112 are yieldable to permit the portions of the toe former at the sides of the toe to be forced somewhat apart by the pressure of the shoe thereon in the upwiping operation. The levers 114, which correspond to the levers 496 shown in the above-mentioned Letters Patent, are adjustable by means not herein fully shown but disclosed in detail in said Letters Patent to adjust the portions of the toe former at the sides of the toe toward or from each other for shoes of different widths, the adjusting means including an adjusting member accessible to the operator at the front of the machine.

Also pivotally mounted midway between its ends on the block 76, in the construction herein shown, is another crossbar 116 through which the block is controlled. Pivotally connected to the left-hand end of this crossbar is a rearwardly extending link 118 the rear end of which is pivotally connected, similarly to a corresponding link shown in the above-mentioned Letters Patent, to the lower bifurcated end of an arm 120 extending downwardly from a sleeve 122 which is fast on a rockshaft 124 mounted to turn in bearings in the casting 24. The right-hand end of the crossbar 116 is connected by a link 126, constructed as hereinafter described, to the lower bifurcated end of an arm 128 also extending downwardly from the sleeve 122. Connected to the lower bifurcated end of a third arm 130 extending downwardly from the sleeve is a spring 132 anchored at its front end to a hook 134 on the casting 24 and tending to turn the sleeve 122 and the rockshaft in the direction to impart forward movement to the block 76 and the toe former. An arm 136 integral with the sleeve 122 carries a screw 138 arranged to engage a lug 140 on the casting 24 to limit any forward movement imparted to the toe former by the spring 132. The toe former is forced somewhat rearwardly against the resistance of this spring by pressure of the shoe thereon in the upwiping operation, the block 76 moving with it along the supporting faces on the wiper holders 14. In this manner the toe former is caused to apply adequate pressure to the upper opposite the toe-end face of the last.

In the use of the machine the necessity sometimes arises for adjusting the toe former bodily in a direction lengthwise of the shoe, so that its intermediate portion will apply the desired pressure to the toe-end face of the upper. Such an adjustment may be required, for example, if the portions of the toe former at the sides of the toe are adjusted toward or from each other through the levers 114 and the links 110, since that adjustment tends to alter the position lengthwise of the shoe of the intermediate portion of the toe former. Since the previously mentioned limiting screw 138 is not conveniently accessible to the operator for purposes of adjustment, the construction herein shown provides means whereby the operator may readily adjust the toe former at any time in direction lengthwise of the shoe while in his working position at the front of the machine. For this purpose the previously mentioned link 126 connecting the arm 128 to the right-hand end of the crossbar 116 comprises a rod 142 connected at its rear end to the arm 128 and threaded at its front end in a rod 144 of larger diameter the front end of which is so formed as to provide a hand wheel 146 for turning it. The rod 144 has therein an annular recess 148 in which lies the rounded right-hand end of the crossbar 116, as shown in Figs. 5 and 6. To hold the rod in proper relation to the crossbar one of the flanges 78 of the block 76 has an upwardly extending lug 150 through an opening in which the rod extends. It will be evident that turning of the rod 144 serves to lengthen or shorten the link 126 and thereby to cause the crossbar 116, swinging about its pivotal connection with the link 118, to move the block 76 and the toe former 34 connected to the block by the crossbar 90 and the links 92 lengthwise of the shoe and thus to position the intermediate portion of the toe former in the desired relation to the toe-end face of the shoe.

Novel features of the means above described for controlling and adjusting the toe former are claimed in a divisional application, Serial No. 507,842, filed on October 27, 1943.

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, the combination with means for positioning bottom upward a last having an upper and an insole thereon, of wipers movable to wipe the margin of the upper about an end of the last inwardly over the insole, a support for said wipers, and means movable to raise said wiper support to carry the wipers upwardly into position for thus operating on the upper, the wiper support being free to move thereafter farther upwardly against the resistance of gravity alone in response to pressure of the upper on the wipers as they are moved inwardly

over the insole while said means for raising the support remains stationary.

2. In a lasting machine, the combination with means for positioning bottom upward a last having an upper and an insole thereon, of wipers movable to wipe the margin of the upper about an end of the last inwardly over the insole, a support for said wipers, and power-operated means having automatically limited movement to raise said wiper support to carry the wipers upwardly into position for thus operating on the upper, the wiper support being free to move thereafter farther upwardly against the resistance of gravity alone in response to pressure of the upper on the wipers as they are moved inwardly over the insole while said power-operated means is at the limit of its movement.

3. In a lasting machine, the combination with means for positioning bottom upward a last having an upper and an insole thereon, of wipers movable to wipe the margin of the upper about an end of the last inwardly over the insole, a support for said wipers, operating means movable to raise said wiper support to carry the wipers upwardly into position for thus operating on the upper, and connections between said operating means and the wiper support for thus raising it, said connections including members constructed and arranged for free relative movement to permit the wiper support further to be raised against the resistance of gravity alone in response to pressure of the upper on the wipers as they are moved inwardly over the insole while said operating means is stationary.

4. In a lasting machine, the combination with means for positioning bottom upward a last having an upper and an insole thereon, of wipers movable to wipe the margin of the upper about an end of the last inwardly over the insole, a support for said wipers, means movable to raise said wiper support to carry the wipers upwardly into position for thus operating on the upper, the wiper support being movable thereafter farther upwardly against the resistance of gravity in response to pressure of the upper on the wipers as they are moved inwardly over the insole while said means for raising the support remains stationary, and means for partially counterbalancing the weight of said wiper support.

5. In a lasting machine, the combination with means for positioning bottom upward a last having an upper and an insole thereon, of wipers movable to wipe the margin of the upper about an end of the last inwardly over the insole, a support for said wipers, fluid-operated means movable to raise said wiper support to carry the wipers upwardly into position for thus operating on the upper, stop mechanism for limiting the movement of said fluid-operated means, and connections between the fluid-operated means and the wiper support for thus raising it, said connections being constructed and arranged to permit the wiper support further to be raised in response to pressure of the upper on the wipers as they are moved inwardly over the insole while said fluid-operated means is stationary.

6. In a lasting machine, the combination with means for positioning bottom upward a last having an upper and an insole thereon, of wipers movable to wipe the margin of the upper about an end of the last inwardly over the insole, a support for said wipers, fluid-operated means movable to raise said wiper support to carry the wipers upwardly into position for thus operating on the upper, the wiper support being movable thereafter farther upwardly against the resistance of gravity in response to pressure of the upper on the wipers as they are moved inwardly over the insole while said fluid-operated means is stationary, and spring means carried by said fluid-operated means for partially counterbalancing the weight of the wiper support.

7. In a lasting machine, the combination with means for positioning bottom upward a last having an upper and an insole thereon, of wipers movable to wipe the margin of the upper about an end of the last inwardly over the insole, a support for said wipers, fluid-operated members movable to raise said wiper support to carry the wipers upwardly into position for thus operating on the upper, and connections between said fluid-operated members and the wiper support comprising links having slots therein to permit the wiper support further to be raised in response to pressure of the upper on the wipers as they are moved inwardly over the insole while said members are stationary.

8. In a lasting machine, the combination with means for positioning bottom upward a last having an upper and an insole thereon, of wipers movable to wipe the margin of the upper about an end of the last inwardly over the insole, a support for said wipers, fluid-operated members movable to raise said wiper support to carry the wipers upwardly into position for thus operating on the upper, connections between said members and the wiper support for thus raising it, said connections being constructed and arranged to permit the wiper support further to be raised against the resistance of gravity in response to pressure of the upper on the wipers as they are moved inwardly over the insole while said members are stationary, and springs carried by said fluid-operated members for partially counterbalancing the weight of the wiper support.

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