July 31, 1945. P. E. BURBY 2,380,407

LASTING MACHINE

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Fig. 1.

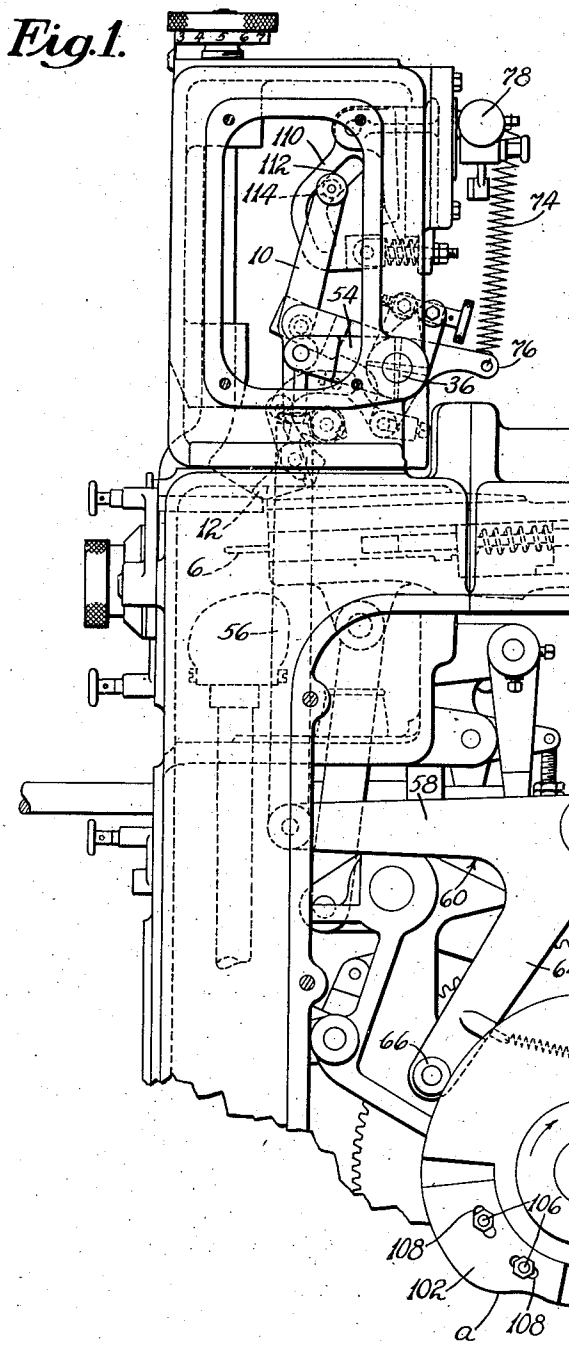
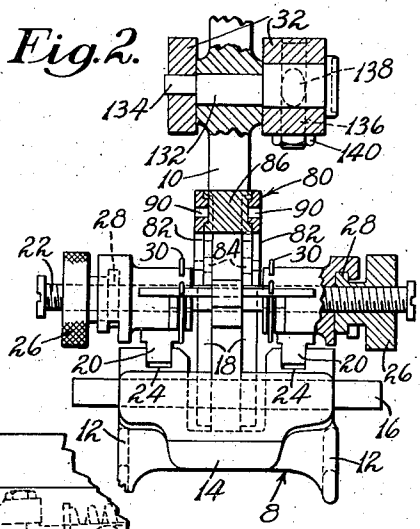


Fig. 2.



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Fig. 3.

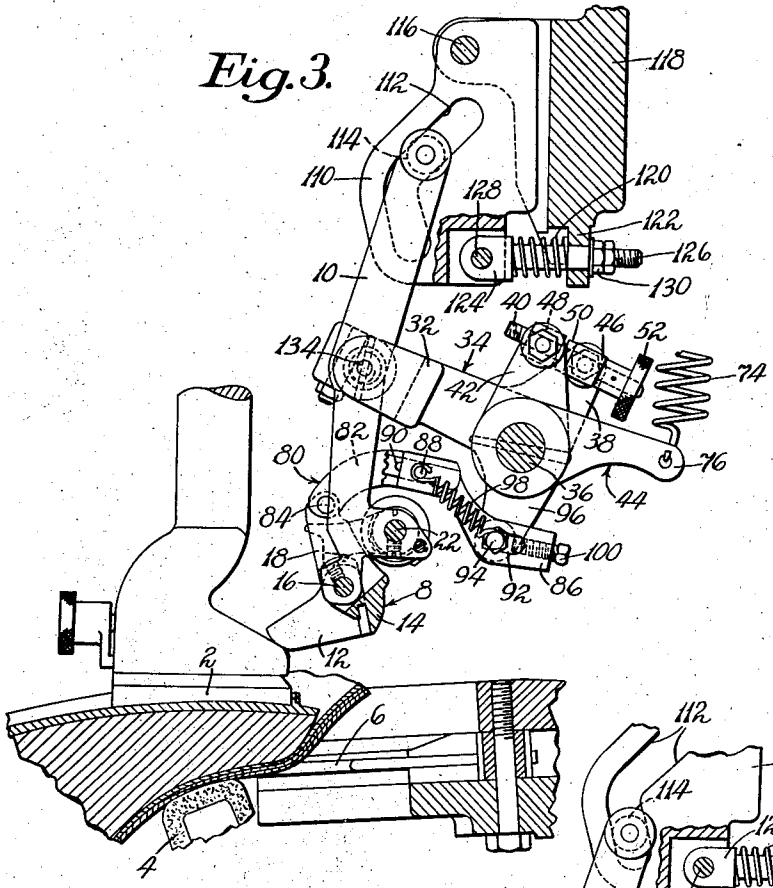
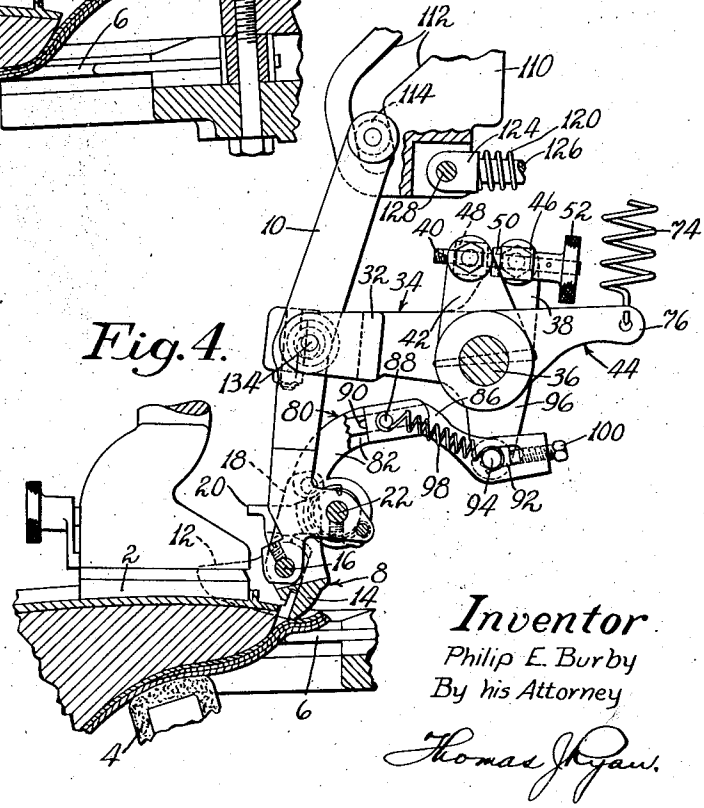


Fig. 4.



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Fig. 5.

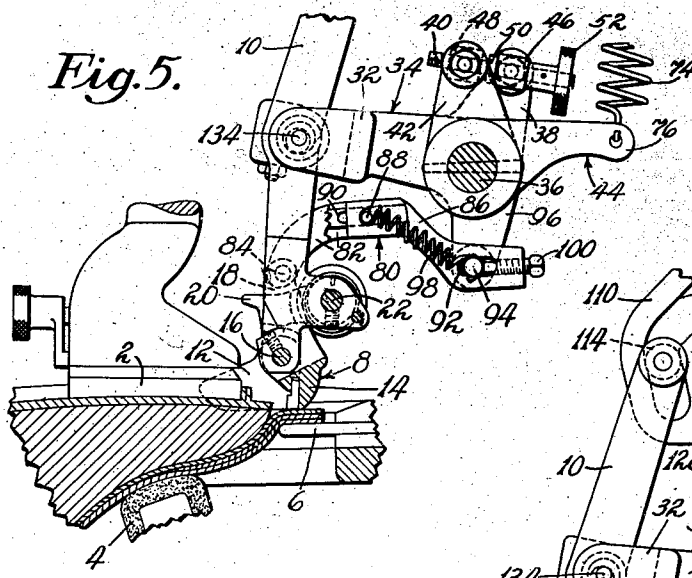


Fig. 6.

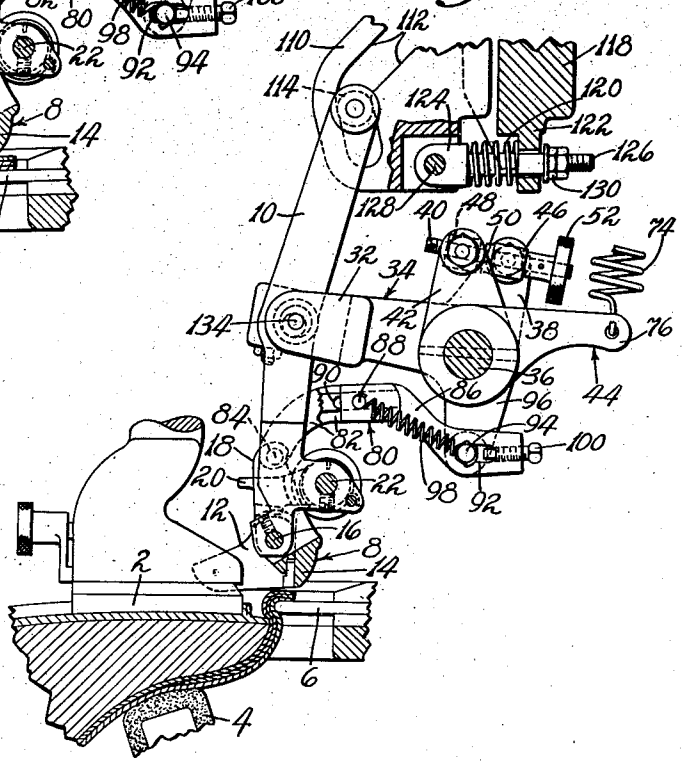
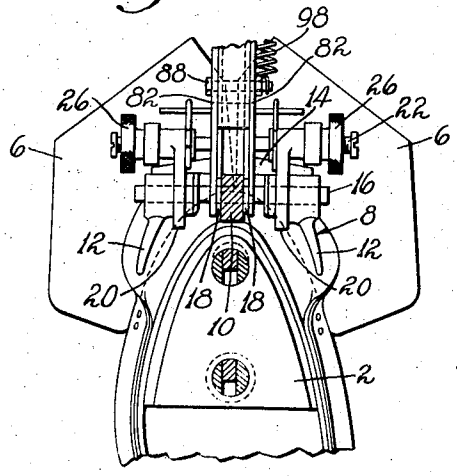


Fig. 7.



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Patented July 31, 1945 2,380,407

UNITED STATES PATENT OFFICE

2,380,407

LASTING MACHINE

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Application July 6, 1944, Serial No. 543,691

25 Claims. (Cl. 12—14)

This invention relates to lasting machines, and is herein illustrated as applied to a power-operated toe-lasting machine constructed generally as disclosed in United States Letters Patent No. 2,160,846, granted on June 6, 1939 on an application of F. C. Eastman and A. F. Pym, but modified in certain respects in accordance with the disclosure of United States Letters Patent No. 2,371,146, granted on March 13, 1945 on an application of mine. It is to be understood, however, that the invention is not limited to machine organizations of that particular character.

The machine shown in the above-mentioned Letters Patent No. 2,160,846 is provided with wipers which are swung about an axis extending widthwise of the last to wipe the toe-end portion of the upper heightwise of the last and are then operated to wipe the marginal portion of the upper inwardly over an insole on the last, and also with grippers which apply a pull to the toe end of the upper and control it during the greater portion of the wiping operations of the wipers. In accordance with the disclosure of Letters Patent No. 2,371,146 there was substituted for such grippers a device having the function of what is commonly known as a retarder, the device being arranged to clamp the marginal portion of the upper outspread on the wipers at the end and the sides of the toe and to cooperate with them in applying a pull to the upper while preventing the formation of any objectionable wrinkles in the upper in the course of the toe-lasting operation. Since a shoe prior to the toe-lasting operation is commonly lasted at the sides of the forepart beyond the toe portion, and since the margin of the upper may, therefore, be more readily outspread and clamped on the toe wipers at the end of the toe than at the sides of the toe near the previously lasted portions when the wipers are in the positions which they occupy at the beginning of the wiping of the upper heightwise of the last (commonly known as the upwiping operation), the retarder shown in the last-mentioned Letters Patent was mounted to tip about an axis extending widthwise of the last and was connected to mechanism for thus tipping it into position to clamp the upper on the wipers first at the end of the toe and for thereafter progressively tipping it in the reverse direction in the course of the upwiping operation to bring it into position to clamp the upper on the wipers also at the sides of the toe.

The present invention, in accordance with one of its features, provides a construction such that the retarder assumes a position for clamping the upper on the wipers at the sides of the toe earlier in the upwiping operation than in the construction above described, thus increasing its effectiveness on the upper in those locations. As herein illustrated, an arm and a link which cooperate to tip the retarder into position to clamp the upper on the wipers first at the end of the toe have a lost-motion connection between them by reason of which the retarder is permitted to tip reversely early in the upwiping operation in response to pressure of the upper thereon and is permitted thereafter to maintain a position parallel to the wipers during their further upwiping movements.

In accordance with another feature, the invention provides novel means for moving the retarder outwardly over the wipers in wiping engagement with the margin of the upper in the course of the upwiping operation to insure that the upper will be smoothly and tightly outspread on the wipers. In the construction shown the retarder is mounted on a bar which extends heightwise of the last and is movable bodily with the retarder by the wipers in the upwiping operation, and in response to that movement of the bar it is swung lengthwise of the last by a cam to impart the outward wiping movement to the retarder. The cam serves also to guide the retarder into proper relation to the last and the wipers in its movement into upper-clamping position. To cause the retarder to release the margin of the upper after the wipers begin their movements to wipe it inwardly over the insole the bar supporting the retarder is moved farther heightwise of the last while still under the influence of the above-mentioned cam, and the retarder, moreover, is tipped relatively to the bar about an axis extending widthwise of the last, as in the construction shown in Letters Patent No. 2,371,146, to release the upper first at the end of the toe while continuing the pressure thereon longer at the sides of the toe. To avoid any tendency for the parts to cramp at this time the cam is so mounted and controlled as to permit it to move yieldingly in response to resistance of the upper at the sides of the toe to the tipping of the retarder.

The above and other features of the invention, including also novel means for variably timing the movements of the retarder toward and from upper-clamping position and various novel details of construction and combinations of parts, will now be more particularly described with reference to the accompanying drawings and thereafter pointed out in the claims.

In the drawings,

Fig. 1 is a view in right-hand side elevation of a portion of the machine in which the invention is herein illustrated as embodied;

Fig. 2 is a view mainly in rear elevation of the retarder and parts closely associated therewith;

Fig. 3 is a view partly in right-hand side elevation and partly in section, showing the parts in the positions which they occupy prior to the beginning of the movements of the wipers and the retarder;

Figs. 4, 5 and 6 are views similar to Fig. 3, illustrating the positions of the parts at different times in the course of the operation of the machine; and

Fig. 7 is mainly a plan view showing the parts in the same positions as in Fig. 5.

In view of the disclosures in the above-mentioned Letters Patent, only such portions of the machine will be herein described as it is necessary to refer to for an understanding of the invention. The position of the shoe, herein shown as one of the welt type, is determined by engagement of a member 2 with the bottom face of the toe end of the insole and with the inner face of the lip of the insole at the end and the sides of the toe. The shoe is clamped against this member by a toe rest 4 which is moved upwardly into clamping position, as illustrated in Fig. 3, substantially at the beginning of the cycle of power operations of the machine. For lasting the toe end of the shoe there are provided wipers 6 which are advanced and closed to embrace the upper about the toe end of the last and are swung upwardly about an axis extending widthwise of the last to wipe the upper heightwise of the last. Thereafter the wipers are further advanced and closed to wipe the marginal portion of the upper inwardly over the feather and against the lip of the insole, the lip being supported against the inward pressure of the wipers by the member 2.

As in the machine shown in the previously mentioned Letters Patent No. 2,371,146, the grippers disclosed in Letters Patent No. 2,160,846 for applying a pull to the toe end of the upper and for controlling it in the toe-lasting operation are dispensed with, and instead there is provided a retarder 8 arranged to clamp the marginal portion of the toe end of the upper outspread on the wipers and to control the upper in the course of the wiping movements of the wipers. This retarder is supported on the lower end of a bar 10 extending heightwise of the last and hereinafter more particularly referred to, and is constructed substantially as disclosed in Letters Patent No. 2,371,146. Briefly, it comprises a pair of upper-clamping members 12 each arranged to engage the upper along one side and part way around the end of the toe, and a central upper-clamping member 14 arranged to bridge any space between the two members 12 at the end of the toe. The two members 12 are mounted on a rod 16 for adjustment toward or from each other in directions widthwise of the shoe, this rod being secured to the lower end of the bar 10. The central member 14 is provided at the opposite sides of the bar 10 with a pair of ears 18 whereby it also is mounted on the rod 16, and it is arranged to overlap and engage flat faces on the two members 12 so that all three members are held in fixed relation to one another for movement as a unit about the rod 16. For adjusting the two members 12 toward or from each other there are provided two latch members 20 slidingly mounted on a rod 22 secured to the bar 10, these latch members being arranged to extend into grooves 24 (Fig. 2) formed in portions of the members 12 which are located above the rod 16. Threaded on the opposite end portions of the rod 22 are nuts 26 each provided with a flange 28 arranged to lie in a groove formed in the hub of the latch member 20 associated therewith. The latch members are normally held in the grooves 24 by springs 30, but may be swung against the resistance of the springs to release the members 12 and permit the latter to be removed from the rod 16 if desired. It will be evident that the members 12 may be adjusted each independently of the other along the rod 16 by the nuts 26.

The bar 10 which supports the retarder 8 is pivotally supported substantially midway between its lower and upper ends, by means more particularly hereinafter described, on one arm 32 of a three-armed lever 34 loosely mounted on a rockshaft 36 supported in bearings on the frame of the machine. Another arm 38 of the lever 34 is connected by a spindle 40 to one arm 42 of a two-armed lever 44 which in the construction herein shown is fast on the rockshaft 36. The spindle 40 is mounted to turn in a trunnion block 46 pivotally mounted on the arm 38 and is threaded in another trunnion block 48 pivotally mounted on the arm 42. By means of a collar 50 and a hand wheel 52 engaging the trunnion block 46 on its opposite sides the spindle is prevented from moving lengthwise relatively to this block, and accordingly turning movement thereof serves to adjust the arm 32 and the bar 10 either in a downward or an upward direction to vary the initial position of the retarder 8 heightwise of the shoe. Fast on one end of the rockshaft 36 (Fig. 1) is an arm 54 connected by a downwardly extending link 56 to one arm 58 of a bell-crank lever 60 mounted to turn about a shaft 62. The other arm 64 of this bell-crank lever is provided with a roll 66 in engagement with the periphery of a cam 68 fast on the main cam shaft 70 of the machine. A spring 72 connected to the arm 64 tends to swing the bell-crank lever 60 in a counterclockwise direction (Fig. 1) and holds the roll 66 normally against the cam. At the proper time in the operation of the machine a drop *a* on the cam 68 permits the spring 72 to swing the lever 60 in the direction to impart downward movement through the rockshaft 36 and the arm 32 to the bar 10 and the retarder 8 and thus to move the retarder into position to clamp the margin of the upper outspread on the wipers 6 (Fig. 4). In this operation the spring 72 is assisted by another spring 74 (Figs. 1 and 3) connected at its lower end to the second arm 76 of the two-armed lever 44 and at its upper end to a lever 78 which is used adjustably to vary the tension of the spring 74 and corresponds to the lever 54 shown in United States Letters Patent No. 2,354,663, granted on August 1, 1944 on an application of mine. It will thus be seen that the upper is clamped on the wipers by the combined forces of the two springs 72 and 74 and that the clamping pressure may be varied by adjusting the tension of the spring 74.

Mechanism similar in many respects to that disclosed in Letters Patent No. 2,371,146, but different in other respects, is provided for controlling the retarder as to movement about the rod 16 and for tipping it about the rod in the course of its downward movement toward the wipers to cause it to clamp the upper on the wipers first at the end of the toe. This mechanism comprises a link 80 which has a pair of arms 82 (Figs. 2 and 7) spaced apart widthwise

of the shoe and pivotally connected at their forward ends by pins 84 to upwardly extending portions of the previously mentioned ears 18 on the central retarder member 14. These two arms 82 are secured near their rear ends to the opposite sides of another rearwardly extending arm 86 by a bolt 88 extending through slots 90 in the arms 82 to permit the effective length of the link 80 to be varied. In the construction herein shown the arm 86, which serves as the rear portion of the link 80, is provided with a slot 92 through which extends a stud 94 threaded in a third arm 96 of the three-armed lever 34. A head on this stud overlaps the arm 86 to maintain it in assembled relation to the arm 96. Connected to the bolt 88 and to the stud 94 is a comparatively light spring 98 which through its action on the link 80 tends to turn the retarder 8 in a clockwise direction (Fig. 3) about the rod 16 and holds the link normally in a position in which the stud 94 is at the forward end of the slot 92, as illustrated in Fig. 3. When the rockshaft 36 is turned as above described to move the retarder downwardly toward the wipers, the arm 96 acts through the spring 98 on the link 80 to tip the retarder about the rod 16 into position to cause it to clamp the upper on the wipers first at the end of the toe, as illustrated in Fig. 4, the stud 94 still remaining at the forward end of the slot 92.

After the upper has been clamped on the wipers at the end of the toe as above described, the wipers in their upwiping movements serve to lift the retarder and the bar 10, causing the rockshaft 36 to turn in the reverse direction, i. e., in a clockwise direction with reference to Fig. 4, against the resistance of the springs 72 and 74. By reason of this turning movement of the rockshaft the arm 96 acts through the stud 94 to move the link 80 toward the left (Fig. 4) to tip the retarder in a counterclockwise direction about the rod 16, thereby causing the upper-clamping face of the retarder to approach a position parallel to the plane of the wipers. Shortly after the beginning of this tipping movement of the retarder the pressure of the upper thereon becomes effective further to tip it quickly in the same direction, because of the fact that the upper-engaging portion of the retarder at the end of the toe becomes farther offset laterally from the axis of the rod 16. This further movement of the retarder by the upper is permitted by the slot 92 and is effected against the resistance of the light spring 98, the link 80 assuming a position in which the stud 94 is spaced from the forward end of the slot, as shown in Fig. 5. In this manner the retarder is caused to assume a position parallel to the wipers, so as to clamp the upper at the sides as well as at the end of the toe, earlier in the upwiping movement of the wipers than in the construction shown in the previously mentioned Letters Patent No. 2,371,146. Threaded in the rear end of the arm 86 of the link 80 is a stop screw 100 arranged to engage the side of the stud 94 and thus to limit the lost motion between the link and the arm 96. By adjustment of this screw, therefore, the time in the upwiping operation when the retarder assumes a position parallel to the wipers may be varied in accordance with the character or condition of the work. It will be evident that during the further upward swinging movement of the wipers after the retarder has effectively clamped the upper at the sides of the toe, the retarder will maintain its parallel relation to the wipers by reason of the opportunity afforded by the slot 92 for the link 80 to move in the reverse direction relatively to the arm 96. By the time the wipers have completed their upward movement the stud 94 is again in a position substantially at the forward end of the slot 92. If desired, the stop screw 100 may be so adjusted as to eliminate any lost motion between the link 80 and the arm 96, so that the retarder will be fully controlled by the arm 96 as to tipping movement about the rod 16, in accordance with the manner of operation disclosed in the last-mentioned Letters Patent.

Shortly after the wipers begin their movements to wipe the marginal portion of the upper inwardly over the insole a rise *b* on the cam 68 arrives in position to engage the roll 66 and to turn the rockshaft 36 still farther in a clockwise direction to lift the bar 10 and thus to carry the retarder away from the upper. In this operation the arm 96 acts through the stud 94 and the link 80 to tip the retarder in a counterclockwise direction, so that it releases the margin of the upper from pressure first at the end of the toe, as shown in Fig. 6, while continuing effective clamping pressure thereon longer at the sides of the toe. Accordingly the wipers and the retarder cooperate to exert a pull on the upper longer at the sides of the toe as its marginal portion is being wiped inwardly over the insole, which helps to guard against the formation of any objectionable wrinkles in the upper in those locations. It will be understood that continued movement of the rockshaft serves to return the parts to the positions in which they are shown in Fig. 3.

In the construction herein shown the cam 68 (Fig. 1) includes two adjustable plates 102 and 104 formed respectively to provide the previously mentioned drop *a* and the rise *b*. These plates are adjustable each independently of the other about the axis of the shaft 70 and are held in adjusted positions by clamping screws 106 extending through slots 108 in the plates. It will be understood that by adjustment of the plate 102 the time in the cycle of operations of the machine when the retarder starts to move downwardly toward the wipers may be varied, thereby varying relatively to the upwiping movements of the wipers the time when the retarder becomes effective to clamp the upper thereon. By adjusting the plate 104 the time when the retarder starts to leave the upper in the course of the overwiping movements of the wipers may be similarly varied.

Further to control the retarder with respect to movements lengthwise of the shoe, there is provided a cam block 110 having therein a cam slot 112 in which lies a roll 114 mounted on the upper end of the bar 10. The lower portion of this cam slot is inclined in such manner that during the latter portion of the downward movement of the bar and the retarder toward the wipers the bar is swung in a clockwise direction (Fig. 4) about its connection with the arm 32 and thereby moves the retarder in a heelward direction to position it properly within the pocket provided by the outwardly inclined to-end portion of the upper and close to the toe-end face of the last when it clamps the upper on the wipers. Contributing to this result also is the fact that as the retarder is moved downwardly it is tipped in a clockwise direction about the rod 16 in the manner hereinbefore described. When the retarder and the bar 10 are lifted by the wipers in the upwiping operation, the lower portion of the cam slot 112 serves to swing the bar 10 reversely and thereby to impart to the retarder a bodily

movement outwardly over the wipers in wiping engagement with the margin of the upper. This outward wiping action of the retarder on the upper supplements a similar action due to its previously described swinging movement about the rod 16, and affords increased insurance that the margin of the upper will be smoothly outspread on the wipers and will be held tight between the edges of the wipers and the last. Such outward wiping movement of the retarder as takes place after the retarder has assumed a parallel relation to the wipers does not disturb that relation because of the lost-motion connection between the link 80 and the arm 96. The upper portion of the cam slot 112 is so inclined that during the latter portion of the upward movement of the retarder in its return to starting position the bar 10 is swung in a clockwise direction to prevent interference between the link 80 and the arm 32. Consequently, during the first portion of the downward movement of the retarder toward the shoe the upper portion of the cam slot swings the bar 10 in the direction to carry the retarder toward the rear of the machine prior to the control of the bar by the lower portion of the cam slot.

To guard against cramping of the parts when the retarder is tipped as shown in Fig. 6 and starts to leave the upper at the end of the toe, the cam block 110 is pivotally mounted at its upper end on a pin 116 supported on a portion 118 of the frame of the machine and is controlled by a spring 120 against the resistance of which it may swing about the pin in response to pressure of the roll 114 on the rear wall of the lower inclined portion of the cam slot 112. The spring 120 is mounted between a downwardly extending lug 122 on the frame 118 and the forked head 124 of a rod 126 pivotally connected to the cam block by a pin 128 and extending rearwardly through an opening in the lug 122. A nut 130 on the rod determines by engagement with the lug 122 the normal position of the cam block with respect to movement about the pin 116. Since the tipping of the retarder effected by the link 80 as the bar 10 begin to move upwardly to withdraw the retarder from the upper is accelerated by any further swinging movement of the bar at this time by the cam block 110, the provision for yielding movement of the cam block prevents the retender from binding unduly on the upper at the sides of the toe by reason of its tipping movement.

The pivotal connection between the bar 10 and the arm 32 comprises an eccentric 132 (Fig. 2) on which the bar is mounted, this eccentric being formed on a pin 134 which is mounted in the forked front end of the arm 32. One of the forks of this arm carries a stud 136 having in one side thereof a curved recess 138 which engages the periphery of an enlarged portion of the pin 134, and on the lower end of this stud is threaded a nut 140 by which the stud may be moved lengthwise to secure the eccentric 132 in adjusted position. By adjusting the eccentric, after loosening the nut 140, the position of the retarder lengthwise of the shoe may be varied.

While the manner of operation of the parts described has already been explained, it will now be briefly summarized. Shortly after the starting of the power operation of the machine, after the shoe has been clamped against the member 2 by the toe rest 4, the wipers 6 are advanced and closed and are swung upwardly to bring their edges into positions for effectively wiping the upper heightwise of the last. In the course of these movements of the wipers the drop *a* on the cam 68 arrives in position opposite the roll 66 and the retarder 8 is moved downwardly toward the wipers by the action of the springs 72 and 74 on the rockshaft 36. As the retarder is thus moved downwardly it is guided into proper position relatively to the margin of the upper and the toe end of the last by the action of the cam slot 112 on the bar 10, and it is also tipped about the rod 16 by the arm 96 acting through the spring 98 on the link 80, so that it assumes a position for clamping the upper on the wipers first at the end of the toe, as shown in Fig. 4. The retarder may become effective thus to clamp the upper on the wipers substantially at the time when the wipers in their upward swinging movements arrive in positions to begin an effective upwiping action on the upper. Thereafter, during the upwiping operation, the retarder and the bar 10 are lifted by the wipers, the retarder cooperating with the wipers to apply an upward pull to the upper while its margin slips more or less inwardly over the wipers. By reason of the lifting of the bar 10 the rockshaft 36 is turned in a clockwise direction and the roll 66 is swung away from the cam 68. As the retarder begins to be lifted by the wipers from the position in which it is shown in Fig. 4, the arm 96 acts through the link 80 to tip it in the reverse direction about the rod 16, and shortly after the beginning of this tipping movement the pressure of the upper on the retarder causes it quickly to tip farther in the same direction against the resistance of the light spring 98, as permitted by the slot 92 in the link 80. The retarder thus assumes a position parallel to the wipers, so that it clamps the upper on the wipers at the sides as well as at the end of the toe, as illustrated in Fig. 5, at a time which may be not long after the beginning of the upwiping operation. Thereafter, during the rest of the upwiping operation, the retarder maintains its parallel relation to the wipers by reason of the provision afforded by the slot 92 for the link 80 to move relatively to the arm 96. During the upwiping operation, moreover, the lower portion of the cam slot 112 serves to swing the bar 10 in the direction to cause the retarder to wipe the margin of the upper outwardly over the wipers, this action supplementing the outward wiping action due to the tipping of the retarder about the rod 16. Following the upwiping operation, the wipers are further advanced and closed to wipe the marginal portion of the upper inwardly over the feather and against the lip of the insole, and shortly after the beginning of their inward movements the rise *b* on the cam 68 begins to act on the roll 66 to turn the rockshaft 36 farther in a clockwise direction and thus to lift the bar 10 and to carry the retarder away from the upper. At the same time the arm 96 acts through the link 80 to tip the retarder in a counterclockwise direction about the rod 16, causing it to release the upper from pressure first at the end of the toe while continuing the pressure longer at the sides of the toe. By reason of the resistance of the upper at the sides of the toe to the tipping of the retarder the cam block 110 may swing rearwardly against the resistance of the spring 120, as further illustrated in Fig. 6. Thereafter, by continued movement of the rockshaft 36, the retarder is returned to the starting position in which it is shown in Fig. 1 as the wipers complete their inward wiping movements.

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 movable to wipe the toe-end portion of an upper on a last heightwise of the last and then inwardly over an insole on the last, a retarder for clamping the upper on the wipers at the end and the sides of the toe, a support for said retarder on which it is mounted for tipping movements about an axis extending widthwise of the last, said support being movable heightwise of the last with the wipers, and mechanism connected to said retarder for tipping it about said axis into position to clamp the upper on the wipers first at the end of the toe, said mechanism comprising parts having a lost-motion connection between them arranged to permit the retarder to tip reversely about said axis independently of the movement of said support in response to pressure of the upper thereon in the wiping of the upper heightwise of the last and thus to permit it to adjust itself to the wipers into position to clamp the upper upon them also at the sides of the toe.

2. In a lasting machine, wipers movable to wipe the toe-end portion of an upper on a last heightwise of the last and then inwardly over an insole on the last, a retarder for clamping the upper on the wipers at the end and the sides of the toe, a support for said retarder on which it is mounted for tipping movements about an axis extending widthwise of the last, said support being movable heightwise of the last with the wipers, and mechanism connected to said retarder for tipping it about said axis into position to clamp the upper on the wipers first at the end of the toe, said mechanism being movable under control of said support to tip the retarder reversely about said axis substantially at the beginning of the wiping of the upper heightwise of the last and comprising parts having a lost-motion connection between them to permit the retarder thereafter further to tip in the same direction independently of the movement of said support in response to pressure of the upper thereon and thus to adjust itself to the wipers into position to clamp the upper upon them also at the sides of the toe.

3. In a lasting machine, wipers movable to wipe the toe-end portion of an upper on a last heightwise of the last and then inwardly over an insole on the last, a retarder for clamping the upper on the wipers at the end and the sides of the toe, a support for said retarder on which it is mounted for tipping movements about an axis extending widthwise of the last, and mechanism connected to said retarder for tipping it about said axis into position to clamp the upper on the wipers first at the end of the toe, said mechanism comprising an arm and a link having a lost-motion connection between them arranged to permit the retarder to tip reversely about said axis in response to pressure of the upper thereon in the wiping of the upper heightwise of the last and thus to permit it to adjust itself to the wipers into position to clamp the upper upon them also at the sides of the toe.

4. In a lasting machine, wipers movable to wipe the toe-end portion of an upper on a last heightwise of the last and then inwardly over an insole on the last, a retarder for clamping the upper on the wipers at the end and the sides of the toe, a support for said retarder on which it is mounted for tipping movements about an axis extending widthwise of the last, and mechanism connected to said retarder for tipping it about said axis into position to clamp the upper on the wipers first at the end of the toe, said mechanism comprising an arm and a link movable to tip the retarder reversely about said axis substantially at the beginning of the wiping of the upper heightwise of the last and having a lost-motion connection between them to permit the retarder thereafter further to tip in the same direction in response to the pressure of the upper thereon and thus to adjust itself to the wipers into position to clamp the upper upon them also at the sides of the toe.

5. In a lasting machine, wipers movable to wipe the toe-end portion of an upper on a last heightwise of the last and then inwardly over an insole on the last, a retarder for clamping the upper on the wipers at the end and the sides of the toe, a support for said retarder on which it is mounted for tipping movements about an axis extending widthwise of the last, said support being movable heightwise of the last with the wipers, and mechanism connected to said retarder for tipping it about said axis into position to clamp the upper on the wipers first at the end of the toe, said mechanism comprising parts having a lost-motion connection between them arranged to permit the retarder to tip reversely about said axis independently of the movement of said support in response to pressure of the upper thereon in the wiping of the upper heightwise of the last, and means for adjustably varying the amount of lost motion between said parts.

6. In a lasting machine, wipers movable to wipe the toe-end portion of an upper on a last heightwise of the last and then inwardly over an insole on the last, a retarder for clamping the upper on the wipers at the end and the sides of the toe, a support for said retarder on which it is mounted for tipping movements about an axis extending widthwise of the last, said support being movable heightwise of the last with the wipers, and mechanism connected to said retarder for tipping it about said axis into position to clamp the upper on the wipers first at the end of the toe, said mechanism being movable under control of said support to tip the retarder reversely about said axis substantially at the beginning of the wiping of the upper heightwise of the last and comprising parts having a lost-motion connection between them to permit the retarder thereafter further to tip in the same direction independently of the movement of said support in response to pressure of the upper thereon, and means for adjustably varying the amount of lost motion between said parts.

7. In a lasting machine, wipers movable to wipe the toe-end portion of an upper on a last heightwise of the last and then inwardly over an insole on the last, a retarder for clamping the upper on the wipers at the end and the sides of the toe, a support for said retarder movable to carry it bodily heightwise of the last toward the wipers and thereafter reversely movable with the wipers, the retarder being mounted on said support for tipping movements about an axis extending widthwise of the last, and means connected to said support and retarder for moving the support and for tipping the retarder about said axis in the course of its bodily movement toward the wipers to a position inclined relatively to the toe end of the shoe bottom to cause it to clamp the upper on the wipers first at the end of the toe, the retarder being thereafter reversely movable about said axis toward a parallel relation to the wipers independently of the reverse

movement of said support in response to pressure of the upper thereon in the wiping of the upper heightwise of the last.

8. In a lasting machine, wipers movable to wipe the toe-end portion of an upper on a last heightwise of the last and then inwardly over an insole on the last, a retarder for clamping the upper on the wipers at the end and the sides of the toe, a support for said retarder movable to carry it bodily heightwise of the last toward the wipers and thereafter reversely movable with the wipers, the retarder being mounted on said support for tipping movements about an axis extending widthwise of the last, an arm mounted to swing about an axis extending widthwise of the last and pivotally connected to said support for moving the retarder toward the wipers, and another arm movable in fixed relation to said first-named arm and connected to the retarder for tipping it in the course of its movement toward the wipers about said first-named axis to a position inclined relatively to the toe end of the shoe bottom to cause it to clamp the upper on the wipers first at the end of the toe, the retarder being thereafter reversely movable about its axis independently of said other arm in response to pressure of the upper thereon in the wiping of the upper heightwise of the last.

9. In a lasting machine, wipers movable to wipe the toe-end portion of an upper on a last heightwise of the last and then inwardly over an insole on the last, a retarder for clamping the upper on the wipers at the end and the sides of the toe, a support for said retarder movable to carry it bodily heightwise of the last toward the wipers and thereafter reversely movable with the wipers, the retarder being mounted on said support for tipping movements about an axis extending widthwise of the last, an arm mounted to swing about an axis extending widthwise of the last and pivotally connected to said support for moving the retarder toward the wipers, another arm movable in fixed relation to said first-named arm, and a link connecting said other arm to the retarder for tipping it in the course of its movement toward the wipers about said first-named axis to a position inclined relatively to the toe end of the shoe bottom to cause it to clamp the upper on the wipers first at the end of the toe, said other arm and the link having a lost-motion connection between them to permit the retarder to tip reversely about its axis independently of the reverse movement of its support in response to pressure of the upper thereon in the wiping of the upper heightwise of the last.

10. In a lasting machine, wipers movable to wipe the toe-end portion of an upper on a last heightwise of the last and then inwardly over an insole on the last, a retarder for clamping the margin of the toe end of the upper outspread on the wipers, said retarder being movable heightwise of the last toward the wipers and reversely movable thereafter by the wipers in the wiping of the upper heightwise of the last, a cam, a member having a roll engaged by said cam for controlling the movement of the retarder toward the wipers, and a spring for thus moving the retarder, said member being movable to carry the roll away from the cam in response to the reverse movement of the retarder by the wipers.

11. In a lasting machine, wipers movable to wipe the toe-end portion of an upper on a last heightwise of the last and then inwardly over an insole on the last, a retarder for clamping the margin of the toe end of the upper outspread on the wipers, a support for said retarder movable to carry it heightwise of the last toward the wipers and reversely movable thereafter with the retarder by the wipers in the wiping of the upper heightwise of the last, a cam, a lever connected to said support and having a roll engaged by said cam for controlling the movement of hte retarder toward the wipers, and a spring for thus moving the retarder, said lever being movable to carry the roll away from the cam in response to the reverse movement of said support and retarder by the wipers.

12. In a lasting machine, wipers movable to wipe the toe-end portion of an upper on a last heightwise of the last and then inwardly over an insole on the last, a retarder for clamping the margin of the toe end of the upper outspread on the wipers, a support for said retarder movable to carry it heightwise of the last toward the wipers and reversely movable thereafter with the retarder by the wipers in the wiping of the upper heightwise of the last, a rockshaft having fast thereon an arm connected to said support for controlling the latter, a cam, a lever connected to said rockshaft and having thereon a roll engaged by said cam for controlling the movement of the retarder toward the wipers, and a spring for thus moving the retarder, said lever being movable to carry the roll away from the cam in response to the reverse movement of said support and retarder by the wipers.

13. In a lasting machine, wipers movable to wipe the toe-end portion of an upper on a last into lasted position, a retarder for clamping the margin of the toe end of the upper on the wipers, a movable cam member, and a support for said retarder movable to carry it toward the wipers into upper-clamping position in a time relation to the movement of the wipers determined by said cam member, the cam member being adjustable to vary the timing of that movement of the support relatively to the movement of the wipers.

14. In a lasting machine, wipers movable to wipe the toe-end portion of an upper on a last heightwise of the last and then inwardly over an insole on the last, a retarder for clamping the margin of the toe end of the upper outspread on the wipers, a movable cam member, and a support for said retarder movable in a time relation to the movement of the wipers determined by said cam member to carry the retarder into position to clamp the upper on the wipers as it is wiped heightwise of the last, said cam member being adjustable to vary the timing of that movement of the support relatively to the movement of the wipers.

15. In a lasting machine, wipers movable to wipe the toe-end portion of an upper on a last into lasted position, a retarder for clamping the margin of the toe end of the uper on the wipers, a movable cam member, and a support for said retarder movable to carry it away from the wipers to release the margin of the upper in a time relation to the movement of the wipers determined by said cam member, the cam member being adjustable to vary the timing of that movement of the support relatively to the movement of the wipers.

16. In a lasting machine, wipers movable to wipe the toe-end portion of an upper on a last into lasted position, a retarder for clamping the margin of the toe end of the upper on the wipers, a movable cam, and a support for said retarder movable to carry it toward the wipers into upper-clamping position and away from the wipers

to release the margin of the upper at times relatively to the movement of the wipers determined by said cam, the cam having different portions thereof adjustable to vary respectively the timing of the movements of the retarder toward and from the wipers.

17. In a lasting machine, wipers movable to wipe the toe-end portion of an upper on a last heightwise of the last and then inwardly over an insole on the last, a retarder for clamping the margin of the toe end of the upper outspread on the wipers, said retarder being movable heightwise of the last by the wipers, and a cam for moving the retarder outwardly over the wipers in wiping contact with the margin of the upper in response to its movement heightwise of the last by the wipers.

18. In a lasting machine, wipers movable to wipe the toe-end portion of an upper on a last heightwise of the last and then inwardly over an insole on the last, a retarder for clamping the margin of the toe end of the upper outspread on the wipers, a support for said retarder movable to carry it heightwise of the last toward the wipers and reversely movable thereafter with the retarder by the wipers in the wiping of the upper heightwise of the last, and a member having a cam face inclined heightwise of the last for imparting to said support movement to cause the retarder to wipe the margin of the upper outwardly over the wipers in response to the reverse movement of the support by the wipers.

19. In a lasting machine, wipers movable to wipe the toe-end portion of an upper on a last heightwise of the last and then inwardly over an insole on the last, a retarder for clamping the margin of the toe end of the upper outspread on the wipers, a bar extending heightwise of the last and supporting said retarder, said bar being movable bodily to carry the retarder heightwise of the last toward the wipers and reversely movable thereafter with the retarder by the wipers in the wiping of the upper heightwise of the last, the bar being mounted for swinging movement lengthwise of the last, and means for thus swinging the bar in the direction to cause the retarder to wipe the margin of the upper outwardly over the wipers in response to the reverse movement of the bar by the wipers.

20. In a lasting machine, wipers movable to wipe the toe-end portion of an upper on a last heightwise of the last and then inwardly over an insole on the last, a retarder for clamping the margin of the toe end of the upper outspread on the wipers, a bar extending heightwise of the last and supporting said retarder, said bar being movable bodily to carry the retarder heightwise of the last toward the wipers and reversely movable thereafter with the retarder by the wipers in the wiping of the upper heightwise of the last, the bar being mounted for swinging movement lengthwise of the last, and a member having a cam face inclined heightwise of the last for thus swinging the bar in the direction to cause the retarder to wipe the margin of the upper outwardly over the wipers in response to the reverse movement of the bar by the wipers.

21. In a lasting machine, wipers movable to wipe the toe-end portion of an upper on a last heightwise of the last and then inwardly over an insole on the last, a retarder for clamping the margin of the toe end of the upper outspread on the wipers, a bar extending heightwise of the last and supporting said retarder at one end, means connected to said bar between its ends for moving the retarder heightwise of the last toward the wipers, the bar and the retarder being thereafter reversely movable by the wipers in the wiping of the upper heightwise of the last, and means arranged to act on the other end of said bar to swing it lengthwise of the last in the direction to cause the retarder to wipe the margin of the upper outwardly over the wipers in response to the reverse movement of the bar by the wipers.

22. In a lasting machine, wipers movable to wipe the toe-end portion of an upper on a last heightwise of the last and then inwardly over an insole on the last, a retarder for clamping the margin of the toe end of the upper outspread on the wipers, a bar extending heightwise of the last and supporting said retarder at one end, means connected to said bar between its ends for moving the retarder heightwise of the last toward the wipers, the bar and the retarder being thereafter reversely movable by the wipers in the wiping of the upper heightwise of the last, and a member having therein a cam slot arranged to act on the other end of said bar to swing it lengthwise of the last and thereby to guide the retarder into proper position relatively to the last and the wipers as it is moved toward the wipers and thereafter to move it outwardly over the wipers in the wiping of the upper heightwise of the last.

23. In a lasting machine, wipers movable to wipe the toe-end portion of an upper on a last heightwise of the last and then inwardly over an insole on the last, a retarder for clamping the margin of the toe end of the upper outspread on the wipers, a support for said retarder movable with it heightwise of the last by the wipers, a cam arranged to act on said support in response to its movement heightwise of the last by the wipers to move it in the direction to cause the retarder to wipe the margin of the upper outwardly over the wipers, means for tipping the retarder relatively to its support about an axis extending widthwise of the last while further moving the support heightwise of the last to withdraw the retarder from the margin of the upper first at the end of the toe while continuing its pressure on the upper at the sides of the toe, and spring means against the resistance of which said cam is yieldingly movable in response to resistance of the upper at the sides of the toe to the tipping of the retarder.

24. In a lasting machine, wipers movable to wipe the toe-end portion of an upper on a last heightwise of the last and then inwardly over an insole on the last, a retarder for clamping the margin of the toe end of the upper outspread on the wipers, a support for said retarder movable with it heightwise of the last by the wipers, a cam member having a cam face inclined heightwise of the last and arranged to act on said support in response to its movement heightwise of the last by the wipers to move it in the direction to cause the retarder to wipe the margin of the upper outwardly over the wipers lengthwise of the last, and means for tipping the retarder relatively to its support about an axis extending widthwise of the last while further moving the support heightwise of the last to withdraw the retarder from the margin of the upper first at the end of the toe while continuing its pressure on the upper at the sides of the toe, said cam member being yieldingly movable in a direction lengthwise of the last in response to resistance of the upper at the sides of the toe to the tipping of the retarder.

25. In a lasting machine, wipers movable to wipe the toe-end portion of an upper on a last heightwise of the last and then inwardly over an

insole on the last, a retarder for clamping the margin of the toe end of the upper outspread on the wipers, a support for said retarder movable with it heightwise of the last by the wipers, a cam member having a cam face inclined heightwise of the last and arranged to act on said support in response to its movement heightwise of the last by the wipers to move it in the direction to cause the retarder to wipe the margin of the upper outwardly over the wipers lengthwise of the last, means for tipping the retarder relatively to its support about an axis extending widthwise of the last while further moving the support heightwise of the last to withdraw the retarder from the margin of the upper first at the end of the toe while continuing its pressure on the upper at the sides of the toe, said cam member being pivotally mounted to permit it to move lengthwise of the last, and a spring against the resistance of which it is thus movable in response to resistance of the upper at the sides of the toe to the tipping of the retarder.

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