April 21, 1942. J. C. JORGENSEN 2,280,152

LASTING MACHINE

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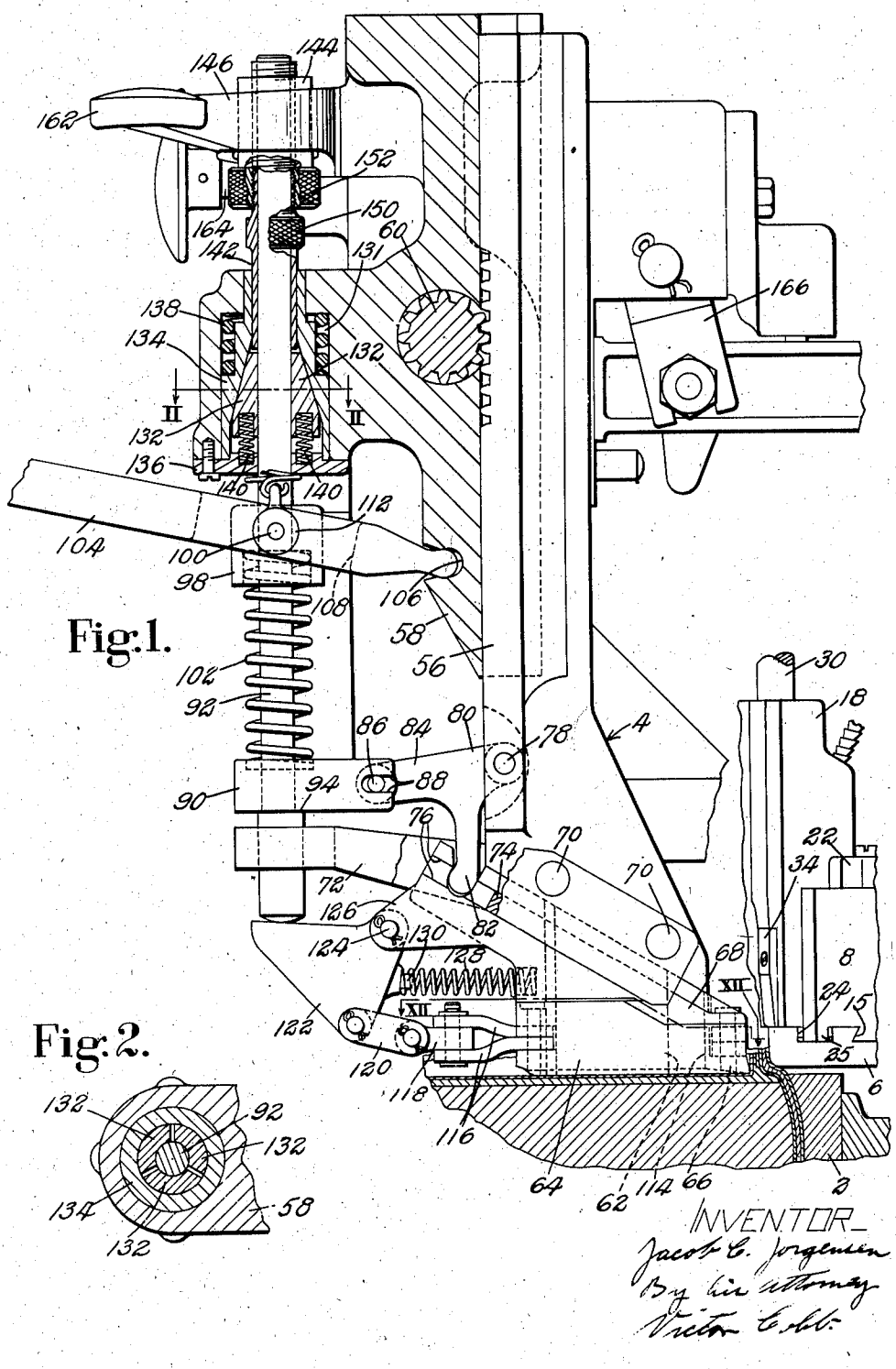


Fig. 1.

Fig. 2.

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Fig. 4.

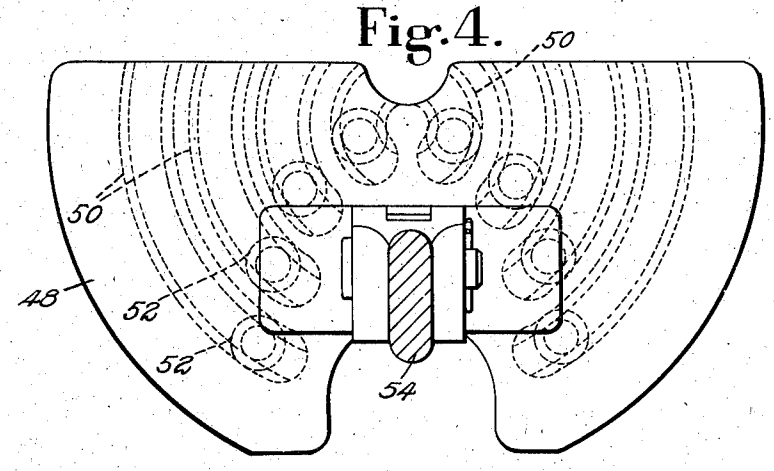
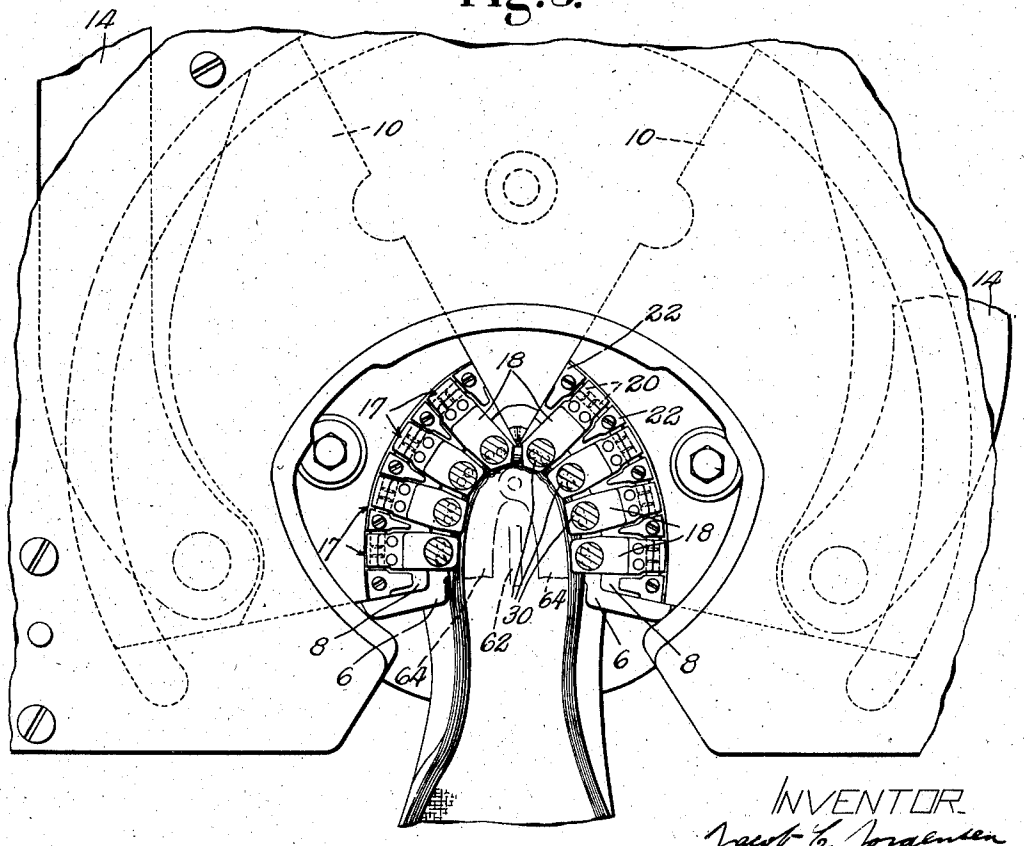


Fig. 3.



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Fig. 8.

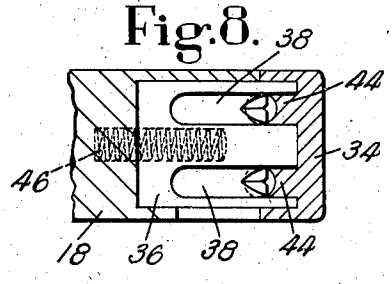


Fig. 7.

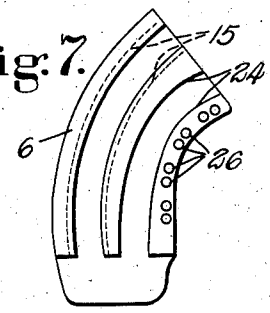


Fig. 5.

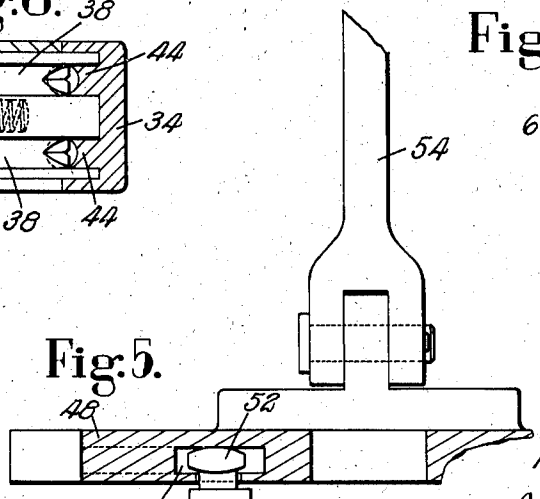


Fig. 6.

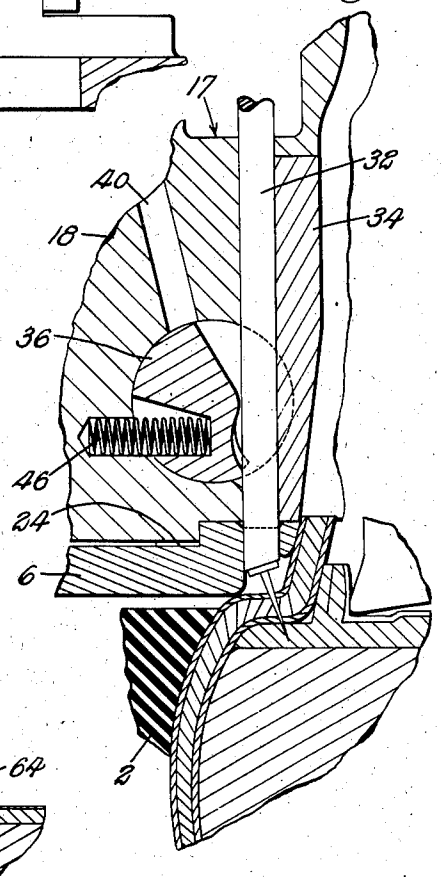
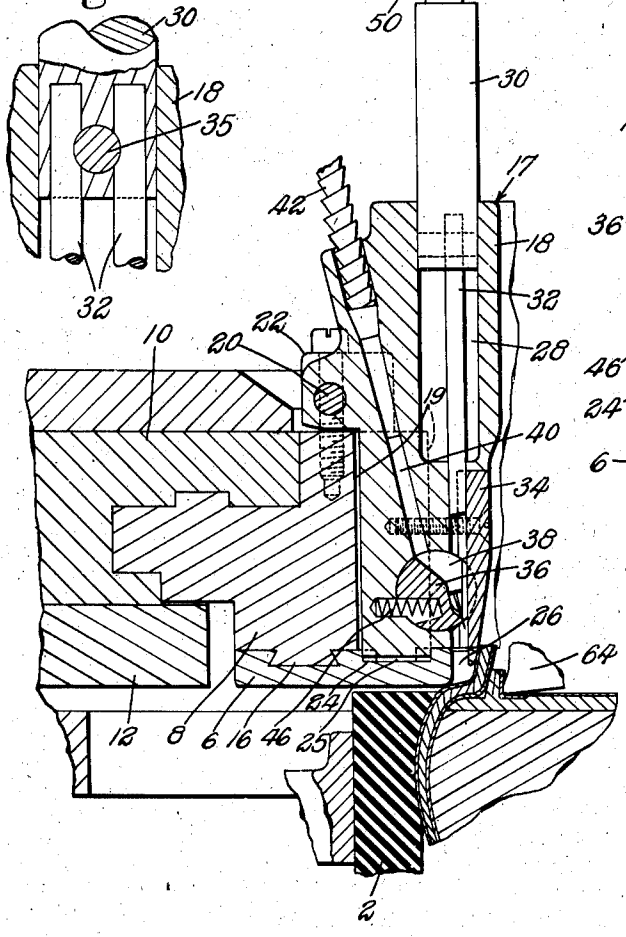


Fig. 9.



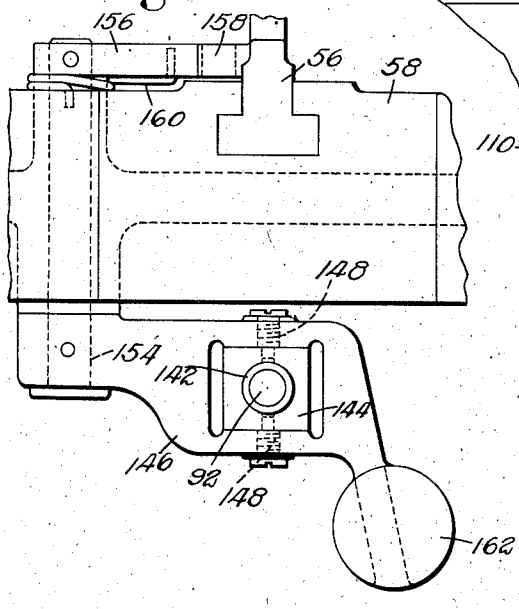
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Fig:11.



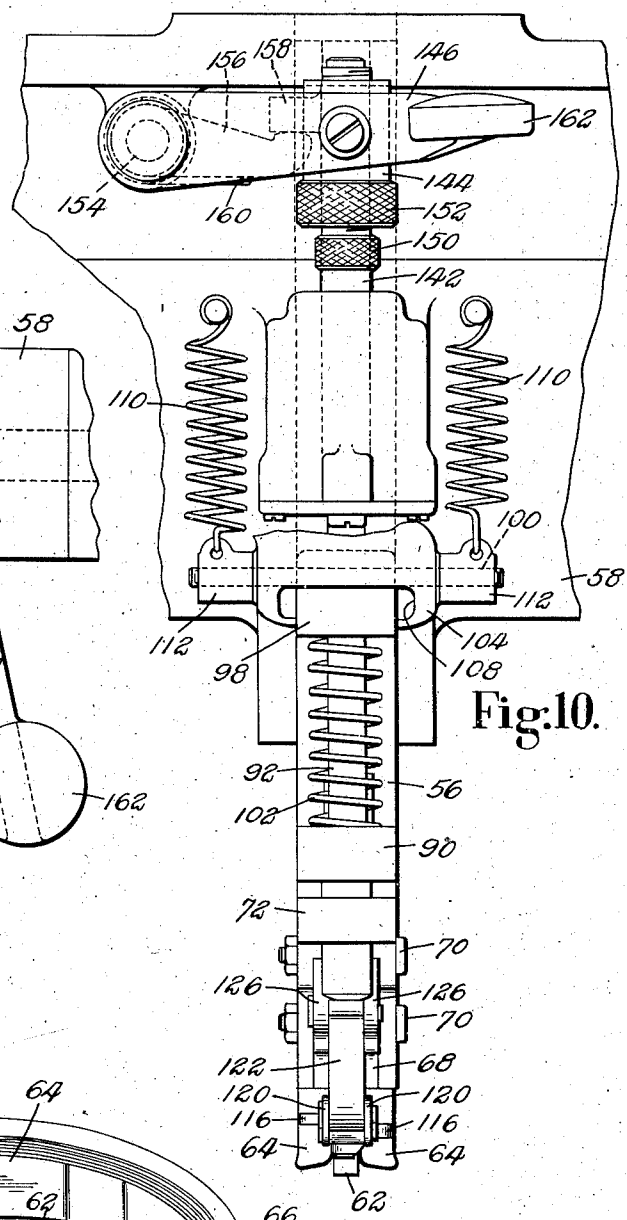
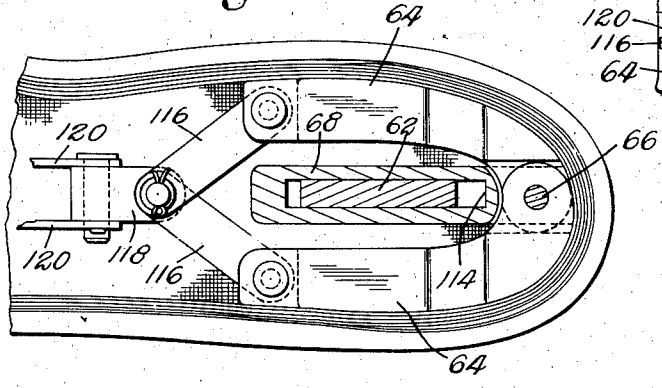


Fig:10.

Fig:12.



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UNITED STATES PATENT OFFICE

2,280,152

LASTING MACHINE

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Application December 2, 1940, Serial No. 368,173

35 Claims. (Cl. 12—4)

This invention relates to lasting machines, and is herein illustrated as applied to a heel-end lasting machine of the type disclosed in United States Letters Patent No. 2,059,241, granted on November 3, 1936, on an application of mine. It is to be understood, however, that the invention is not limited to machines of that particular type and that in various novel aspects also it is not limited to machines for lasting the heel ends of shoes as distinguished from the toe ends.

The invention has especially in view the provision of improved means for lasting the heel ends of shoes of that kind in which a welt is applied around the heel end as well as at other portions and in which the margin of the heel end of the upper is lasted against a welt-attaching lip on the insole. A machine of the above-mentioned type is provided with wipers for wiping the marginal portion of the heel end of an upper inwardly over the insole and with a plurality of fastening-inserting devices for driving a row of fastenings, which are customarily tacks, through holes in the wipers near their inner wiping edges to fasten the upper. In operating on shoes in which the heel end of the upper is lasted against a lip on the insole it is desirable that the contour of the wiping edges of the wipers correspond as nearly as possible to the contour of the lip of the insole lengthwise of the edge of the shoe bottom, and accordingly different wipers need to be used on shoes that differ substantially in style or size. It is also desirable that the several fastenings be driven at substantially uniform distances from the lip of the insole. The present invention accordingly provides a novel construction such that the wipers may be readily detached from their movable supports to permit different wipers to be substituted, and such that the same fastening-inserting devices are used with different wipers but assume different relative positions determined by the different wipers. In the construction shown each of the wiper supports carries a plurality of fastening-inserting devices so mounted thereon as to permit them, when the wipers are detached, to swing relatively to one another in such directions as to vary relatively the positions of fastenings inserted respectively by the different devices, and the wipers when in place on their supports interlock with the fastening-inserting devices and maintain them in a relation to one another appropriate for the contour of the wipers. The wipers, as more particularly herein illustrated, are guided to move in predetermined curved paths to mount them on or detach them from their supports, and are provided with grooves arranged to receive successively the different fastening-inserting devices associated therewith as the wipers are moved into place on their supports. Preferably, as shown, the fastenings are driven only part way into the shoe, so that they may be conveniently removed at a later stage in the manufacture of the shoe, and the wipers are so formed that the holes through which the fastenings are driven are open toward the inner edges of the wipers throughout a portion of the thickness of the wipers to provide clearance for the upstanding portions of the fastenings when the wipers are retracted.

The invention further provides novel means for supporting the lip of the insole against inward pressure in the lasting operation. A machine of the type shown in the above-mentioned Letters Patent is provided with a holddown which engages the heel end of the insole to determine the position of the shoe heightwise relatively to the wipers, the holddown being movable automatically in the power operation of the machine to depress the shoe relatively to the wipers and thus to relieve the pressure of the wipers on the upper after the lasting operation. For purposes of this invention, the construction herein shown comprises lip-supporting means which is mounted on the holddown and is movable by the operator relatively to the holddown into lip-supporting position prior to the starting of the power operation of the machine. More particularly, the lip-supporting means comprises members movable relatively to each other widthwise of the last into supporting relation to the lip at the sides of the insole, and a carrier for these members movable in a path inclined lengthwise and heightwise of the last to carry the members into engagement with the insole and into supporting relation to the lip at the extreme end of the insole. The carrier is thus moved by a lever which by further movement serves to swing the lip-supporting members apart into supporting relation to the lip at the sides of the insole. A device is further provided for holding the lip-supporting means in operative position and for releasing it in response to the above-mentioned automatic movement of the holddown after the lasting operation to permit its return to starting position.

The above and other features of the invention, including various novel details of construction and combinations of parts, will now be more par-

ticularly described with reference to the accompanying drawings and thereafter pointed out in the claims.

In the drawings,

Fig. 1 is a view partly in right-hand side elevation and partly in section of a portion of a machine of the type illustrated in the above-mentioned Letters Patent as modified for purposes of this invention, the parts being shown in the positions which they occupy when the wipers are at the end of their inward wiping movements;

Fig. 2 is a section on the line II—II of Fig. 1;

Fig. 3 is a plan view, with parts in section, showing the wipers and the fastening-inserting devices in the same relation to the shoe as in Fig. 1, this view illustrating diagrammatically the relation of the holddown and the lip-supporting members to the shoe;

Fig. 4 is mainly a plan view of a portion of the mechanism provided for operating the tack drivers;

Fig. 5 is a view mainly in vertical section in a plane extending widthwise of the shoe, showing one of the wipers and one of the fastening-inserting devices associated therewith and illustrating the relation of these parts to their operating mechanisms and to the shoe;

Fig. 6 is a view similar to Fig. 5 of a portion of the same structure, but showing the parts as they appear when the tack drivers are at the end of their tack-driving movements;

Fig. 7 is a plan view of one of the wipers detached;

Fig. 8 is mainly a sectional view in a horizontal plane, further illustrating the construction of tack-controlling means with which each of the fastening-inserting devices is provided;

Fig. 9 is a view in vertical section illustrating how two tack drivers of each fastening-inserting device are connected to a driver bar which operates them;

Fig. 10 is a view in front elevation showing the lip-supporting means and its controlling mechanism, with the parts in their initial positions;

Fig. 11 is a plan view of the structure shown in Fig. 10; and

Fig. 12 is a view partly in plan and partly in section on the line XII—XII of Fig. 1, illustrating more fully the construction of the lip-supporting means and its relation to the shoe.

As disclosed in the previously mentioned Letters Patent, a machine of the illustrated type is provided with a shoe support or jack (not herein shown) which is movable prior to the starting of the power operation of the machine to carry a shoe on its last lengthwise to a position in which its heel-end portion is embraced by a heel band **2** and also to move it upwardly to engage the heel end of its insole with the lower end of a holddown **4** which determines the height at which the shoe is positioned in the lasting operation. In the power operation of the machine the shoe is forced more firmly back against the heel band and up against the holddown and the heel band is closed about its heel-end portion, after which the margin of the heel end of the upper is wiped inwardly over the insole and is fastened thereto by the driving of a plurality of lasting tacks.

For wiping the margin of the heel end of the upper inwardly against a lip on the insole, in operating on a shoe of that type in which a welt is applied around the heel end, the machine herein shown is provided with a pair of wipers **6** the construction of one of which is clearly illustrated in Figs. 5 and 7. It will be understood that the two wipers are alike except for such differences as are necessary to permit them to be mounted in the machine for use respectively on the opposite side portions of the heel end of the shoe. The wipers **6** are detachably mounted on wiper supports or holders comprising blocks **8** which, although differently constructed in certain respects, are mounted in the machine and are operated in the same manner as the blocks **404** shown in the previously mentioned Letters Patent. That is, each block **8** is detachably secured to a member **10** guided for swinging movements laterally of the shoe on a slide **12** which is movable lengthwise of the shoe, the members **10** and **12** corresponding respectively to the cam-operated members **416** and **420** shown in the above-mentioned Letters Patent. It will be understood that the slide **12** is operated to advance the wipers bodily lengthwise of the shoe and that the members **10** are operated, through links **14** (Fig. 3), to swing or close the wipers inward laterally of the shoe in a horizontal plane in the course of their advancing movement.

For use in lasting shoes of the illustrated type the cams with which the machine is provided for thus operating the wipers are so formed as to impart to them movements shorter than heretofore, to wipe the upper over the feather of the insole and to press a portion of its margin in upstanding position against the lip of the insole, and are also formed to move them inwardly only once instead of twice in the cycle. Since for the best results the inner edges of the wipers should be curved similarly to the lip around the heel end of the insole, the wipers are so mounted on their supporting blocks **8** that they may be readily detached therefrom to permit different wipers to be used for shoes of different sizes or styles. To this end, as illustrated in Fig. 7, each wiper is provided with a curved groove **15** formed to receive a dovetailed tongue **16** (Fig. 5) on the lower face of the supporting block **8**, so that the wiper may be readily detached from the block and another wiper mounted on the block by sliding it along this tongue in a curved path. When the wiper is in proper position on the block it may be fastened thereto by any suitable means such as a screw (not shown).

After the upper has been wiped into lasted position by the wipers it is fastened temporarily by driving a plurality of tacks in the angle between the feather and the lip of the insole in the manner illustrated in Fig. 6, the tacks being driven only part way in so that they may be conveniently removed at a later stage in the manufacture of the shoe. For thus driving the tacks there are associated with each of the wipers a plurality of tackers **17** which are relatively adjustable to permit them to assume different positions as determined by different wipers mounted in the machine, so that in operating on shoes of different sizes or styles the tacks will be driven in as close relation as is practicable to the lip of the insole. Each tacker comprises a block **18** mounted in a vertical slot **19** (Fig. 5) in the block **8** and having an outwardly extending portion provided with holes to receive studs **20** (Fig. 3) projecting from members **22** fastened to the block **8** at opposite sides of the block **18**. In this manner the several blocks **18** are so mounted as to permit their lower ends to be swung inwardly or outwardly when there are no wipers in the machine. These lower ends of the blocks are arranged to enter grooves **24** formed in the wipers in locations between the grooves **15** and their inner

wiping edges when the wipers are moved into place on their supporting blocks 8, so that the several tackers assume positions determined by the wipers and appropriate for the particular contour of the wipers. As illustrated in Fig. 5, the lower ends of the blocks 18 are preferably spaced somewhat above the bottoms of the grooves 24, but portions 25 of the blocks 8, which are narrower than the grooves, extend to the bottoms of the grooves to assist in supporting the wipers firmly against upward pressure of the shoe upon them.

In the construction herein shown each tacker 17 is formed to drive a pair of tacks through holes 26 in the corresponding wiper. For this purpose each block 18 has a circular bore 28 (Fig. 5) in which operates a driver bar 30 provided at its lower end with two tack drivers 32 movable in driver passages formed partly in the block 18 and partly in a plate 34 fastened to the block. The drivers 32 are mounted in sockets in the bar 30 and are held in place by a pin 35, as illustrated in Fig. 9. Mounted for turning movement in the block 18 and the plate 34 is a tack holder 36 (Figs. 5 and 8) of generally cylindrical contour provided with recesses 38 which serve as tack pockets associated with the respective driver passages and into which tacks are delivered at the proper time through passages 40 in the block 18. Tacks are conducted to the passages 40 through flexible tubes 42 from tack-supplying mechanism constructed as disclosed in the previously mentioned Letters Patent. Extending into the two recesses 38 in the tack holder 36 are flanges 44 (Fig. 8) of the plate 34, in which flanges portions of the above-mentioned driver passages are formed. A spring 46 tends to turn the tack holder 36 in a counterclockwise direction, as the parts are viewed in Figs. 5 and 6, and maintains it initially in a position determined by engagement of edges formed thereon at the lower ends of the recesses 38 with the flanges 44. When the tack holder is in this position the lower ends of the shanks of the tacks controlled thereby extend short distances below these edges in engagement with the walls of the driver passages, as illustrated in Fig. 5, the shanks of the tacks being inclined relatively to the paths of movement of the drivers 32 and inwardly inclined relatively to the edge of the shoe bottom. The drivers 32 have lower end faces inclined similarly to the corresponding inclinations of the heads of the tacks, and accordingly the tacks are driven into the shoe at inclinations substantially the same as they occupy when in the tack pockets, the points of the tacks being guided during a portion of the tack-driving operation by the flanges 44 and the walls of the holes 26 in the wipers. It will be understood that the tack holder 36 turns against the resistance of the spring 46 to permit the passage of the tacks and the tack drivers and is returned by the spring to its initial position when the drivers are retracted.

The wipers 6 are so formed that the walls of the holes 26 at the sides of the holes toward the inner edges of the wipers terminate short of the wiping faces of the wipers, so that the lower portions of the holes 26 are open toward the inner edges of the wipers to provide clearance for the heads of the upstanding tacks when the wipers are retracted. For the purpose of leaving the tacks upstanding the operative movements of the drivers are limited by mechanism provided in accordance with the disclosure of the previously mentioned Letters Patent. In view of the multiplicity of the driver bars 30, the construction herein shown includes, for operating these bars, a plate 48 (Figs. 4 and 5) having therein a plurality of guideways 50 curved similarly to the paths of movement of the wipers, in which guideways lie flanged heads 52 formed on the upper ends of the driver bars 30. By reason of this construction the driver bars are moved downwardly and upwardly by corresponding movements of the plate 48 and are permitted to move with the wipers while maintaining their operative relation to the plate. The plate 48 is operated at the proper time through a link 54 which corresponds to the link 564 shown in the previously mentioned Letters Patent.

The previously mentioned holddown 4 comprises a slide 56 (Figs. 1 and 10) which is vertically movable in a guideway in the frame 58 like the member 504 shown in the previously mentioned Letters Patent and is automatically controlled in the power operation of the machine through a cam-operated pinion 60 in engagement with rack teeth formed on the slide. In the construction herein shown the lower end of the slide 56 is so shaped as to provide a holddown foot 62 (Figs. 1 and 12) which is comparatively narrow widthwise of the shoe and the lower edge of which is arranged to engage the heel-end portion of the insole when the shoe is moved upwardly by the shoe support, as hereinbefore described, prior to the starting of the power operation of the machine. This upward movement of the shoe serves to impart a short upward movement to the slide 56, as and for purposes described in the above-mentioned Letters Patent. As distinguished from the prior construction, the cam (not shown) for operating the pinion 60 is preferably so formed that when the slide 56 has been thus lifted prior to the starting of the power operation of the machine the shoe is at the proper height for the wipers to operate thereon, and thereafter the slide remains stationary until it is moved downwardly a short distance to depress the shoe and thus to relieve the pressure of the wipers on the upper after the tacks have been driven, such depression of the shoe further insuring that the heads of the tacks will clear the wipers when the latter are retracted.

Further to accomplish the objects of the present invention, the holddown 4 has associated therewith means for engaging the inner face of the lip of the insole around the heel end of the insole and for supporting the lip against the inward pressure of the wipers. This lip-supporting means comprises a pair of arms 64 (Figs. 1 and 12) the outer faces of which are curved in general similarity to the curvature of the lip of the insole, the two arms being pivotally mounted at their rear ends on a pin 66 supported by a slide 68 which serves as a carrier for the arms. The slide 68 is supported on the lower end of the holddown slide 56, so that it moves upwardly and downwardly with the latter, and it is also mounted for movement relatively to the slide 56 in an inclined path extending heightwise and lengthwise of the shoe. For this purpose there is fastened to the slide 56 by bolts 70 a bracket 72 which is bifurcated to extend along opposite sides of the slide 56, the forks of the bracket being provided with inwardly extending flanges, a portion of one of which is shown in section at 74 in Fig. 1, extending into grooves 76 formed in opposite side portions of the slide 68. The

flanges 74 and the grooves 76 are inclined as illustrated, so that by movement of the slide 68 in one direction the lip-supporting arms 64 are carried both downwardly toward the insole and rearwardly toward the portion of the insole lip which is located at the extreme rear end of the insole. For moving the slide 68 in that direction and also in the opposite direction, there is pivotally mounted on a pin 78 on the slide 56 a bell-crank lever 80 one arm 82 of which has a rounded end extending into a recess in the slide 68 and the other arm 84 of which carries a pin 86 extending into slots 88 formed in a bifurcated rear portion of a block 90. The block 90 is mounted on a vertically movable rod 92 and rests normally on a shoulder 94 provided by an enlarged lower end portion of the rod, this portion of the rod being guided for vertical movements in the front end of the bracket 72. Between the block 90 and another block 98 which is fastened by a transverse pin 100 to the rod 92 is a spring 102. Accordingly, in response to downward movement of the rod 92 and the block 98 force is transmitted yieldingly through the spring 102 to the block 90 and the bell-crank lever 80 to move the slide 68 in a downward and rearward direction and thus to carry the lip-supporting arms 64 rearwardly against the lip of the insole and against the bottom face of the insole adjacent to the lip. For thus operating the rod 92 there is provided a hand lever 104 the rear end of which is rounded and lies in a recess 106 in the frame 58. The hand lever 104 is provided with an opening 108 into which the block 98 extends, and it is pivotally connected by the pin 100 to the rod 92 and the block 98. Downward movement of the rod by the hand lever is effected against the resistance of springs 110 which are connected at their upper ends to the frame and at their lower ends to sleeves 112 threaded on the opposite ends of the pin 100. By these springs the rod 92 is maintained initially in such an upraised position that the slide 68 and the arms 64 are forwardly and upwardly retracted from the positions which they occupy in Fig. 1, the holddown foot 62 extending somewhat farther downwardly than the arms, as shown in Fig. 10, for engagement with the shoe when the latter is lifted by the work support. It will be observed that the foot 62 extends downwardly through a slot 114 (Fig. 12) in the slide 68, this slot being sufficiently elongated to permit the required movements of the slide.

The lip-supporting arms 64 are positioned in proper relation to the lip at the opposite sides of the insole by swinging them outwardly about the pin 66. For this purpose the front ends of the arms are connected by links 116 to a small block 118 which is itself connected by a pair of links 120 to a lever 122 pivotally mounted on a pin 124 supported in forwardly extending lugs 126 formed on the slide 68. The lever 122 is engaged by the lower end of the rod 92, so that by its downward movement this rod acts through the lever 122 and its connections with the arms 64 to swing these arms outwardly against the lip of the insole. This movement of the lever 122 is effected against the resistance of a spring 128 which is seated at one end in a recess in the slide 68 and surrounds at its other end a short stud 130 projecting from the lever 122. It will be understood that the spring 128 serves, when permitted, to swing the arms 64 inwardly toward each other, so that it maintains them initially in positions comparatively close to the opposite sides of the holddown foot 62, as illustrated in Fig. 10. The construction is such that the downward and rearward movement of the slide 68 is stopped by the engagement of the insole with the arms 64 before the arms have been swung fully outward to their lip-supporting positions, after which the spring 102 yields as the hand lever 104 is moved farther downwardly to move the arms into those positions.

The lip-supporting arms 64 are moved into supporting relation to the lip of the insole by the hand lever 104, as above described, after the shoe has been moved rearwardly and upwardly by the work support against the heel band 2 and the holddown foot 62, but prior to the starting of the power operation of the machine. To permit the operator immediately to release the hand lever 104 after operating it, mechanism is provided for maintaining the arms 64 in the positions to which they are moved by the hand lever by locking the rod 92 against reverse upward movement. For this purpose there are mounted in a recess 131 (Fig. 1) in the frame 58, through which recess the rod 92 extends, three brake shoes 132 which substantially surround the rod, as illustrated in Fig. 2, these brake shoes having conical outer surfaces which are engaged by a complemental surface formed on the interior of a bushing 134 also mounted in the recess 131. This bushing is held normally down against a plate 136 fast on the frame by a comparatively heavy spring 138, and the three brake shoes 132 are forced upwardly against the interior face of the bushing by lighter springs 140, one for each brake shoe. Accordingly, the brake shoes do not prevent downward movement of the rod 92 by the lever 104, but they act as wedges between the rod and the inner face of the bushing 134 to lock the rod frictionally against reverse upward movement. Provision is afforded for upward movement of the bushing 134 against the resistance of the spring 138 merely for safety, in case the wiper-operating mechanism should be accidentally so adjusted as to close the wipers too far inward laterally of the shoe. In that event the lip-supporting arms 64 may be forced inwardly by the wipers and will act through the lever 122 to lift the rod 92, the brake shoes 132 and the bushing 134 against the resistance of the spring 138.

To release the rod 92 and thus permit the rod and the parts controlled thereby to return to their starting positions, there is provided a sleeve 142 slidingly mounted on the rod for downward movement to engage and depress the brake shoes 132. This sleeve is threaded in a trunnion block 144 which is mounted in an opening provided in a lever 146 and is pivotally mounted on the ends of studs 148 threaded in this lever. The sleeve 142 is provided with a knurled portion 150 by which it may be turned to adjust it toward or from the upper ends of the brake shoes 132, and threaded on the sleeve is a lock nut 152 arranged to engage the lower face of the trunnion block 144 to lock the sleeve in adjusted position. The lever 146 is fast on a rockshaft 154 mounted in the frame 58, and also fast on this rockshaft is another lever 156 one end of which is arranged to underlie a lug 158 formed on the holddown slide 56. A spring 160 tends to lift the lever 156 and to maintain it in engagement with the lug 158. When the holddown slide 56 is moved downwardly to depress the shoe after the wiping and tacking operations the lever 156 is swung

downwardly by the lug 158 to impart through the lever 146 such downward movement to the sleeve 142 as to depress the brake shoes 132 and thus to release the rod 92. The lever 146 is provided with a handle 162 by which it may be swung downwardly by the operator in case it should be desired, prior to the starting of the power operation of the machine, to return the lip-supporting arms 64 and permit them to be moved again into supporting relation to the lip.

In Fig. 1 are shown certain parts of mechanism like that disclosed in Letters Patent No. 2,115,722, granted on May 3, 1938, on an application, by the use of which the operator may adjust the holddown 4 temporarily to a slightly lower position than usual in case observation of any particular shoe should indicate that the wipers preferably should operate thereon with less than the customary pressure. These parts include a plunger 164 and a lever 166 which correspond respectively to the parts identified by the reference characters 74 and 62 in the above-mentioned Letters Patent. It will be understood that with the sleeve 142 properly adjusted such further downward adjustment of the holddown may be effected without interfering thereafter with the proper action of the brake shoes 132.

In accordance with the disclosure of Fig. 6 the driver-operating mechanism is so adjusted that the tacks penetrate only part way through the insole. The tacks may, however, be driven farther inwardly if, as shown, the last has no metal plate on the bottom of its heel-end portion which, by clinching the points of the tacks, would interfere with their removal.

The manner of operation of the machine will now be briefly summarized. If the machine is not equipped with wiper plates suitable for shoes of the size and style to be lasted, the operator removes the plates which are in the machine and substitutes others of the proper shape, sliding them in curved paths into their proper positions along the dovetailed tongues 16 on the wiper-supporting blocks 8. In thus mounting each wiper plate on its supporting block the operator causes the lower ends of the corresponding tacker blocks 18 successively to enter the groove 24 in the wiper plate. The machine having thus been provided with the proper wipers and the tackers being positioned as determined by the wipers, the operator mounts a shoe on the shoe support, and by movement of the support the shoe is carried rearwardly to a position within the heel band 2 and is forced upwardly against the holddown foot 62, the pressure of the shoe on the holddown foot forcing the holddown slide 56 a short distance upwardly. The shoe having thus been presented, the operator swings the hand lever 104 downwardly to move the lip-supporting members 64 downwardly and rearwardly into engagement with the insole and to swing them apart into proper supporting relation to the lip at the sides of the insole, their swinging movements being completed after their downward movement has been stopped by their contact with the insole. The brake shoes 132 automatically lock the lip-supporting members against reverse movements, so that the operator may release the hand lever 104. If for any reason, however, it should be desired to return the lip-supporting members and to move them again to their operative positions, the operator swings the lever 146 downwardly to depress the brake shoes 132 and thus permit return movement of the rod 92, and thereafter again lowers the hand lever 104. After properly positioning the lip-supporting members the operator starts the power operation of the machine, whereupon the wipers are advanced and closed to wipe the marginal portion of the heel end of the upper inwardly over the feather of the insole and to press it against the lip of the insole, the tacks being then driven in the manner illustrated in Fig. 6 to hold the heel end of the upper in lasted position. The holddown slide 56 is thereafter moved downwardly, in proper time relation to the opening of the heel band, to lower the shoe enough to relieve the pressure of the wipers on the upper before the wipers are retracted to their starting positions, and in response to such downward movement of the slide 56 the sleeve 142 is lowered to depress the brake shoes 132 and thus to release the rod 92. This permits the slide 68 to be returned to its initial position by the springs 110 and the lip-supporting members 64 to be swung inwardly toward each other by the spring 128. Thereafter all the parts of the machine not already in their starting positions are returned to such positions preparatory to the operation of the machine upon another shoe.

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 wiping the marginal portion of an upper into lasted position around an end of a last, supports for said wipers movable to operate them, the wipers being detachable from said supports to permit different wipers to be used on shoes of different styles or sizes, and a plurality of fastening-inserting devices movable with each of said wiper supports into positions to insert fastenings to fasten the upper after the wiping operation of the wipers, the fastening-inserting devices associated with each of said supports being so mounted on that support as to permit them when the wipers are detached to swing on the support relatively to one another in such directions as to vary relatively the positions of fastenings inserted respectively by the different devices, and the wipers being constructed to determine the relation of the fastening-inserting devices to one another and to maintain them positively in that relation when the wipers are in place on their supports.

2. In a lasting machine, wipers for wiping the marginal portion of an upper into lasted position around an end of a last, supports for said wipers movable to operate them, the wipers being detachable from said supports to permit different wipers to be used on shoes of different styles or sizes, and a plurality of fastening-inserting devices movable with each of said wiper supports into positions to insert fastenings to fasten the upper after the wiping operation of the wipers, the fastening-inserting devices associated with each of said supports being positioned respectively in different slots in that support extending in perpendicular relation to the plane of the wipers and being so mounted as to permit them when the wipers are detached to swing in said slots relatively to one another in such directions as to vary relatively the positions of fastenings inserted respectively by the different devices, and the wipers being constructed to interlock with the fastening-inserting devices when the wipers are in place on their

supports to determine the relation of said devices to one another.

3. In a lasting machine, wipers for wiping the marginal portion of an upper into lasted position around an end of a last, supports for said wipers movable to operate them, the wipers being detachable from said supports to permit different wipers to be used on shoes of different styles or sizes, and a plurality of fastening-inserting devices movable with each of said wiper supports into positions to insert fastenings to fasten the upper after the wiping operation of the wipers, the fastening-inserting devices associated with each of said supports being so mounted on that support as to permit them when the wipers are detached to move on the support relatively to one another in such directions as to vary relatively the positions of fastenings inserted respectively by the different devices, and the wipers being provided with grooves arranged to receive portions of said fastening-inserting devices to determine the relation of said devices to one another and to lock them positively in that relation when the wipers are in place on their supports.

4. In a lasting machine, wipers for wiping the marginal portion of an upper into lasted position around an end of a last, supports for said wipers movable to operate them, the wipers being movable in predetermined paths to mount them on or detach them from said supports to permit different wipers to be used on shoes of different styles or sizes, and a plurality of fastening-inserting devices movable with each of said wiper supports into positions to insert fastenings to fasten the upper after the wiping operation of the wipers, the fastening-inserting devices associated with each of said supports being so mounted as to permit them when the wipers are detached to move relatively to one another in such directions as to vary relatively the positions of fastenings inserted respectively by the different devices, and the wipers being constructed to engage successively the different fastening-inserting devices associated therewith as the wipers are moved into place on their supports to determine the relation of the several devices to one another.

5. In a lasting machine, wipers for wiping the marginal portion of an upper into lasted position around an end of a last, supports for said wipers movable to operate them, the wipers being guided to move in predetermined curved paths to mount them on or detach them from said supports to permit different wipers to be used on shoes of different styles or sizes, and a plurality of fastening-inserting devices movable with each of said wiper supports into positions to insert fastenings to fasten the upper after the wiping operation of the wipers, the fastening-inserting devices associated with each of said supports being so mounted as to permit them when the wipers are detached to move relatively to one another in such directions as to vary relatively the positions of fastenings inserted respectively by the different devices, and the wipers being provided with curved grooves arranged to receive successively the fastening-inserting devices associated therewith as the wipers are moved into place on their supports to determine the relation of said devices to one another.

6. In a lasting machine, wipers for wiping the marginal portion of an upper into lasted position around an end of a last, supports for said wipers movable to operate them, the wipers being guided to move in predetermined curved paths to mount them on or detach them from said supports to permit different wipers to be used on shoes of different styles or sizes, and a plurality of fastening-inserting devices movable with each of said wiper supports into positions to insert fastenings to fasten the upper after the wiping operation of the wipers, the fastening-inserting devices associated with each of said supports being so mounted as to permit them when the wipers are detached to swing relatively to one another in such directions as to vary relatively the positions of fastenings inserted respectively by the different devices, and the wipers being constructed to interlock successively with the fastening-inserting devices associated therewith as the wipers are moved into place on their supports to determine the relation of said devices to one another.

7. In a lasting machine, wipers for wiping the marginal portion of an upper into lasted position around an end of a last, said wipers being provided with a plurality of holes through which to drive fastenings to fasten the upper, and a plurality of fastening-inserting devices arranged to drive fastenings through said holes in the wipers and part way only into the shoe to leave portions of the fastenings upstanding, said holes in the wipers being open toward the inner edges of the wipers throughout a portion only of the thickness of the wipers to provide clearance for the upstanding portions of the fastenings when the wipers are retracted.

8. In a lasting machine, wipers for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, said wipers being provided with a plurality of holes through which to drive fastenings to fasten the upper in the angle between the feather and the lip of the insole, and a plurality of fastening-inserting devices including drivers arranged to drive fastenings through said holes in the wipers and part way only into the shoe to leave portions of the fastenings upstanding, said fastening-inserting devices having means for positioning the fastenings at inclinations to the paths of movement of the drivers to cause them to enter the shoe in directions inclined inwardly from the edge of the shoe bottom, and the walls of said holes in the wipers at the sides of the holes toward the inner edges of the wipers serving as guides for the inclined fastenings but terminating short of the wiping faces of the wipers to provide clearance for the upstanding portions of the fastenings when the wipers are retracted.

9. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of means for supporting the lip of the insole against the inward pressure of said wiping means thereon, said lip-supporting means being movable into engagement with the insole in a predetermined path inclined lengthwise and heightwise of the last toward the portion of the lip at the extreme end of the insole and comprising members also movable relatively to each other widthwise of the last into supporting relation to the lip at the sides of the insole.

10. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of means for supporting the lip of the insole against the inward pressure of said wiping

means thereon, said lip-supporting means comprising members movable relatively to each other widthwise of the last into supporting relation to the lip at the sides of the insole, a carrier on which said members are mounted, means guiding said carrier for sliding movement in a path inclined lengthwise and heightwise of the last toward the portion of the lip at the extreme end of the insole to carry said members into engagement with the insole adjacent to that portion of the lip, and means for moving said lip-supporting members widthwise of the last toward the lip at the sides of the insole after they have thus engaged the insole.

11. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of means for supporting the lip of the insole against the inward pressure of said wiping means thereon, said lip-supporting means comprising members movable relatively to each other widthwise of the last into supporting relation to the lip at the sides of the insole, a carrier on which said members are mounted, said carrier being movable in a predetermined path inclined lengthwise and heightwise of the last toward the portion of the lip at the extreme end of the insole to carry said members into engagement with the insole, an operating member for thus moving said carrier, and means for moving said lip-supporting members widthwise of the last into their lip-supporting positions also by movement of said operating member.

12. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of means for supporting the lip at the extreme end and along the sides of the insole against the inward pressure of said wiping means thereon, said lip-supporting means comprising members movable relatively to each other widthwise of the last into supporting relation to the lip along the sides of the insole, a carrier on which said members are mounted, said carrier being movable to carry said members into engagement with the insole, a lever mounted for swinging movement thus to move said carrier, and means for moving the lip-supporting members widthwise of the last into their lip-supporting positions also by swinging movement of said lever.

13. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of means for supporting the lip of the insole against the inward pressure of said wiping means thereon, said lip-supporting means comprising members movable relatively to each other widthwise of the last into supporting relation to the lip at the sides of the insole, a carrier on which said members are mounted, said carrier being movable in a predetermined path inclined lengthwise and heightwise of the last toward the portion of the lip at the extreme end of the insole to carry said members into engagement with the insole, a lever mounted for swinging movement thus to move said carrier, and means for moving the lip-supporting members widthwise of the last into their lip-supporting positions also by swinging movement of said lever.

14. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of means for supporting the lip of the insole against the inward pressure of said wiping means thereon, said lip-supporting means comprising members movable relatively to each other widthwise of the last into supporting relation to the lip at the sides of the insole, a carrier on which said members are mounted, said carrier being movable to carry said members into engagement with the insole, an operating member for thus moving said carrier, a spring through which the carrier is operated by said member, said spring being yieldable to permit further movement of said operating member after the lip-supporting members have engaged the insole, and means for moving the lip-supporting members widthwise of the last into their lip-supporting positions by such further movement of the operating member.

15. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of means for supporting the lip of the insole against the inward pressure of said wiping means thereon, said lip-supporting means comprising members movable relatively to each other widthwise of the last into supporting relation to the lip at the sides of the insole, a carrier on which said members are mounted, said carrier being movable in a predetermined path inclined lengthwise and heightwise of the last toward the portion of the lip at the extreme end of the insole to carry said members into engagement with the insole, a lever for thus moving said carrier, a spring through which the carrier is operated by said lever, said spring being yieldable to permit further movement of the lever after said members have engaged the insole, and means for moving said lip-supporting members widthwise of the last into their lip-supporting positions by such further movement of the lever.

16. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of means for supporting the lip of the insole against the inward pressure of said wiping means thereon, said lip-supporting means comprising members mounted to swing relatively to each other widthwise of the last into supporting relation to the lip at the sides of the insole, a carrier on which said members are thus mounted, said carrier being movable lengthwise and heightwise of the last to carry said members into engagement with the bottom face of the insole and with the lip at the extreme end of the insole, an operating member for thus moving said carrier, and means for swinging said members apart into supporting relation to the lip at the sides of the insole by further movement of said operating member independently of movement of the carrier.

17. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of means for supporting the lip of the insole against the inward pressure of said wiping means thereon, said lip-supporting means comprising members mounted to swing relatively to each other widthwise of the last into supporting relation to the lip at the sides of the insole,

a carrier on which said members are thus mounted, said carrier being movable lengthwise and heightwise of the last to carry said members into engagement with the bottom face of the insole and with the lip at the extreme end of the insole, a lever for thus moving said carrier, a spring through which the carrier is operated by said lever, said spring being yieldable to permit further movement of the lever after said members have engaged the insole, and means for swinging said lip-supporting members apart into their lip-supporting positions by such further movement of the lever.

18. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of means for supporting the lip of the insole against the inward pressure of said wiping means thereon, said lip-supporting means comprising members movable relatively to each other widthwise of the last into supporting relation to the lip at the sides of the insole, a carrier on which said members are mounted, said carrier being movable in a predetermined path inclined lengthwise and heightwise of the last toward the portion of the lip at the extreme end of the insole to carry said members into engagement with the insole, a bell-crank lever for thus operating said carrier, another lever for yieldingly operating said bell-crank lever, and a lever mounted on said carrier and arranged to be operated by said other lever to move said lip-supporting members widthwise of the last into their lip-supporting positions.

19. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of means for supporting the lip of the insole against the inward pressure of said wiping means thereon, said lip-supporting means comprising members movable relatively to each other widthwise of the last into lip-supporting positions, means for thus moving said members, and additional means for holding said members against reverse movements.

20. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of means for supporting the lip of the insole against the inward pressure of said wiping means thereon, said lip-supporting means comprising members movable relatively to each other widthwise of the last into lip-supporting positions, means for thus moving said members, and a frictionally acting locking device for holding said members against reverse movements.

21. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of means for supporting the lip of the insole against the inward pressure of said wiping means thereon, said lip-supporting means comprising members movable relatively to each other widthwise of the last into lip-supporting positions, means comprising a longitudinally movable rod for thus moving said members into their lip-supporting positions, and a brake arranged to act frictionally on said rod to hold the members against reverse movements.

22. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of means for supporting the lip of the insole against the inward pressure of said wiping means thereon, said lip-supporting means comprising members movable relatively to each other widthwise of the last into lip-supporting positions, means for thus moving said members, a locking device for holding said members against reverse movements, and a spring against the resistance of which said locking device is yieldable in response to excessive pressure of the wiping means on said members.

23. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of means for supporting the lip of the insole against the inward pressure of said wiping means thereon, said lip-supporting means comprising members movable relatively to each other widthwise of the last into lip-supporting positions, means comprising a longitudinally movable rod for thus moving said members, a brake shoe arranged to engage said rod to hold said members against reverse movements, a device adjacent to the rod for rendering the brake shoe effective, and a spring against the resistance of which said device is movable with the brake shoe and the rod in response to excessive pressure of the wiping means on said members.

24. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of means for supporting the lip of the insole against the inward pressure of said wiping means thereon, said lip-supporting means comprising members movable relatively to each other widthwise of the last into supporting relation to the lip at the sides of the insole, a carrier on which said members are mounted, means for moving said carrier to carry the lip-supporting members into engagement with the insole and for also moving said members widthwise of the last into their lip-supporting positions, and additional means for holding said carrier and members against reverse movements.

25. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of means for supporting the lip of the insole against the inward pressure of said wiping means thereon, said lip-supporting means comprising members movable relatively to each other widthwise of the last into supporting relation to the lip at the sides of the insole, a carrier on which said members are mounted, means for moving said carrier to carry the lip-supporting members into engagement with the insole and for also moving said members widthwise of the last into their lip-supporting positions, and a device common to said carrier and members for holding said carrier against reverse movement and for also holding said members against reverse relative movements.

26. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of means for supporting the lip of the insole against the inward pressure of said wiping means thereon, said lip-supporting means comprising members movable relatively

to each other widthwise of the last into supporting relation to the lip at the sides of the insole, a carrier on which said members are mounted, said carrier being movable in a path inclined lengthwise and heightwise of the last toward the portion of the lip at the extreme end of the insole to carry said members into engagement with the insole, a member for thus moving said carrier, means for also moving said lip-supporting members widthwise of the last into their lip-supporting positions by movement of said member, and a device arranged to act on said member to hold said carrier and the lip-supporting members against reverse movements.

27. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of means for supporting the lip of the insole against the inward pressure of said wiping means thereon, means comprising a lengthwise movable rod for moving said lip-supporting means into operative position, a device for engaging said rod frictionally to hold the lip-supporting means against reverse movement, and a member movable along said rod and arranged to act on said device to cause it to release the rod.

28. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of a holddown for engaging the end of the insole, means mounted on said holddown for supporting the lip of the insole against the inward pressure of said wiping means thereon, said lip-supporting means being movable relatively to the holddown into engagement with the insole, and means for thus moving said lip-supporting means after the holddown has engaged the insole.

29. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of a holddown for engaging the end of the insole, means mounted on said holddown for supporting the lip of the insole against the inward pressure of said wiping means thereon, said lip-supporting means being movable relatively to the holddown into engagement with the insole in a path inclined lengthwise and heightwise of the last toward the portion of the lip at the extreme end of the insole, and means for thus moving said lip-supporting means after the holddown has engaged the insole.

30. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of a holddown for engaging the end of the insole, means mounted on said holddown for supporting the lip of the insole against the inward pressure of said wiping means thereon, said lip-supporting means being movable relatively to the holddown into engagement with the insole and comprising members movable also relatively to each other widthwise of the last into supporting relation to the lip at the sides of the insole, and means for thus moving the lip-supporting means into engagement with the insole and for also moving said members widthwise of the last into their lip-supporting positions after the holddown has engaged the insole.

31. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of a holddown for engaging the end of the insole, means mounted on said holddown for supporting the lip of the insole against the inward pressure of said wiping means thereon, said lip-supporting means comprising members mounted to swing relatively to each other widthwise of the last into supporting relation to the lip at the sides of the insole, a carrier on which said members are thus mounted, said carrier being movable relatively to the holddown lengthwise and heightwise of the last to carry said members into engagement with the bottom face of the insole and with the lip at the extreme end of the insole, and means for thus moving said carrier and for also swinging said members apart into supporting relation to the lip at the sides of the insole after the holddown has engaged the insole.

32. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of a holddown arranged to engage the end of the insole to determine the position of the shoe heightwise relatively to the wiping means and movable after the wiping operation to relieve the pressure of the wiping means on the upper, means for supporting the lip of the insole against the inward pressure of said wiping means thereon, said lip-supporting means being movable relatively to the holddown into lip-supporting position, means for thus moving said lip-supporting means, a device for holding the lip-supporting means against reverse movement in the wiping operation, and mechanism for rendering said holding device inoperative in response to the movement of the holddown after the wiping operation.

33. In a lasting machine, the combination with means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of a holddown arranged to engage the end of the insole to determine the position of the shoe heightwise relatively to the wiping means and movable after the wiping operation to relieve the pressure of the wiping means on the upper, means mounted on said holddown for supporting the lip of the insole against the inward pressure of said wiping means thereon, said lip-supporting means comprising members movable relatively to each other widthwise of the last into supporting relation to the lip at the sides of the insole, a carrier on which said members are thus mounted, said carrier being movable relatively to the holddown lengthwise and heightwise of the last to carry said members into engagement with the insole, means for thus moving said carrier and for also moving said members apart into supporting relation to the lip at the sides of the insole, a device for holding said carrier and members against reverse movements, and means for rendering said device inoperative in response to the movement of the holddown after the wiping operation.

34. In a power-operated lasting machine, the combination with power-operated means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of a holddown for engaging the end of the insole, means for supporting the lip around the end of

the insole against the inward pressure of said wiping means thereon, means for moving said lip-supporting means relatively to the holddown into lip-supporting position prior to the starting of the power operation of the machine, and automatic means for returning said lip-supporting means to its initial position relatively to the holddown after the wiping operation.

35. In a power-operated lasting machine, the combination with power-operated means for wiping the marginal portion of an upper around an end of a last inwardly over the margin of an insole on the last and against a lip on the insole, of a holddown for engaging the end of the insole, means for supporting the lip around the end of the insole against the inward pressure of said wiping means thereon, means for moving said lip-supporting means relatively to the holddown into lip-supporting position prior to the starting of the power operation of the machine, a device for holding said lip-supporting means against reverse movement, and automatic means for rendering said device inoperative after the wiping operation.

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