Nov. 1, 1932. R. B. WOODCOCK ET AL 1,886,279

LASTING MACHINE

Filed Nov. 16, 1931

Fig.1.

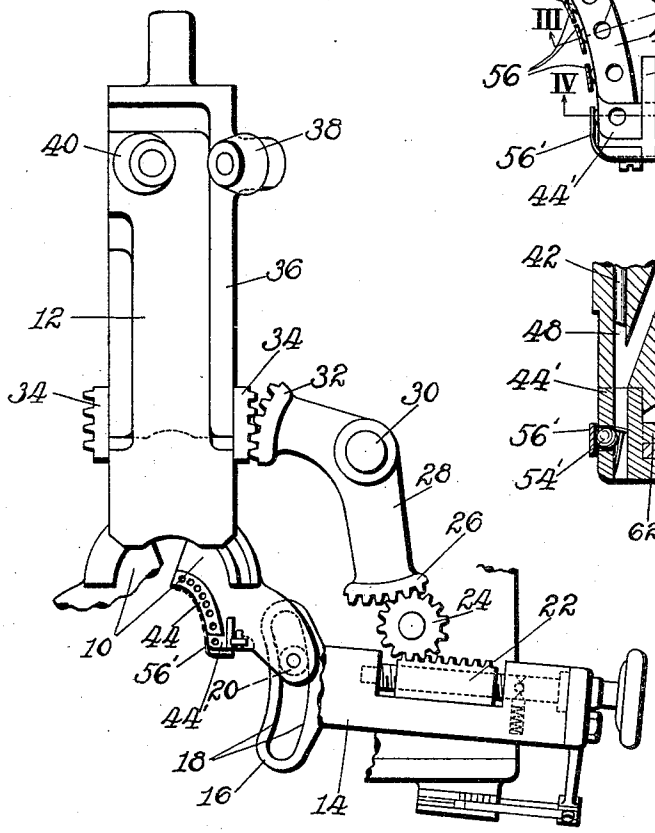


Fig.2.

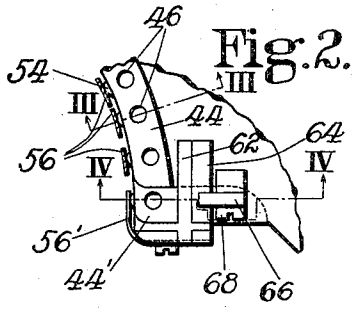


Fig.4.

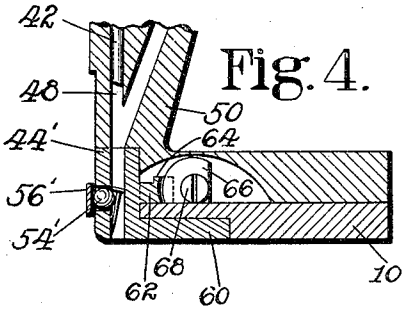


Fig.5.

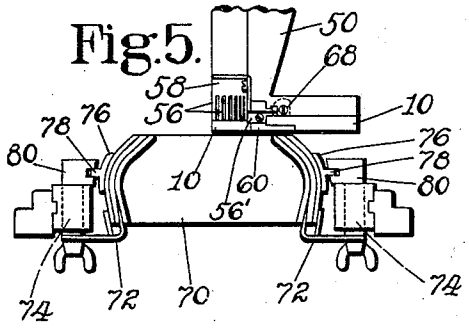
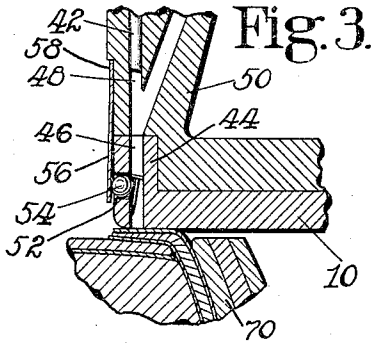


Fig.3.



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1,886,279

UNITED STATES PATENT OFFICE

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LASTING MACHINE

Application filed November 16, 1931, Serial No. 575,306, and in Great Britain December 9, 1930.

This invention relates to lasting machines for use in the manufacture of shoes, and more particularly to machines having wipers for wiping the marginal portion of an upper into lasted position about an end of a shoe and means for driving fastenings to fasten the upper in lasted position. The invention is herein illustrated as applied to a machine for lasting the heel ends of shoes, of the same general type as that disclosed in Letters Patent No. 1,583,044, granted on May 4, 1926, upon an application of C. H. Hoyt and provided with upper-fastening means of a type more particularly disclosed in Letters Patent No. 1,852,015, granted on April 5, 1932, upon an application of J. C. Jorgensen. It is to be understood, however, that the invention is not thus limited in its applicability.

In accordance with the disclosure of the last-mentioned Letters Patent the upper-fastening means comprises drivers movable in directions substantially perpendicular to the plane of the wipers to drive tacks through the upper into the shoe bottom, and means for holding the tacks with their shank portions inclined inwardly away from the edge of the shoe bottom when they are in positions to be driven so that they enter the shoe in such inclined directions when they are driven. An object of the present invention, among others, is to provide in an organization of that general character improved means for holding or controlling the tacks or like fastenings which will be simple in construction, unlikely to get out of order and readily accessible when desired. For the purposes in view the tack-holding means herein shown comprises spring-pressed members arranged to suspend the tacks by their heads with their shank portions inclined as above described and yieldable to permit the heads of the tacks to pass as the tacks are driven, these members, as illustrated, consisting of balls arranged to extend part way only across passages through which the tacks are driven and to engage the heads of the tacks at the sides thereof that are farthest from the edge of the shoe bottom when the tacks are in positions to be driven. The construction shown comprises upper-fastening mechanisms that are movable inwardly over the shoe bottom with the wipers in the same general manner as disclosed in the last-mentioned Letters Patent, and the tack-controlling members are pressed yieldingly into the paths of the tacks in directions substantially opposite to the directions of closing movement of the respective wipers over the shoe bottom. These members, moreover, as illustrated, are mounted in openings that extend to the sides of the different mechanisms that face each other across the shoe bottom in the wiping operation, so that they are readily accessible at any time.

In accordance with a further feature, the invention provides improved means to adapt the machine to operate on shoes of different sizes. For this purpose the wipers herein shown have each a readily detachable end portion provided with a wiping face forming an extension of the wiping face of the rest of the wiper and provided with means for supporting one of the upper-fastening tacks in position to be driven.

The above and other features of the invention, including also novel means for supporting the heel band with which a machine of the illustrated type is customarily provided, and various novel details of construction and combinations of parts, will now be more particularly described by reference to the accompanying drawing and pointed out in the claims.

In the drawing:

Fig. 1 is a plan view of a portion of a machine in which the invention is embodied, parts of the structure being removed;

Fig. 2 is a plan view on an enlarged scale of a portion of the structure shown in Fig. 1;

Figs. 3 and 4 are sections on the lines III—III and IV—IV respectively of Fig. 2, showing also portions of the structure omitted from Fig. 2; and

Fig. 5 is a view in front elevation showing the heel band and its supporting means, and also a portion of the wiping and fastening means.

As more fully disclosed in the above-mentioned Letters Patent, the machine in which the invention is herein illustrated as em-

bodied comprises a pair of wipers 10 formed to embrace the heel end of an upper and movable to wipe the marginal portion of the upper inwardly into lasted position over a sole or insole on a last. These wipers are supported on a slide 12 which is movable to advance them bodily lengthwise of the shoes and on which they are guided for swinging movements about an axis extending heightwise of the shoe to close them inwardly toward each other laterally of the shoe. For imparting the swinging or closing movements to the wipers there are provided slides 14, one for each wiper, mounted on the frame of the machine for movements laterally of the shoe, each slide having an end portion 16 provided with a slot 18 in which is mounted a roll 20 carried by the adjacent wiper. The slots 18 extend lengthwise of the shoe to permit advancing movement of the wipers relatively to the slides 14. Each of the slides 14 carries a rack bar 22 engaged by a pinion 24 which is engaged and operated by a curved rack 26 formed on one end of a bell-crank lever 28 pivoted at 30 on the frame of the machine, the other end of this lever having thereon a curved rack 32 engaged and operated by a rack bar 34. The construction shown comprises means more fully disclosed in a copending application of Fred Ricks, Serial No. 562,083, filed on September 10, 1931, for imparting to the wipers first advancing movement lengthwise of the shoe without any closing movements, then simultaneous advacing and closing movements, and thereafter closing movements only to complete the overwiping operation. For this purpose the two rack bars 34 are carried by a wiper closing slide 36 which is operated independently of the wiper-advancing slide 12, and on these two slides are mounted rolls 38 and 40 respectively which are engaged and operated by a cam (not shown), to impart to the wipers movements in the above-mentioned order, as disclosed in said Ricks' application.

For fastening the heel end of the upper in lasted position the machine herein shown is provided with upper-fastening mechanisms associated respectively with the different wipers 10 and movable with the wipers inwardly over the shoe bottom in the same general manner as disclosed in the above-mentioned Letters Patent No. 1,852,015, each of the mechanisms including a plurality of tack drivers 42 movable in directions substantially perpendicular to the plane of the wipers to drive upper-fastening tacks through the wipers into the shoe bottom, together with means for holding the tacks with their shank portions inclined inwardly away from the edge of the shoe bottom when they are in positions to be driven. For positioning and controlling the tacks, in accordance with one of the features of the present invention, each wiper 10 is provided with an upstanding portion or flange 44 curved similarly to its wiping edge and in which are formed a plurality of cylindrical tack and driver guide passages 46 extending perpendicularly to the plane of the wipers and in alinement with driver guide passages 48 formed in a block 50 which is secured on the wiper in the same general manner as disclosed in the last-mentioned Letters Patent. Formed also in each flange 44 are a plurality of cylindrical openings 52 (Fig. 3) spaced above the wiping face of the wiper and extending from the different respective tack passages 46 to the concave side of the flange which faces the flange 44 of the opposite wiper across the shoe bottom. Mounted in each of the openings 52 is a small steel ball 54 which is snugly guided in the opening and is arranged to extend part way only across the tack passage 46 to engage the head of the tack at that side thereof which is farthest from the edge of the shoe bottom when the tack is in position to be driven and thus to suspend the tack by its head with its shank portion inclined inwardly away from the edge of the shoe bottom, as illustrated in Fig. 3. The extent to which the ball may thus project into the tack passage is limited by a reduction of the bore of the opening 52 at the end of the opening next to the tack passage. The diameter of the ball is such that when it is thus positioned a portion of it projects also from the concave face of the flange 44. The balls that are carried by each wiper are pressed into the tack passages in directions substantially opposite to the direction of closing movement of the wiper and its associated fastening mechanism over the shoe by a series of depending spring fingers 56 formed on a comb-like member 58 bent in a concave form and secured to the concave face of the flange 44. When the tacks are driven by the drivers 42 these fingers yield to permit the heads of the tacks to pass the balls 54. It will be understood that each ball, while obstructing the tack passage sufficiently to prevent the tack from falling through it by gravity, affords on its rounded surface merely a single point of support for the lower surface of the tack head at the side of the tack which is nearest the concave face of the flange 44, so that the tack is suspended by its head in an inclined position with its point just above the lower face of the wiper and in contact with that side of the tack passage 46 at which the ball is located.

It will be evident that the above-described construction is simple to manufacture, durable and not likely to give any trouble by reason of an obstruction in any of the tack passages. The balls 54, moreover, are readily accessible, since all that is necessary if it is desired to remove or replace any of them is simply to remove the appropriate spring member 58.

To adapt the machine to operate in the

best manner on shoes that differ widely in size with considerable corresponding variations in the lengths of the heel seats, each wiper 10, in accordance with a further feature of the invention, is provided with a readily detachable end portion 60 (Fig. 4) located at the end thereof which is farthest from the extreme end of the shoe and provided with means for supporting one of the tacks in position to be driven. Each detachable end portion 60 has a wiping face that forms an extension of the wiping face of the main portion of the wiper to which it is attached and has a horizontally extending rib 62 between which and the lower part of the end portion the main portion of the wiper extends to hold the different portions in vertically fixed relation to each other. There is also a tongue 64 on the rib 62 which interlocks with a groove in the block 50 to hold the different portions in fixed relation to each other with respect to movement laterally of the shoe while permitting the end portion 60 to be detached by sliding it in a forward direction. To hold the end portion 60 in place there is provided a latch 66 which is pivoted on the block 50 within a recess in the block and may be turned either into or out of a notch formed in the rib 62. The latch has a head 68 thereon accessible to the operator and provided with a slot adapted to receive a screw driver whereby the latch may be turned. Each detachable end portion has a flange 44′ thereon which serves as an extension of the flange 44 and is provided with a tack passage 46′ in alinement with a corresponding driver passage 48 in the block 50. There is also a ball 54′ and a spring 56′ which perform the functions of the corresponding parts on the main portion of the wiper, the spring 56′ being fastened to the front face of the end portion 60 and extending rearwardly into position to control the ball 54′ as illustrated in Fig. 2.

The machine herein shown, similarly to that shown and described in the previously mentioned Letters Patent No. 1,583,044, is provided with a heel band 70 supported near its forward ends by clips 72 on rods 74 in such a manner as to permit relative sliding movements lengthwise of the band between the clips and the end portions of the band as the band is closed around the heel end of the shoe. The present invention further provides additional means for supporting the end portions of the band against downward tipping movement such as might result from the tendency of the wipers to tip the shoe when they first meet the heel end of the shoe. This additional means comprises blocks 76, secured on the outer faces of the end portions of the band between its upper and lower edges and provided with ribs 78 which are slidable in directions lengthwise of the band in grooves formed in blocks 80 which are fast on the rods 74. By these rib and groove connections the forward ends of the band are additionally supported against downward movement with provision for relative movement lengthwise of the shoe between the blocks 76 and 80 as the band is closed about the end of the shoe.

It is to be understood that in its more general aspects the invention is not limited to an organization in which the tack drivers are movable inwardly over the shoe bottom with the wipers, as herein shown, nor in which the drivers are movable perpendicularly to the plane of the wipers to drive the tacks; nor limited to an organization for driving fastenings in the form of tacks.

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

1. In an end-lasting machine, the combination with wipers for wiping the marginal portion of an upper into lasted position about an end of a shoe, of upper-fastening means comprising a plurality of tack drivers movable in directions substantially perpendicular to the plane of the wipers to drive tacks through the upper into the shoe bottom, said upper-fastening means including mechanism for suspending the tacks by their heads in such positions as to incline their shank portions inwardly away from the edge of the shoe bottom in angular relation to the paths of movement of the drivers preparatory to the tack-driving operation.

2. In an end-lasting machine, the combination with wipers for wiping the marginal portion of an upper into lasted position about an end of a shoe, of upper-fastening means comprising a plurality of tack drivers movable in directions substantially perpendicular to the plane of the wipers to drive tacks through the upper into the shoe bottom, said upper-fastening means including spring-controlled members located at the sides of the tacks that are farthest from the edge of the shoe bottom when the tacks are in positions to be driven and arranged for engagement with the heads of the tacks to suspend them by their heads with their shank portions inclined inwardly away from the edge of the shoe bottom in angular relation to the paths of movement of the drivers, said members being yieldable to permit the heads of the tacks to pass as the tacks are driven.

3. In an end-lasting machine, the combination with wipers for wiping the marginal portion of an upper into lasted position about an end of a shoe, of upper-fastening means comprising a plurality of tack drivers movable in directions substantially perpendicular to the plane of the wipers to drive tacks through the upper into the shoe bottom, said upper-fastening means having tack passages in alinement with the drivers and including spring-pressed balls arranged to extend part

way only across said passages in positions to support the tacks by their heads with their shank portions inclined inwardly away from the edge of the shoe bottom in angular relation to the paths of movement of the drivers.

4. In an end-lasting machine, the combination with wipers movable to wipe the marginal portion of an upper into lasted position about an end of a shoe, of upper-fastening mechanisms movable respectively with the different wipers inwardly over the shoe bottom and each comprising drivers movable in directions substantially perpendicular to the plane of the wipers to drive tacks through the wipers into the shoe bottom, said upper-fastening mechanisms including means for suspending the tacks by their heads in such positions as to incline their shank portions inwardly away from the edge of the shoe bottom in angular relation to the paths of movement of the drivers preparatory to the tack-driving operation.

5. In an end-lasting machine, the combination with wipers movable to wipe the marginal portion of an upper into lasted position about an end of a shoe, of upper-fastening mechanisms movable respectively with the different wipers inwardly over the shoe bottom and each comprising drivers movable in directions substantially perpendicular to the plane of the wipers to drive tacks through the upper into the shoe bottom, said upper-fastening mechanisms having tack passages in alinement with the drivers and having in each passage a single spring-pressed member arranged to extend part way only across the passage and to support a tack by its head in such a position as to incline its shank portion inwardly away from the edge of the shoe bottom preparatory to the tack-driving operation.

6. In an end-lasting machine, the combination with wipers movable to wipe the marginal portion of an upper into lasted position about an end of a shoe, of a plurality of tack drivers movable in directions substantially perpendicular to the plane of the wipers to drive upper-fastening tacks through the wipers into the shoe bottom, and means movable with the wipers for holding the tacks in positions to be driven, said tack-holding means comprising spring-pressed members arranged to suspend the tacks by engagement with their heads at the sides thereof that are farthest from the edge of the shoe bottom when they are in positions to be driven and thereby to incline their shank portions inwardly away from the edge of the shoe bottom in angular relation to the paths of movement of the drivers.

7. In an end-lasting machine, the combination with wipers mounted for closing movements toward each other to wipe the marginal portion of an upper into lasted position about an end of a shoe, of a plurality of tack drivers movable in directions substantially perpendicular to the plane of the wipers to drive upper-fastening tacks through the upper into the shoe bottom, and tack-positioning means movable with the wipers and provided with a plurality of tack passages arranged to aline with the drivers, said tack-positioning means including members yieldingly pressed part way only across said passages in directions substantially opposite to the directions of closing movements of the wipers over the shoe bottom and arranged to suspend the tacks by engagement with their heads at the sides thereof that are farthest from the edge of the shoe bottom when they are in positions to be driven and thereby to incline their shank portions inwardly away from the edge of the shoe bottom in angular relation to the paths of movement of the drivers.

8. In an end-lasting machine, the combination with wipers mounted for closing movements toward each other to wipe the marginal portion of an upper into lasted position about an end of a shoe, of upper-fastening mechanisms movable respectively with the different wipers inwardly over the shoe bottom and arranged to drive fastenings through the wipers to fasten the upper in lasted position, said upper-fastening mechanisms having passages therein for the fastenings and having in each passage a single member for supporting a fastening in position to be driven, said member being yieldingly pressed into the path of a fastening in said passage in a direction substantially opposite to the direction of closing movement of the respective wiper over the shoe bottom.

9. In an end-lasting machine, the combination with wipers mounted for closing movements toward each other to wipe the marginal portion of an upper into lasted position about an end of a shoe, of upper-fastening mechanisms movable respectively with the different wipers inwardy over the shoe bottom into positions for driving tacks through the upper into the shoe bottom, said upper-fastening mechanisms having tack passages therein and including members yieldingly pressed part way only across said passages in directions substantially opposite to the directions of closing movements of the respective wipers over the shoe bottom to support the tacks by their heads in positions to be driven with their shank portions inclined inwardly away from the edge of the shoe bottom.

10. In an end-lasting machine, the combination with wipers mounted for closing movements toward each other to wipe the marginal portion of an upper into lasted position about an end of a shoe, of means for driving fastenings to fasten the upper in lasted position, and mechanisms movable respectively with the different wipers inwardly over the shoe bottom for holding the fastenings in positions to

be driven, said mechanisms having passages therein for the fastenings and including members spaced from the wiping faces of the wipers and yieldingly pressed into the paths of fastenings in said passages in directions substantially opposite to the directions of closing movements of the respective wipers to support the fastenings, said members being removable from the sides of the different mechanisms that face each other across the shoe bottom in the wiping operation.

11. In an end-lasting machine, the combination with wipers mounted for closing movements toward each other to wipe the marginal portion of an upper into lasted position about an end of a shoe, of means for driving fastenings to fasten the upper in lasted position, and mechanisms movable respectively with the different wipers inwardly over the shoe bottom for holding the fastenings in positions to be driven, said mechanisms having passages therein for the fastenings and openings spaced from the wiping faces of the wipers and extending from said passages to the sides of the different mechanisms that face each other across the shoe bottom in the wiping operation, and spring-pressed members in said openings arranged to support the fastenings and accessible from said oppositely facing sides of the different mechanisms.

12. In an end-lasting machine, the combination with wipers mounted for closing movements toward each other to wipe the marginal portion of an upper into lasted position about an end of a shoe, of means for driving tacks to fasten the upper in lasted position, and mechanisms movable respectively with the different wipers inwardly over the shoe bottom for holding the tacks in positions to be driven, said mechanisms having tack passages therein and also openings extending from said passages to the sides of the different mechanisms that face each other across the shoe bottom in the wiping operation, and spring-pressed members in said openings arranged to extend part way only across said passages to support the tacks by their heads with their shank portions inclined inwardly away from the edge of the shoe bottom, said members being accessible from said oppositely facing sides of the different mechanisms.

13. In an end-lasting machine, the combination with wipers mounted for closing movements toward each other to wipe the marginal portion of an upper into lasted position about an end of a shoe, of means for driving fastenings to fasten the upper in lasted position, and mechanisms movable inwardly over the shoe bottom in fixed relation to the different respective wipers for holding the fastenings in positions to be driven, said mechanisms having passages therein for the fastenings and also openings extending from said passages to the sides of the different mechanisms that face each other across the shoe bottom in the wiping operation, members in said openings arranged to support the fastenings, and springs on said oppositely facing sides of the different mechanisms arranged to press said members yieldingly into the passages.

14. In an end-lasting machine, the combination with wipers mounted for closing movements toward each other to wipe the marginal portion of an upper into lasted position about an end of a shoe, of means for driving tacks to fasten the upper in lasted position, and mechanisms movable inwardly over the shoe bottom in fixed relation to the different respective wipers for holding the tacks in positions to be driven, said mechanisms having tack passages therein and also openings spaced from the wiping faces of the wipers and extending from said passages to the sides of the different mechanisms that face each other across the shoe bottom in the wiping operation, balls in said openings arranged to support the tacks by their heads, and spring members on said oppositely facing sides of the different mechanisms arranged to press said balls yieldingly into the tack passages.

15. In an end-lasting machine, wipers formed to embrace an upper about an end of a shoe and movable to wipe the marginal portion of the upper into lasted position, each of said wipers having thereon an upstanding portion provided with a concave face substantially parallel to the wiping edge of the wiper and provided with passages for fastenings to be driven into the shoe bottom to fasten the upper in lasted position, members yieldingly pressed into said passages to support the fastenings and accessible from said concave face, and means for driving the fastenings.

16. In an end-lasting machine, wipers formed to embrace an upper about an end of a shoe and movable to wipe the marginal portion of the upper into lasted position, each of said wipers having thereon an upstanding portion provided with a concave face substantially parallel to the wiping edge of the wiper and provided with passages for fastenings to be driven into the shoe bottom to fasten the upper in lasted position, openings extending from said concave face to the different passages, members in said openings arranged to support fastenings in said passages, spring means on said concave face for pressing said members into the passages, and means for driving the fastenings.

17. In an end-lasting machine, wipers formed to embrace an upper about an end of a shoe and movable to wipe the marginal portion of the upper into lasted position, each of said wipers having thereon an upstanding portion provided with a concave face substantially parallel to the wiping edge of the wiper and provided with passages for fas-

tenings to be driven into the shoe bottom to fasten the upper in lasted position, openings extending from said concave face to the different passages, balls in said openings arranged to project part way only across said passages to support the fastenings and also to project from said concave face, spring means on said concave face for pressing the balls into said passages, and means for driving the fastenings.

18. In an end-lasting machine, wipers constructed and arranged to extend around an end of a shoe to wipe the marginal portion of the shoe upper into lasted position, said wipers having means thereon for supporting a plurality of fastenings in positions to be driven through the upper into the bottom of the shoe to fasten the upper in lasted position and having also readily detachable portions each provided with a wiping face and with means for supporting at least one of said fastenings.

19. In an end-lasting machine, a pair of wipers formed to extend around an end of a shoe to wipe the marginal portion of the shoe upper into lasted position, each of said wipers having means thereon for supporting a plurality of fastenings in positions to be driven through the wiper to fasten the upper in lasted position and having also a readily detachable end portion provided with a wiping face forming an extension of the wiping face of the rest of the wiper and provided with means for supporting at least one of said fastenings.

20. In an end-lasting machine, wipers formed to extend around an end of a shoe and mounted for swinging movements each about an axis extending heightwise of the shoe to wipe the marginal portion of the shoe upper into lasted position at opposite sides of the shoe bottom, said wipers having means thereon for supporting a plurality of fastenings in positions to be driven through the upper into the shoe bottom to fasten the upper in lasted position and having also readily detachable portions located at the ends thereof that are farthest from the extreme end of the shoe, each of said detachable portions having a wiping face forming an extension of the wiping face of the portion to which it is attached and being provided with means for supporting at least one of said fastenings.

21. In an end-lasting machine, a pair of wipers formed to extend around an end of a shoe to wipe the marginal portion of the shoe upper into lasted position, each of said wipers having means thereon for supporting a plurality of fastenings in positions to be driven through the wiper to fasten the upper in lasted position and having also a detachable end portion provided with a wiping face forming an extension of the wiping face of the rest of the wiper and provided with means for supporting at least one of said fastenings, and devices for holding said detachable portions in fixed relation to the portions of the wipers to which they are attached or for releasing them to permit them to be detached.

22. In a heel-end-lasting machine, the combination with means for wiping the marginal portion of the heel end of an upper into lasted postion, of a heel band for embracing and clamping the heel end of the shoe, and means for supporting said heel band against displacement heightwise of the shoe, said supporting means comprising, at each of the opposite ends of the band, a member secured to the band between the upper and lower edges of the latter and another member supporting said first-named member with provision for relative movement lengthwise of the shoe between the different members as the band is closed about the end of the shoe.

23. In a heel-end-lasting machine, the combination with means for wiping the marginal portion of the heel end of an upper into lasted position, of a heel band for embracing and clamping the heel end of the shoe, and means for supporting said heel band against displacement heightwise of the shoe, said supporting means comprising, at each of the opposite ends of the band, a member secured to the band between the upper and lower edges of the latter and having a rib thereon extending lengthwise of the shoe, and another member having a groove to receive said rib and support said first-named member with provision for relative sliding movement lengthwise of the shoe between the different members as the band is closed about the end of the shoe.

In testimony whereof we have signed our names to this specification.

REGINALD BOYD WOODCOCK.
HAROLD LANE.