Nov. 11, 1924. 1,514,756

P. BEIER

UPPER FORMING MACHINE

Filed April 3, 1920 4 Sheets-Sheet 1

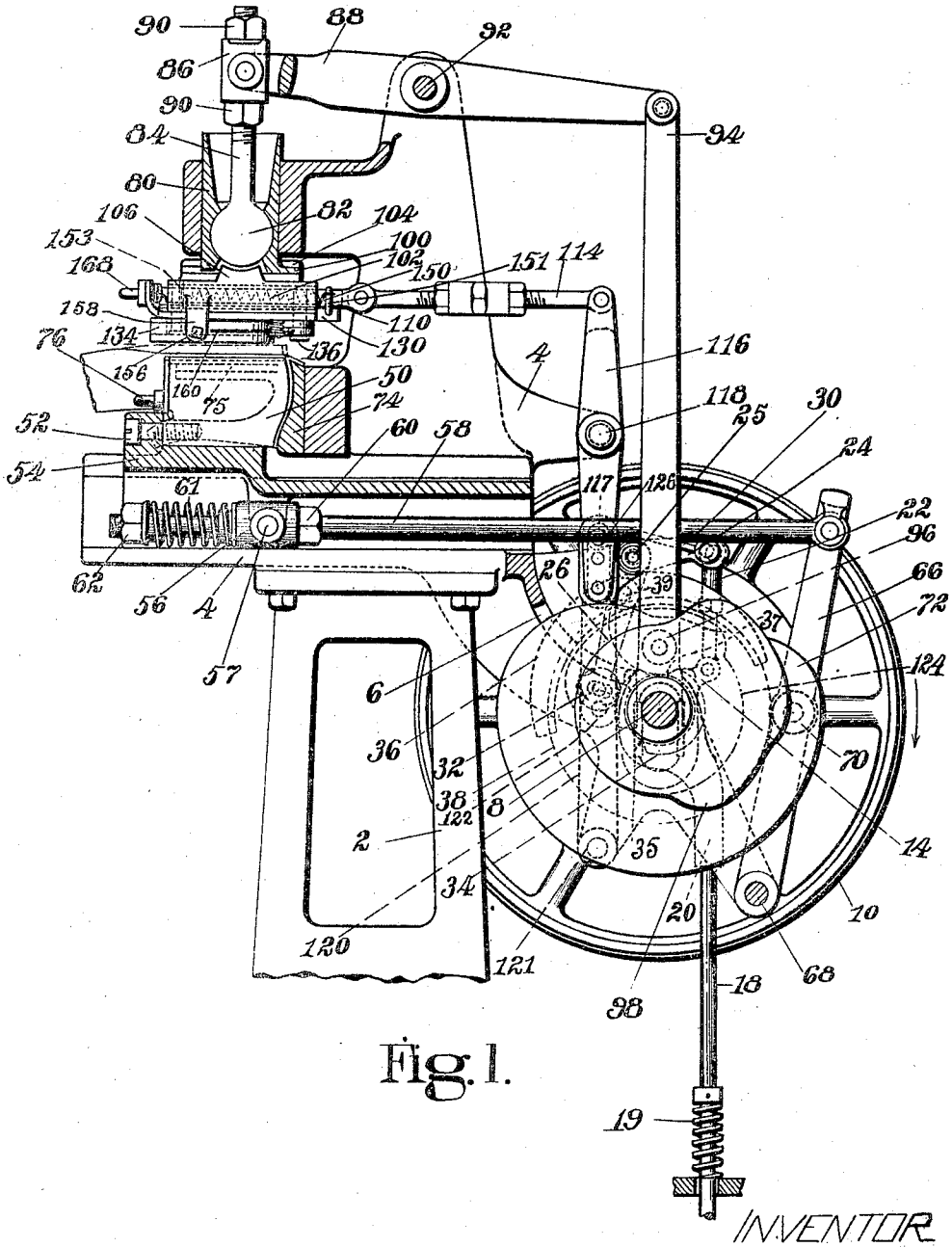


Fig. 1.

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UPPER FORMING MACHINE

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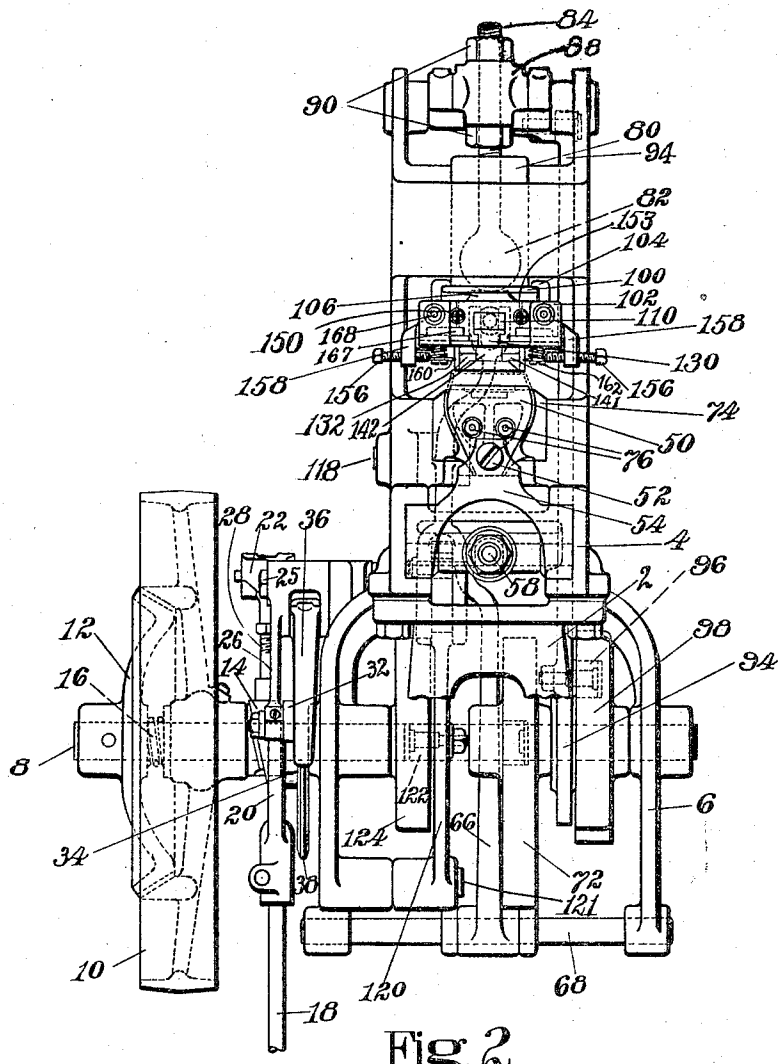


Fig. 2.

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UPPER FORMING MACHINE

Filed April 3, 1920 4 Sheets-Sheet 3

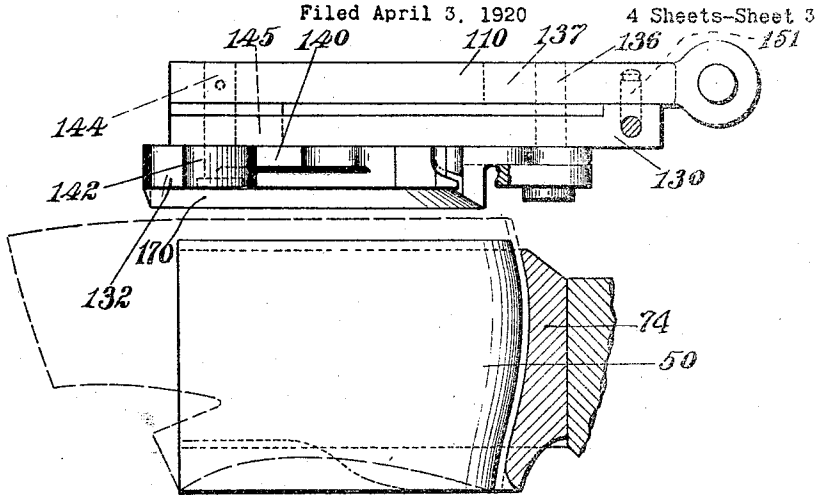


Fig. 3.

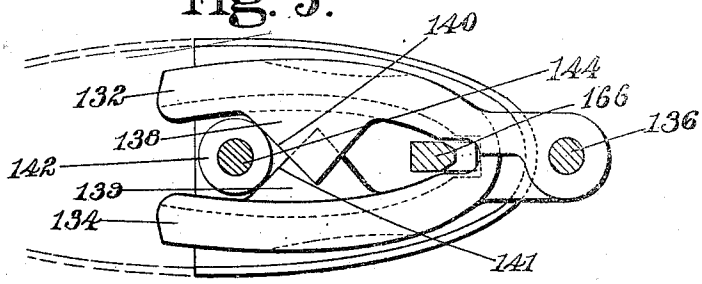


Fig. 4.

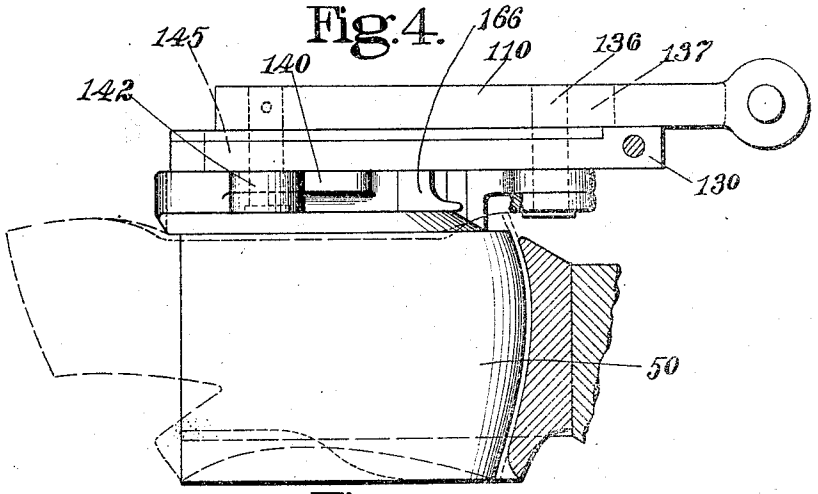


Fig. 5.

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Nov. 11, 1924. 1,514,756

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UPPER FORMING MACHINE

Filed April 3, 1920 4 Sheets-Sheet 4

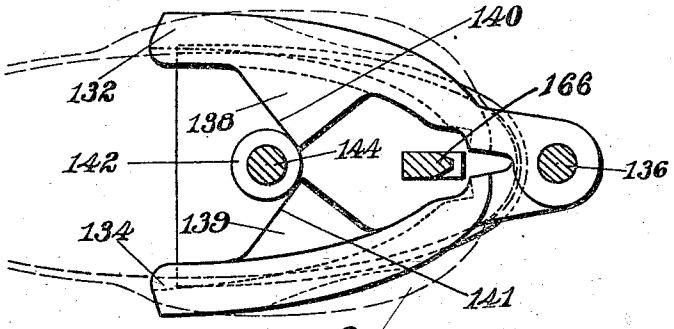


Fig. 6.

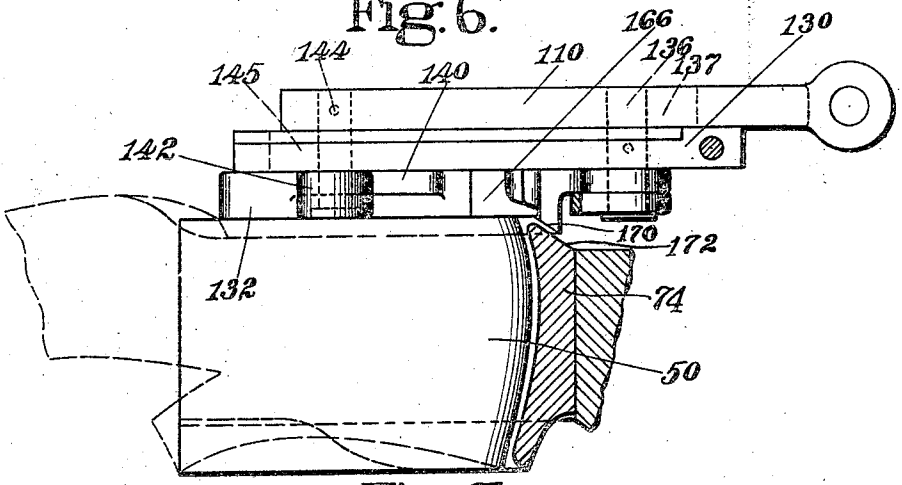


Fig. 7.

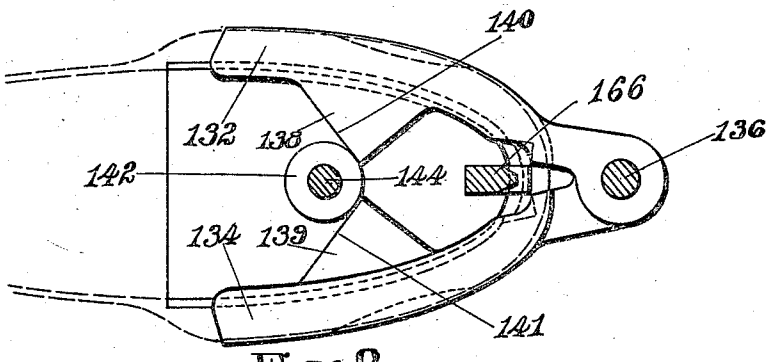


Fig. 8.

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By his Attorney

Patented Nov. 11, 1924. 1,514,756

UNITED STATES PATENT OFFICE.

PAUL BEIER, OF KARLSRUHE, GERMANY, ASSIGNOR TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

UPPER-FORMING MACHINE.

Application filed April 3, 1920. Serial No. 371,132.

To all whom it may concern:

Be it known that I, PAUL BEIER, engineer, a citizen of the Free State of Baden, residing in Karlsruhe, Jollystrasse 9, Germany, have invented certain Improvements in Upper-Forming Machines, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to machines for forming or shaping the end portions of the uppers of boots and shoes and is herein shown as embodied in a machine for shaping or molding the heel end of a stitchdown shoe upper and forming thereon an outturned sole attaching flange.

A general object of the present invention is to provide an improved machine for this work which will be simple in construction and more effective in operation than prior machines.

A feature of the invention consists in the combination with heel end molding or shaping means for a shoe upper arranged to leave a marginal portion projecting outside said shaping means, of flange forming means comprising members which, as shown, are first separated to turn outwardly the side portions of the projecting margin and are then moved bodily to turn outwardly the rear portion of the projecting margin.

A further feature of the invention consists in the combination with molds for shaping the rear portion of a shoe upper, of a pair of flange forming members which are pivoted outside of the area enclosed by the rear portion of the upper, as at the rear of the molds, and are separated at their front ends to act upon the projecting margin in directions substantially normal to the margin. Since the inner mold of the molding means diminishes in lateral extent from front to rear of the upper and the illustrated pivot of the members is at the rear of the upper, the lateral movement of the members at various portions of their length is substantially proportional to the lateral extent of the inner mold and substantially normal to the side portions of the projecting margin throughout their extent.

Another feature of the invention consists in means for varying the movement of separation of the flange forming members to adapt them for co-operation with molds of different widths. After the described separative movement of the flange forming members they are given a movement of translation to cause them to engage and turn outwardly the portion of the projecting margin at the rear end of the molds.

A further feature of the invention consists in means for varying the bodily movement of the flange forming means to adapt the machine for operation upon the flanges of uppers held by molds of different length.

Still another feature of the invention consists in means for acting upon the upper at the center of the rear portion of the upper in the gap or opening, occasioned by the separative movement of the flange forming members about their pivot, to press the upper at this point against the outer mold.

Another feature of the invention consists in means for positively pressing the flange forming members upon the outturned flange to hold it against the top face of the outer mold of the heel end molding means with a uniform pressure throughout the extent of the flange. Preferably and as shown, the carrier for the flange forming members is so mounted that the members have universal movement and may adapt themselves to the plane of the flange irrespectively of the variations in thickness of different portions of the flange.

In order that the relation of the flange forming members to the molds shall not vary when molds of different height are used in the machine, it is important that the positively moved flange forming means have a variable movement of approach to the mold perpendicularly to the direction in which the flange forming means acts in turning out the projecting margin. Accordingly, a further feature of the invention consists in means for varying the limit of approach of the flange forming means to the molds in the flange pressing operation to adapt it for operation upon molds of different height.

These and other features of the invention including certain details of construction and combinations of parts will appear more fully from the following description when read in connection with the accompanying drawings and will be pointed out in the appended claims.

In the drawings,

Fig. 1 is a side view, partly in central

section, of a machine embodying this invention;

Fig. 2 is a front view of the machine, the column being broken away;

Fig. 3 is a side view of the flange forming means in raised position, the outer mold being in section;

Fig. 4 is a plan view of the flange forming means in the position shown in Fig. 3;

Fig. 5 is a side view similar to Fig. 3 with the flange forming means lowered and open;

Fig. 6 is a plan view of the flange forming means in the position shown in Fig. 5.

Fig. 7 is a side view similar to Fig. 8 but with the flange forming means moved rearwardly and downwardly to form the outturned flange against the outer mold; and

Fig. 8 is a plan view of the flange forming means in the position shown in Fig. 7.

Referring to Fig. 1, the numeral 2 indicates the column of the machine to which is bolted the frame 4 of the head by which all the operating parts are carried. The frame 4 has rearwardly extending brackets 6 in which a cam shaft 8 is journaled. A drive wheel 10 is loose on the shaft 8 (Fig. 2) and is formed with a female friction cone cooperating with a male cone 12 pinned to the shaft 8. A wedge 14 is operated in a manner to be described to force the hub of the drive wheel 10 outwardly to bring the friction cones into engagement and when the wedge is reversely moved a spring 16 forces the friction cones out of engagement and allows the machine to stop.

The wedge 14 is operated by a treadle rod 18 connected to a foot treadle (not shown) and is raised by a spring 19. On the upper end of the treadle rod is a member 20 forming part of the wedge 14 (Fig. 2) and mounted for vertical movement on the shaft 8. The member 20 is connected by a link 22 with one arm 24 of an angle lever pivoted at 25 to a portion of one of the brackets 6, the other arm of the lever being indicated by the numeral 26. The length of the link 22 is adjustable and also is connected to the arm 24 by mechanism comprising an eccentric operated by a handle 30 for conveniently varying the relation of the arm 24 to the wedge 14 for a purpose which will appear. The arm 26 carries a roll 32 normally lying in a depression 35 in a cam 34, being swung out of the depression when the wedge 14 is depressed by reason of the connection 22 to the arm 24. As soon as the machine starts the cam 34 holds the roll 32 away from the axis of the cam and, of course, holds the wedge 14 in clutch closing position. The machine, therefore, will remain in operation until another depression 37 in the cam 34 reaches the roll 32, whereupon the roll enters the depression and allows the wedge 14 to rise and the machine to stop. Since the cam 34 has two depressions 35, 37 the machine stops not only at the end of the cycle but also at a point in the cycle after the materials have been operated upon by the machine and need to be held for a time in that condition to allow them to set in the shape that they are made to assume by the forming mechanism. On the arm 26 is pivoted at 39 a brake shoe 36 which engages a brake disk 38 when the roll 32 reaches a depression in the cam 34 and quickly stops the machine. The roll 32 is adjustably held on the end of the arm 26 so that adjustment may be made to vary the action of the brake shoe, and the handle 30 may be operated and the length of the link 22 adjusted to vary the movement of the wedge 14 and hence the pressure on the clutching surfaces under different working conditions.

An interchangeable inner or male mold 50 is held by a screw 52 upon a slide 54 which is mounted for horizontal movement in the frame 4. A sleeve 56 is journaled at 57 on the slide 54 and through the sleeve 56 passes freely an operating rod 58 which carries a stop nut 60 on one side of the sleeve and a spring 61 abutting against an adjustable nut 62 on the other side. The rod 58 is pivoted at its inner end to the upper end of a lever 66 fulcrumed to the frame 4 at 68 and carrying between its ends a cam roll 70 which lies in a cam path formed in the inner face of a cam block 72. The cam 72 acts through the spring 61 to draw the inner mold 50 into an outer mold 74 and to shape the upper material placed about the inner mold to the form of the rear portion of a shoe. The inner mold 50 is preferably heated to cause the molded material to set more quickly in its molded shape and the heating means is preferably electrical, a heating unit 75 being inserted in a space formed in the mold 50. The terminals for connection of the electric current to the unit 75 are indicated at 76.

For forming the marginal portion of the upper material projecting above the molds 50, 74, into an outturned flange the following mechanism is provided. A sliding sleeve 80 is mounted for vertical movement in the frame 4. In order to permit the ball 82 to be assembled within the sleeve 80 the sleeve is preferably made in two parts. Inside the sliding sleeve is a ball 82 which engages a spherical formation on the inner walls of the sliding sleeve. The ball 82 has a threaded stem 84 which passes through a sleeve 86, journaled on the end of a lever 88. Nuts 90 on the sleeve 84 above and below the sleeve 86 provide for vertical adjustment of the sliding sleeve 80. The lever 88 is fulcrumed at 92 to the frame 4 and its rear end is pivoted to a bar 94 which has its lower end slotted to embrace the shaft 8 and slide

vertically thereon. On the bar 94 is a cam roll 96 lying in a cam path formed in the inner face of a cam block 98 on the shaft 8. The cam operates the lever 88 to raise and lower the sliding sleeve 80 positively and the nuts 90 afford means for varying the positively applied pressure and to adapt the mechanism for molds of different heights.

The portion of the sleeve 80 which projects below the frame 4 is formed with laterally extending flanges 100 (Fig. 2). A slide carrier 102 has portions 104 which overlie the flanges 100 so that the slide carrier will be raised by upward movement of the sliding sleeve 80. Beneath the ball 82 the slide carrier 102 has a projection 106 with a spherical depression in its top face (Fig. 1) to be engaged by the lower surface of the ball 82 when the slide carrier is held from downward movement, there being a space between the flange 100 and the top face of the slide carrier 102 providing a small amount of lost motion between the parts to allow the lower face of the ball 82 to seat in the spherical depression in the projection 106 when downward movement of the carrier is arrested.

In the slide carrier 102 is mounted a slide 110. The slide 110 is connected at its rear end to one end of an adjustable link 114 the other end of which is pivoted to a lever 116 fulcrumed at 118 to the frame 4. The lever 116 has its lower end bifurcated to embrace the slotted upper end of a lever 120 and between the bifurcations is mounted a roll 117 lying in the slot of the lever 120.

The lever 120 is fulcrumed to the frame at 121 and, between its ends, carries a cam roll 122 which engages a cam path in a cam block 124 on the shaft 8. The bifurcated end of the lever 116 has a plurality of holes at different distances from its fulcrum and a pin 126 which carries the roll 117 may be placed in either one of the holes and through the roll and the slotted upper end of the lever 120. By changing the location of the roll 117 the amount of movement communicated by the cam 124 to the slide 110 may be varied. The levers 116, 120 constitute a compound lever for transmitting motion from the cam 124 to the slide 110.

Below the slide 110 another slide 130 is mounted in the slide carrier 102 for movement in the same direction as the slide 110. To the rear end of the slide 130 are pivoted two flange formers or wipers 132, 134, by a pin 136 which passes through the slide 130 into a slot 137 formed in the slide 110 (Fig. 5). The wipers have on their inner edges projections 138, 139 which overlap when the wipers are closed (Fig. 4) and have rearwardly inclined faces 140, 141 arranged to be engaged by a roll 142 on a pin 144 which passes through a slot 145 in the slide 130 and is fixed in the slide 110 (Fig. 6). The slide 130 is held forward relatively to the slide carrier 102 by springs 150 (Fig. 1) which have their rear ends attached to the slide 130 by pins 151 and extend forwardly through holes in the slide carrier 102, their front ends being fastened to the carrier by pins 153.

When the slide 110 is moved rearwardly by the operative connections described the slide 130 remains stationary by reason of the tension of the springs 150, and the roll 142 engages the inclined faces 140, 141 of the wipers and causes them to open (Fig. 6). When the wipers have opened to the degree desired for the given shoe upper their front ends engage screws 156 (Fig. 2) which are threaded through downward projections 158 from the slide carrier 102 and are adjusted properly to limit the outward swing of the forward end of the wipers in accordance with the size of the mold. The wipers 138, 139 are moved to closed position by grasshopper springs 160 each of which is coiled around a screw 162 and has one end resting against an outer face of a wiper and the other end resting against one of the projections 158 (Fig. 1). The pivot pin 136 is located at a point to the rear and outside of the molds and as a result the opening movement of the front ends of the wipers is substantially normal to the face of the projecting margin which they engage. The fact that the wipers are pivoted at the rear of their acting faces causes the portions of the acting faces which engage the upper at the rear to separate when the forward ends of the wipers are swung outwardly. To fill the gap thus formed a projection or part 166 is provided on the slide 130 which engages the upper at the rear between the wipers and forces it into engagement with the mold 74 (Fig. 7). After the slide 110 has moved rearwardly far enough to effect the desired separation of the flange turning means or wipers 132, 134, and their further movement has been limited by the screws 156, or if the screws are set widely apart, by engagement of the pin 136 with the forward end of the slot 137, further movement of the slide 110 effects bodily movement of the wiper to turn outwardly the upwardly projecting margin at the rear of the shoe (Fig. 7). This movement causes the projection 166 to turn outwardly the portion of the upper between the separated wipers. The wipers are then depressed, as shown in Fig. 7, to over-mold the flange and apply ironing pressure thereto between the inclined surfaces 170, 172.

The operation of the machine is as follows: In the position of the machine shown in Figs. 1 and 2 the upper has been operated upon and the machine is about to stop. The drive wheel 10 is rotating in the direction of the arrow (Fig. 1), the wipers have been

returned to their forward and closed position, and the upper is about to be released by a forward movement of the male mold 50. The machine will stop when the depression 35 of the cam 34 reaches the roll 32, causing the wedge 14 to be raised and the brake 36 to be applied. The molded upper will then be removed and another unmolded upper placed over the male mold 50 with its marginal portions extending above the molds 50, 74, as shown in dotted lines in Fig. 1. The treadle rod 18 will then be operated to start the machine. The male mold 50 will be drawn by the action of the cam 72 into the female mold 74 and cause the upper to be shaped to correspond to the sides and end of the rear portion of a shoe, the spring 61 providing for variations in the thickness of the upper and also variations in the size of the molds. The cam 98 next operates to lower the sleeve 80 and connected parts until the wipers 132, 134 rest against the top face of the male mold 50 and then farther until the lower surface of the ball 82 rests in the spherical depression in the projection 106, this being permitted by the lost motion provided by the space between the flanges 100 and the top face of the slide carrier 102. The carrier is, therefore, capable of limited universal movement. After this preliminary movement of the wipers is effected the cam 124 acts to move rearwardly the slide 110, causing the roll 142 to engage the inclined faces 140, 141 of the wipers and move their front ends outwardly to lay the upper over the top face of the female mold 74. After the wipers have fully opened and their front ends have engaged the screws 156 relative movement between the slides 110, 130 ceases and both move together to cause the wipers to fold outwardly the end portion of the upper margin over the rear end of the mold 74. At this point in the operation a formation of the cam 98 acts on the roll 96 to further depress the wipers positively against the outwardly turned margin of the upper.

The wipers have downwardly and outwardly inclined faces 170 (Fig. 7) which co-operate with corresponding downwardly and outwardly inclined faces 172 on the mold 74. As the wipers are positively pressed farther downwardly these faces cooperate to form the outturned flange of the upper into a downwardly and outwardly directed flange and to iron down the flange. Since the slide carrier 102 and the wipers are able to rock in any direction, differences in thickness of different portions of the leather acted upon by the wipers is taken care of and equal bearing of the wipers on all portions of the flange formed as the wipers force outwardly the margin of upper extending above the molds 50, 74 is ensured. It is only neecssary of course that the flange project at right angles to the side of the last but the over-molding effected by this machine ensures that the molded flange will not "go back" or react after removal from the mold, beyond the desired position at right angles to the side of the shoe.

The second depression 37 in the cam 34 has now reached the roll 32 and the machine stops with the upper and flange under molding pressure where it should remain for a time to allow the material to set in molded condition. To expedite this setting the wipers are preferably heated. In the construction herein shown this is effected by electrical heating units 167 inserted in spaces provided in the slide carrier 102 and connected in series, the terminals for making the electrical connections being indicated at 168. The machines are preferably arranged in pairs so that one machine may be allowed to remain stopped with an upper therein while an upper is being placed in the other machine and the machine started. After allowing the machine to remain at rest for a suitable length of time it is again started and stops automatically with the upper released.

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

1. In a machine of the class described, the combination of inner and outer mold members for molding the heel end of a shoe upper arranged to leave a marginal portion of said upper projecting outside of said molds, pivoted flange forming members, and means for operating said flange forming members first to turn outwardly the projecting margin at the sides of the molds and then to turn outwardly the margin at the rear of the molds.

2. In a machine of the class described, the combination of means for shaping the heel end of a shoe upper arranged to leave a marginal portion thereof projecting outside said means, and means for forming an outturned flange from said projecting margin comprising members which are first moved relatively to each other to form a portion of the flange and are then moved bodily to form the remainder of the flange.

3. In a machine of the class described, the combination of means for molding the heel end of a shoe upper arranged to leave the marginal portion of a shoe upper projecting outside said means, and means for forming a sole attaching flange from said marginal portion comprising a carrier, a slide mounted on the carrier for movement toward the rear end of the upper, wipers mounted on the slide, means for moving the carrier in a direction parallel to the marginal portion of the upper to carry the wipers directly into and out of operative

position within said projecting margin, means for moving the slide rearwardly to bend outwardly the rear part of the marginal portion, and means for swinging outwardly the front ends of the wipers to bend outwardly the sides of the marginal portion.

4. In a machine of the class described, the combination of means for shaping the heel end of a shoe upper arranged to leave the marginal portion thereof projecting outside said means, means for forming an outwardly directed flange from said projecting margin comprising members having flange forming movements in two directions, one a movement of the members relatively to each other laterally of the heel end of the shoe upper and the other a movement together longitudinally of the shoe upper, and means for causing said movements to take place in succession.

5. In a machine of the class described, the combination of a pair of slides, flange forming means on one of the slides comprising separable members, means for moving the slides at first relatively to each other and then together, and means for effecting from the slides at first a movement of separation of said members and then a bodily movement of said members.

6. In a machine for molding the rear end of a shoe upper, the combination with inner and outer molds acting to shape the rear end of the shoe upper and to leave the marginal portion projecting outside of the molds, of flange forming members arranged for relative movement first to turn outwardly the side portions of the projecting margin and then for movement to turn outwardly the rear portion of the projecting margin.

7. In a machine of the class described, the combination of means for shaping the heel end of a shoe upper arranged to leave the marginal portion thereof projecting outside said means, and means for forming a flange from said projecting margin comprising members having flange forming movements of separation about a point located in the rear of and outside of the shoe upper.

8. In a machine of the class described, the combination of means for shaping the heel end of a shoe upper arranged to leave the marginal portion thereof projecting outside said means, means for forming a flange from said projecting margin comprising members having flange forming movements of separation about a point located in the rear of and outside of the shoe upper, and means for engaging the upper in the space between the members occasioned by their movement about said point.

9. In a machine of the class described, the combination of means for shaping the heel end of a shoe upper arranged to leave a marginal portion thereof projecting outside said means, and means for forming an outturned flange from said projecting margin comprising members pivoted together at a point located at the rear of said heel end shaping means, and means acting first to separate the forward ends of the members to form a portion of the outturned flange and then to move the pivot to cause the members to form the remainder of the outturned flange.

10. In a machine of the class described, the combination of means for shaping the heel end of a shoe upper arranged to leave the marginal portion thereof projecting outside said means, means for forming the projecting margin at an angle to the portion of upper within the shaping means comprising pivoted members having forming movements in two directions, one movement being a relative movement of separation about the pivot, and the other movement being effected by a motion of the pivot relatively to the shoe upper, and means for effecting said movements in the order named.

11. In a machine of the class described, the combination of means for shaping the heel end of a shoe upper arranged to leave a marginal portion of said upper projecting outside of said means, and means for forming an outturned flange from said projecting margin comprising two members pivoted at their rear ends, the axis of said pivot lying parallel to the direction of lateral extent of said projecting portion before it is outturned and outside of the area enclosed by said projecting portion.

12. In a machine of the class described, the combination of rearwardly tapering inner and outer mold members for molding the heel end of a shoe upper arranged to leave a marginal portion of said upper projecting outside of said molds, and flange forming members different operative portions of which have movements of separation laterally of the inner mold corresponding substantially to the diminishing lateral extent of the mold toward the rear of the mold.

13. In a machine of the class described, the combination of inner and outer mold members for molding the heel end of a shoe upper arranged to leave a marginal portion of said upper projecting outside of said molds, and means for forming an outturned flange from said projecting margin having separate flange forming movements in three directions, the first in the plane of the top face of the inner mold laterally of the heel portion of the shoe upper, the second longitudinally of the shoe upper, and a third perpendicular to the plane of the top face of the inner mold.

14. In a machine of the class described, the combination of members for shaping the heel end of a shoe upper arranged to leave

a marginal portion of said upper projecting outside of said members, means for forming an outturned flange from said projecting margin comprising two flange formers each of which has flange forming movements in two directions, and means movable rearwardly of said upper for first separating said formers and then moving them bodily with said means.

15. In a machine of the class described, the combination of means for molding the heel end of a shoe upper arranged to leave a marginal portion of said upper projecting outside of said means, members for forming an outturned flange from said projecting margin, means movable rearwardly of said shoe upper for separating said members, and means for varying the amount of separative movement of said members.

16. In a machine of the class described, the combination of means for molding the heel end of a shoe upper arranged to leave a marginal portion of said upper projecting outside of said means, members for forming an outturned flange from said projecting margin, means movable rearwardly of said shoe upper for first separating said members and then moving the members bodily, and means for varying the amount of bodily movement of said members.

17. A machine for molding the rear portion of shoe upper materials, having, in combination, inside and outside formers and operating mechanism therefor, a sleeve mounted for vertical bodily movement toward and from the formers, a plurality of slides mounted upon the sleeve, wipers connected to one of the slides, means for positively moving the other slide, and means for imparting from the positively moving slide to the wipers first a separating movement and then a bodily movement longitudinally of the formers.

18. In a machine for molding the rear end of a shoe upper, the combination with inner and outer molds acting to shape the rear end of the shoe upper and to leave the marginal portion projecting outside of the molds, of flange forming members arranged for relative movement first to turn outwardly the side portions of the projecting margin and then for movement to turn outwardly the rear portion of the projecting margin, and means whereby the outward movement at the rear end may be varied.

19. In a machine for molding the rear end of a shoe upper, the combination with inner and outer molds acting to shape the rear end of the shoe upper and to leave the marginal portion projecting outside of the molds, of a pair of flange forming members pivoted at the rear of the molds and outside of the area enclosed by the rear portion of the upper, and means acting first to move said members relatively upon their pivot to turn outwardly the forward part of the projecting margin and then acting to move the pivot of said members rearwardly to cause said members to turn outwardly the rear portion of the projecting margin.

20. In a machine of the class described, the combination of a pair of slides, flange forming means on one of the slides comprising separable members, means for effecting limited movement of separation of the flange forming members, and means becoming effective when the separative movement ceases for giving said members a movement of translation.

21. In a machine of the class described, the combination of means for molding the heel end of a shoe upper arranged to leave a marginal portion thereof projecting outside said means, means for forming an outturned flange from said projecting margin comprising wipers and wiper carrying means movable rearwardly of the shoe upper, and wiper operating means acting first to move the wipers, relatively to each other laterally against the side portions of the projecting margin and then to move the wipers bodily rearwardly to form the projecting margin at the rear of the upper into an outwardly directed flange.

22. In a machine of the class described, the combination of means for molding the heel end of a shoe upper arranged to leave the marginal portion thereof projecting beyond the sides of said means, a carrier, flange forming means supported by the carrier, and means on the carrier and movable relatively to the carrier to act upon said flange forming means and cause it to turn outwardly the marginal portion of said upper.

23. In a machine of the class described, the combination of means for molding the heel end of a shoe upper arranged to leave the marginal portion thereof projecting beyond said means, a carrier, flange forming means supported by the carrier, and means on the carrier movable relatively to the carrier to effect movement of said flange forming means at first normal to the side portion of the margin and then normal to the end portions of said margin.

24. In a machine of the class described, the combination of means for molding the heel end of a shoe upper arranged to leave a marginal portion of said upper projecting outside of said means, and means for forming an outturned flange from said projecting margin comprising two members each having flange forming movement about its rear end and an inwardly projecting portion on each member having an inwardly and rearwardly inclined face, a member arranged to be moved rearwardly, and means on said mem-

ber arranged to engage said faces, and to operate the flange forming members to do their work.

25. In a machine of the class described, the combination of inner and outer mold members for molding the heel end of a shoe upper arranged to leave a marginal portion of said upper projecting outside of said molds, a carrier, means for moving the carrier in a direction perpendicular to the top face of the inner mold, two slides mounted on the carrier one above the other, means for moving one of the slides, and means for yieldingly holding the other slide against movement, flange forming means mounted on the lower slide, means for effecting movement of the flange forming means in opposite directions when the slides are moved relatively, and means for effecting movement of the flange forming means in another direction when the slides are moved together.

26. In a machine of the class described, the combination of means for shaping the heel end of a shoe upper arranged to leave the marginal portion thereof projecting outside said means, and means for forming a flange from said projecting margin comprising members pivoted together at a point outside the shoe upper, means for effecting a relative movement of separation of said members to form a flange, and means for engaging the upper in the gap formed by the said movement of separation about the pivot.

27. In a machine of the class described, the combination of means for shaping the heel end of a shoe upper arranged to leave the marginal portion thereof projecting outside said means, and means for forming a flange from said projecting margin comprising members pivoted together at a point outside the shoe upper and at the rear thereof, means for effecting a relative movement of separation of said members to form a portion of the flange, means for engaging the upper in the gap formed by the movement of separation about the pivot, and means for moving said means and the members bodily rearwardly of the upper to complete the flange forming operation.

28. In a machine for molding the rear end of a shoe upper, the combination with inner and outer molds acting to shape the rear end of the shoe upper and to leave the marginal portion projecting outside of the molds, of a pair of flange forming members pivoted at the rear of the molds, means for moving said members relatively to each other upon their pivot to turn outwardly the upwardly projecting margin of the upper, and means between said members to act upon the portion of the margin in the space formed by the said movement of the members about their pivot.

29. In a machine of the class described, the combination of means for molding the heel end of a shoe upper arranged to leave a marginal portion thereof projecting outside said means, and expansible means for forming a flange from said projecting margin located, when in inoperative position, above said molding means and arranged to be moved in a direction parallel to the projecting marginal portion into operative position within said projecting margin.

30. In a machine of the class described, the combination of means for molding the heel end of a shoe upper arranged to leave a marginal portion of said upper projecting outside of said means, and means for forming an outturned flange from said projecting margin, said means being mounted for universal movement to equalize the flange forming pressure of the flange forming means.

31. In a machine of the class described, the combination of inner and outer mold members for molding the end of a shoe upper arranged to leave a portion of the upper projecting outside of said molds, means for forming a flange from said projecting margin, and means for applying positively an equalized compressive force to the outturned margin and holding it under pressure against the outer mold.

32. In a machine of the class described, the combination of inner and outer mold members for molding the end of a shoe upper arranged to leave a portion of the upper projecting outside of said molds, means for forming said projecting margin into an outturned flange, and means for applying a uniform compressing force to opposite sides of the outturned margin irrespectively of variations in the thickness of the margin.

33. In a machine of the class described, the combination of a one-piece outer mold, a one-piece inner mold, means for moving the inner mold into the outer mold to mold therein the heel portion of a shoe upper leaving the marginal portion thereof projecting outside of said molds, means for turning outwardly the marginal portion of the upper over the outer mold, means for applying positively an equalized pressure to the outturned margin, and means for varying the total pressure applied to the outturned margin.

34. In a machine of the class described, the combination of heel end forming mechanism comprising a male mold, a co-operating female mold, means for effecting a relative movement of said molds into molding relation to an upper located between them with the marginal portion projecting beyond the molds, means for turning outwardly the projecting margin over the female mold, means for applying positive pressure to the outturned margin, and means for varying the positive movement of the pressure applying means.

35. A machine for molding the rear

portions of shoe upper materials, having, in combination, inside and outside formers and operating means therefor, a flange wiping and ironing down mechanism movable bodily from a position over the work to wipe the flange of the upper materials outwardly upon the upper face of the outside former, means for so moving said mechanism, and separate means for supplying through said wiping mechanism an ironing down pressure to the flange.

36. In a machine of the class described, the combination of means for shaping the heel end of a shoe upper arranged to leave the marginal portion thereof projecting outside said means, wipers, operating mechanism serving to operate the wipers to turn outwardly the said margin, and means operating automatically after the margin is outturned for pressing the wipers upon the margin perpendicularly to the plane of their outturning movement.

37. A machine for molding the rear portions of shoe upper materials having, in combination, work holding means, wipers, means for separating the wipers, means for moving the wipers bodily rearwardly of the work holding means, and means for depressing the wipers.

38. In a machine for molding the rear end of a shoe upper, the combination of inner and outer molds acting to shape the rear end of the shoe upper and to leave the marginal portion projecting outside of the molds, a pair of flange forming members pivoted at the rear of the molds and outside of the area enclosed by the rear portion of the upper, co-operating inclined surfaces on the outer mold and on the flange forming members, means acting first to move said members relatively upon their pivot to turn outwardly the forward part of the projecting margin and then acting to move the pivot of said members rearwardly to cause said members to turn outwardly the rear portion of the projecting margin, and means to move relatively the outer mold and the flange forming members to cause their co-operating surfaces to overmold the outwardly turned flange.

39. In a machine for molding the rear end of a shoe upper, the combination with inner and outer molds acting to shape the rear end of the shoe upper and to leave the marginal portion projecting outside of the molds, of a pair of flange forming members, a power operated compound lever for moving said flange forming members, and means constructed and arranged to enable the movement of the operating end of the lever to be varied.

40. In a machine for shaping the uppers of boots and shoes, the combination of means for forming the rear portion of an upper to the shape of the rear portion of a last, means for bending outwardly the margin of the upper at the sides of the heel-seat, and means for then bending the upper outwardly at the end of the heel-seat.

41. In a machine for shaping the uppers of boots and shoes, the combination of means for forming the rear portion of an upper to the shape of a last and leaving the margin of the upper projecting beyond the forming means, means for forming the side portions of the projecting margin into an outwardly directed flange, means for then forming the projecting margin at the rear into an outwardly directed flange, and means for applying to the side and rear portions of the flange an equalized pressure.

42. Means for shaping an upper to the form of the rear portion of a shoe having the margin in upstanding relation to the shoe bottom, and separable members for forming said margin into an outwardly directed flange, said members acting to bend outwardly the side portions of the margin and then the rear portion.

43. In a machine of the class described, the combination of a pair of slides, flange forming means comprising separable members carried by one of the slides, and means operated by the slides for effecting movements of separation and translation of the flange forming means.

44. A machine for molding the end portion of shoe upper materials, having, in combination, inside and outside formers and operating mechanism therefor, a member mounted for vertical bodily movement toward and from the formers, a plurality of slides mounted upon said member, wipers connected to one of the slides, means for moving the slide, and means for imparting by said movement first a separating movement of the wipers and then a bodily movement thereof longitudinally of the formers.

45. A machine for molding the end portion of shoe upper materials, having, in combination, inside and outside formers and operating mechanism therefor, a carrier mounted for vertical bodily movement toward and from the formers, members mounted on the carrier for movement relatively and together, wipers operatively connected to said members, and operating means for said members acting through said connections to impart separative movement to the wipers and then movement of translation.

46. In a machine of the class described, the combination of a pair of slides, flange forming means comprising separable members carried by one of the slides, and means operated by movement of the slides relatively to each other for effecting movements of separation of the flange forming means and

by movement of the slides together for effecting translation of the flange forming means.

47. A machine for molding the end portion of shoe upper materials, having, in combination, inside and outside formers and operating mechanism therefor, a member mounted for vertical bodily movement toward and from the formers, a slide mounted upon said member, wipers movably connected to the slide, means for moving the slide, and means for imparting to the wipers by movement of the slide a separating movement and a bodily movement thereof longitudinally of the formers.

48. In a machine of the class described, the combination of inner and outer mold members for molding the end of a shoe upper arranged to leave a marginal portion of the upper projecting outside of said molds, a carrier, two slides having lost motion connection between them and mounted on the carrier, operating means connected to one of the slides, means for yieldingly holding the other slide against movement, and flange forming members operatively connected to the slides and arranged to be located inside the projecting margin of the upper, said operating means acting through the slides to effect first movement of the flange forming members in opposite directions and then movement of them bodily.

49. In a machine of the class described, the combination of inner and outer mold members for molding the end of a shoe upper arranged to leave a marginal portion of the upper projecting outside of said molds, a carrier, two slides having lost motion connection between them and mounted on the carrier, operating means connected to one of the slides, means for yieldingly holding the other slide against movement, and flange forming members operatively connected to the slides and arranged to be located inside the projecting margin of the upper, the slides acting when moved relatively to effect movement of the flange forming members in opposite directions and when moved together to effect movement of the flange forming members bodily.

In testimony whereof I have signed my name to this specification.

PAUL BEIER.