March 19, 1929. R. E. DUPLESSIS 1,706,277

UPPER SHAPING MACHINE

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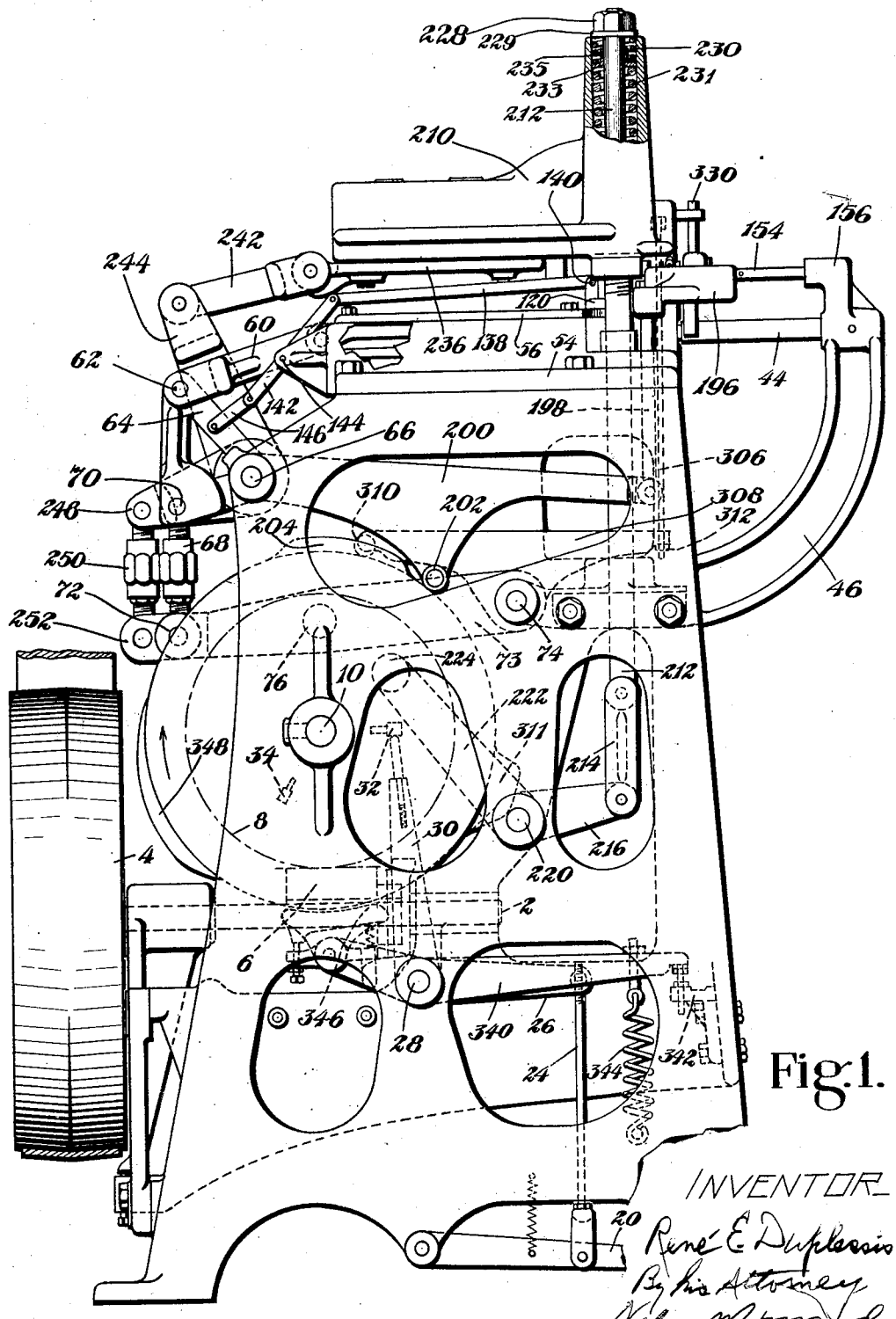


Fig. 1.

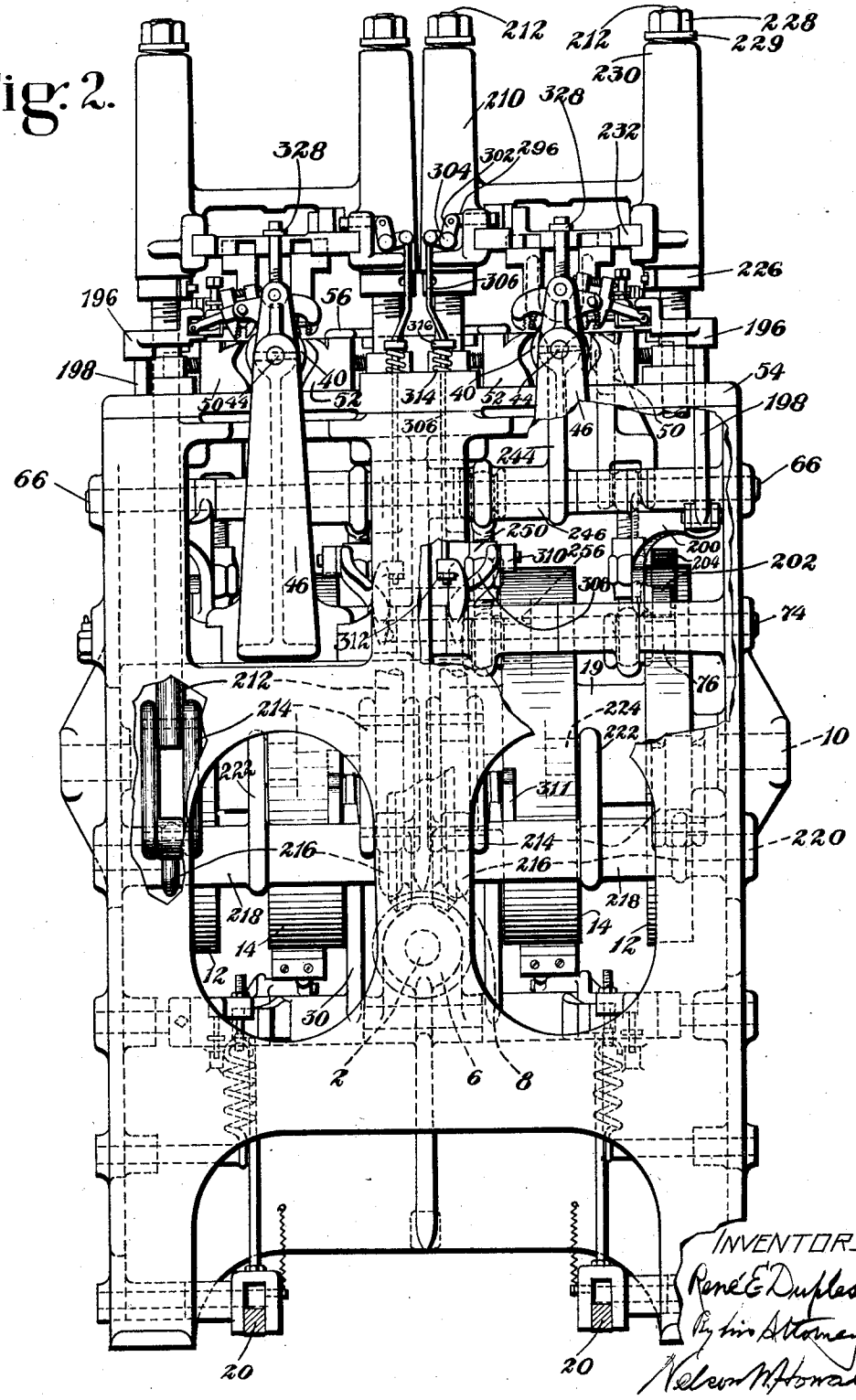
INVENTOR
René E. Duplessis
By his Attorney
Nelson M. Donald

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UPPER SHAPING MACHINE

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Fig. 2.



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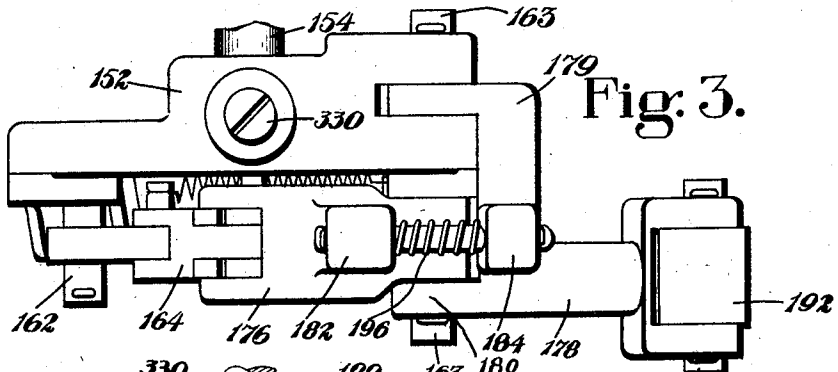


Fig. 3.

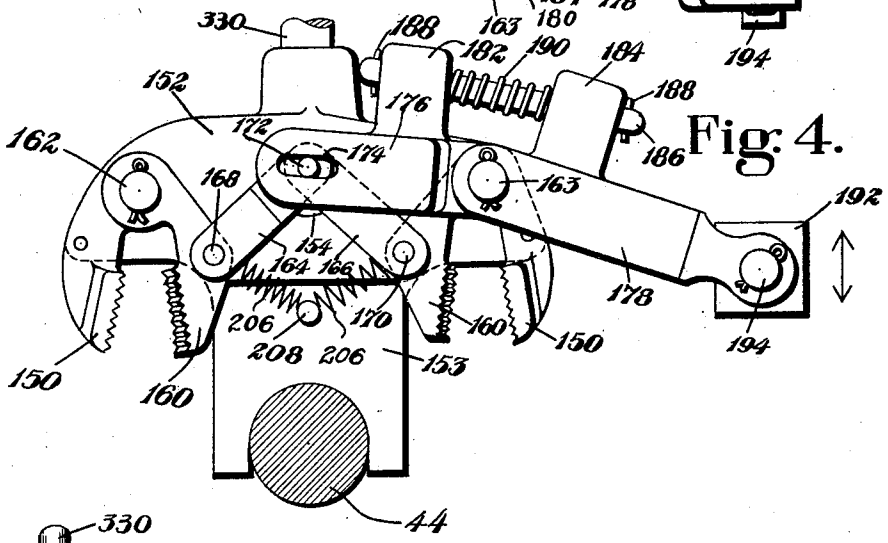


Fig. 4.

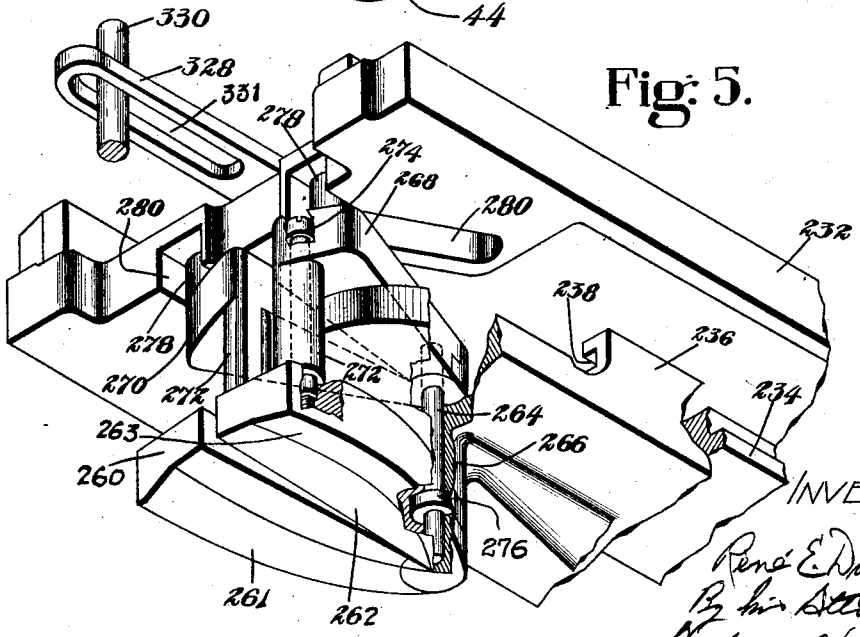


Fig. 5.

INVENTOR

René E. Duplessis

By his Attorney

Nelson W. Howard

March 19, 1929. R. E. DUPLESSIS 1,706,277

UPPER SHAPING MACHINE

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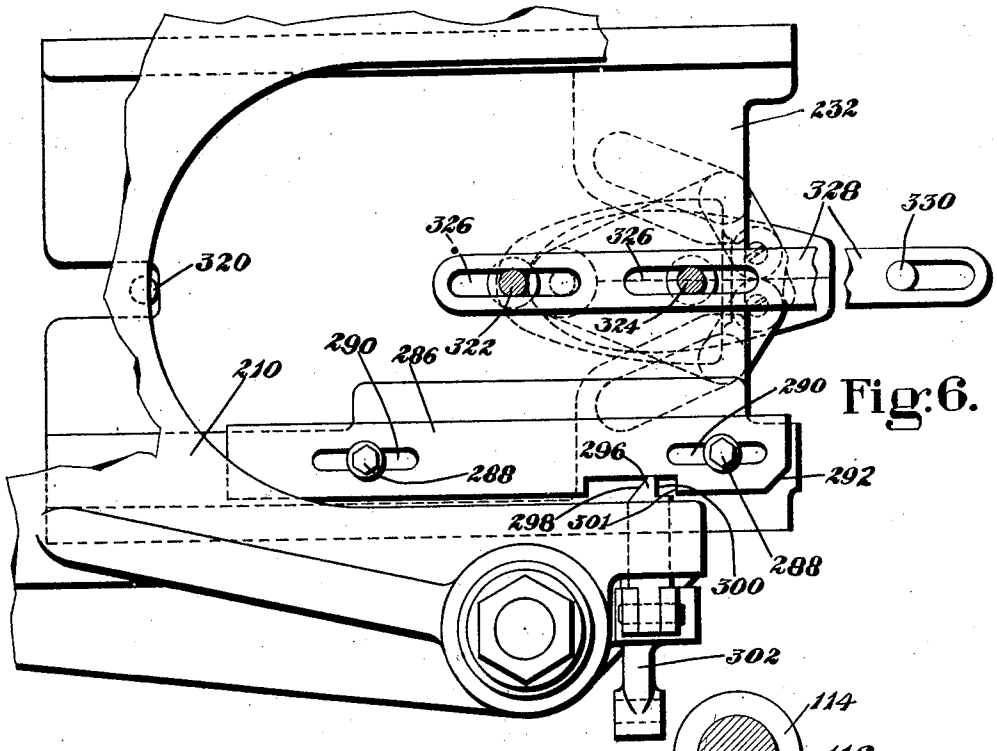


Fig. 6.

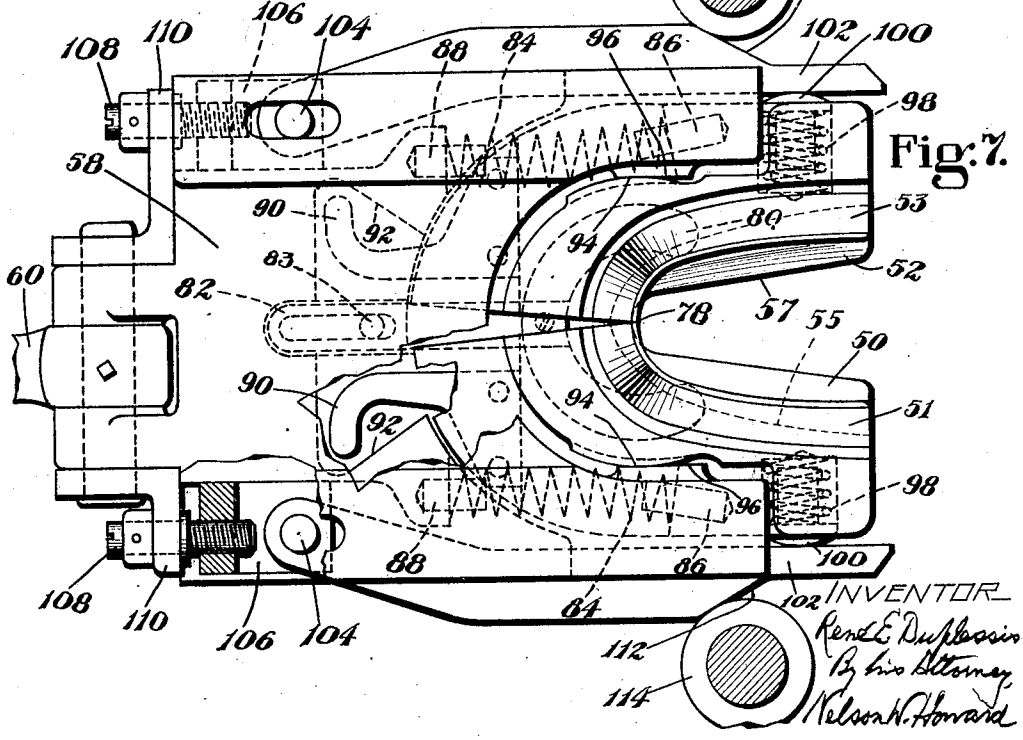


Fig. 7.

INVENTOR
Rene E. Duplessis
By his Attorney
Nelson W. Howard

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UPPER SHAPING MACHINE

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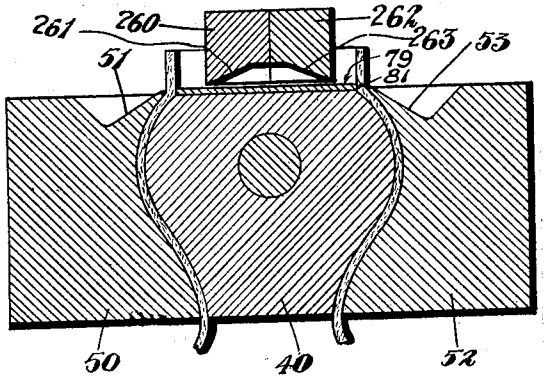


Fig:8.

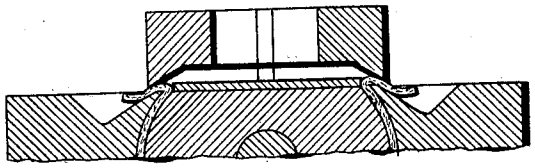


Fig:9.

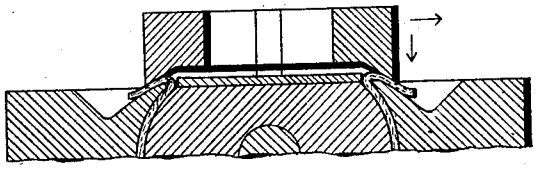


Fig:10.

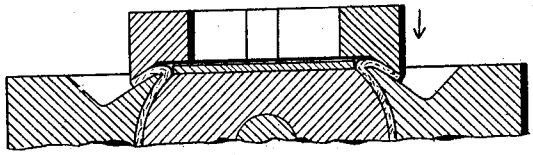


Fig:11.

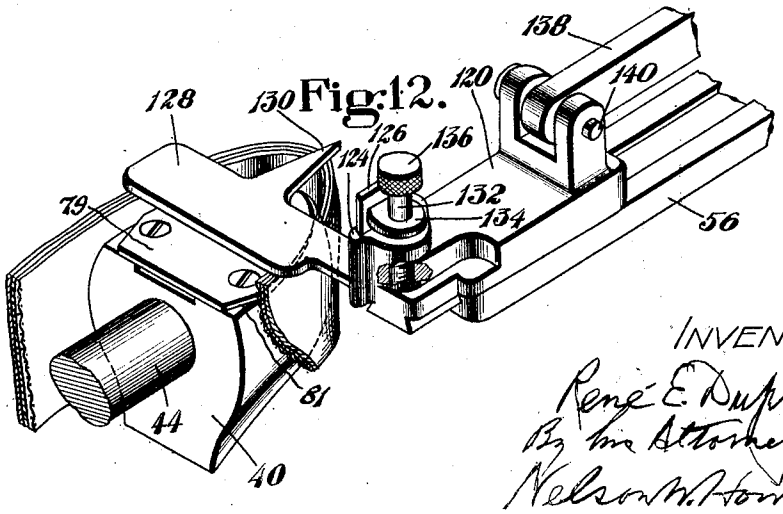


Fig:12.

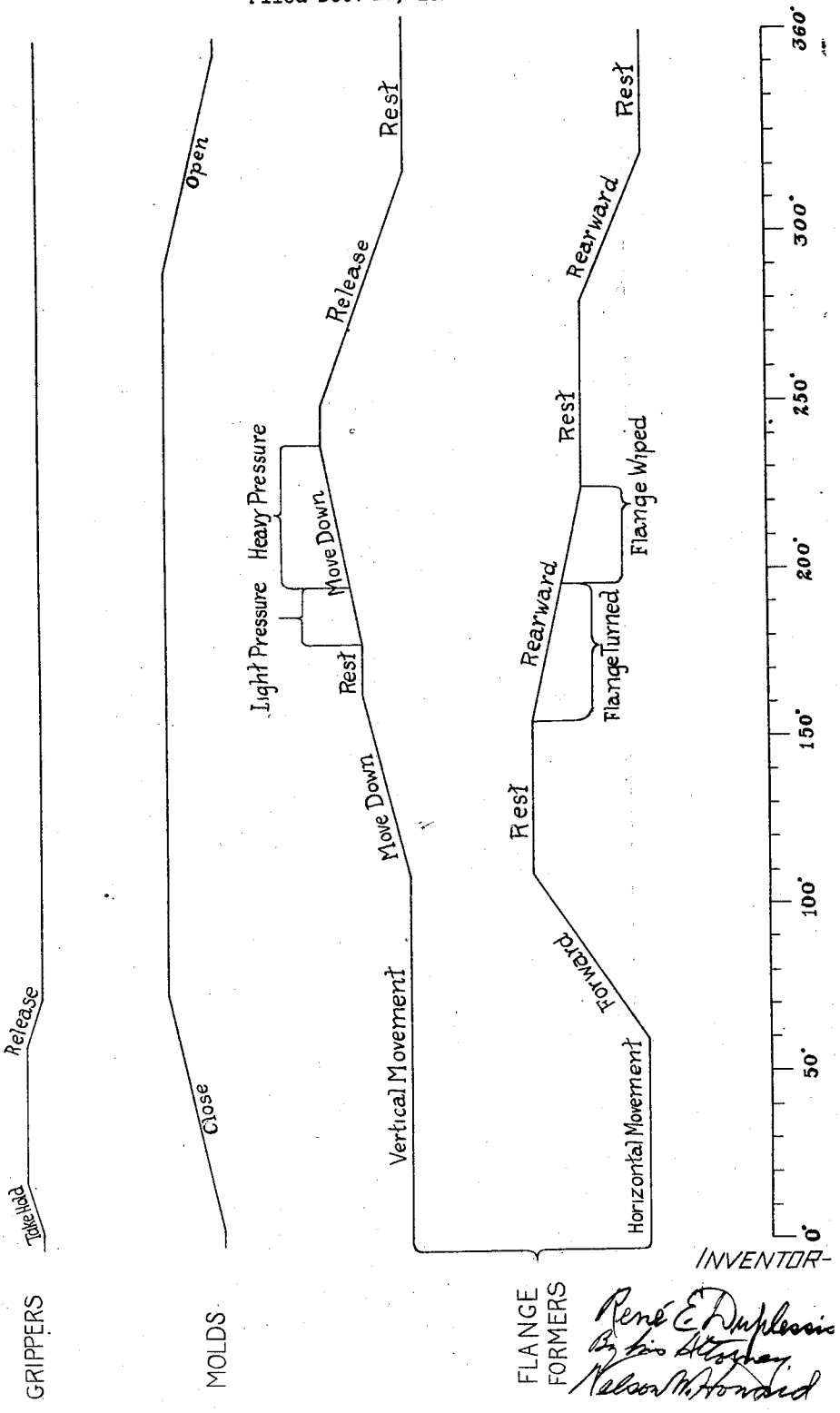
INVENTOR
René E. Duplessis
By his Attorney,
Nelson W. Howard

March 19, 1929. R. E. DUPLESSIS 1,706,277

UPPER SHAPING MACHINE

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Fig. 13.



INVENTOR-

René E. Duplessis

By his Attorney

Nelson M. Rondel

Patented Mar. 19, 1929. 1,706,277

UNITED STATES PATENT OFFICE.

RENÉ E. DUPLESSIS, OF BEVERLY, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

UPPER-SHAPING MACHINE.

Application filed December 13, 1924. Serial No. 755,668.

This invention relates to machines for shaping shoe uppers preliminarily to lasting, and particularly to machines for shaping the rear portions of stitchdown shoe uppers and forming thereon outwardly directed sole attaching flanges.

In the manufacture of stitchdown shoes, for instance, by the well-known staple lasting process, it is highly advantageous that the margin of the upper materials including the heel stiffener or counter be given a permanent outward set prior to the assembling of the upper upon its last. The more nearly perpendicular the outward margin or flange of the upper, when assembled, is to the side of the last the greater the facility with which the upper may be worked into the angle between the side of the last and the projecting margin of the sole, for example, by the action of the nozzle of the staple lasting machine or other instrumentality for securing the upper and counter to the shoe sole in the said angle.

Objects of this invention are to provide a machine which will shape the rear portion of an upper and form thereon an outturned flange more perfectly and expeditiously than can be done by prior machines intended for this purpose and which will hold and shape a straight counter and an upper and will form thereon an outturned flange at right angles to the remainder of the upper so as to facilitate the subsequent operations of assembling and lasting.

Other objects of the invention are generally to improve machines for this work without sacrificing any of the advantages of prior machines and to provide a machine which will be more convenient to operate, more rapid and effective in operation, and which will produce a higher quality of product than prior machines.

Features of the invention consist in an organization comprising means, for example inner and outer molds, for shaping the rear portion of a shoe upper, and flange forming means, which are preferably expansible, for forming thereon an outwardly directed flange, with means such as grippers for holding the upper materials adjacent to the wings of the counter from being displaced during the shaping of the upper. As shown, the grippers comprise a pair of relatively fixed jaws which have an operative position above the front ends of the upper shaping molds, and co-operating with the fixed jaws are movable jaws which are operated by a single operating means, shown as a toggle, the toggle being actuated by power operation of a yielding lever. Pressure of the jaws on the two portions of the material gripped by them is thus equalized and is unaffected by differences in the thickness of the two portions of material.

Another feature of the invention consists in means for effecting pressure of the flange between the flange formers and surfaces formed on the outer molds in conjunction with the flange forming operation so that the flange is not only turned outwardly but is wiped or ironed transversely outwardly while it is being formed.

Another feature of the invention consists in means for applying pressure to the flange in two stages,—a light pressure during the initial part of the flange turning operation and a heavier pressure during the flange forming, wiping or ironing operation. As shown, downward pressure is applied to the flange forming means, first, through a light spring during the initial outward movement of the flange formers, and then through a heavy spring the tension of which is increased progressively with the outward movement of the flange formers, further pressure being applied through the heavy spring after the flange formers have completed their outward movement.

Preferably and as shown, the surfaces of the outer mold members over which the flange is formed are receding, that is, they extend downwardly and outwardly from the inner faces of the outer mold members, and the co-operating surfaces of the flange formers are correspondingly shaped so that the flange is overmolded beyond a position at right angles to the side of the upper and is pressed or molded between substantially parallel surfaces. This overmolding of the flange, together with the outward ironing and downward pressure, gives a permanent set to the upper materials such that the tendency of the flange to recover or re-assume its original position will not carry it beyond a position at right angles to the other portions of the upper.

Another feature of the invention consists in so shaping and operating the molds and

flange forming members that the flange, during the initial stages of its formation, will be pressed upon locally at the ends of the counter wings and at the corners of the heel and that these areas of pressure will be gradually extended as the flange forming operation proceeds until they merge into each other and the entire surface of the flange is subjected to pressure.

The machine is organized to come to rest with the work under the pressure of several powerful springs such as the mold closing and flange pressing springs. When the clutch is thrown in to re-start the machine and release the work, these springs react upon the mechanism between the clutch and the springs, causing the mechanism to be thrown ahead of the movement which would be imparted by power transmitted through the clutch with a consequent shock and likelihood of damage to the clutch or other parts of the machine. Accordingly, a feature of the present invention consists in means for retarding the reaction of the spring means through which pressure is applied to the work to prevent shock or injury to the machine. As shown herein, when the machine is restarted, a projection on one of the operating cams engages a yieldingly held brake shoe which provides sufficient frictional resistance to prevent the cam from being moved by the reacting springs and to require power transmitted through the clutch to move the cam and bring the machine to normal or open position.

The inner surfaces of the outer mold for this work bulge outwardly at the sides and end, between the plane of the heel-seat and the cone of the last, in order to give the upper the shape of the last, the inner mold being, of course, complemental in shape, and as previously made the molds were narrowed at the forward end of the heel-seat and shank to shape these parts of the upper inwardly more than the parts at the rear. Consequently, the forward ends of the outer mold had to open widely to permit them to pass the inner mold. The outer mold parts open and close about a point located where the center of the rear end of the heel-seat will be in the finished shoe, and since the mold surfaces bulge rearwardly of this point, there will be, if the opening and closing movement of the outer mold parts is considerable, an opening between the mold parts at the back seam, when the molds are closed, which will be sufficient to mark or injure the upper along the vertical line of juncture of the mold parts. In the present construction the inner mold is made widest at its forward end and the corresponding surfaces of the outer mold have consequently less distance to travel in opening and closing and there is less opening between the mold parts at their line of juncture when the mold is closed. This construction enables the opening to be so minimized that marking of the upper due to the mold opening is avoided while the shape given to the upper by the molds sufficiently approximates the shape of the last so that the upper may be readily conformed to the last in the lasting operation.

A further feature of the invention is to be recognized in the combination of an inner mold, outer mold members constructed and arranged to close upon the inner mold, flange forming members adapted to act upon the projecting margin of the upper, and means for relatively moving the flange forming members to turn the margin of the upper outwardly over the outer mold members to form a sole attaching flange.

Still another feature of the invention is found in the construction of the illustrated inner mold which is provided about the periphery of its tread face with a face extending heightwise of the mold and which cooperates with the adjacent edge of the outer mold to dispose the margin of the upper in upstanding relation to the tread face of the inner mold. The upper margin is thus disposed in better position for the reception and action of the flange forming members.

Another feature of the invention consists in a gage adjustable to determine the width of the margin of upper which extends above the molds and from which the flange is to be formed, said gage being constructed and arranged to be moved into and out of operative position automatically by power of the machine and without attention on the part of the operator. The gage has a pointer which extends over the rear portion of the margin of the upper which serves not only to gage the width of the extending margin but also to indicate the proper position of the back seam of the upper.

These and other features of the invention, including various novel constructions 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 elevation of a machine embodying the present invention;

Fig. 2 is a front elevation of the machine;

Fig. 3 is a plan view of gripper mechanism with which the machine is provided;

Fig. 4 is a rear elevation of the gripper mechanism shown in Fig. 3;

Fig. 5 is a perspective view, partly in section of the flange formers and their operating mechanism;

Fig. 6 is a plan view of the flange forming mechanism and connected parts;

Fig. 7 is a plan view of the outer molds and the operating mechanism;

Fig. 8 is a sectional view through the flange

forming mechanism and the inner and outer molds showing the molded shoe upper prior to the flange forming operation;

Figs. 9, 10 and 11 are similar views showing successive stages of the flange forming operation;

Fig. 12 is a perspective view showing in detail the gage for locating the upper; and

Fig. 13 is a diagram showing developments of the principal cams by which various instrumentalities of the machine are operated.

In the drawings the machine is shown as duplex or double, that is, it is provided with two complete molding mechanisms either of which may be connected independently to a common power shaft 2 upon which is a belt pulley 4. On the shaft 2 is a worm 6 which engages a worm wheel 8 on a shaft 10, the above-mentioned parts being common to the two sides of the machine. In the following description it is to be understood that the construction and operation of the right-hand and left-hand mechanisms are similar except that the parts not identical in form are reversely or reflectively arranged, that is, the parts of one side are formed and arranged like the parts of the other side as seen in a mirror. Hence, for simplicity and convenience of description the same reference characters will be used to designate parts of the two sides of the machine which are merely reversed as well as those which are duplicates.

Loose on the cam shaft 10 are two similar pairs of cam blocks 12, 14, one pair for each side of the machine, and each pair is connected together by a sleeve portion 19 (Fig. 2). The cam blocks 12, 14 may be operatively connected to the worm wheel 8 by means of suitable clutch mechanism when a left-hand treadle 20 is depressed, and the cam blocks 12, 14 on the right-hand side of the machine may be similarly connected to the worm wheel 8 when a right-hand treadle 20 is depressed. The clutch may be of any suitable type. As shown in Fig. 1, the treadle 20 is connected by a link 24 to an arm 26 of an angle lever pivoted at 28, the other arm 30 of the lever serving as a clutch stop arm and acting to trip the clutch to release the cam blocks 12, 14 from the worm wheel 8 when a clutch projection 32, carried by a portion of the clutch which rotates with the cam blocks, engages it. There is a second clutch projection 34 which engages the stop arm 30 after the cam blocks have rotated 245 degrees and stops the machine with the work under forming pressure. Of course, when the machine is started to release the work, the cam blocks will rotate 115 degrees before the stop projection 32 again engages the stop arm 30, to stop the machine with the parts in position for removal and insertion of the work. The opposite treadle 20 controls the right-hand side of the machine in a similar manner.

The inner molds or forms 40, 40 (Figs. 2 and 8) are supported on the inner ends of rods 44 the outer ends of which are rigidly secured to outwardly and upwardly curved brackets 46 secured to the frame. Each of the outer molds is in two parts 50, 52 (Figs. 2, 7 and 8), the inner faces of which are contoured to correspond to the shape of the inner mold with which they co-operate to give shape, as shown, to the rear end of a shoe upper. The parts of the outer molds are supported from beneath on a plate 54 (Fig. 2) secured to the top of the machine frame on which they can move laterally and longitudinally in a horizontal plane, a cover plate 56 being provided to prevent upward movement of them. The mold parts 50, 52 are operated by movement of a frame 58 (Fig. 7) arranged for movement longitudinally of the molds and operated by a link 60 (Fig. 1) connected at 62 to a triangular lever 64 fulcrumed at 66 on the frame. One end of a turnbuckle link 68 is connected at 70 to the lever 64 and the other end is connected at 72 to a lever 73 fulcrumed at 74 and having a cam roll 76 (Fig. 2) engaging a cam track formed in the inner face of the cam block 12 by action of which the frame 58 is moved to close the mold parts. The mold parts 50, 52, as shown in Fig. 7, are arranged to close about a point 78 located substantially where the molding surfaces of the two parts meet and are guided for this movement by a horseshoe-shaped member 80 which engages grooves formed in the under sides of the mold parts, which grooves are circularly curved from the point 78 as a center. The member 80 has a rearwardly extending stem 82 which is slotted to receive a pin 83 on the frame 58.

Each of the inner mold members 40 is provided about the periphery of its tread face 79 with a face 81 extending heightwise of the mold 40. The vertical face 81 cooperates with the upper edges of the outer mold members 50, 52 to dispose the margin of the upper in upstanding relation to the tread face 79 and prevents its extending inwardly as it would naturally do and consequently be in the way of introduction of the flange forming members to be described.

The mold parts are initially held in forward position by stiff springs 84 the ends of which engage pins 86, 88 located respectively on the mold parts and on the frame 58. Expansion of these springs moves the mold parts forwardly and each mold part is provided with an outwardly curved tail-piece 90 the end of which engages an inclined surface 92 on the frame 58. The inclined surfaces 92 cause the mold parts to turn on the center 78 to open position when the frame 58 moves rearwardly and the springs 84 expand. Their expansion is limited by engagement of the pin 83 with the rear end of the slot in the stem 82 and the mold parts thereafter move rearwardly with the frame 58. To assist the member 80 in preventing lateral spreading

of the mold parts when lateral pressure is applied, each mold part is provided with a surface 94 curved on the center 78 and engaging a flat surface 96 on the frame 58. To effect lateral closing movement and molding pressure of the mold parts 50, 52 against the inner mold, each mold part is recessed to accommodate a strong spring 98 and a plunger 100 which is pressed outwardly by the spring. The forward end of a lever 102 bears on each plunger 100 and is fulcrumed at 104 on a member 106 which is adjustable lengthwise of the lever 102 by a screw 108 threaded in the member 106 and rotatably mounted in a lug 110 on the frame 58. When the frame 58 is moved forward as described, the mold members 50, 52 are moved, through the springs 84, longitudinally of the inner mold 40 till they engage, press and conform the upper to its rear end and are partially closed against the sides of the upper. The springs 84 then yield to allow further movement of the frame 58, whereupon inclined faces 112 on the levers 102 engage rolls 114 having fixed axes on the machine frame, and the mold parts 50, 52 are yieldingly closed toward each other with powerful molding pressure transmitted through the springs 98. By turning the screws 108 to adjust the levers 102 longitudinally of the molds, closing movement of the outer mold members may be varied for molds of different sizes and the pressure of the two sides of the mold may be independently varied.

In Fig. 7 the mold members 50, 52 are shown substantially in their closed position, the inner mold being omitted to permit better showing of the molding surfaces of the outer mold members. The inner edges of the surfaces 51, 53 which also define the upper edges of the vertical surfaces of the mold members are shaped to correspond substantially to the periphery of the heel-seat of the last. The lower edges 57 of the mold members have a contour corresponding substantially to the periphery of the cone of the last. Between these upper and lower edges the molding surfaces bulge outwardly and rearwardly as indicated by dotted line 55, and since this line extends rearwardly of the center 78 about which the molds close there is a slight opening between the mold members at the rearward bulge when the molds are closed. In the construction shown, however, this opening is minimized by making the inner mold member widest and the space between the molding surfaces of the outer molds consequently greatest at the forward ends of the molds. Thus, only a relatively small opening and closing movement of the outer mold members is required to mold and release the upper and a sufficiently close approximation to the last shape is given to the upper to enable the wings of the counter to be brought into proper position in the lasting operation even if the shank portion of the shoe is substantially narrower than the heel-seat portion.

In order that the proper amount of the margin of the upper may project above the molds from which an outturned flange is to be formed, a gage, shown in Figs. 1 and 12, is provided. As shown in Fig. 12, which represents the right-hand gage, a block 120 is dovetailed into the upper surface of the cover plate 56 and arranged for movement lengthwise of the molds. The block 120 carries a vertical guide 124 in which slides a vertical portion 126 of a gage 128. The gage 128 is arranged, as shown, to contact with the edge of the upper at the two sides and has a projection 130 to engage the edge of the upper at the rear end and to indicate the position of the back seam. To adjust the gage 128, 130 vertically, a screw 132 is threaded into the block 120 and has fixed thereon a circular flange 134 which engages a slot in the vertical portion 126 of the gage. Turning the screw 132 by its milled head 136 will adjust the gage 128 vertically with respect to the mold to vary the width of upper materials extending above the molds from which the outturned flange is formed. The gage is movable horizontally toward the rear of the machine with the block 120 out of operative position during the formation of the flange. As seen in Fig. 1, which shows the operating mechanism for the left-hand gage, a link 138 is pivoted at 140 to ears on the block 120 and extends rearwardly, its rear end being pivoted to the upper end of a lever 142 fulcrumed at 144 on the plate 54. The lower end of the lever 142 is connected by a link 146 to the triangular lever 64 at a suitable distance from its fulcrum 66 so that as the lever moves clockwise to close the molds the link 138 and gage 128 will be withdrawn rearwardly of the mold out of operative position.

It will be understood that the closing of the outer molds upon the upper, particularly the forward pressure of the molds in shaping the vertical curvature of the back seam, tends to displace the wings of the counter which are not yet held by full closure of the molds at the sides. Usually the counter wings are forced downwardly, thus narrowing the flange forming margin and resulting in an improperly molded upper. In order to hold the upper materials including the wings of the counter in proper position, a pair of grippers for each side of the machine is provided, as shown in Figs. 2, 3 and 4, the rear side of the left-hand pair of grippers being shown in Fig. 4. Each gripper is arranged to seize the vertical margin of the upper materials at a point above the forward end of the outer mold and has a stationary outer jaw 150 secured to a carrier 152 the lower end 153 of which is forked and embraces the rod 44. Secured to and extending forwardly from the

carrier 152 is a rod 154 which slides freely in a bearing 156 (Fig. 1) on the bracket 46. Inner movable jaws 160 of each pair of grippers are pivoted respectively at 162, 163 to the carrier. A toggle comprising links 164, 166 has one end pivoted at 168 to one inner jaw and the other end pivoted at 170 to the other inner jaw. Straightening of the toggle (Fig. 4) will cause the inner jaws 160 to move toward the outer jaws 150. The central pivot pin 172 of the toggle passes through slots 174 formed in the bifurcated end of a member 176 which is pivoted on the pivot pin 163 of one of the inner jaws. Pivoted on the same pin 163 is a member 178 having one bearing at 180 on the pin and a forwardly extending L-shaped portion 179 (Fig. 3) also pivoted on the pin. Upward projections 182, 184, formed respectively on the members 176, 178, have a rod 186 passing loosely through them and held therein by pins 188. On the rod between the projection 182, 184 is a compression spring 190. The members 176, 178 constitute a yielding lever for operating the toggle 164, 166. The outer end of the member 178 is bifurcated to receive a block 192 held by a pin 194. The block 192 slides in a horizontal slot formed in a member 196 (Figs. 1 and 2) which is secured to the upper end of a vertically movable rod 198. The rod 198 is pivoted to the forward end of a lever 200 fulcrumed on the shaft 66 and having a roll 202 engaging an edge cam 204 on the cam block 12. When the member 196 is moved upward by its cam, the outer end of the lever 176, 178 is lifted so that downward pressure is applied yieldingly through the spring 190 to the joint 172 of the toggle 164, 166, causing it to straighten and move the jaws 160 toward the jaws 150. Should one pair of jaws close sooner or engage thicker stock than the other, one movable jaw may stop while the other continues to move because of the pin and slot connection between the member 176 and the joint 172 of the toggle, and, after the jaws are both closed, equal holding pressure is applied to the two movable jaws. The jaws are held open by springs 206 connected between a stationary pin 208 and the pins 168, 170 on the two movable jaws respectively. The jaws are movable forwardly out of the way of the flange forming mechanism by means to be described after explanation of said mechanism which follows.

Referring to Figs. 1 and 2, each flange forming mechanism is carried by a vertically moving head 210 slidably mounted on two vertical rods 212, 212, the lower ends of which are connected by links 214 to forward arms 216 of a sleeve 218 rotatably mounted on a shaft 220. An arm 222 extending rearwardly from the central portion of the sleeve 218 carries a roll 224 entering a path cam in the outer face of the cam block 14. The cam operates to move the rods 212, 212 up and down. The upper portions of the rods are threaded and have collars 226 threaded thereon below the head 210 and nuts 228 at their upper ends, washers 229 being provided beneath the nuts. Between each nut and head are two compression springs 230, 231, one, 230, being a light spring and the other, 231, being a heavy spring. Between the springs 230, 231 is a washer 233 having a sleeve 235 extending upwardly within the light spring 230 through which sleeve pressure may be transmitted to the heavy spring 231 after the spring 230 has been sufficiently compressed. By adjusting the collars 226 and the nuts 228 the initial vertical position of the head and the initial tension of the springs 230 may be varied.

Arranged for horizontal movement in the head 210 lengthwise of the molds is a slide 232 on the lower face of which (Fig. 5) is a T-guide 234. A slide 236 has a T-slot 238 engaging the T-guide 234 on which it can move with respect to the slide 232, the arrangement being such that the slides 232, 236 can move independently or together. The slide 236 is connected at its rear end (Fig. 1) by a link 242 to an upwardly extending arm 244 of a sleeve 246 mounted on the shaft 66 and having a rearwardly extending arm 248 connected by a turnbuckle link 250 to the rear end of a lever 252 the forward end of which is fulcrumed on the shaft 74 and which carries a cam roll 256 entering a path cam formed in the inner face of the cam block 14. Forward and backward movement is imparted to the slide 236 by the cam.

Below the slide 236 are arranged two flange forming and pressing members or wipers 260, 262 (Fig. 5) which are halved together at their rear ends and mounted to turn on a pin 264 extending upwardly through the slide 236 and a downward projection 266 therefrom. Above the slide 236 and mounted by a halved joint on the pin 264 are two spreaders 268, 270 having downward projections 272 through which pass screws 274 to connect the spreaders 268, 270 respectively to the flange formers 260, 262. The pin 264 extends only partly through the outer flange former so that it cannot drop down and has a flange 276 fixed thereon which prevents its moving upwardly. On the upper side of each spreader is mounted a roll 278, the rolls engaging similar but oppositely arranged cam slots 280 formed in the slide 232. The slots have forward parallel portions and rearward diverging portions. It will be clear that rearward movement of the slide 236 relatively to the slide 232 will cause the forward ends of the spreaders, and hence of the flange formers, to separate.

Movement of the upper slide 232 is controlled by mechanism shown in Figs. 1, 2 and 6. A bar 286 (Fig. 6) is adjustably secured by cap screws 288 to the slide 232, the

screws passing through slots 290 extending lengthwise of the bar. The bar 286 has an inclined face 292 at its front end and an elongated notch in its inner side to receive a latch 296 having a beveled rear face 298 co-operating with the inclined face 292 on the bar and a flat front face 300 which may engage the forward end 301 of the notch to prevent rearward movement of the slide 232. The latch 296 is connected to one arm of an angle lever 302 (Fig. 2) pivoted at 304 on the head 210. The other arm of the angle lever is pivoted to a rod 306 which extends downwardly through the end of an operating lever 308 fulcrumed on the shaft 74 (Fig. 1) and having at its rear end a roll 310 engaging an edge cam on the cam block 14 the projection 311 of which is shown in Figs. 1 and 2. Depression of the forward end of the lever when its rear end is raised by the cam projection 311 causes the lever to engage a stop nut 312 on the rod and pull it down, releasing the latch 296 from the bar 286. The rod 306 is held up and the latch 296 in operative position by a spring 314 (Fig. 2) interposed between the plate 54 and a collar 316 fixed to the rod 306.

When the slide 236 is moved forward by its cam it moves relatively to the slide 232 because this is retarded by engagement of the inclined face 292 of the bar 286 with the inclined face 298 of the plunger 296 (Fig. 6). This relative movement of the slides 236, 232 causes the flange formers 260, 262 to move toward each other to closed position (Fig. 5). When sufficient relative movement for this purpose has occurred, a pin 320 on the slide 236 (Fig. 6) engages the slide 232, compelling the two to move together and the plunger 296 to be pushed in. Continued movement of the two slides together causes the flange formers 260, 262 to move over the inner mold member and the head 210 then moves downward to position the flange formers inside the upper. During the forward movement of the slide 232 a bar 328 which is adjustably connected to the slide 232 by screws 322, 324 moves forward with it. The forward end of the bar 328 is slotted to receive a vertical stud 330 on the pincer carrier and when the stud engages the inner end of the slot the grippers are moved forwardly out of the way, the grippers having, of course, previously released the upper.

The mechanism has now been sufficiently described so that the operation of the machine may be readily understood with the aid of Fig. 13, which is a development of the various cams and indicates the relative timing of the movements of the machine.

In operating the machine, the operator places the rear portion of a shoe upper about the inner form 40 of one side of the machine with its margin extending upwardly beyond the top of the form, the edge of the margin resting against the gage 128, as shown in Fig. 12, the rearward projection 130 serving to assist the operator in properly locating the back seam. Having properly positioned the upper over the inner mold, the operator depresses the treadle 20 which trips the clutch and causes the cam blocks 12 and 14 to revolve. As indicated in the diagram of Fig. 13, the gripper jaws 150, 160 are first operated to seize and hold the upper adjacent to the wings of the counter, the grippers preferably seizing the margin of the upper and counter at a point just above the forward end of the inner mold 42. The frame 58 (Fig. 7) now moves forward so that the upper is pressed between the rear end of the outer mold 50, 52 and the rear end of the inner mold 42, thus conforming the upper to the shape of this portion of the molds. The molds are shaped, of course, to give the rear end of the upper the usual outward bulge, and in the formation of this the wings of the counter are apt to be displaced either upwardly or downwardly, usually the latter. In the present construction, however, since the wings of the counter are securely held by the grippers, no such displacement of the counter or upper can occur. As the movement of the frame 58 continues, the outer mold begins to be closed by the engagement of the inclined surfaces 112 with the rolls 14 by which lateral pressure is transmitted through the springs 98 to the sides of the rear portion of the upper. The springs 84 permit movement of the mold bodily lengthwise of the mold to cease while the movement of the frame 58 continues to effect further closing of the mold. As soon as the molds have engaged the rear end of the upper and the molding pressure has begun to extend forwardly along the sides the grippers are released and when the slide 232 has moved forwardly far enough to take up the lost motion of the stud 330 on the gripper carrier 252 in the slot 331 in the bar 328, the gripper carrier will be slid forwardly as the movement of the slide 232 continues, the rod 154 attached to the gripper carrier sliding freely in the bearing 156. The gripper mechanism is thus moved forwardly and horizontally out of the way during the flange forming operation.

During the closing of the mold the slide 236 begins to move forward, first moving relatively to the slide 232 because of the frictional contact of the plunger 296 with the inclined face 292 of the bar 286, thus causing the flange forming members 260, 262 to be closed together. When this has occurred, the stop pin 320 on the slide 236 engages the slide 232 and both slides move together to position the flange formers 260, 262 over the inner mold. The head 210 now descends and locates the flange formers inside the upwardly extending margin of upper which has been disposed in an upright position by the action of the upper edges of the outer mold members

50, 52 which force it against the vertical face 81. The lower surfaces of the flange forming members are brought close to but preferably not in contact with the upper or tread face of the inner mold. The slide 236 now begins to move rearwardly, carrying with it the slide 232, the flange forming members 260, 262 remaining closed, engage the rear portion of the upper and counter and initiate the turning of it outwardly over the rear portion of the outer mold. As soon, however, as the surface 301 on the bar 286 (Fig. 6) engages the face 300 on the latch 296 which is so set as to permit a correct amount of rearward movement of the flange forming members, the rearward movement of the slide 232 ceases and, as the movement of the slide 236 continues, the flange forming members 260, 262 will be moved apart about their pivot 264 in conjunction with their bodily rearward movement and will spread the side portions of the upper outwardly over the side portions of the outer mold and over the rear portion thereof.

By adjusting the bar 286 (Fig. 6) longitudinally, the extent of expanding movement of the flange formers or wipers 160, 162, relatively to the extent of their bodily movement, may be varied so that molds of different sizes may be employed in the same machine. This adjustment also provides means for causing the expansion of the flange formers to occur before their bodily movement longitudinally of the molds has been sufficient to cause them to engage the rear portion of the upper margin, so that the side portions of the upper margin will be turned outwardly prior to the end portion. This is effected by adjusting the bar 286 to take up part or all of the lost motion between the surface 301 of the bar and the surface 300 of the latch 296 and setting the cam projection 311 to release the latch after the expansive movement of the flange formers or a suitable part thereof has been effected. As shown, however, the adjustment is such that after contact of the flange formers with the margin of the rear end of the upper and the initiation of the outward flanging, the side portions of the flange formers engage the upper margin and the flanging operation continues outward progressively about the whole periphery of the heel end. In any adjustment of the flange formers, the fact that the margin of the upper has already been molded into an upright position assists materially the flange forming operation.

Successive stages of the flange forming operation are shown in Figs. 8, 9, 10 and 11, from which it will be seen that the top faces of the outer molds have receding surfaces 51, 53 inclined downwardly and outwardly, and that the bottom faces of the flange forming members 260, 262 are formed to correspond to the shape of the outer molds having surfaces 261, 263 substantially parallel to the surfaces 51, 53 of the molds. Of course the surfaces of the flange formers can fit the corresponding surfaces of the outer molds only after they have moved rearwardly and opened to the proper extent. However, these co-operating surfaces are so formed and operated that during the early stages of the outward flanging operation the flange formers apply downward pressure to the flange of upper which is being outturned at the portions adjacent to the wings of the counter and at the portions adjacent to the corners of the heel. As the flange forming operation continues, the pressure is increased, and as the flange formers or wipers separate farther and move farther rearwardly to wipe the upper outwardly upon the surfaces 51, 53 of the molds, the areas of wiping pressure gradually extend and finally merge into each other so that, in the final stage (Fig. 11), forming pressure is applied substantially uniformly to all portions of the outturned flange. If desired, the flange pressing surfaces, instead of being parallel, may slightly diverge outwardly so that the maximum pressure will be applied to the flange near the line of outward bend.

During the initial stages of the flange forming operation while the projecting margin of the upper is being bent or "broken" over the inner edges of the surfaces 51, 53, relatively light downward pressure of the flange formers 160, 162 is highly advantageous since danger of tearing or otherwise injuring the lining or other upper materials is avoided. In the present construction, the light springs 230 are brought into action during the initial stages of the flange forming operation, while the flange is being broken outwardly, up to the point represented in Fig. 9, at which point the yield of the light spring 230 is taken up and heavy pressure through the springs 231 begins to be applied. This heavy pressure continues and preferably increases progressively during the continued outward movement of the flange formers or wipers 160, 162, as represented in Fig. 10, so that the flange is firmly pressed during its formation and is wiped or crowded out upon the surfaces 51, 53 of the molds. When the flange forming members have fully expanded so that their surfaces 161, 163 correspond with the surfaces 51, 53 of the outer mold, as represented in Fig. 11, increased downward pressure is applied to shape and set the flange.

After the flange forming operation has been completed as described, the stop projection 34 engages the stop arm 30 and the machine comes to rest with the upper under molding pressure, there to remain until a similar molding operation has been completed on the other side of the machine, whereupon the operator will again depress

the treadle 20 to again start the first side of the machine. As the machine starts, the cam projection 311 operates upon the lever 308 to release the plunger 296, the downward pressure of the head 210 is released and the slides 232 and 236 are moved rearwardly together from their position over the molds, the molds at the same time being opened to release the upper. The cycle of operations is shown diagrammatically in Fig. 13.

When the machine starts from its position of rest with the upper under molding pressure, various springs such as the springs 84, 98 and 231, are under compression and react against their cams to cause a sudden forward movement of the cam blocks 12, 14, resulting in shock or breakage to the clutch mechanism. To prevent this objectionable overthrow, means shown in Fig. 1 is provided. A lever 340 is pivoted at 28 and has its forward end normally held against a stop 342 by a spring 344. On its rear end the lever 340 carries a shoe 346 which is engaged by a cam projection 348. As soon as the machine starts from its position of rest with the parts in operative position, the projection 348 engages and depresses the shoe 346 against the tension of the spring 344 and offers sufficient frictional resistance to prevent the cam blocks from being thrown ahead of their operating mechanism while the tension of the compressed springs is being relieved.

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 shaped to form the rear portion of a shoe upper, jaws arranged to seize the margin of the upper extending above the molds to prevent displacement of the upper during the closing of the molds, and means for forming the margin of the upper into an outturned flange.

2. In a machine of the class described, the combination of inner and outer mold members shaped to form the rear portion of a shoe upper, fixed jaws mounted over the forward ends of the mold members, movable jaws to co-operate with the fixed jaws in seizing the margin of upper extending above the mold members, and a single toggle for moving both movable jaws toward the fixed jaws.

3. In a machine of the class described, the combination of inner and outer mold members shaped to form the rear portion of a shoe upper, jaws fixed relatively to the inner mold member and mounted over the forward end of the mold members, movable jaws to co-operate with the fixed jaws in seizing the margin of upper extending above the mold members, means for moving the movable jaws toward the fixed jaws, and a yielding lever for operating said jaw moving means.

4. In a machine of the class described, the combination of inner and outer mold members shaped to form the rear portion of a shoe upper, grippers each arranged adjacent to the wings of the counter to hold the margin of the upper materials extending beyond the molds from displacement during the closing of the molds, and means for forming the margin of the upper materials into an outturned flange.

5. In a machine of the class described, the combination of inner and outer mold members shaped to form the rear portion of a shoe upper, grippers each comprising a pair of relatively movable jaws mounted over the forward end of the mold members, a single toggle for closing both grippers, a lever for operating the toggle, and a lost motion connection between the toggle and the lever.

6. In a machine for molding the rear portion of shoe upper materials, inner and outer mold members, means for closing the mold members upon the upper materials to shape them, grippers located adjacent to the margin of the upper materials extending about the mold members, mechanism for operating the grippers to seize the margin prior to the closing of the mold members and for releasing the grippers, means for forming the margin of the upper materials into a sole attaching flange, and means for moving the grippers horizontally out of the way of the flange forming means prior to its flanging operation.

7. In a machine of the class described, the combination of inner and outer mold members shaped to form the rear portion of a shoe upper, fixed jaws mounted over the forward end of the mold members, movable jaws to co-operate with the fixed jaws in seizing the margin of upper extending above the mold members, means for moving the movable jaws toward the fixed jaws, and means for equalizing the closing pressure of the movable jaws against the fixed jaws.

8. In a machine of the class described, the combination of inner and outer mold members shaped to form the rear portion of a shoe upper, jaws for seizing the margin of the upper projecting beyond the mold members until the molds have closed sufficiently to hold the upper, and means for then moving the grippers horizontally out of the way.

9. A machine for molding the rear portion of shoe upper materials having, in combination, an inner mold, an outer mold, grippers fixed as to bodily movement for engaging the margin of the upper materials above the molds and adjacent to the wings of the counter, and power operated mechanism for closing the grippers.

10. A machine for molding the rear portion of shoe upper materials having, in combination, an inner mold, an outer mold, grippers for engaging marginal portions of the upper

materials above the molds and adjacent to the wings of the counter and holding them in the place where they are disposed by the operator, and power operated mechanism for closing the grippers and for closing the molds after the grippers are closed.

11. A machine for molding the rear portion of shoe upper materials having, in combination, an inner mold, an outer mold, grippers for engaging the margin of upper materials above the molds and adjacent to the wings of the counter and holding it in fixed position, and power operated mechanism for closing the grippers and for closing the molds after the grippers have closed and for releasing the grippers after the molds have closed sufficiently to assume control of the upper.

12. A machine for molding the rear portion of shoe upper materials having, in combination, an inner mold, an outer mold, grippers for engaging the margin of upper materials above the molds and adjacent to the wings of the counter, power operated mechanism for closing the grippers and for closing the molds after the grippers have closed and for releasing the grippers after the molds have closed sufficiently to assume control of the upper, and mechanism for moving the grippers forwardly after they have released the upper.

13. A machine for molding the rear portion of shoe upper materials having, in combination, inner and outer mold members, means for closing the mold members upon the upper materials to shape them, grippers located adjacent to the margin of the upper materials extending above the mold members, power mechanism for operating the grippers to seize the margin prior to the closing of the mold members and releasing the grippers during the closing of said members, means for forming the margin of the upper materials into an outturned flange, and means operated by the flange forming means for moving the grippers out of the way of the flange forming means prior to its flanging operation.

14. In a machine of the class described, the combination of molds for shaping the rear portion of shoe upper materials, a pair of grippers for holding the wings of the counter, during the closing of the molds, in the positions in which they are placed by the operator, said grippers comprising fixed outer jaws and movable inner jaws, and means for closing the jaws, the positions of the grippers longitudinally of the shoe while they are closed being maintained.

15. In a machine of the class described, the combination of molds for shaping the rear portion of shoe upper materials, a pair of grippers for holding the wings of the counter in position during the closing of the molds, said grippers comprising fixed outer jaws and movable inner jaws, and a single toggle mechanism for moving both movable jaws toward the fixed jaws.

16. In a machine of the class described, the combination of molds for shaping the rear portion of shoe upper materials, flange forming means movable into and out of position over the molds, grippers for holding the upper materials in position during the closing of the molds, said grippers being arranged for bodily movement lengthwise of the molds out of operative position, and connections between the flange forming means and the grippers for moving them out of the way when the flange forming means moves into operative position.

17. A machine for shaping the end portion of a shoe upper having, in combination, inner and outer mold members for shaping the upper, upper flanging members, means for relatively moving the flanging members to turn the upper outwardly over the mold members, and means independent of said relatively moving means for moving the flanging members toward said outer mold members in conjunction with their expanding movement to effect a combined wiping and pressing action on the outturned flange.

18. A machine of the class described having, in combination, means for shaping the heel end of a shoe upper, and means for forming said upper while it is held by the shaping means with an outturned sole attaching flange, said means being arranged to move transversely of the flange in the plane of the flange and transversely of the plane of the flange simultaneously, said latter movement being effected in a plurality of stages.

19. In a machine of the class described, the combination with means for shaping a portion of a shoe upper into the shape desired in the finished shoe constructed to leave a marginal portion of the upper projecting outside of the shaping means, of means for wiping said margin from its presented position through a position parallel to the plane of the sole into a position at an acute angle to said plane, and means including powerful springs for causing said wiping means to press said margin into its final position during the wiping operation and apply thereto heavy yielding pressure.

20. A machine for shaping the end portion of a shoe upper having, in combination, inner and outer mold members for shaping the upper, upper flanging means, means for operating the flanging means to turn the upper outwardly over the outer mold, and means for moving the flanging means toward said outer mold with successive degrees of increasing pressure in conjunction with said outward turning of the upper to effect a combined wiping and pressing action on the outturned upper.

21. A machine for shaping the end portion

of a shoe upper having, in combination, inner and outer mold members for shaping the upper, upper flanging members, means for relatively moving the flanging members to turn all parts of the upper flange simultaneously outwardly over the outer mold members, and means for moving the flanging members toward said outer mold members with increasing pressure in conjunction with their expanding movement to effect a combined wiping and pressing action upon the outturned flange.

22. In a machine of the class described, means for shaping the rear end of a stitch-down shoe upper comprising an inner mold and an outer mold constructed and arranged to close upon the inner mold and having a surface upon which the flange may be pressed, expansible flange forming means operated through a predetermined distance to turn the flange over upon said surface of the outer mold, and means independent of the flange forming means for pressing the flange forming means toward the outer mold during its flange forming operation to wipe the flange against the surface of the outer mold and finally to press said flange upon said surface.

23. In a machine of the class described, means for shaping the rear end of a stitch-down shoe upper comprising an inner mold and an outer mold arranged to close upon the inner mold to shape the rear portion of an upper and having an edge over which a sole attaching flange is turned and a surface adjacent to said edge upon which the flange is pressed, expansible flange forming means operated through a predetermined distance to turn the flange over the edge of the outer mold, and means for pressing the flanging means toward the outer mold during its flange forming operation to wipe the flange against the surface of the outer mold and finally to press said flange upon said surface.

24. In a machine of the class described, means for shaping the rear end of a stitch-down shoe upper comprising an outer mold having an edge over which a sole attaching flange may be turned and a receding surface adjacent to said edge, expansible flange forming means having an inner face substantially parallel to the receding surface of the outer mold, means for expanding said flange forming means to break the sole attaching flange over the edge of the outer mold, and means for maintaining pressure of the flange forming means upon the flange during its subsequent expansion to wipe the flange outwardly and to apply substantially increased forming pressure to the flange between the receding surface of the outer mold and the parallel surface of the flange forming means after the flange has been formed.

25. In a machine of the class described, the combination of inner and outer molds for shaping the rear portion of shoe upper materials, a pair of slides movable longitudinally of the molds, expansible flange forming means mounted on one of said slides, connections between the flange forming means and the other slide to open and close the flange forming means upon relative movement of the slides, means for moving the slides at first relatively and then together to close the flange forming means and locate it over the molds, means for lowering the flange forming means to a position inside the upstanding margin of the upper, and means for arresting movement of one of the slides while rearward movement of the other continues to cause the flange forming means to move rearwardly and expand to turn outwardly the margin of the upper while action of the lowering means continues to press the flange between the flange forming means and the outer mold.

26. In a machine of the class described, means for shaping the rear end of a stitch-down shoe upper comprising an outer mold having a flange receiving surface, expansible flange forming means having an inner face substantially parallel to the receiving surface of the outer mold, means for expanding said flange forming means to break the sole attaching flange over upon said surface of the outer mold, and means for maintaining pressure of the flange forming means upon the flange during its subsequent expansion to wipe the flange outwardly, the inner face of the flange forming means and the receiving surface of the molds being formed initially to apply pressure locally to the flange at the wings of the counter and the corners of the heel end and to cause said areas of local pressure to extend as the flanging operation proceeds until they merge into each other.

27. A machine for shaping the end portion of a shoe upper having, in combination, inner and outer mold members, upper flanging members, means for relatively moving the flanging members to turn the flange over one of the mold members, and means including light and heavy springs for effecting pressure upon the upper between the flanging members and the mold first with a light spring during the initial part of the flange forming operation and then through a heavy springs to press out the flange.

28. In a machine of the class described, the combination of inner and outer molds for shaping the rear end of a shoe upper, said outer mold having an edge over which a sole attaching flange may be turned and a flange receiving surface adjacent to the edge, flange forming means expansible from a position within said edge to a position in which it may press said flange upon said receiving surface, and means for effecting pressure between said flange forming means and the said surface of the outer mold during the flange forming operation with increasing degrees of intensity to form the flange progres-

sively of its width against the flange receiving surface of the outer mold.

29. In a machine of the class described, the combination of inner and outer molds for shaping the rear end of a shoe upper, said outer mold having an edge over which a sole attaching flange may be turned and a receding surface adjacent to the edge, flange forming means expansible from a position within said edge to a position in which it may press said flange out upon said receding surface, means for effecting light pressure between the outer mold and the flange forming means during the initial stages of the flange forming operation, and means for applying progressively increasing pressure during the later stages thereof to rub the flange outwardly upon and press it against the outer mold while the flange is being formed.

30. In a machine of the class described, means for shaping the rear end of a shoe upper comprising inner and outer molds, one of said molds having a surface to receive a sole attaching flange of the upper, flange forming means having a surface substantially parallel to the receiving surface of the mold, means for operating said flange forming means to bend the sole attaching flange over the receiving surface of the mold, spring means for effecting light pressure between the mold and the flange forming means during said bending operation, and additional spring means for effecting and maintaining a higher pressure between the mold and said flange forming means to wipe the flange during its formation and apply forming pressure thereto.

31. In a machine of the class described, the combination of inner and outer molds to shape the rear end of a shoe upper and leave the margin of the upper extending beyond the molds, said outer mold having a surface over which the margin of the upper may be turned to form a sole attaching flange, flange forming means expansible from a position within said margin to a position in which it will press the said margin out upon said receiving surface to form the flange, a light spring for effecting pressure between the outer mold and the flange forming means during the initial stages of the flange forming operation, and a heavy spring becoming operative during later stages of the operation to increase the pressure.

32. In a machine of the class described, means for shaping the rear end of a stitch-down shoe upper comprising an outer mold having an edge over which an upwardly projecting margin of the upper may be turned outwardly and a receding surface adjacent to said edge, expansible flange forming means having a surface substantially parallel to the receding surface of the outer mold, means for expanding said flange forming means to direct the sole attaching flange outwardly over the edge of the outer mold, means for effecting light pressure between the mold and the flange forming means during said outwardly directing operation, and means for effecting and maintaining higher pressure between the mold and the flange forming means during subsequent expansion of the flange forming means to wipe the flange outwardly and apply forming pressure to the flange.

33. In a machine of the class described, the combination of inner and outer molds for shaping the rear portion of shoe upper materials, means for turning a margin of the upper outwardly over the outer molds comprising expansible flange forming means, means for moving the flange forming means lengthwise of the molds, a latch on the machine frame, a slide for expanding the flange forming means, and an adjustable bar on said slide having a surface to engage the latch, adjustment of said bar serving independently to vary the longitudinal movement of the flange forming means and the expanding movement of said means so as to adapt the flange forming means for co-operation with outer molds of different sizes.

34. In a machine of the class described, the combination of an inner mold member, outer mold members adapted to close upon the inner mold member, means for moving the outer mold members longitudinally relatively to the inner mold member, means for closing the outer mold members upon the inner member, and means for independently adjusting the longitudinal movement of the outer mold members and their closing movement.

35. In a machine of the class described, the combination of a rigid inner mold, rigid outer mold members each having a fixed shape complemental to one half of the inner mold and arranged to close upon the inner mold, mechanism for closing the outer mold members upon the inner mold, and means for varying the closing movement of the outer mold members to accommodate inner molds of the same shape but of different sizes.

36. In a machine of the class described, the combination of a rigid inner mold, rigid outer mold members each having a fixed shape complemental to one half of the inner mold and arranged to close upon the inner mold, mechanism for closing the outer mold members, and means for independently varying the closing movement imparted to said mold members by said closing mechanism.

37. In a machine of the class described, the combination of an inner mold, outer mold members arranged to close upon the inner mold, levers pivoted at their rear ends and arranged to act at their forward ends upon the outer mold members to close them, means for operating the levers, and means for adjusting the levers lengthwise to vary their closing action on the mold members.

38. In a machine of the class described, the

combination of an inner mold, outer mold members jointed to close upon the inner mold, levers arranged one on each side of the outer mold members and having cam faces, stationary rolls acting on said cam faces to move the levers toward each other and to close the mold members, means for moving the levers lengthwise in unison, and means for effecting independent lengthwise adjustment of the levers to vary their action on the mold members.

39. In a machine of the class described, the combination of an inner mold member, outer mold members adapted to close upon the inner mold member, means for yieldingly moving the outer mold members longitudinally relatively to the inner mold member, means for closing the outer mold members upon the inner member, and means independent of the closing means for positively opening the outer mold members when they are moved rearwardly.

40. In a machine for molding the rear portions of shoe uppers, the combination of an inner mold the lateral extent of which is greatest at the forward end and which has a rearward bulge, a two-part outer mold arranged for opening and closing movement about a center located, when the mold is closed, inside the bulge of the inner mold, and means for moving the outer mold parts lengthwise and transversely of the inner mold to mold the upper.

41. In a machine for molding the rear portions of shoe uppers, the combination of an inner mold the lateral extent of which is greatest at the forward end and which has a rearward bulge, a two-part outer mold arranged for opening and closing movement about a center located, when the mold is closed, inside the bulge of the inner mold, means for moving the outer mold parts lengthwise and transversely of the inner mold to mold the upper, and means for forming the margin of the upper extending above the molds into an outturned flange.

42. In a machine for shaping shoe parts comprising co-operative pressure members for imparting shape to said parts, powerful spring means through which said members are relatively operated, mechanism for compressing the spring means, a clutch for operating said mechanism and stopping it with the spring means compressed, and means for preventing the action of the spring means from moving said mechanism until the mechanism is moved by power transmitted through the clutch.

43. In a machine of the class described, the combination of molds for applying pressure to shoe parts, powerful springs through which such pressure is applied, power means including driving and driven clutch members for applying pressure to the molds through the springs, means for stopping the machine with the parts in pressing position, and means coming into operation when the machine is re-started to prevent sudden reaction of the springs from throwing the driven clutch member ahead of the driving clutch member.

44. In a machine of the class described, the combination of molds for applying pressure to shoe parts, spring means through which the pressure is applied by the molds to the shoe parts, lever means for operating the spring means, cam means for operating the levers, power mechanism for operating the cam means, and means for retarding movement of the cam means when the pressure is being released to prevent the cam means from being thrown ahead of its operating mechanism.

45. In a machine of the class described, the combination of inner and outer mold members shaped to form the rear portion of a shoe upper, a gage arranged for movement in a plane substantially normal to the upper engaging surfaces of the mold members into and out of operative position over the molds to determine the width of the margin of upper extending beyond the upper engaging surfaces of the molds, and means for automatically moving the gage forwardly into and rearwardly out of operative position.

46. In a machine of the class described, the combination of inner and outer mold members shaped to form the rear portion of a shoe upper, a gage arranged over the molds to determine the width of the margin of upper extending beyond the upper engaging surfaces of the molds, and means for moving the gage into and out of position over the molds comprising link and lever elements including a power actuated lever for giving positive movement to the gage in both directions.

47. In a machine of the class described, the combination of upper shaping means, flange forming means, a sliding gage for the upper constructed and arranged when in operative position to engage the edge of an upper positioned in the shaping means at a plurality of points to determine the width of upper to be formed into a flange by the flange forming means, and power operated means for sliding the gage bodily rearwardly out of gaging position during operation of the machine and thereafter restoring it to gaging position.

48. In a machine of the class described, the combination of upper shaping means, flange forming means, a gage constructed and arranged to engage the edge of an upper disposed in the shaping means at opposite points to determine the width of the side portions of the upper to be formed into a flange by the flange forming means, a pointer on the gage to indicate the proper location of the back seam of the upper, and means for automati-

cally moving the gage into operative position over the upper shaping means prior to the operation of the machine and for retracting it bodily to a position at the rear of the shaping means during the operation of the machine.

49. A machine for shaping upper materials over a form having, in combination, a form, members cooperating with the form to shape the marginal portion of the upper materials, and means for effecting relative pressure applying movement of said members and the form heightwise of the form comprising a spring arranged to apply comparatively light pressure to the materials and another spring arranged to come into play thereafter to increase the pressure.

50. A machine for shaping the end portion of a shoe upper having, in combination, an inner mold member, outer mold members constructed and arranged to close upon the inner mold member for shaping the upper and leaving the margin of the upper projecting beyond the molds, flange forming members for operating upon the projecting margin of the upper, and means for relatively moving the flanging members to turn the upper outwardly over the outer mold members to form an outwardly projecting sole attaching flange.

51. In a machine of the class described, the combination of an inner mold, an outer mold adapted to cooperate with the inner mold to impart the proper shape to the end portion of a shoe upper, a portion of the upper extending beyond the molding surfaces to be formed into a sole attaching flange, the inner mold member having a face extending perpendicularly to its tread face adjacent to the margin of the upper and adapted to cooperate with the adjacent edge of the outer mold to dispose the margin of the upper in perpendicular relation to the tread face of the inner mold, and means for turning the margin of the upper outwardly and pressing it against the outer mold to form a flange.

52. In a machine of the class described, the combination of an inner mold, an outer mold constructed and arranged to close upon the inner mold to shape the rear portion of a shoe upper and to leave the margin of the upper extending beyond the molding surfaces, the inner mold having adjacent to the bottom thereof a peripherally arranged vertical surface adapted to cooperate with the edge of the outer mold to dispose the margin of the upper in a position parallel to said surface and perpendicular to the tread face of the inner mold, flange forming means constructed and arranged to descend inside the upstanding margin of the upper, and means for operating the flange forming means to bend the margin of the upper outwardly over the surface of the outer mold to form a sole attaching flange.

53. In a machine of the class described, the combination of an inner mold, an outer mold constructed and arranged to close upon the inner mold to shape the rear portion of a shoe upper and to leave the margin of the upper extending beyond the molding surfaces, the inner mold having adjacent to the bottom thereof a vertical surface extending peripherally of the inner mold and adapted to cooperate with the edge of the outer mold to dispose the margin of the upper in a position parallel to said surface and perpendicular to the bottom of the inner mold, and flange forming members constructed and arranged to descend inside the upstanding margin of the upper and to expand outwardly to bend the margin over the surface of the outer mold to form an outwardly directed flange.

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

RENÉ E. DUPLESSIS.