M. BROCK.

MACHINE FOR SHAPING UPPERS.

APPLICATION FILED OCT. 28, 1912.

1,197,437.

Patented Sept. 5, 1916.

5 SHEETS—SHEET 1.

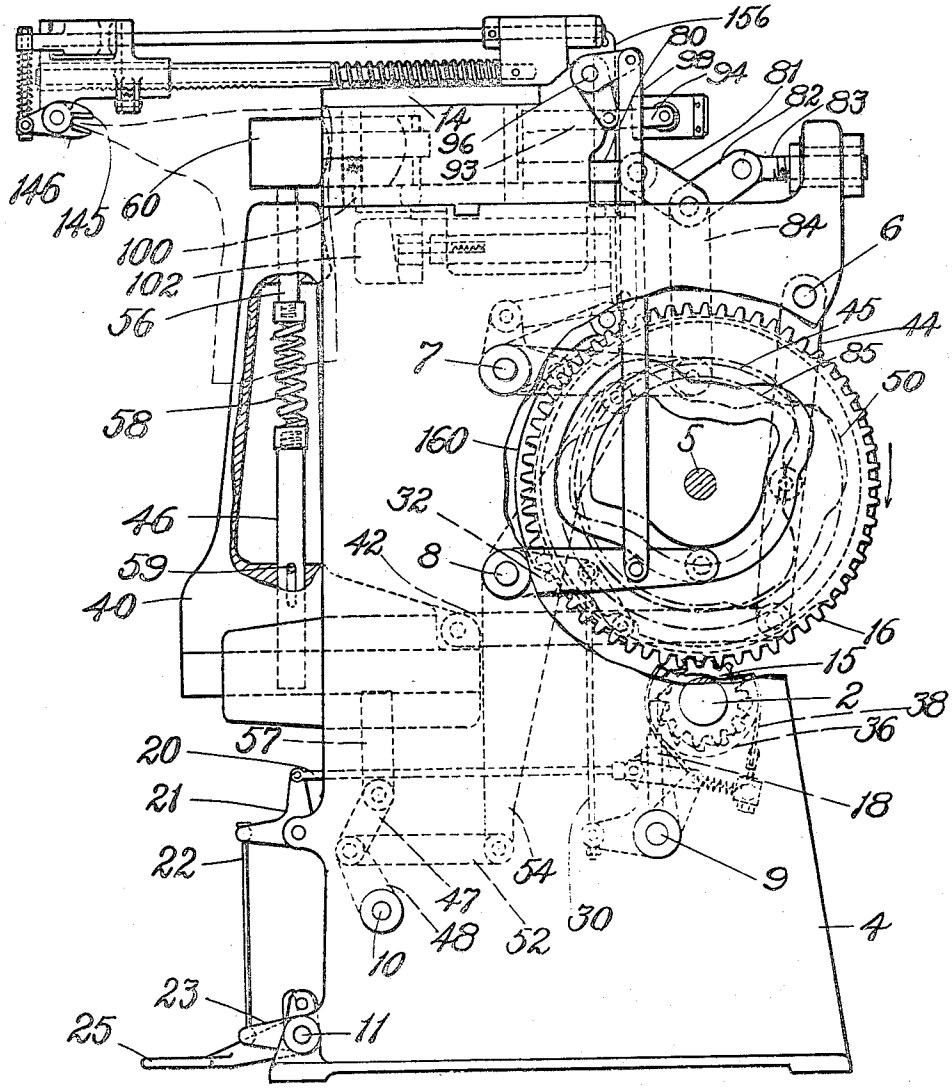


Fig. 1.

WITNESSES.

O. Blanche Hargrave

Elizabeth C. Coffe

INVENTOR.

Matthias Brock

By Mrs. Williams

Nolan M. Marshall

M. BROCK.

MACHINE FOR SHAPING UPPERS.

APPLICATION FILED OCT. 28, 1912.

1,197,437.

Patented Sept. 5, 1916.

5 SHEETS—SHEET 2.

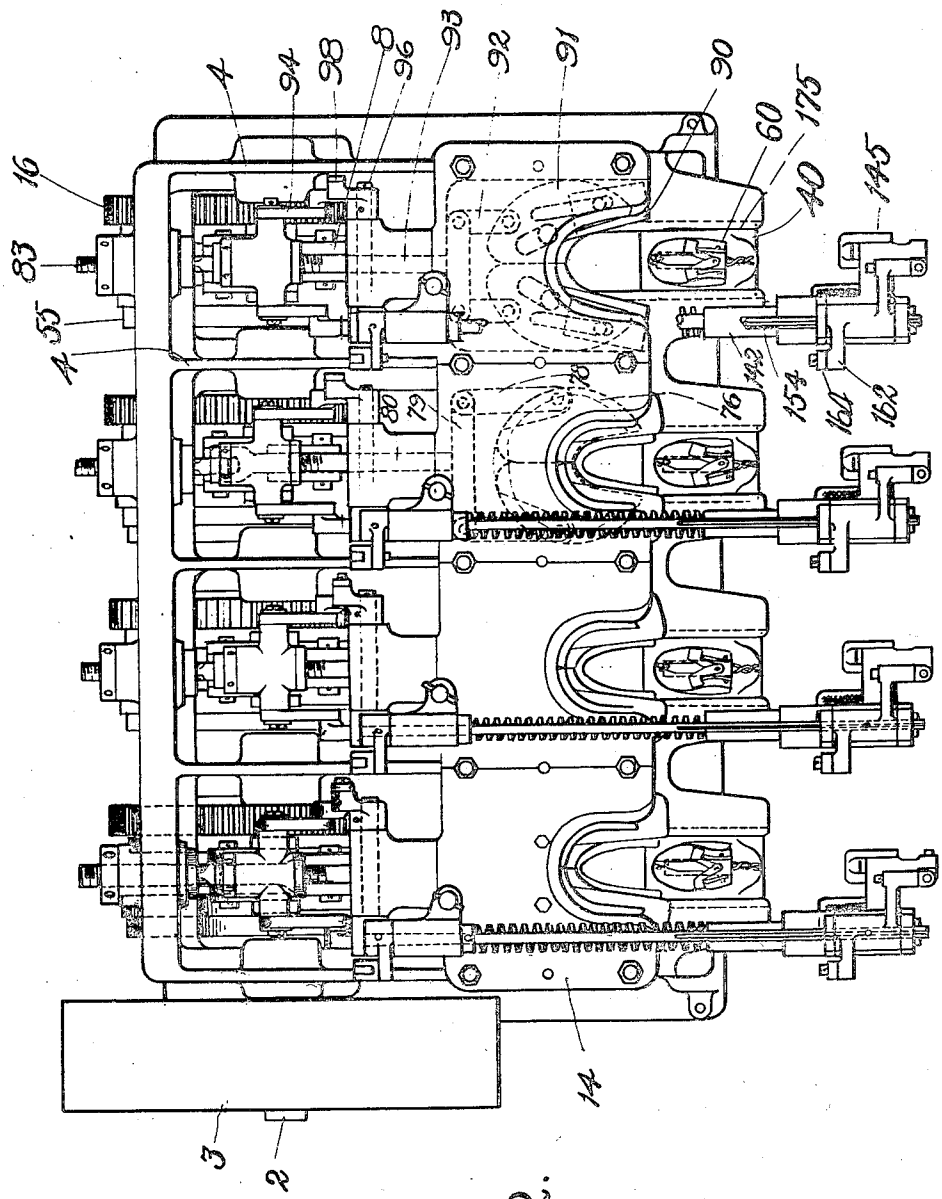


Fig. 2.

WITNESSES.

O. Blanche Hargraves

Elizabeth C. Coupe

INVENTOR.

Matthias Brock

By his Attorney

Robert W. Howard

M. BROCK.

MACHINE FOR SHAPING UPPERS.

APPLICATION FILED OCT. 28, 1912.

1,197,437. Patented Sept. 5, 1916.

5 SHEETS—SHEET 3.

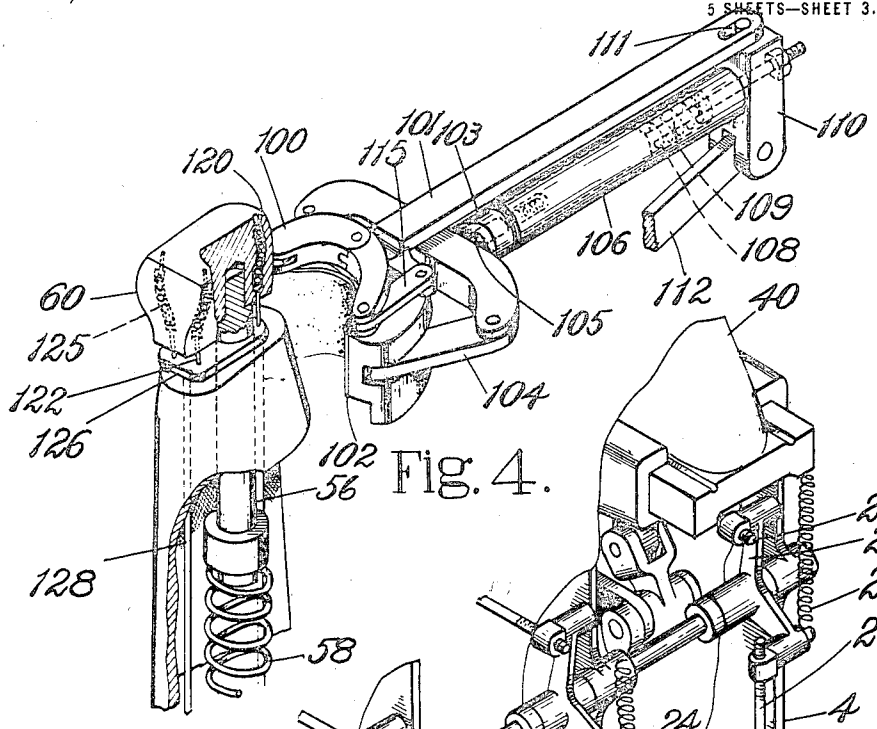


Fig. 4.

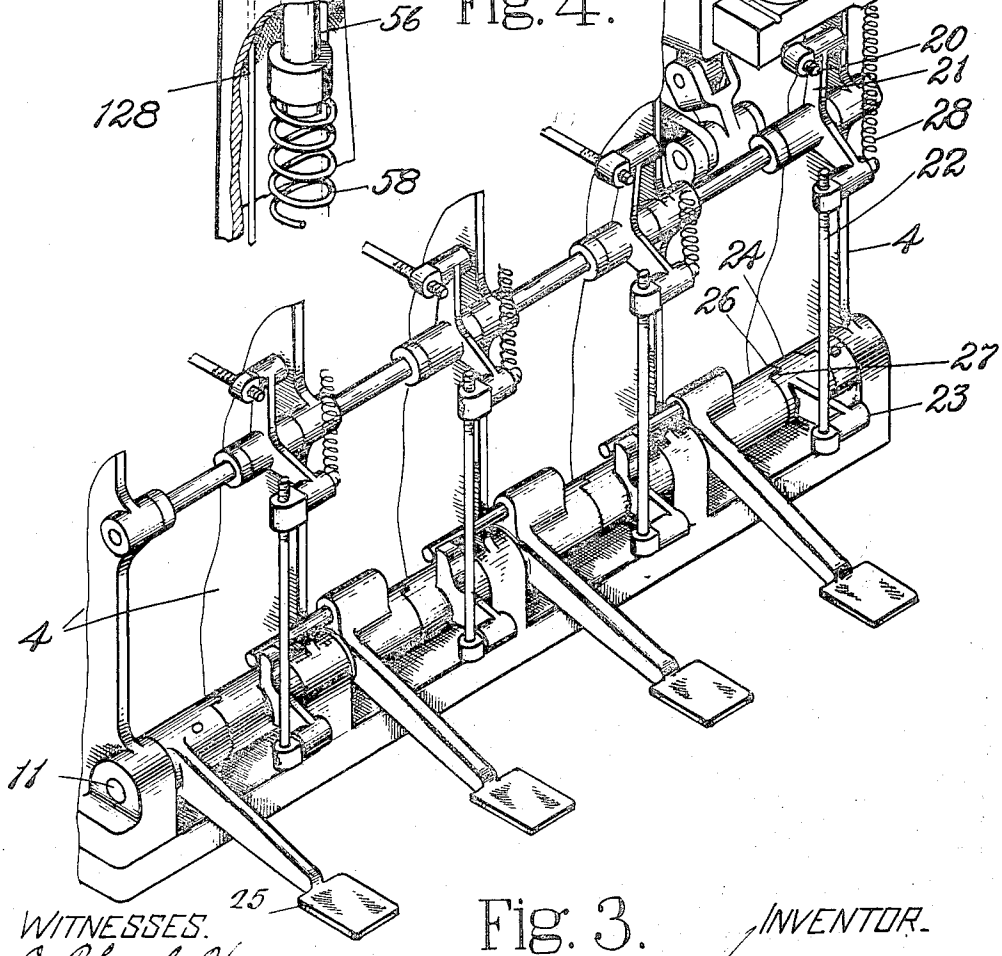


Fig. 3.

WITNESSES.
C. Blanche Hargraves
Elizabeth C. Coffe

INVENTOR.
Matthias Brock
By Geo. H. Strong
Edson M. Woodard

M. BROCK.

MACHINE FOR SHAPING UPPERS.

APPLICATION FILED OCT. 28, 1912.

1,197,437.

Patented Sept. 5, 1916

5 SHEETS—SHEET 4.

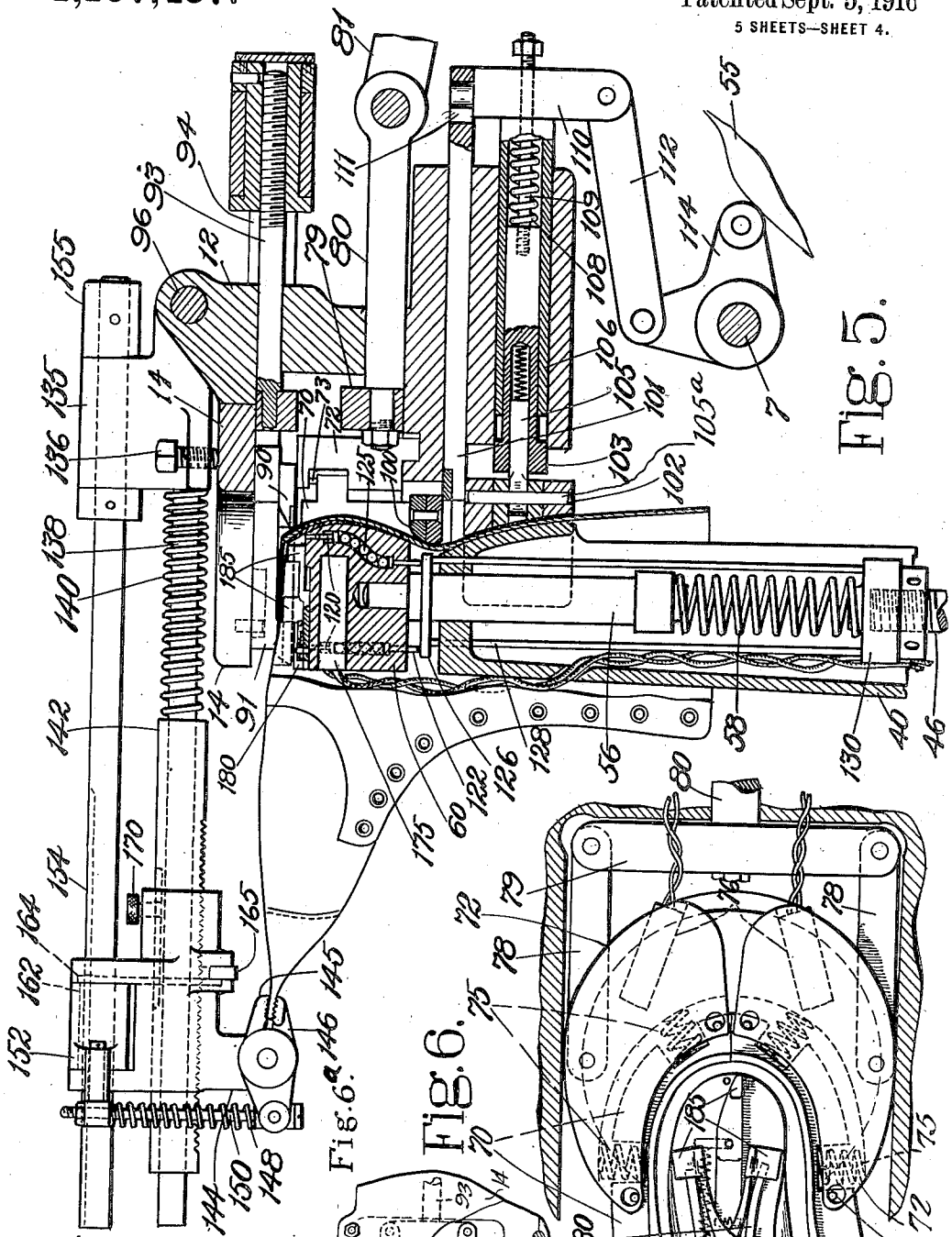


Fig. 5.

Fig. 6.

Fig. 6a.

WITNESSES.

O. Blanche Hargraves

Elizabeth C. Comfort

INVENTOR.

Matthias Brock

By his Attorney

Nelson W. Howard

M. BROCK.

MACHINE FOR SHAPING UPPERS.

APPLICATION FILED OCT. 28, 1912.

1,197,437.

Patented Sept. 5, 1916.

5 SHEETS—SHEET 5.

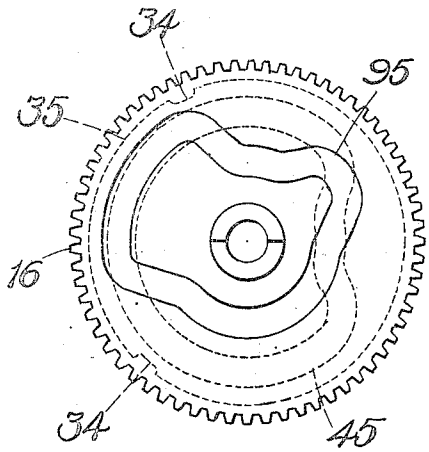


Fig. 8.

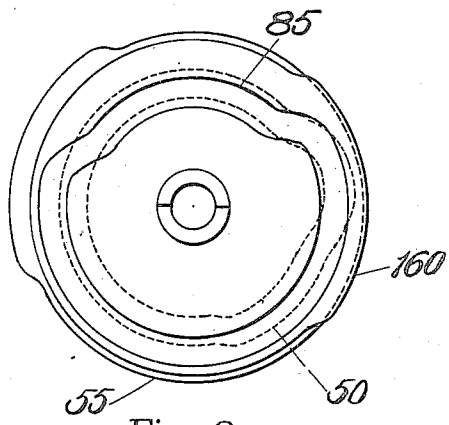


Fig. 9.

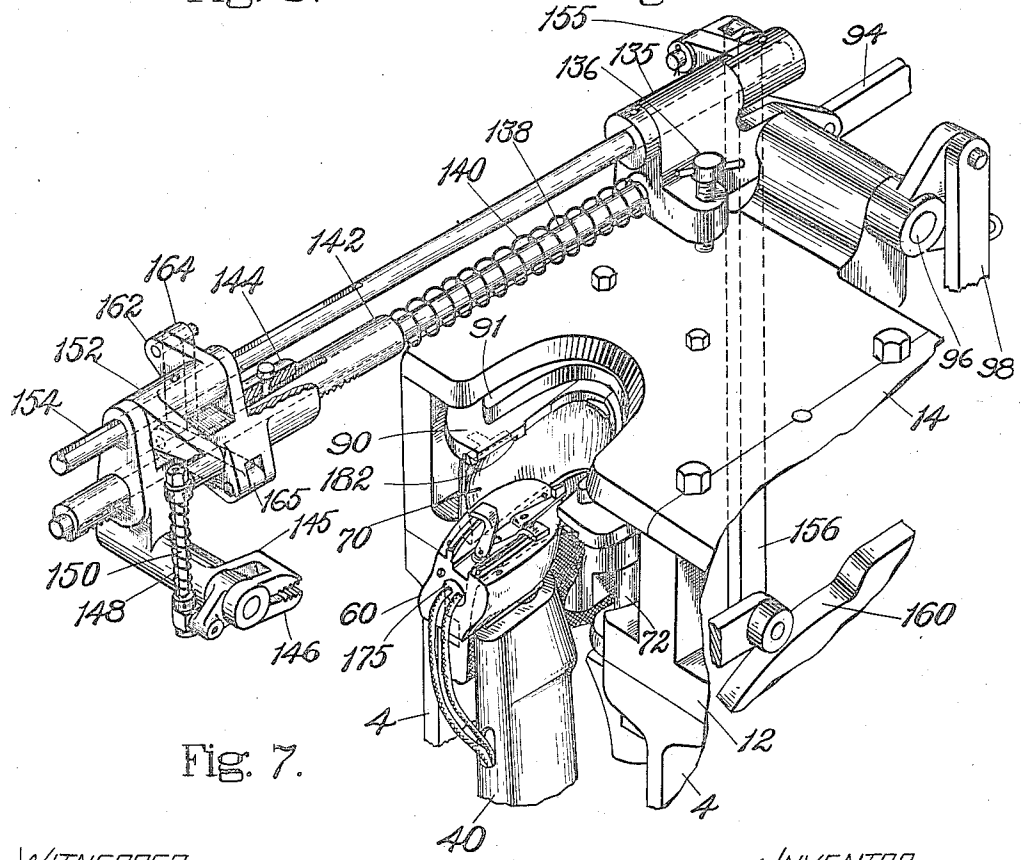


Fig. 7.

WITNESSES
O. Blanche Hargraves
Elizabeth C. Coyle

INVENTOR.
Matthias Brock
By his Attorney
Edson M. Howard

UNITED STATES PATENT OFFICE.

MATTHIAS BROCK, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

MACHINE FOR SHAPING UPPERS.

1,197,437. Specification of Letters Patent. Patented Sept. 5, 1916.

Application filed October 28, 1912. Serial No. 728,183.

To all whom it may concern:

Be it known that I, MATTHIAS BROCK, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Machines for Shaping Uppers, 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 shaping the heel portions of shoes and is herein embodied in a machine for preliminarily molding the upper materials, including the heel stiffener, of a shoe prior to assembling said upper materials with the innersole upon the last over which the shoe is to be made.

By molding the shoe upper with its lining and the heel stiffener all together and under heavy pressure the unity of the upper materials is made more complete with the result that they supplement one another and also that a trimmer and less bulky appearance in the shoe is obtained. By molding the upper materials preliminary to assembling the shoe the use of metallic formers is made possible with the aid of which greater and more effective molding pressure can be applied than wooden lasts would endure and the work can be most effectively treated with heat for rendering its shape permanent. Furthermore the shaping operation can thus be carried farther and made more effectual by using formers that overmold the work to an extent to compensate for its inevitable reaction after it is freed from the shoemaking apparatus. Preferably the shaping operation on the upper materials is carried far enough so that, after making allowance for the reaction, the heel portion of said materials will acquire permanently the shape which they should have in the completed shoe after its last has been withdrawn. One further advantage that is most useful in boot making is that the formers may comprise means, such for example as herein shown, for shaping the ankle and leg portion of the upper materials which extend above the top face of the usual last and are not ordinarily treated in lasting operations. It will be understood, however, that many of the advantages of which the present invention is possessed may be obtained even if a shoe last is employed as the inside former. The machine is shown as a multiple unit apparatus in which three shoes remain under pressure to render the shape permanent while one shoe is being applied, and the units are so connected that the shoe which has been longest in the machine is automatically ejected simultaneously with the insertion of a fresh shoe to economize time and effort of the operator.

An important feature of the invention consists in improved means for holding the inside former. As herein shown the former is connected with novel mechanism for drawing the work into the machine and for compressing the work.

Another feature of the invention consists in novel means for obtaining a molded shoe upper which shall snugly fit the last when the shoe is assembled. In the illustrated embodiment of this invention the materials of the rear part of a shoe upper, including the heel stiffener, are molded over an inside former which is narrower than the corresponding portion of the last for which the upper is being prepared and the former has its curvatures exaggerated. Preferably the mechanism is constructed and arranged to maintain the work under pressure and heat to set.

Another feature of the invention relates to the controlling mechanism for the machine. As shown the machine comprises four molding mechanisms for each of which an operating mechanism is provided, and a treadle for each mechanism has also a novel connection with another mechanism by which one mechanism is made to carry work into position of pressure and another mechanism is made to eject the work which has been under pressure.

Another important feature of the invention consists in improved outside formers. In the drawings these are shown as including backing plates to which face plates are movably connected for adaptation to conditions presented by the work and also for vertical movement with the inside former.

A further feature of the invention consists in novel work positioning devices to assist the operator in securing the required stock for the heel seat flange and another feature consists in means for molding upper materials for use in welt shoes to fit against the rib of a welt shoe innersole.

Further features of the invention consist in novel means for tensioning the upper about an inside heel former preparatory to molding; novel means to produce a snug fit of upper materials over the ball of the heel of the wearer's foot; novel means for driving tacks from inside a shoe upper outwardly and novel means for shaping the leg portion of boot uppers.

These and other features of the invention, including certain details of construction and combinations of parts, will now be more fully described in connection with the accompanying drawings and will then be pointed out in the claims, except the novel method herein disclosed which is claimed in co-pending application Ser. No. 62,041, filed Nov. 17, 1915.

In the drawings, Figure 1 is a right hand side elevation of the machine; Fig. 2 is a plan view; Fig. 3 is a front perspective of the lower portion of the machine; Fig. 4 is a perspective view showing the inside former and the neck and leg crimping devices in open position; Fig. 5 is a side elevation partly in section showing the shoe carrier and inside former drawn into the machine; Fig. 6 is a plan view in section being located between the heel seat formers and the outside molds; Fig. 6^a is a plan view of the heel seat forming plates and their operating mechanism; Fig. 7 is a perspective view illustrating particularly the inside former with its gages and flange shapers and the gripper mechanism; Figs. 8 and 9 are views showing in full and dotted lines the principal cam tracks.

The machine is shown as a quadruple apparatus comprising four like molding mechanisms coupled up so that one is caused to free a shoe when a shoe is put under forming pressure in another and while two shoes stand under pressure in the third and fourth mechanisms. The fourth mechanism at the right hand side of the machine has been selected for illustration and duplication of reference characters on the drawings will be omitted in the interest of clearness.

The main shaft 2 is driven from a pulley 3 and turns in bearings formed in the end walls 4 and similar partition walls that are located between each pair of the mechanisms, said walls being tied together by rods 6, 7, 8, 9, 10 and 11 which serve as fulcra for various levers, etc., which will be mentioned. These walls with the floor base constitute the machine frame and upon the walls is mounted a head plate 12 which is recessed in its front face to receive and support the outside molds and the wipers and which is covered by a cap plate 14.

Motion is transmitted from the main shaft 2 to the cam shaft 5 through speed reducing gears 15, 16 the gear 15 being connected to the main shaft by a Horton clutch the stop pawl 18 for which is withdrawn to start the gear 15 and the mechanism operated by that gear by a connection 20, 21, 22, 23, Figs. 1 and 3 to a sleeve 24 which is loose on the rod 11, being moved in the direction to withdraw the clutch pawl 18 by a starting treadle. There are four starting treadles each of which is arranged to trip the clutches of two of the four molding mechanisms, the connections to said mechanisms being so arranged that one mechanism carries the shoe just prepared into molding position and the mechanism in which a shoe has been longest under pressure forces that shoe out into position to be removed from its carrier. The starting treadle which causes the right hand mechanism to carry a shoe into the machine is the treadle located at the left hand end of the machine and which at the same time causes the left hand mechanism to force out the shoe that has been under pressure in that mechanism. This result is obtained by pinning the hub of the left hand treadle to the treadle rod 11 and providing said rod, near its right hand end, with a fixed collar having a shoulder which abuts against a shoulder on the sleeve 24 above mentioned. From this arrangement, which is clearly shown in Fig. 3 of the drawings, it is plain that the treadle lever 25 at the left hand end of the machine can be made to start the mechanism at the right hand end of the machine. It may also be seen from Fig. 3 that the hub of each starting treadle has a shoulder 26 which, when the treadle is depressed, will engage a shoulder 27 on the adjacent sleeve 24 and turn that sleeve. This movement of that sleeve for the left hand molding mechanism starts that mechanism and causes it to eject the shoe which it has been holding under pressure. Each of the starting treadles except the left hand one carries on its hub a laterally projecting rod adapted to engage a lug standing up from the sleeve 24 which is at the left hand side of the hub and to cause the molding mechanism that is connected with that sleeve to draw into molding position a prepared shoe at the same time that a molded shoe is being forced out of the next mechanism at the right of the one into which the shoe has been drawn. Return springs 28 maintain the treadles normally elevated. After the clutch has been closed and the machine started the pawl is held away from the clutch by a rod 30, Fig. 1, the upper end of which is connected to an arm 32 that is hung on rod 8 and has a roll engaged by the peripheral face of a cam disk 35 formed integral with one side face of gear 16, Fig. 8, and which has two recesses 34 suitably spaced apart to allow the pawl to reëngage the clutch at points in the cycle representing the shoe receiving position of the mechanism and the position

of pressure respectively. There is a brake disk 36 fast with the gear 15 and a brake strap 38 encircles this disk and is connected with the clutch pawl operating mechanism to be applied when the pawl is set to open the clutch and to be released when the pawl is withdrawn for starting the gear 15.

A work support or jack post 40 has its foot mounted to slide in and out horizontally in guides formed on the walls 4, Figs. 1 and 3, such movement being transmitted thereto through a connecting rod 42 and lever 44 swung from rod 6, Fig. 1, and carrying a roll that stands in a cam path 45 in the side of cam disk 35, Fig. 8. This cam path is formed to project the jack post alternately to shoe receiving position and draw it into the shoe shaping mechanism.

Within the jack post 40 a plunger 46 reciprocates vertically and carries the inside former. This movement is transmitted to it by a toggle 47, 48, a toggle operating link 52 and a lever 54 fulcrumed on rod 8, Fig. 1, and carrying a roll that stands in a cam path 50 in a disk 55, Fig. 9, that is fast on the cam shaft 5, being back of pinion 16 in Fig. 1. The plunger 46 is formed in two sections, Figs. 1 and 5, between which is interposed a spring 58 to provide for yielding vertical pressure on the work and for a final movement of the lower section of the plunger relatively to the upper section 56 thereof for another purpose which will later appear. The plunger is directly over the thrust pin 57 of the toggle in position to be operated thereby when the jack presents the shoe within the shaping devices, and when the jack is advanced as in Fig. 1 to shoe receiving and delivering position the plunger is restrained from falling by a pin 59 which extends from the jack post therethrough in a slot.

On the head of plunger section 56 is the inside former 60 the general shape of which corresponds to the rear part of a last from about the middle of the shank to the heel end, the former, however, preferably varying from the contour of the last in that it is narrower and its curvatures are exaggerated for the purpose of overmolding the work. The overmolding is preferably of an extent to cause the work, even after it reacts, to fit the last snugly and, it may be, require to be spread in applying it to the last.

The coöperating shaping devices include outside formers and seat wipers and, it may be, neck-crimping jaws. The outside formers comprise jaws or face plates 70 the inner sides of which are contoured to fit the inside former 60. These are loosely connected, Figs. 5 and 6, to backing plates 72 which have in their faces that are adjacent to the jaws, see Figs. 5 and 6, grooves or recesses to receive tongues or ribs projecting from the jaws and by which the jaws are sustained for movement toward and from the backing plates. This movement is limited by pins 73 extending through the tongues on the jaws and through enlarged holes in the plates 72, and stiff springs 75 are interposed between the jaws and plates and permit the jaws to adapt themselves to thickness of stock and it may be to some variation in sizes of the inside formers 60. The tongues of the jaws are of less thickness than the recesses in the plates 72, as shown in Fig. 5, so that the jaws or outside formers can rise with the shoe when the inside former 60 is elevated, thereby avoiding downward drag on the shoe stock with which the jaws are in engagement. The backing plates 72 have arc-shaped guide ribs, see dotted lines Fig. 6, standing in a circular groove in the head 12 and are operated to close upon a shoe applied to the inside former by means of the links 78 connecting them with the crosshead 79 of the thrust pin 80 of a toggle 81, 82, Fig. 1, which is operated by a link connection 84 with a roll standing in a cam path 85 formed in that side of the cam disk 55 which is opposite to the path 50. The toggle has an adjustable abutment 83 through which the spread of jaws 70 can be varied.

The seat wipers comprise preferably the construction of lasting plates shown in Figs. 6 and 7, and which are fully described and claimed in my earlier application for Letters Patent of the United States Serial No. 706,655, said plates being herein designated generally by the reference character 90. They are operated to wipe the flange of the upper materials inwardly upon the top face of the inside former 60 by movements of the wiper parts each in a direction substantially perpendicular to the portion of the edge of the former over which it moves, although the front part of the wiper may advantageously have a rearward component of closing movement. Movement is transmitted to the wipers through their carriers 91, which have pin and slot guiding connections with cap plate 14. The carriers are connected by links 92 to the crosshead of a plunger 93 which is connected by links 94 to a rock shaft 96 which is moved by a link 98 from a cam path 95, Fig. 8, in the side of the gear 16 which is opposite to that in which the jack post sliding cam path 45 is cut.

The neck crimping jaws 100 are arranged vertically to engage the work in the region of the neck of a boot, which is at and below the top of an Oxford shoe and just at or about the upper edge of the heel stiffener in a "bal" shoe or a high boot, and crimp the upper materials, including the stiffener, inwardly to produce a snug fit over the ball of the heel of the wearer of the shoe. This engagement is timed to occur after the outside formers close. Associated with the

crimping jaws 100 for boot work is a flexible strip of leather or thin sheet metal secured to carrier blocks which are pivotally connected together in the middle, as best shown in Fig. 5, by a vertical pin 105ª against which acts a spring pressed plunger 105. The free ends of the carrier blocks, see Fig. 4, are connected by links 104 to the plunger 103 in which the spring pressed plunger 105 is guided as shown in Fig. 5. The pressure of the plunger 105 forces the connected ends of the carrier blocks, and therefore the middle portion of the leg band, normally forward and maintains the leg band normally open to be engaged and closed and thrust backward by the shoe as the jack post is drawn into the machine whereby initial clamping of the leg of the shoe is effected. The plunger 103 is embraced by a thimble sleeve 106 which contains a spring 108 and is traversed by a rod 109 fastened into the plunger and extending through a slide block 110 that is actuated by a link 112 and a bell crank 114 connecting with a cam formed on the periphery of disk 55. This cam gives the final closing pressure to the leg band and thereafter, and after the outside formers have been closed, through a lost motion connection 111 between the block 110 and the plunger 101, said cam advances and closes the neck crimping jaws 100, which are connected to their plunger by links 115 to stretch the stock between the band and the formers for producing the crimp.

Tack drivers 120 are mounted in the inside former as shown in Figs. 4 and 5 to insert tacks from the inside up through the overwiped margin of the upper, and it may be into a connecter for holding the two sides of the upper from spreading after the work is removed from the machine. These drivers are advantageously located near the outer edge of the inside former which is comparatively narrow at its lower face, thus rendering difficult the use of ordinary driver bars. I have therefore formed the driver passages in the former crooked as in Fig. 5 and interposed, as a movement transmitter between the drivers 120 and short bars 122, a series of balls 125 through which the tack driving force is transmitted. The bars rest upon a driver plate 126 which is supported by rods 128 that extend through the head of the jack post 40 and into a collar 130 which is adjustable upon the lower jack plunger section 46 whereby the drivers are operated when the spring 58 yields.

The grippers, Figs. 1, 2, 5 and 7, for stretching the upper forwardly and drawing it snugly around the rear end of the inside former before the outside formers close, are mounted on a carrier 135 that is connected loosely to an extension of the rock shaft 96 and the vertical position of which is determined by a stop screw 136. A carrier rod 138 projects forwardly being encircled by spring 140 and sleeve 142 upon which the gripper block 144 is shiftable for the length of the shoe. The block has a depending arm on which the upper jaw 145 is fixed in a position to engage the middle of the toe of the upper. The lower jaw 146 is pivotally mounted and has a rear arm to which closing movement is imparted yieldingly through spring 148 and connections comprising rod 150, rocker 152 which is splined on shaft 154 and has a rigid arm 155 joined by link 156 to a connection with a cam 160 on one lateral portion of the periphery of cam disk 55 which closes the jaws when the machine is first started and holds them closed while the shoe is in the machine. The rocker 152 has a second arm 162 connected by a link 164 with a swinging pawl 165 which it lifts into engagement with ratchet teeth on the lower side of sleeve 142 when the gripper jaws are closed. While the jaws are open the operator can freely slide the gripper block longitudinally of rod 138 and shaft 154 to position the jaws with the toe of the upper between them. When the machine is started the jaws close and the shoe is drawn by the jack post into the machine and away from the jaws, which can, however, yield by reason of spring 138. In place of the automatic lock 162, 164, 165 a manual latch 170 may be used.

The inside former is chambered to receive an electrical heating cartridge 175 and the outside formers are heated by electrical units 176 from which heat is also communicated to the wipers 90. Separate controls, not shown, are provided by which either or both the formers can be heated. The inside former may have on its top face, for shaping uppers for welt shoes, shoulders or ribs 180 located at a distance from the edge of the form corresponding substantially to the width of the feather of the innersole with which the upper is to be assembled and extending back as far as the heel breast line, the outer edges of the shoulders or ribs being preferably undercut. With these ribs or shoulders will be used wipers the edges of which have a coöperating formation as at 182, Fig. 7, to mold the marginal portion of the upper materials, including the heel stiffener, into an upstanding lip to fit against the rib of the innersole to which said materials are to be attached. The rear end of the lip so formed constitutes a gage mark formed in the upper to indicate the proper points of division between the heel seat tacking and the inseam sewing operations. The ribs or shoulders 180, by projecting above the inside former, constitute a height gage to guide the operator in placing the upper upon the inside former so that the right amount of material will be available for forming the heel seat

flange. Alternatively movable height gages 185 (Fig. 6) may be used which stand normally at or near the outer edge of the top face of the former, and therefore more closely adjacent to the upper materials than do the ribs 180, and can move inwardly with the wipers to avoid interference with the wiping operation.

In the use of the machine the upper is applied to the inside former when the jack post is in its forward position. The gripper is adjusted longitudinally on its carrier to a position appropriate for the length of the shoe and the toe of the vamp is positioned in it while the heel of the upper is positioned vertically with the assistance of the height gages to afford the stock necessary to form the desired width of heel seat flange. The treadle 25 is then depressed to start the power mechanism which produces the several automatic operations in the following order: The grippers are first closed and are locked on their carrier. The jack post carries the inside former backward thereby stretching the upper and drawing it snugly about said former which proceeds into the outside formers, the gripper spring 140 yielding when its tension has been exceeded. The outside formers now close and the heel seat wipers close partially for initially breaking down the flange of the upper and heel stiffener after which they back off and the inside former is raised about one eighth of an inch to bring the heel seat nearer to the plane of the wipers. The leg band, which was in position to be engaged by the leg of the boot when the jack moved back at the starting of the machine, is now closed firmly and then the crimping jaws are closed and stretch, in the direction of the height of the shoe, the upper which is between the outside formers and the leg band and crimp it inwardly to fit around the wearer's foot just above the ball of the heel. This being in progress the wipers fully close over the heel seat, forming the upstanding flange just forward of the heel breast line if the shoulders or ribs 180 are used, and then the plunger sections are actuated to elevate fully the inside former for compressing the heel seat materials between the inside former and the wipers. During this elevation the tack drivers are operated to insert tacks upwardly from the inside of the shoe through the heel seat materials that are held by the wipers. A connecting strip may have been applied upon the top face of the inside former in position to be thus fastened by the tacks to the upper materials at opposite sides of the heel seat to prevent spreading after the upper is removed from the machine. The machine now stops with the work under molding pressure between the formers and the heel seat wipers where, preferably by the aid of heat from either or both of the formers, the three or more layers of the upper, heel stiffener and lining will be consolidated and shaped into one multi-ply structure in which each will brace or reinforce the others. The depression of treadle 25 will have closed the clutch not only for the right hand apparatus which has been particularly described, but also, by turning the treadle rod, for the left hand or No. 1 apparatus in which, it will be assumed, a shoe has been longest under pressure and on this treadling the cams of the No. 1 apparatus will have been run through that portion of their cycle in which the shoe is released and the jack post advanced to position for the molded work to be removed and a new upper to be applied. The formation of the cams is such that the former 60 is lowered before the wipers are backed off the heel seat so that dragging of the wipers outwardly over the heel seat is avoided.

This application is a continuation of my co-pending application Ser. No. 637,655 as to certain subject-matter that is common to both applications. The novel method herein disclosed is claimed in my application Ser. No. 62,041, filed Nov. 17, 1915.

The novel method of preparing shoe uppers in which opposite sides of the upper are connected by a connecting strip is not herein claimed but is made the subject-matter of my co-pending application Serial No. 112,108 filed July 29, 1916.

Having explained the nature of this invention and described a preferred construction embodying the same, I claim as new and desire to secure by Letters Patent of the United States:

1. In a machine of the class described, a jack post, a plunger mounted to reciprocate vertically within the jack post, an inside former on the plunger, an outside former, means to draw the inside former into the outside former to shape the shoe stock at the back of the shoe between said formers, and means to raise the plunger after the inside former has been moved into the outside former.

2. In a machine of the class described, a jack post, a plunger mounted to reciprocate vertically within the jack post, an inside former on the plunger, an outside former, and connected mechanism to draw the inside former into the outside former to shape the shoe stock at the back of the shoe between said formers and then to raise the plunger.

3. In a machine of the class described, a jack post, a plunger mounted to reciprocate vertically within the jack post, an inside former on the plunger, means to draw the jack post into the machine, and plunger elevating means into operative relation to which the plunger is brought by the jack post at the end of its inward movement and

which is operatively connected with the post moving means to raise the plunger after the post has come to rest.

4. In a machine of the class described, a jack post, a plunger mounted to reciprocate vertically within the jack post, an inside former on the plunger, outside formers, means to move the post to draw the shoe on the inside former into the outside formers, and means to raise the inside former, the outside formers being mounted to rise with the shoe.

5. In a machine of the class described, a jack post, a plunger mounted to reciprocate vertically within the jack post, an inside former carried on the plunger and shaped similarly to the heel part of a last, outside formers, means for moving the post to draw the work that is on the inside former into the outside formers, and means to operate the outside formers to mold shoe upper materials to the contour of the inside former.

6. In a machine of the class described, a plunger mounted to reciprocate vertically, an inside former which is arranged to be elevated by the plunger and is shaped similarly to the heel portion of a last, means for heating the inside former, outside formers, heel seat wiper plates; and operating mechanism to draw the inside former into the outside formers, to close the outside formers and the heel seat wiper plates, and to elevate the inside former and then come to rest with the work under molding pressure between the heated inside former and the wiper plates and outside formers, said operating mechanism being constructed and arranged to lower the plunger and thereby relieve the heel seat molding pressure and thereafter to retract the heel seat wiper plates.

7. In a machine of the class described, a post, a plunger mounted to reciprocate vertically within the post, an inside former on the plunger, outside formers, heel seat wiper plates, and operating mechanism arranged to cause the post to draw the work into the outside formers, to close the plates over the heel seat face of the inside former, and to cause relative movement between the heel seat wiper plates and the inside former to compress the heel seat.

8. In a machine of the class described, a jack post, a plunger mounted to reciprocate vertically within the jack post, an inside former on the plunger, outside formers, heel seat forming plates, and operating mechanism arranged to cause the jack post to draw the shoe into the outside formers, to close the plates over the heel seat, and to raise the plunger to compress the heel seat between the inside former and the plates, said outside formers being free to rise with the work on the inside former.

9. In a machine of the class described, a movably mounted jack post, a plunger mounted to reciprocate vertically within the jack post, an inside former mounted on the plunger, outside formers, heel seat forming plates, and operating mechanism arranged to actuate the jack post to draw the shoe into the outside formers, to close the plates over the heel seat and then to actuate them to back off, to elevate the plunger and inside former to raise the shoe relatively to the plane of the plates and to close the plates again and then increase yieldingly the elevation of the plunger and the shoe to compress the heel seat between the plates and the inside former.

10. In a machine of the class described, an inside former the general shape of which corresponds to the rear part of a last from about the middle of the shank to the heel end and is slightly narrower and has its curvatures exaggerated for the purpose of overmolding the upper materials, coöperating outside formers, and operating mechanism for relatively operating said formers to shape an upper so that after it reacts it will fit snugly the last for which the inside former was designed.

11. In a machine of the class described, the combination with an inside former; of outside forming means comprising jaws the inner sides of which are contoured to fit the inside former; backing plates; connections comprising tongues on the jaws and pins extending loosely through relatively large pin openings in the backing plates and through the tongues to connect the jaws to the plates, and springs interposed between the jaws and plates to permit the jaws to adapt themselves, relatively to the backing plates, to the thickness of the stock.

12. In a machine of the class described, the combination with an inside former, of outside forming means comprising jaws shaped on their inner side faces to fit the inside former and backing plates for said jaws, and mechanism operating through the backing plates to close the jaws about the inside former, said jaws and backing plates having on their adjacent faces grooves and flanges by which the jaws are supported by the backing plates and are permitted movement toward and from said plates, means limiting movement of the jaws outwardly, and springs against the resistance of which inward movement of the jaws can take place as the jaws adapt themselves relatively to the backing plates and to the thickness of the stock.

13. In a machine of the class described, the combination with an inside former; of outside forming means comprising jaws the inner sides of which are contoured to fit the inside former; backing plates; springs interposed between the jaws and plates, and loose connections confining the springs and permitting relative movement of the jaws

and plates to adapt the jaws to different sizes of inside formers.

14. In a machine of the class described, an inside former the general shape of which corresponds to the rear part of a last from about the middle of the shank to the heel end and is slightly narrower and has its curvatures exaggerated for the purpose of overmolding the upper materials; coöperating outside formers; means for heating the outside formers; and operating mechanism for relatively moving said formers to shape an upper.

15. In a machine of the class described, an inside former the general shape of which corresponds to the rear part of a last; cooperating outside formers; operating mechanism for relatively moving said formers to shape the upper, heel stiffener and lining of a shoe into a unitary multi-ply structure, said operating mechanism having provision for bringing the formers to rest with the work under pressure, and means for heating the inside and the outside formers while the work is under pressure to reduce the reaction of the shaped work after it is removed from the formers.

16. In a machine of the class described, the combination with an inside former and outside formers, of neck crimping means arranged for movement relatively to said formers to engage the work at about the upper edge of the heel stiffener of a boot and crimp the upper materials inwardly to produce a snug fit over the ball of the heel of the wearer of the boot.

17. In a machine of the class described, the combination with an inside former and outside formers, of neck crimping jaws arranged below and in advance of the outside formers, and operating mechanism allowing movement of the inside former with the shoe into the outside formers and the open jaws whereby the upper is bent inwardly by the jaws, said operating mechanism effecting closing movement of the jaws around the neck of the shoe after the outside formers have closed.

18. In a machine of the class described, the combination with an inside former and outside formers, of neck crimping jaws arranged below and in advance of the outside formers, and operating mechanism arranged and timed to draw the inside former and the work into engagement with the outside formers and thereafter to close the outside formers and finally to close the crimping jaws.

19. In a machine of the class described, the combination with a heel embracing outside former arranged to engage the upper portion of an inverted shoe, of relatively movable means for embracing the lower portion of the rear part of the shoe to shape it for the purpose described.

20. In a machine of the class described, means adapted to embrace and shape the heel portion of a shoe upper, neck crimping jaws additional to the said heel shaping means and arranged to operate below the heel shaping means, a shoe holder serving to position the shoe vertically for the operation of said shaping means and the jaws, and mechanism for relatively moving the holder and the jaws to crimp the neck of the shoe.

21. In a machine of the class described, the combination with means arranged to embrace the upper portion of the heel of an inverted boot, of a leg band and intermediately positioned crimping means, and operating mechanism to close the crimping means after the embracing means and the band have been closed whereby the stock at the neck of the boot is stretched in the direction of its vertical extent in crimping it.

22. In a machine of the class described, boot neck crimping means, means to clamp the stock above and below the crimping means, and mechanism to operate the crimping means to stretch the stock of the rear portion of the boot upper in the direction of the height of the boot and crimp it inwardly.

23. In a machine of the class described, the combination with outside formers, of a leg band normally held open and yieldingly forward in position to be engaged and thrust backward and closed by the shoe as the shoe is positioned within the outside formers, and an inside former by which the shoe may be so positioned.

24. In a machine of the class described, the combination with outside formers, of a leg band, crimping jaws, connected mechanism for closing the formers, the band and the jaws in the order specified, and an inside former to support the shoe.

25. In a machine of the class described, plates for shaping upper materials to form a heel seat, means for operating the plates, an inside former coöperating with the plates, and means for driving tacks from the inside of the shoe outwardly into the upper materials held by the plates.

26. In a machine of the class described, an inside former, heel seat plates, means for relatively operating the plates and former to shape the heel seat, and tack drivers carried in the former and driving upwardly toward the plates.

27. In a machine of the class described, a jack post, a plunger therein movable lengthwise of the post and comprising two sections yieldingly separated, an inside former on the upper section of the plunger, tack inserting means in the former, tack driver rods on the lower section and extending to the inserting means on the upper section, and operating mechanism for the plunger.

28. In a machine of the class described, an inside heel former which is wide on its sole face and narrow on the reverse face, tack driving apertures extending from one face to the other in a course curved to terminate near the edge of the sole face, drivers in the apertures near the sole face, rods extending through the reverse face, and a ball transmission between the rods and drivers.

29. In a machine of the class described, seat forming plates, an inside former, tack drivers movable in the former to drive tacks upwardly toward said plates, driver rods, and a series of balls arranged to transmit movement along a curved course through the former from the rods to the drivers.

30. In a machine of the class described, an inside former having driver passages terminating in its sole face near its edge and a movement transmitter comprising a series of balls confined in the former and through which the tack driving force may be transmitted to tacks arranged to be driven into stock on the sole face of the inside former.

31. In a machine of the class described, a form, heal seat wiper plates, mechanism for operating said plates to shape the heel seat flange of shoe upper materials over the sole face of the form, and means constructed and arranged to drive tacks from inside the upper outwardly through the portions of the flange held by the wiper plates.

32. In a machine of the class described, an inside former, outside formers into which the inside former carries the rear part of the shoe, means for moving said inside former toward the outside formers, and a gripper arranged to seize the upper to tension the upper forwardly as the inside former moves backwardly toward the outside formers.

33. In a machine of the class described, an inside former, outside formers into which the inside former carries the rear part of the shoe, a gripper arranged to seize the upper forward of the heel part of the shoe, and operating means to close the gripper and then move the inside former relatively thereto into the outside former.

34. In a machine of the class described, an inside former shaped to receive the rear part of a shoe upper, heel seat forming plates into the field of operation of which the inside former carries the rear part of the shoe, gripping means arranged to seize the shoe upper forward of the inside former, and operating mechanism to move the inside former away from the gripping means and toward the heel seat forming plates while the gripping means holds the upper.

35. In a machine of the class described, an inside former, outside formers into which the inside former carries the rear part of the shoe, a gripper arranged to seize the upper, and operating mechanism to move the inside former toward the outside formers and to cause the gripper to draw the upper snugly around the rear end of the inside former before the shoe reaches the outside formers and then to accompany the inside former during the remainder of its movement.

36. In a machine of the class described, an inside former, outside formers into which the inside former carries the rear part of the shoe, a gripper carrier rod projecting forwardly relatively to the formers and supported for adjustment vertically, a gripper sliding on the rod to position it for the length of the shoe, and operating mechanism for the former and the gripper arranged to close the gripper and lock it on its rod and then to move the former relatively thereto into the outside former.

37. In a machine of the class described, an inside former, outside formers into which the inside former carries the rear part of the shoe, a gripper carrier rod, a sleeve thereon, a spring holding the sleeve forwardly on the rod, a gripper adjustable on the sleeve, and operating mechanism arranged to close the gripper, lock it to its sleeve, and then force the inside former backwardly into the outside former and relatively to the gripper while the spring holds the gripper yieldingly forward.

38. In a machine of the class described, an inside former having the general shape of the rear part of a last from the shank to the rear end of the heel and having on its sole face ribs which extend along the shank to the breast end of the heel seat and are located at a distance from the edges of the sole face corresponding substantially to the width of the feather edge of a welt shoe innersole, and heel seat forming plates having forward portions which extend along the shank and are constructed and arranged to coöperate with said ribs to mold the marginal portions of shoe upper materials into upstanding lips to fit against the lips of a welt shoe innersole.

39. In a machine of the class described, an inside former having the general shape of the rear part of a last and provided on its sole face with ribs which correspond substantially in location with the lips of a welt shoe innersole, and means for molding the marginal portions of shoe upper materials against the sole face and the ribs of said former.

40. In a machine of the class described, an inside former having the general shape of the rear part of a last from the shank to the rear end of the heel and having on its top face, along the shank to the heel breast, ribs located at a distance from the side edges of the former corresponding substantially to the width of the feather of a welt shoe

innersole, coöperating outside formers, and heel seat forming plates the edges of which have a formation adapted to coöperate with said ribs to mold the marginal portions of the upper materials including the heel stiffener into an upstanding lip to fit against the rib of a welt shoe innersole.

41. In a machine of the class described, an inside former having the general shape of the rear part of a last from the shank to the rear end of the heel and having on its top face, along the shank to the heel breast, ribs located at a distance from the side edges of the former corresponding substantially to the width of the feather of a welt shoe innersole, said ribs being obliquely undercut at their outer edges, and heel seat forming plates mounted for inward movement over the top face of the former and having edges shaped to press the upper materials against and under said undercut edges of the ribs to overmold the marginal portion of the upper materials to produce an upstanding flange.

42. In a machine of the class described, an inside former having the general shape of the rear part of a last from the shank to the rear end of the heel and having on its top face, along the shank to the heel breast, ribs located at a distance from the side edges of the former corresponding substantially to the width of the feather of a welt shoe innersole, heel seat forming plates arranged to close inwardly into coöperative relation to the inside former, said plates having formations to coöperate with the ribs in producing upstanding flanges on the upper materials by said closing movements, and automatic operating mechanism for said former and plates including means to compress the upper materials vertically and horizontally at the bases of said flanges.

43. In a machine of the class described, an inside former, seat forming plates, operating mechanism for said parts, and height gages carried by the inside former to assist the operator in positioning the upper materials to provide the appropriate stock for the action of the seat forming plates.

44. In a machine of the class described, an inside former, seat forming plates, operating mechanism for said parts, and height gages carried by the inside former movably to occupy a working position near the edge of the inside former to assist the operator in positioning the upper materials and movable out of the path of the seat forming plates.

45. In a machine of the class described, an inside former, outside formers, neck crimping jaws, and operating mechanism for said parts, combined with height gages arranged to assist the operator in positioning the upper materials vertically to provide for the production of an appropriate heel seat flange by the operation of the formers and jaws.

46. A machine of the class described, having, in combination, a series of upper molding mechanisms arranged in a row comprising end mechanisms and an intermediate mechanism, power operating means for each mechanism including means to move the work into position to be molded and come to rest with the work under pressure and to move the work out of molding position when the operating means is restarted, and controlling devices for said mechanisms including one controlling device which is constructed and arranged to cause one end mechanism to move the work presented to it into position to be molded and to cause the other end mechanism to move the work that is in it out of molding position while the intermediate molding mechanism remains undisturbed with work in it continued under pressure.

47. A machine of the class described, having, in combination, a series of upper molding mechanisms arranged in a row comprising end mechanisms and an intermediate mechanism, power operating means for each mechanism including means to move the work into position to be molded and come to rest with the work under pressure and to move the work out of molding position when the operating means is restarted, and controlling devices for said mechanisms including a starting treadle for each mechanism, a treadle rod on which the starting treadle for one end mechanism is fastened and on which other treadles are loosely fulcrumed, a collar secured on the rod adjacent to the starting treadle for the opposite end mechanism, and connections through which said collar controls said opposite end mechanism independently of the treadle for said opposite end mechanism.

48. A machine of the class described, having, in combination, a series of upper molding mechanisms arranged in a row comprising end mechanisms and an intermediate mechanism, power operating means for each mechanism including means to move the work into position to be molded and come to rest with the work under pressure and to move the work out of molding position when the operating means is restarted, and controlling devices for said mechanisms including a treadle and connections for causing said intermediate mechanism to move the work which is in it out of molding position, a treadle for the adjacent mechanism, and connections from the treadle for the intermediate mechanism to the operating means for the adjacent mechanism to cause the adjacent mechanism to move work presented to it into the machine independently of the treadle connected with said adjacent mechanism.

49. A machine of the class described, having, in combination, a series of upper molding mechanisms arranged in a row comprising end mechanisms and an intermediate mechanism, power operating means for each mechanism including means to move the work into position to be molded and come to rest with the work under pressure and to move the work out of molding position when the operating means is restarted, and controlling devices for said mechanisms including a treadle for each of two adjacent mechanisms, a rod on which each of the treadles is fulcrumed, a sleeve located on the rod between the treadles, connections from the sleeve to cause the power operating means for one of said mechanisms to do its work, and connections from each of said treadles to the sleeve for moving the sleeve whenever either of the treadles is depressed.

50. In a machine of the class described, an inside former, outside forming means comprising jaws or face plates the inner sides of which are contoured to fit the inside former, means to force the inside former and the outside forming means together to shape the stock of the rear portion of the shoe upper, means to wipe the upper inwardly over the inside former, and means to raise the inside former after it has been drawn into the outside forming means and the upper has been wiped in.

51. In a machine of the class described, an inside former, jaws or face plates the inner sides of which are contoured to fit the inside former, means to force the former and the jaws together to shape the stock of the rear portion of the shoe upper, means to wipe the marginal edge of the upper materials inwardly over the inside former to produce a heel seat flange, means for relatively operating the inside former and the wiping means to bring their adjacent faces nearer together to compress the heel seat flange after the wiping movement has commenced, and power operating mechanism for said several means.

52. In a machine of the class described, an inside former, outside formers comprising jaws or face plates the inner sides of which are contoured to fit the inside former, means to force the inside former and the outside formers together to shape the stock of the rear portion of the shoe upper between said formers, means to wipe the marginal edge of the upper materials inwardly over the inside former to produce a heel seat flange, means for relatively operating the inside former and the wiping means to bring their adjacent faces nearer together to compress the heel seat flange after the wiping movement has commenced, power operating mechanism for said several means, and means to heat the work during the operation of the machine on it.

53. In a machine of the class described, an inside former, jaws or face plates the inner sides of which are contoured to fit the inside former, means to draw the former into the jaws to shape the stock of the rear portion of the shoe upper between said formers, wipers to shape the marginal portion of the upper materials into a heel seat flange over the tread face of the inside former, means for heating the work while it is in the machine to render it responsive to the shaping action of formers and wipers, means to close and open the wipers, and means to separate the wipers and the tread face of the inside former before the wipers are opened to avoid displacing the heel seat flange.

54. In a machine of the class described, a jack post, an inside former carried by the jack post, an outside former comprising jaws or face plates the inner sides of which are contoured to fit the inside former, means to draw the inside former into the outside former to shape the stock of the rear portion of the shoe upper between said formers, and means acting through the inside former to heat the upper for rendering it responsive to the shaping action of the plates.

55. In a machine of the class described, an inside former, an outside former comprising members which are angularly movable relatively and have face plates which are yieldingly connected to the body of the members, and means for operating said members and inside former relatively to clamp the upper materials to the side faces of the inside former with molding pressure.

56. In a machine of the class described, a gripper, a form to hold an upper, and means for relatively moving the gripper and the form to pull the upper, combined with a support on which the gripper is adjustable while its jaws are open, and means to close the jaws and lock the gripper to its support preparatory for the upper pulling movement.

57. In a machine of the class described, a form to hold an upper, a gripper to engage the forepart of the upper, power mechanism to close the gripper and then move the form backwardly in a substantially right line to stretch the upper, and means to shape the heel seat portion of the upper over the form while the upper is held under lengthwise tension between the gripper and the form.

58. In a machine of the class described, a form to hold an upper, a gripper to engage the forepart of the upper, and power mechanism to close the gripper and then move the form backwardly in a substantially right line to stretch the upper.

59. An upper molding machine having, in combination, an inside former shaped simi-

larly to the heel portion of a last, outside forming means to wrap the upper around and mold it to the inside former, heel seat flange forming means, and operating means for said parts organized to permit an upper to be adjusted upon and then tensioned forwardly around the inside former, to cause the inside former to carry the upper backwardly into the outside forming means, to close the outside forming means, to operate the flange forming means for breaking down the flange of the upper and the heel stiffener, to raise the inside former and then to operate the flange forming means to wipe the flange over the heel seat face of the inside former.

60. An upper molding machine having, in combination, an inside former shaped similarly to the heel portion of a last, outside forming means to wrap the upper around and mold it to the inside former, heel seat flange forming means, and operating means for said parts organized to permit an upper to be adjusted upon and then tensioned forwardly around the inside former, to cause the inside former to carry the upper backwardly into the outside forming means, to close the outside forming means, to operate the flange forming means, and then to elevate the inside former and the outside forming means to compress the flange between the flange forming means and the heel seat face of the inside former.

61. An upper molding machine having, in combination, an inside former shaped similarly to the heel portion of a last, heel seat flange formers to wipe the margin of upper materials over the top face of the inside former, means to raise the inside former to compress the flange against the flange formers, outside forming means mounted to close for wrapping the upper materials around the inside former and mounted for movement upwardly with the inside former and relatively to the flange forming means for the purpose described, and operating mechanism for said formers and forming means.

62. An upper molding machine having, in combination, an inside former shaped similarly to the heel portion of a last, outside forming means to wrap the upper around and hold it to the inside former, heel seat flange forming means, said inside former and outside forming means on the one hand and the flange forming means on the other hand being arranged for relative movement substantially perpendicularly to the plane of the heel seat face of the inside former to compress the flange, and means to operate said parts to mold the rear part of an upper and compress the heel seat flange.

63. A machine for operating on shoes having, in combination, means comprising jaws which are angularly movable relatively and are constructed and arranged to embrace the heel portion of a form, heel seat wipers, a form having a heel portion, a form support normally occupying a position out of operative relation to the wipers and heel embracing means and in which position a shoe upper can be arranged upon the support, and operating mechanism for moving the support and the wipers and the heel embracing means relatively into operative relation including power driven mechanism for moving the embracing means and the wipers and the support relatively to conform the shoe materials to and compress them against the side and bottom faces of the heel portion of the form.

64. An apparatus of the class described having, in combination, a form having a portion shaped similarly to an end portion of a last, a form support, end embracing means comprising jaws which are angularly movable relatively to embrace and shape the shoe materials around the end portion of the form, and connected mechanism for moving the support and the form into operative relation to the jaws and for operating the jaws to do their work and come automatically to rest.

65. A machine of the class described having, in combination, a form having a portion shaped similarly to an end portion of a last, a form support, end embracing means comprising coöperating jaws which are angularly movable relatively and have inner faces corresponding in contour to the shape of the side faces of the end portion of the form, and connected mechanism for operating said support backwardly to force the rear end of the shoe into engagement with the embracing means and for operating the jaws to close against the side faces of the form to clamp the upper materials with molding pressure between said jaws and the form.

66. A machine of the class described, having, in combination, a form having a portion shaped similarly to an end portion of a last, means comprising coöperating jaws which are angularly movable relatively and heel seat forming plates for positively molding the upper materials to the contour of the side and bottom faces of the form, and power driven operating mechanism for said means arranged to come automatically to rest to allow the work to remain under molding pressure for the upper materials to become set and their shape permanently established in accordance with the contour of the form.

67. A machine of the class described having, in combination, a form having a portion shaped similarly to an end portion of a last, a form support, a former having cooperating jaws which are angularly movable relatively for clamping the upper materials about the heel portion of the form, and connected mechanism for moving the

support to force the shoe into the former and for moving said jaws to clamp the upper materials to the side faces of the form with a molding pressure.

68. A machine of the class described having, in combination, heel embracing means comprising coöperating jaws which are angularly movable relatively, heel seat wipers, and connected mechanism for operating the jaws to embrace and clamp the heel portion of the shoe upper with molding pressure and for operating the wipers to form the margin of the upper into a heel seat flange.

69. A machine of the class described having, in combination, a form having a heel portion, a form support, heel embracing means comprising coöperating jaws, heel seat wipers, and connected mechanism for operating the jaws to clamp the upper materials against the side faces of the form with molding pressure and for operating the wipers to form the margin of the upper into a heel seat flange and come to rest with the shoe under molding pressure in said jaws and wipers.

70. A machine of the class described having, in combination, a form having a portion shaped similarly to an end portion of a last, a former comprising jaws which are angularly movable relatively and have face plates yieldingly connected to the body portion of the jaws, and means for operating said jaws to clamp the upper materials to the side faces of the form with a molding pressure.

71. A machine of the class described having, in combination, a form support, a heel former comprising pivotally connected jaws having face plates yieldingly connected thereto and provided with working faces shaped like the side faces of the heel part of a last, means for relatively moving said form support and former to effect pressure of the heel end of the shoe against said former, and means for closing the jaws to clamp and hold the shoe with molding pressure.

72. An apparatus of the class described having, in combination, a shoe support including a form having a heel portion, heel seat lasting plates that are adapted to wipe the upper over the heel seat portion of the form, and connected mechanism for moving the support and the form into operative relation to the lasting plates and for operating the plates to do their work and for relatively moving the shoe support and the lasting plates to compress the upper upon the heel seat and come automatically to rest with the work under compression.

73. A machine of the class described having, in combination, a shoe support, upper pulling means, mechanism to operate said means, end lasting means, and power mechanism to transfer the shoe with the pulled upper under tension from operative relation to the pulling means into operative relation to the end lasting means and to operate the end lasting means to wipe the upper over the shoe bottom.

74. An organized machine having, in combination with a shoe support, grippers, end lasting wipers, and operating mechanism arranged to operate the grippers and shoe support relatively to pull the upper, transfer the shoe into the field of the wipers and operate the wipers to do their work.

75. An organized machine having, in combination with a support, a form carried by the support and having a portion shaped similarly to an end portion of a last, grippers adapted to tighten the upper about said form, end embracing means and operating mechanism arranged to operate the grippers and form relatively to tension the upper, transfer the shoe into the field of action of the embracing means and operate said means to shape the upper by exterior pressure about said form.

76. An organized machine having, in combination with a shoe support, grippers, heel seat lasting wipers, and operating mechanism arranged to operate the grippers and support relatively to pull the upper, transfer the shoe into the field of the wipers and operate the wipers to do their work and then relatively move the shoe support and the wipers to subject the heel seat to vertical compression.

77. An organized machine having, in combination with a shoe support, grippers, heel seat lasting wipers, and operating mechanism arranged to operate the grippers and support relatively to pull the upper, transfer the shoe into the field of the wipers and operate the wipers to do their work and then relatively move the shoe support and the wipers to subject the heel seat to vertical compression and come to rest, and when restarted to relieve the compression in time to prevent drag of the wipers outwardly over the heel seat.

78. An organized machine having, in combination with a shoe support, heel seat lasting wipers and operating mechanism to move the shoe support to present the shoe to the wipers, to close the wipers, to move the shoe support and wipers relatively in the direction to subject the heel seat to compression between the wipers and the shoe support and then to relieve such compression and thereafter open the wipers.

79. An organized machine having, in combination with a shoe support, heel seat lasting wipers and operating mechanism to close the wipers, to move the shoe support and the wipers relatively in the direction to subject the heel seat to compression between the wipers and the shoe support and come

automatically to rest and when restarted to relieve the compression prior to the opening of the wipers, for the purpose described.

80. A machine for shaping the heel ends of boots and shoes comprising an inside former and an outside former coöperating to shape the upper materials around the end and sides of the heel, and coöperating heel seat wiper plates adapted to break down the upper materials on the line around the heel seat where they are clamped by the formers, combined with automatically operating mechanism imparting the necessary movements to said formers and wipers to do their work and then relatively actuating the inside and outside formers on the one hand and the wipers on the other in a direction to effect compression of the shoe stock upon the heel seat and then automatically to relieve such compression prior to the retraction of the heel seat wipers.

81. A machine for shaping end portions of shoe uppers having, in combination, a form having a portion similar in shape to an end portion of a last, a form support, end embracing wipers for turning the margin of an upper inwardly over the form to produce a sole attaching flange, and connected operating mechanism responsive to manual control to close the wipers for turning in the flange and to move the form support and the wipers relatively in the direction to subject the flange to compression between the form and the wipers, said operating mechanism being constructed and arranged to continue automatically to effect flange shaping by the wipers until further control of said mechanism is exercised, and thereafter to move the wipers and the form into a relation which will permit removal of the work from the form.

82. In a machine of the class described, the combination with an inside former, seat forming means and operating mechanism for said means, of height gaging means located with relation to an edge of the inside former to assist the operator in positioning the upper materials for the desired projection thereof into the path of operation of the seat forming means.

83. In a machine of the class described, the combination with an inside former, seat forming means and operating mechanism for said means, of height gaging means located with relation to an edge of the inside former to assist the operator in positioning the upper materials for the desired projection thereof into the path of operation of the seat forming means, said machine being constructed and arranged to permit relative movement between the gage means and the former to facilitate unhampered operation of the seat forming means on the work.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MATTHIAS BROCK.

Witnesses:
ARTHUR L. RUSSELL,
MARTHA W. COUPE.