Feb. 14, 1933. A. BATES 1,897,037

MACHINE FOR SHAPING SHOE UPPERS

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Fig. 1.

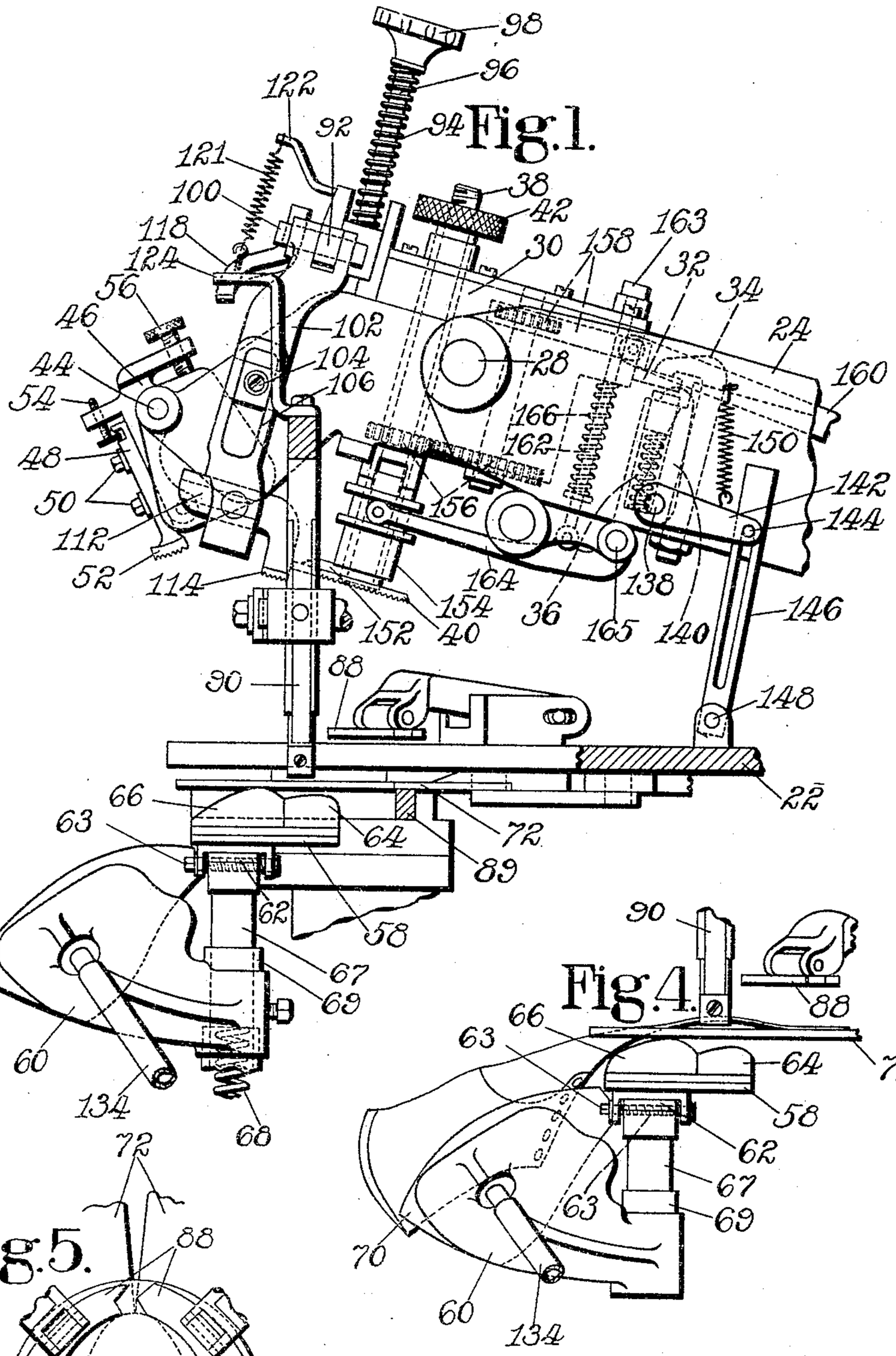
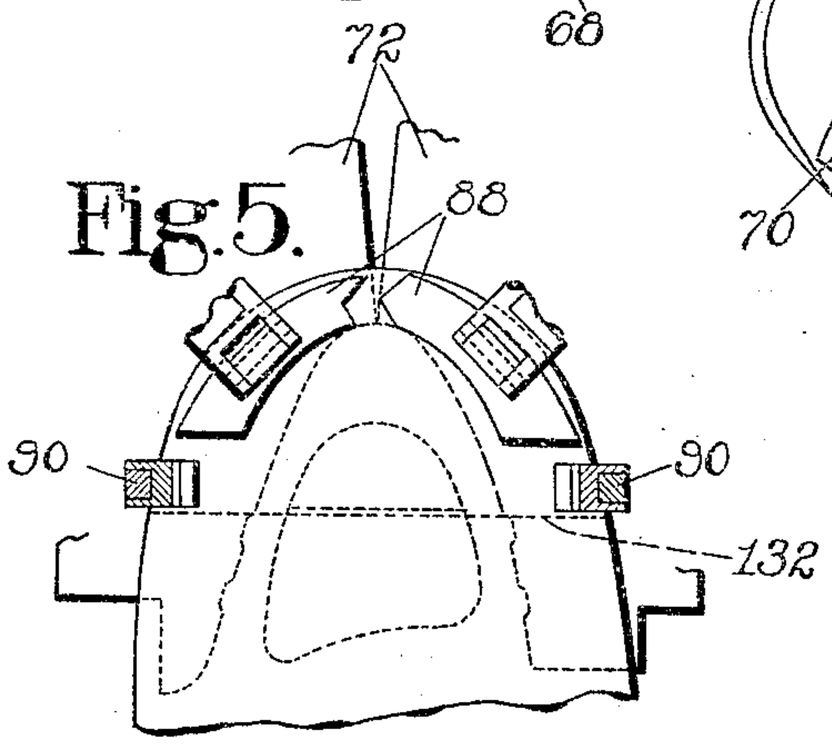


Fig. 4.

Fig. 5.



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Feb. 14, 1933. A. BATES 1,897,037

MACHINE FOR SHAPING SHOE UPPERS

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Fig. 2.

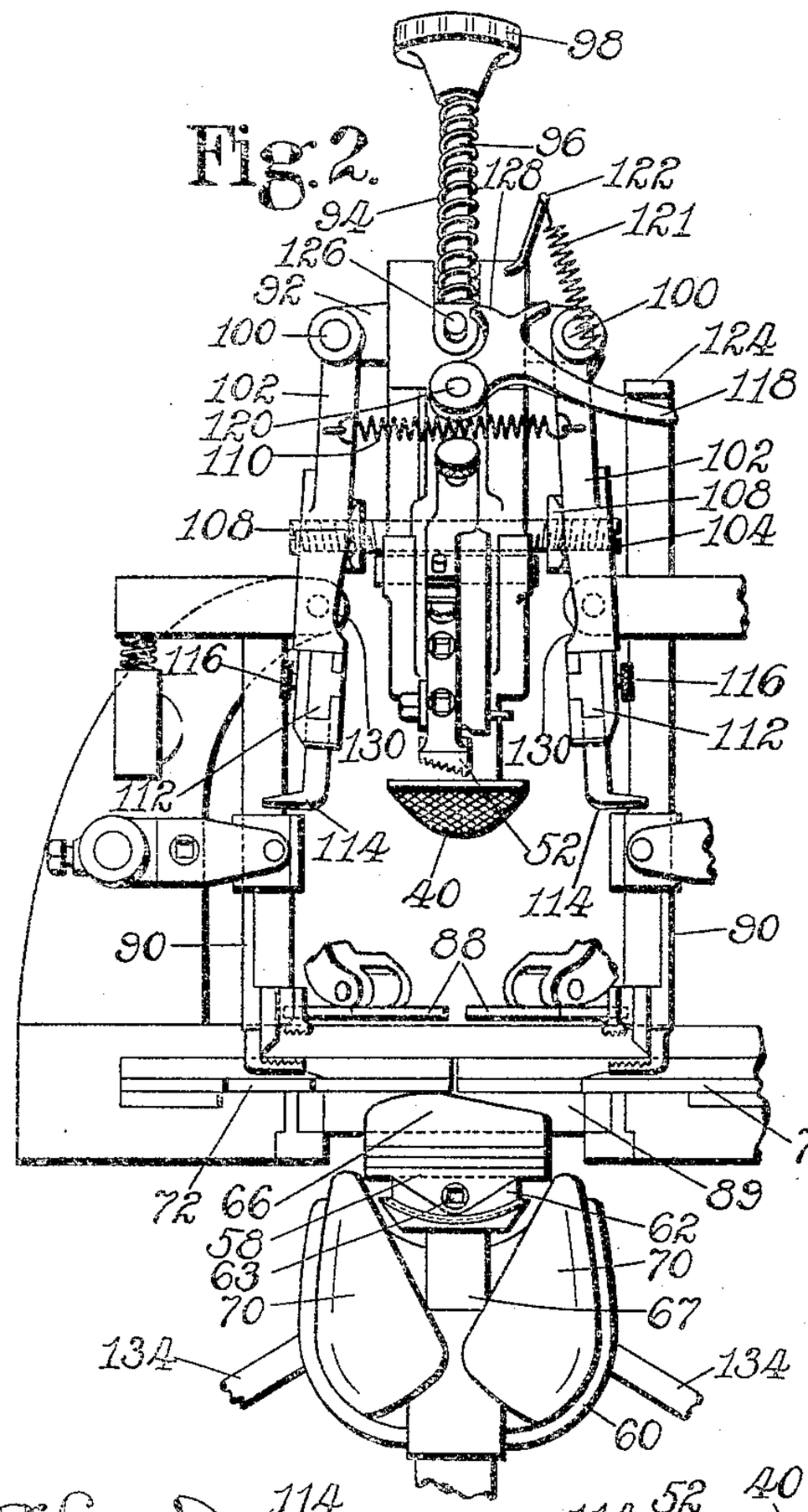


Fig. 6.

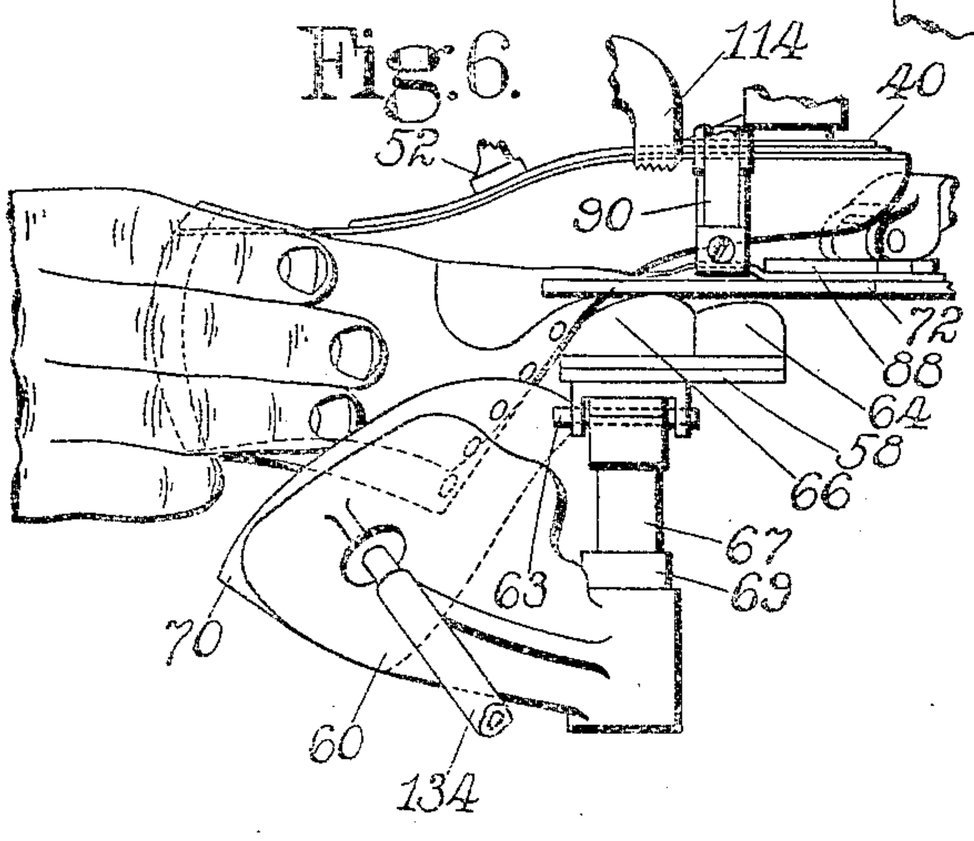
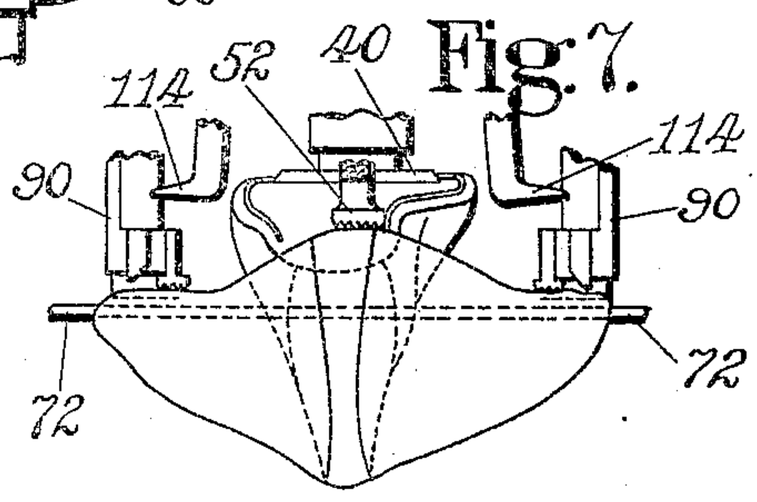


Fig. 7.



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MACHINE FOR SHAPING SHOE UPPERS

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Fig. 3.

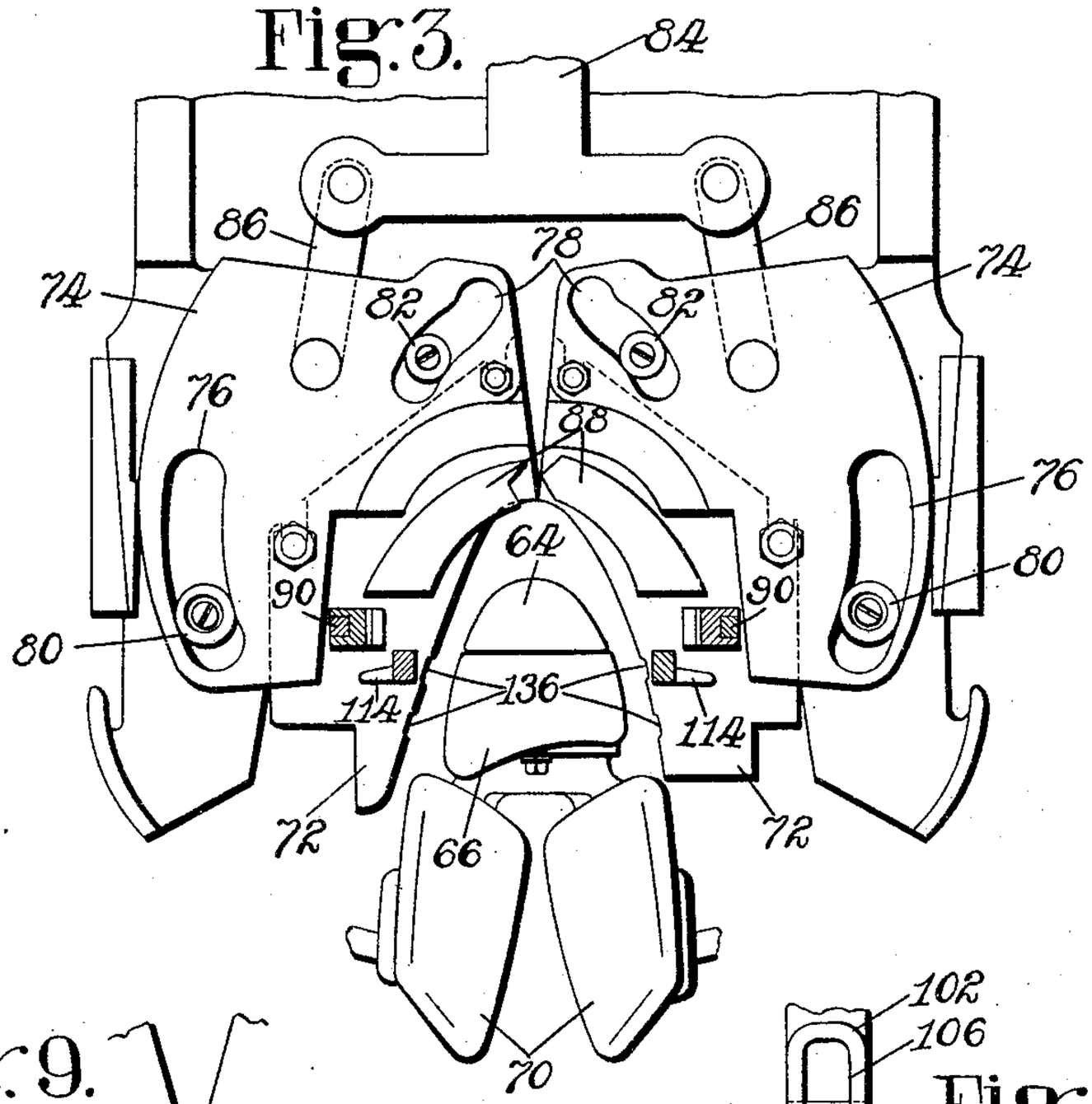


Fig. 9.

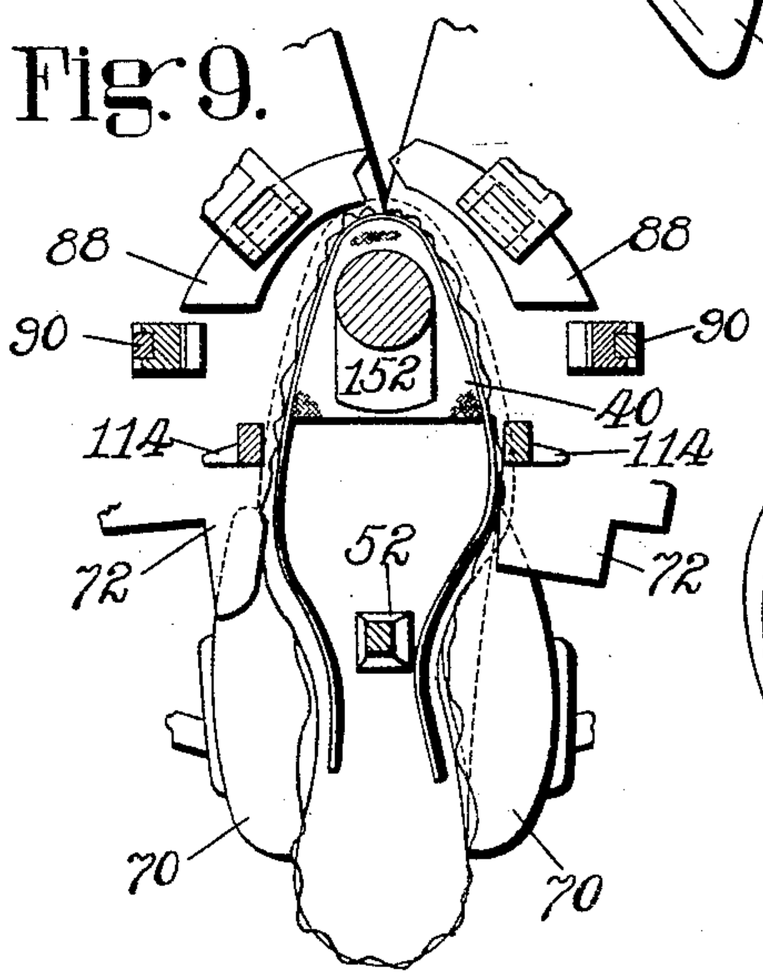
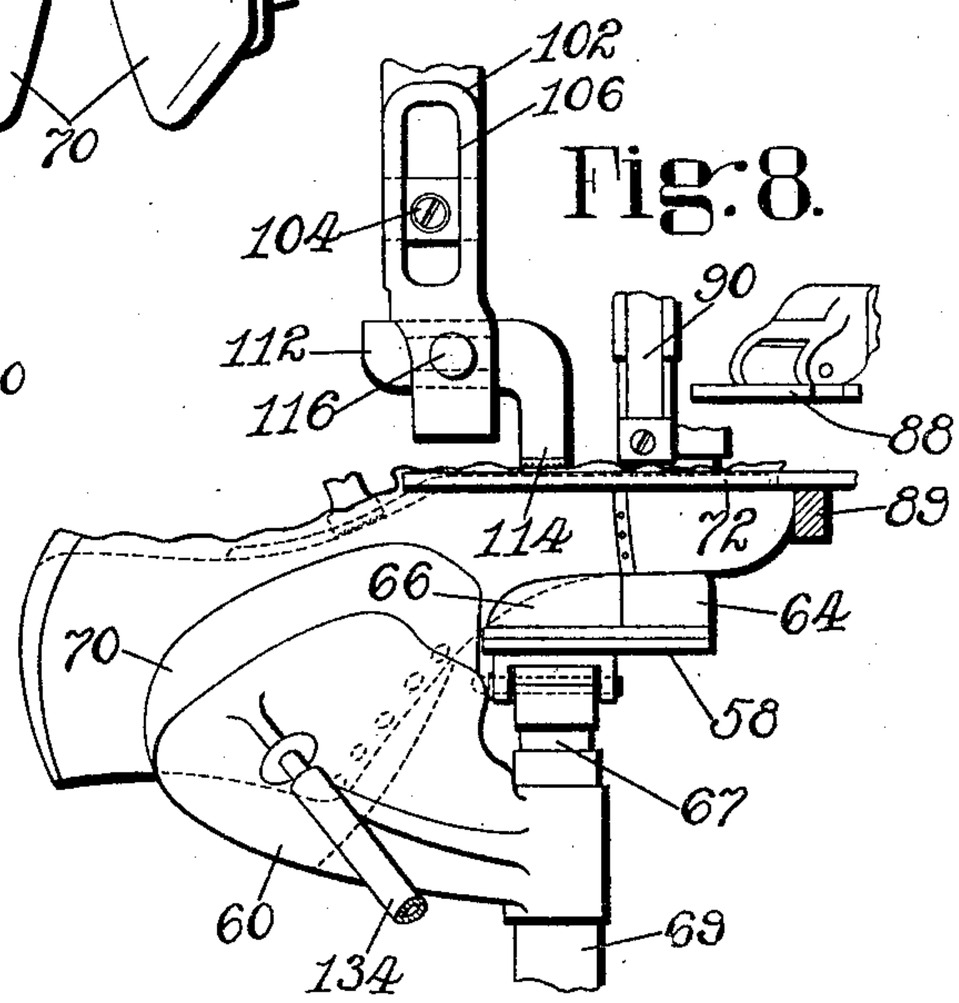


Fig. 8.



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MACHINE FOR SHAPING SHOE UPPERS

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Fig. 11.

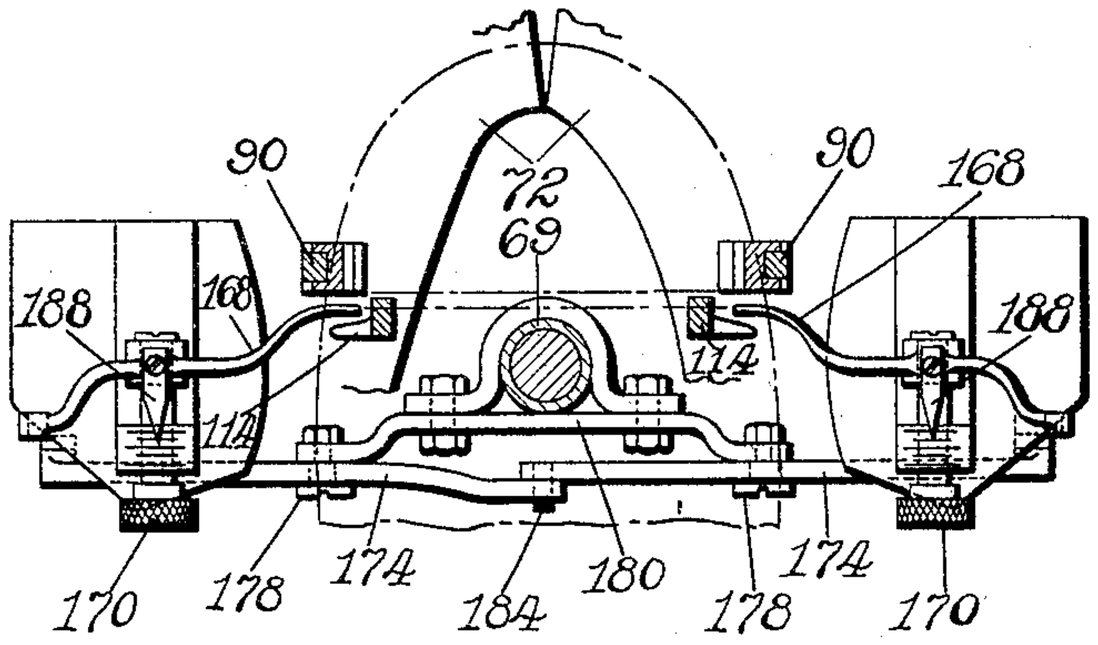
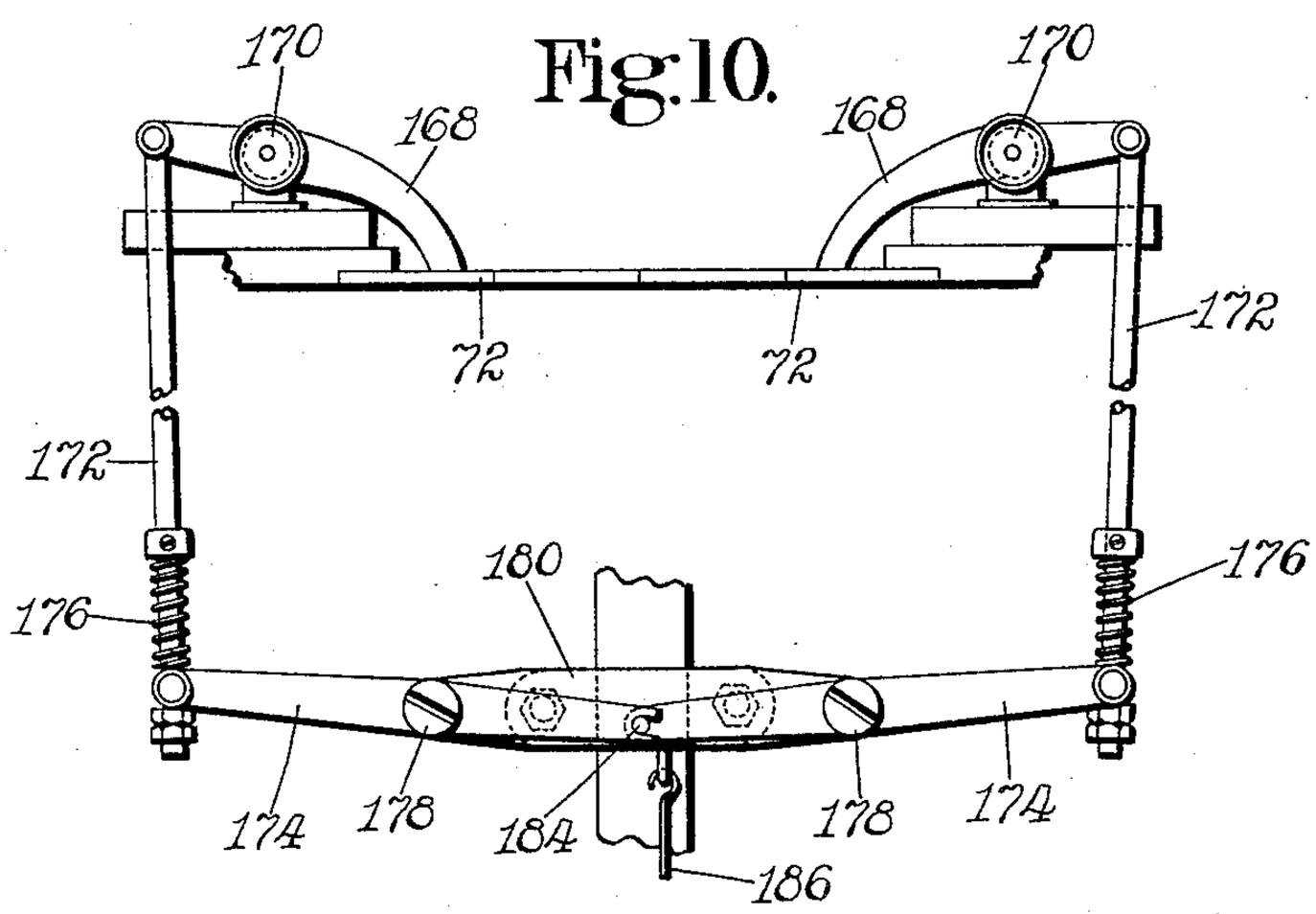


Fig. 10.



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MACHINE FOR SHAPING SHOE UPPERS

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Fig:13.

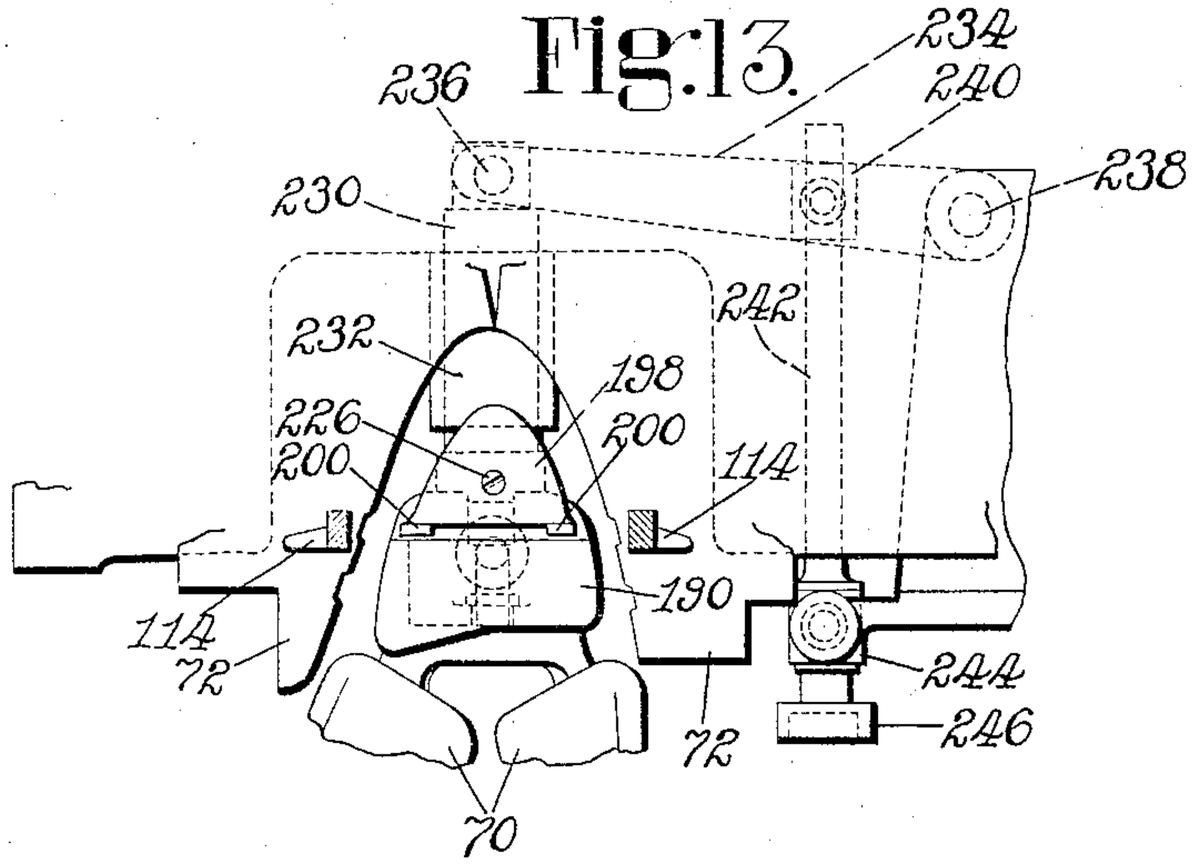


Fig:12.

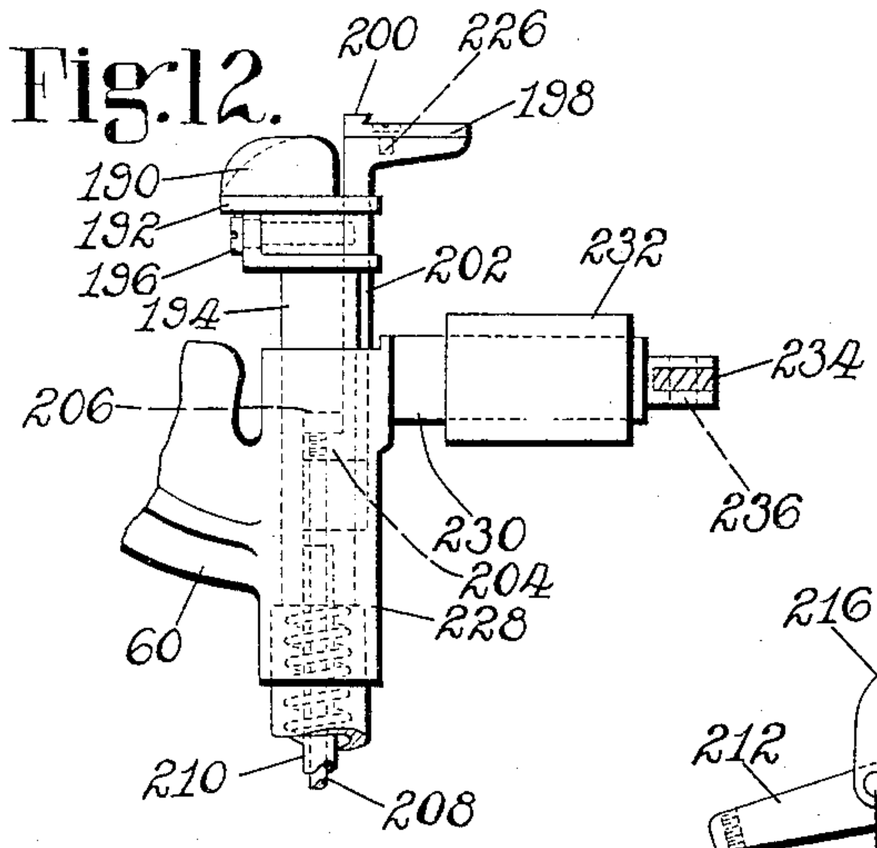
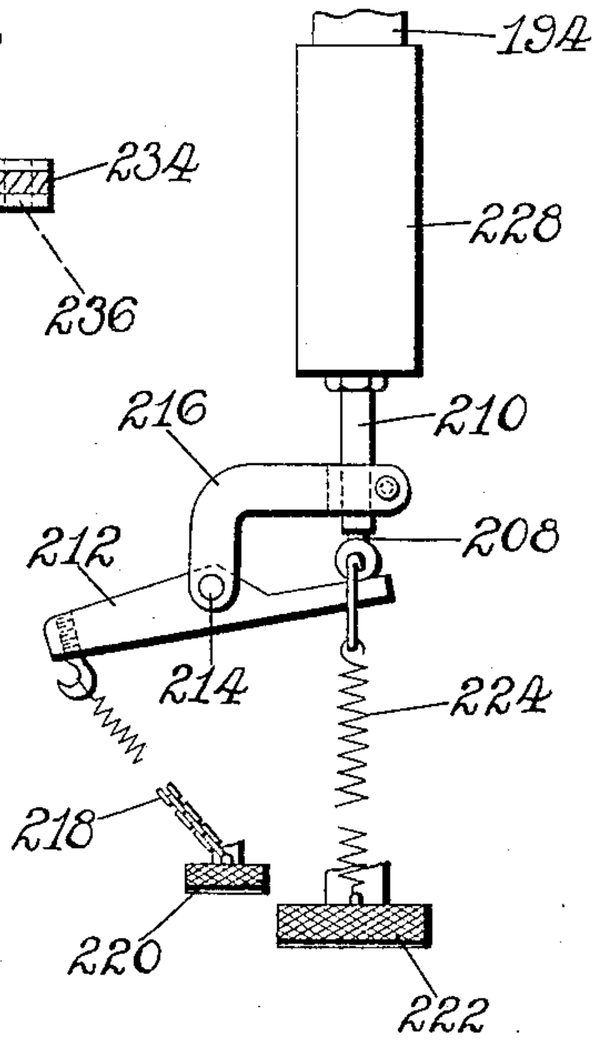


Fig:14.



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MACHINE FOR SHAPING SHOE UPPERS

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Fig:15.

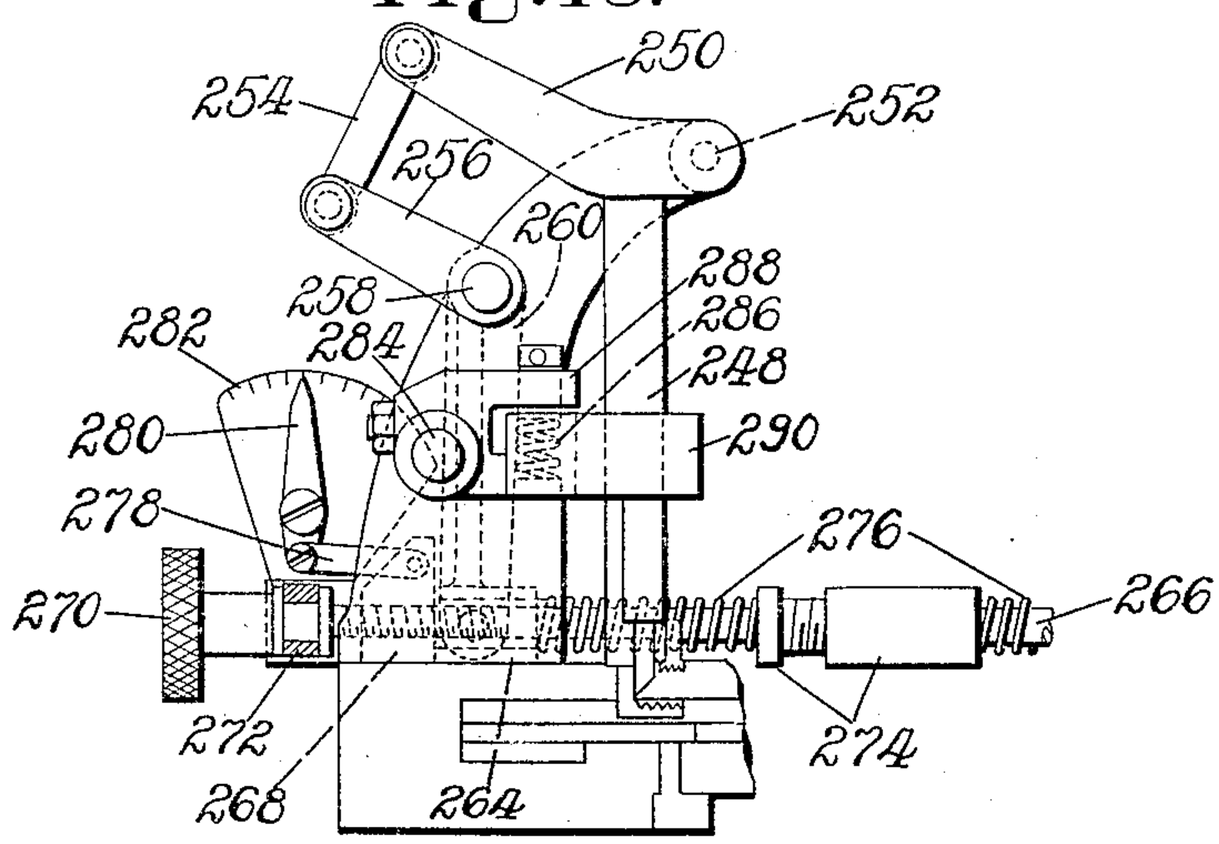
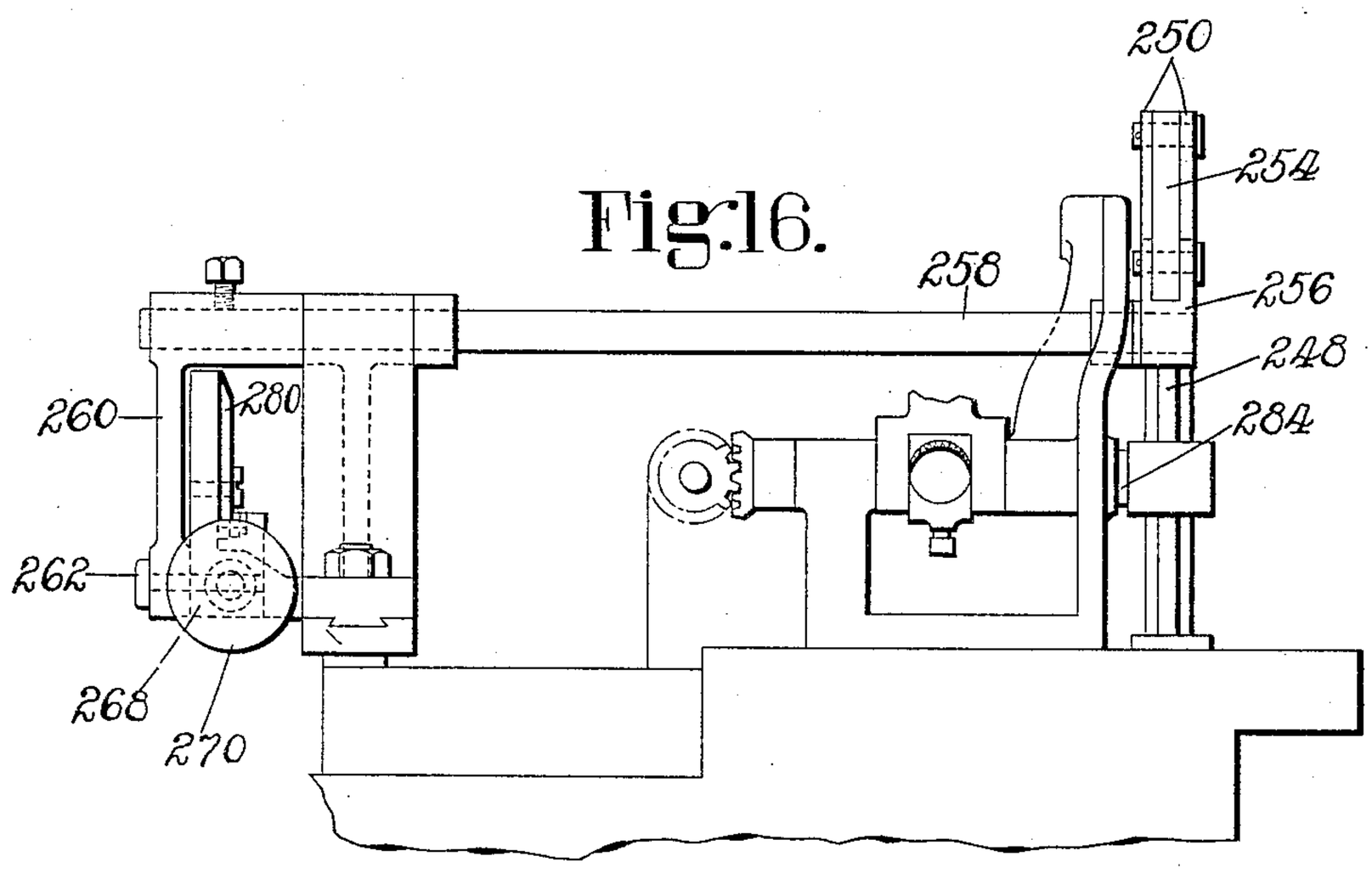


Fig:16.



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Feb. 14, 1933. A. BATES 1,897,037

MACHINE FOR SHAPING SHOE UPPERS

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Fig.17.

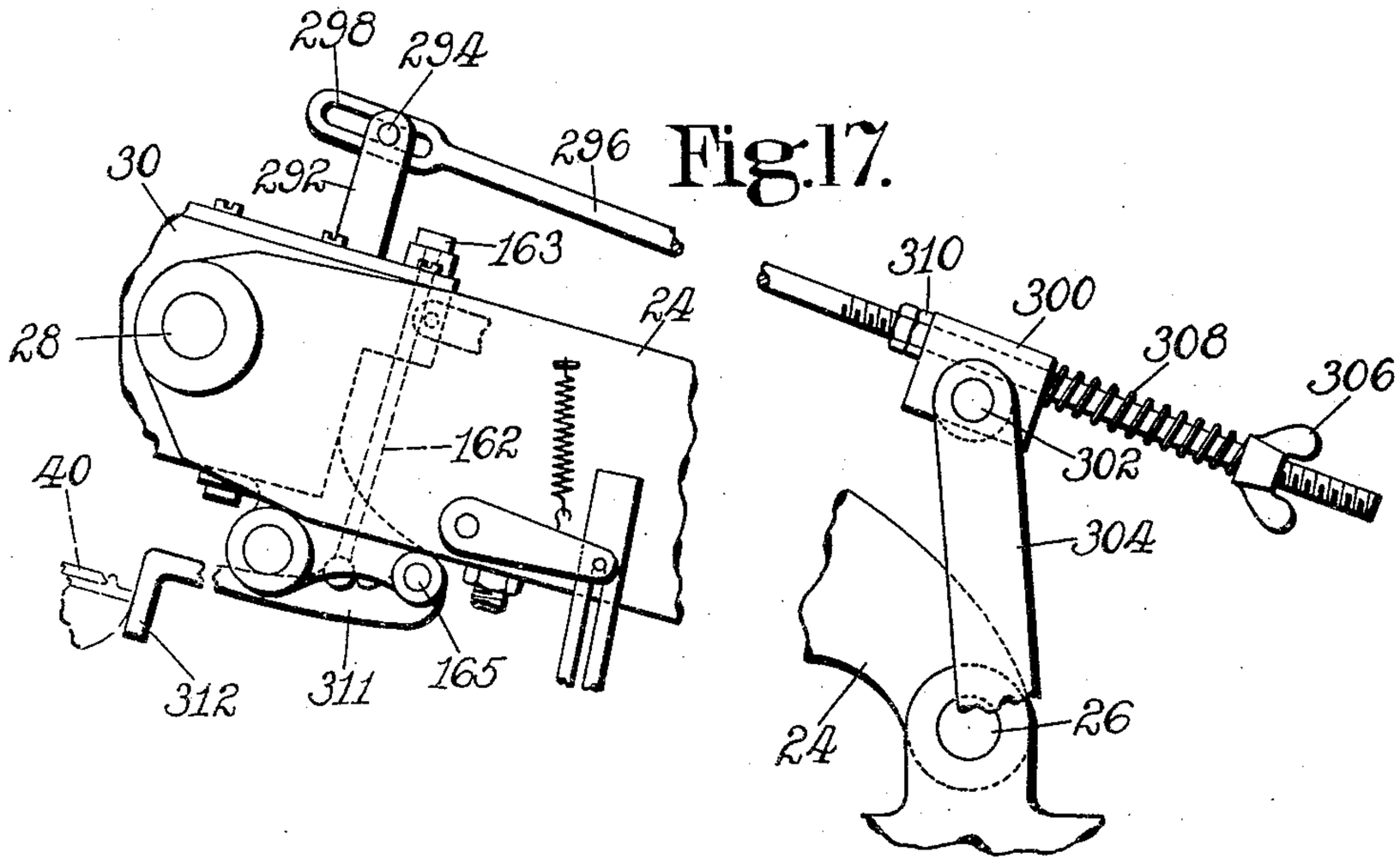
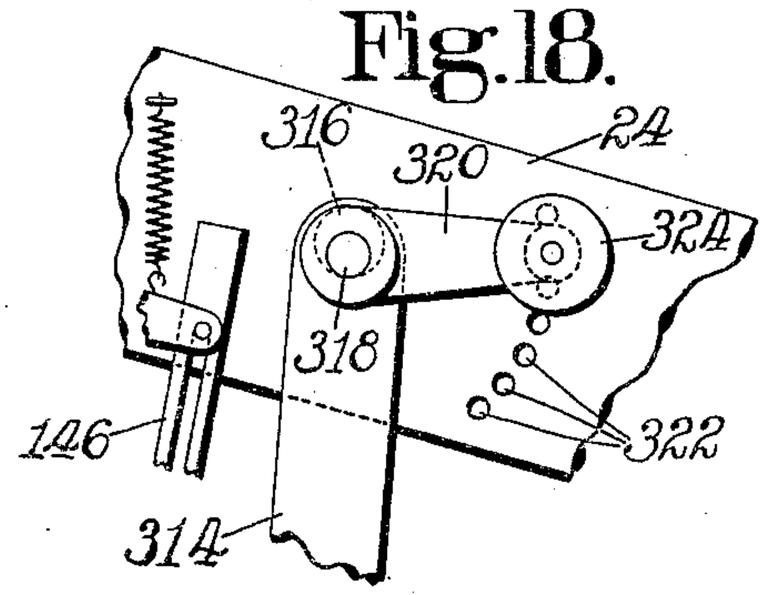


Fig.18.



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Patented Feb. 14, 1933 1,897,037

UNITED STATES PATENT OFFICE

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MACHINE FOR SHAPING SHOE UPPERS

Application filed June 2, 1931, Serial No. 541,585, and in Great Britain June 13, 1930.

This invention relates to machines for shaping shoe uppers, and is herein illustrated as embodied in a machine constructed to operate upon a previously untensioned upper to tension it over a last and also to last the toe-end portion of the shoe. It will be recognized, however, that in some of its novel aspects the invention is not limited to an organization of that particular character.

In the manufacture of various kinds of shoes, including welt shoes, it is the common practice to subject the upper to a pulling-over operation, whereby it is tensioned or stretched lengthwise of the last and also heightwise thereof at the forepart and is shaped in general conformity to the contour of the forepart of the last, and thereafter to last the toe of the shoe in a different machine, usually after the sides have been lasted between the toe and heel-end portions. It has, however, been proposed to tension the upper over the last and to last the toe in the same machine, one type of machine for that purpose being disclosed, for example, in Letters Patent No. 1,702,397, granted on February 19, 1929 upon an application of W. C. Baxter. Among the advantages of this procedure are the avoidance of such loss of tension in the upper as may result from the withdrawal of one or more of the pulling-over tacks preparatory to the toe-lasting operation and of difficulties due to the necessity of reshaping, more or less, in this operation portions of the upper shaped in substantial conformity to the contour of the last and insole in the pulling-over operation. Furthermore, by thus tensioning the upper and lasting the toe before lasting the sides the shoe may be conveniently prepared for presentation to a combined side-lasting and welting machine of the type disclosed in my copending application Serial No. 325,839, filed on December 13, 1928, if it is desired to make use of such a machine.

An object of the present invention, among others, is to provide an improved machine constructed to operate in the above-mentioned manner, the invention being herein illustrated as applied to a machine of the same general type as disclosed in the above-mentioned Letters Patent No. 1,702,397. In one aspect, the invention provides a novel organization of means for shaping an upper over a last by relative movement of the upper and the last. The machine herein shown is so constructed that the marginal portion of the upper is clamped at its toe end before the upper is mounted on a last, after which a last, supported at first by the operator, is moved by the machine toward the upper, the arrangement being such as to enable the operator to apply the heel end of the upper about the heel end of the last prior to such movement of the last. In order to tension the upper longitudinally, the last in the construction disclosed is moved in a lengthwise direction as well as in the direction of its height to force it into the upper, its lengthwise movement being initiated after the beginning of its heightwise movement.

The lengthwise movement of the last, as illustrated, is effected through contact with the bottom face of an insole on the last, one form of construction disclosed, moreover, including a member arranged to act on the toe-end face of the last to assist in this movement. A further feature comprises novel means whereby lengthwise movement of the last is effected by relative movement of parts of a device that is moved heightwise of the last to force it into the upper, such relative movement, in one form of construction illustrated, resulting from resistance of a yieldable shoe support to the heightwise movement of the last, and, in another form, being effected by means that is not dependent upon such resistance.

In another aspect, the invention provides novel means for controlling the marginal portion of the upper in the upper-shaping operation. The machine herein shown comprises toe-embracing wipers for wiping the marginal portion of the toe end of the upper into lasted relation to an insole on the last, and means for clamping the marginal portion of the toe end of the upper on the wipers to assist in tensioning and controlling the upper; and for purposes of this invention there are provided additional members for

clamping the upper upon the wipers at the rear of its toe-end portion prior to the inward wiping movement of the wipers. In the construction shown the wipers are formed and arranged to wipe the upper inwardly over the insole along the sides of the shoe substantially as far rearwardly as the ball of the shoe, and the additional clamping members are arranged to control the upper in locations near the ball of the shoe and at the rear of grippers provided for gripping and controlling the margin of the upper at or near the tip seam. In accordance with further novel characteristics of the illustrative construction, the additional clamp members are carried by the means that is moved heightwise of the last to force the last into the upper, and are so controlled that they are permitted to move inwardly toward the shoe with the wipers during a portion of the movement of the wipers and are then stopped while the wipers continue their movement. Initially, moreover, these members are arranged to occupy positions near the opposite sides of a last presented to the machine by the operator to assist in determining the proper position of the last.

The invention also provides a novel organization including means for pressing portions of the upper into conformity to the contour of the last, with the object not only of assisting in the proper lasting of the toe portion of the upper, but also of positioning portions of the upper at the rear of the toe in approximately the right relation to the last where they tend to remain after the lasting of the toe, so as to facilitate the proper side-lasting of the shoe without disturbing the previously lasted toe. The construction shown comprises a shoe support which presses the upper into conformity to the contour of the last at the top of the forepart at the rear of the toe, and fluid-pressure means that conforms the upper to the sides of the last at the rear of this shoe support. As illustrated this fluid-pressure means comprises pneumatic pads which are spaced from each other and are arranged to press the upper to the sides of the last at the waist portion and substantially as far rearwardly as the heel-end portion of the shoe.

The invention further provides novel means for determining the proper position of the upper relatively to the wipers. In one form illustrated this means comprises fingers that are movable into or out of positions substantially contiguous to the upper on the opposite side thereof from the wipers, when the margin of the upper is outspread upon the wipers, for gaging by reference to the tip seam the position of the upper relatively to the wipers, these fingers being arranged to be controlled by the operator and being adjustable for uppers of different sizes. In another form the gaging means comprises a device mounted for movement into or out of a position close to the upper on the same side thereof as the wipers, this means, as illustrated, comprising a plate having an edge portion against which the operator is enabled to press the upper to determine by reference to the tip seam the proper position of the upper.

The above and other features of the invention, including also novel means for controlling and adjusting the grippers which grip the upper at the opposite sides of the toe, novel means for determining the proper position of the last and insole, and various other novel details of construction and combinations of parts, will now be more particularly described by reference to the accompanying drawings and thereafter pointed out in the claims.

In the drawings,

Fig. 1 shows in side elevation portions of the head of a machine in which the invention is embodied, parts of the structure being broken away;

Fig. 2 is a view in front elevation of the portions of the machine shown in Fig. 1;

Fig. 3 is a plan view illustrating the relation to one another of certain parts hereinafter referred to;

Fig. 4 is a view of portions of the structure in side elevation, illustrating the manner in which a shoe upper is presented to the machine;

Fig. 5 is a plan view illustrating the relation to one another of certain parts of the machine when the shoe upper is presented as shown in Fig. 4;

Fig. 6 is a view in side elevation illustrating the relation of portions of the machine to a last and to the shoe upper at a later stage in the cycle of operations;

Fig. 7 is a view from the left of Fig. 6 of parts of the structure there shown, with the parts in the same relation to one another as in Fig. 6;

Fig. 8 is a view in side elevation showing the relation between certain machine parts and the shoe near the end of the cycle of operations;

Fig. 9 is a plan view showing the parts and the shoe in the same relation as in Fig. 8;

Fig. 10 is a view in front elevation showing certain work-positioning means hereinafter described;

Fig. 11 is a plan view, with parts in section, illustrating the relation of the work-positioning means shown in Fig. 10 to some of the operating instrumentalities of the machine when the parts are in their starting positions;

Fig. 12 is a view in side elevation showing different work-positioning means and other parts associated therewith;

Fig. 13 is a plan view of the parts shown in Fig. 12 and of other closely related portions of the machine;

Fig. 14 is a view in front elevation of controlling mechanism connected with portions of the structure shown in Figs. 12 and 13.

Fig. 15 is a view in front elevation showing a portion of mechanism that may be used to control and adjust the side grippers;

Fig. 16 is a view in side elevation of the structure shown in Fig. 15;

Fig. 17 is a view in side elevation, with parts broken away, showing modified means for controlling the last and the insole; and

Fig. 18 is a side elevation of certain adjusting means hereinafter described.

Since the invention, as above stated, is herein illustrated as applied to a machine of the same general type as disclosed in the above-mentioned Letters Patent No. 1,702,397, only such parts of the general organization of the machine as it is necessary to refer to for an understanding of the invention are herein shown and will be described in detail. It will be understood that the illustrative machine comprises two sets of operating instrumentalities for operating respectively upon right shoes and left shoes, the different sets performing their operations alternately. The drawings, however, show portions of only one of these sets of instrumentalities, since the different sets are similar to each other in construction and arrangement.

The machine is provided with a table 22 mounted on the top of a suitable frame, and each of the sets of operating instrumentalities includes an arm 24 supported on this table, the arm being mounted at its rear end on a horizontal pivot, not shown in Fig. 1 but indicated at 26 in Fig. 17, for downward swinging movement in a vertical plane to force a last into an upper controlled as hereinafter described. It will be understood that this arm is swung downwardly and upwardly by power-operated cam mechanism such as disclosed in the above-mentioned Letters Patent. On the front end of the arm 24 there is a horizontal pivot 28 upon which, for one of the objects of this invention, as more particularly hereinafter explained, there is mounted a block 30. The extent to which this block may turn about the pivot 28 in a counterclockwise direction is limited by contact of a lug 32 at the rear end of the block with an adjustable hook 34 secured to the arm 24, a spring 36 being provided in a bore in the arm 24 to swing the block in this direction. Movement of the block in the opposite direction is limited by means of stop faces, not shown in detail, on the block and the arm. A threaded rod 38 extending upwardly through the block 30 in front of the pivot 28 carries at its lower end a toe plate 40 having a roughened lower face and shaped to fit within the rib extending around the toe end of a welt shoe insole, the edges of the plate being beveled to permit it to abut snugly against the inner side of the rib. A hand nut 42 threaded on the upper end of the rod 38 may be turned to adjust the plate 40 upwardly or downwardly. Mounted in a slot in the front end of the block 30 on a horizontal pivot 44 is a three-armed bracket 46 provided with forwardly, rearwardly and downwardly extending arms. A stem 48 is adjustably secured to the front face of the downwardly extending arm of the bracket 46 by means of clamping screws 50 extending through slots in the stem, and at its lower end the stem is so formed as to provide a presser foot 52 the lower face of which is roughened, as by knurling. The presser foot 52 may be so positioned that when the toe plate 40 is seated flat upon the toe-end portion of an insole on a last within the rib of the insole, the presser foot engages the insole substantially at the front end portion of the shank, as illustrated in Fig. 6. The presser foot 52 is also so positioned that when an insole is in proper engagement with the toe plate 40, the presser foot is substantially in engagement with the inner face of the insole rib at one side of the shoe bottom, as shown in Fig. 7. In order to adjust the stem 48, and accordingly the presser foot 52, relatively to the plate 40 in directions heightwise of the last, there is provided a screw 54 extending through a threaded hole in the forwardly extending arm of the bracket 46, this screw having a knurled head which extends into a transverse groove formed in the stem 48. After the clamping screws 50 have been loosened the screw 54 can be turned to raise or lower the stem 48 in accordance with the slope of the shank portion of the bottom of a shoe to be operated upon. The presser foot 52 is adjustable toward or from the toe plate 40 in directions lengthwise of the shoe by means of a screw 56 threaded in the rearwardly extending arm of the bracket 46 and bearing at its lower end upon the block 30.

The toe plate 40 and the presser foot 52 are so arranged that by downward movement of the arm 24 they depress a last within an upper positioned and controlled as hereinafter described and force the last and upper downwardly upon shoe-supporting members. These members comprise a forepart support, indicated generally at 58, and a cradle 60. The forepart support 58 is mounted on a holder 62 which, as shown in Fig. 2, is swiveled, by means of a curved lower face, for movement about a horizontal axis extending lengthwise of the last at about the level of the longitudinal median line of the upper surface of the forepart support to accommodate differently shaped lasts. By means of a screw 63 the support 58 may be adjusted relatively to the holder 62 in directions lengthwise of the last. The support 58 includes two members 64 and 66 both of which are formed of comparatively hard but

still resilient material, such as stiff rubber. The member 64 is arranged to support the shoe and last in a location forwardly of the tip line of the upper, and the member 66 is arranged to press the upper into conformity to the contour of the last in a location rearwardly of the tip line and at either side of the longitudinal median line of the last, as illustrated in Fig. 8. The upper surface of the member 66 stands normally somewhat higher than the top of the member 64 and is convex lengthwise of the shoe to fill the hollow at the rear of the toe-end portion of the shoe. The forepart support 58 and its holder 62 are carried by a vertical stem 67 which is yieldingly upheld by a spring 68 so that the support can be depressed with the shoe and last in the course of the operation of the machine.

The cradle 60, which is secured to a fixed sleeve 69 in which the stem 67 is mounted and accordingly does not move vertically with the forepart support 58, comprises two wings spaced somewhat apart and each lined with an inflatable pad 70, these pads being inflated automatically at a certain time in the operation of the machine to press against the upper on the last. The pads 70 are arranged to engage the portions of the sides of the upper which lie on either side of the last, and in the construction shown each covers an area extending from immediately at the rear of the forepart support member 66 to a location at the side of the heel-end portion of the shoe, as shown in Fig. 8. The pads 70, as shown in Fig. 3, are arranged to provide a wedge-shaped opening between them within which the last and upper are received, the pads being spaced from each other far enough to avoid applying any substantial pressure to portions of the upper at the top of the last which the lacing normally occupies if the shoe is a laced shoe.

For lasting the forepart of the shoe the machine further includes wipers 72 mounted in carriers 74 (Fig. 3) having cam slots 76 and 78 cooperating with rolls 80 and 82 to effect the closing movements of the wipers laterally of the shoe, the carriers 74 being advanced and retracted by a cross-head 84 connected to the carriers by links 86. It will be understood that the cross-head 84 is operated by mechanism of the same character as disclosed in the previously-mentioned Letters Patent No. 1,702,397. In the construction herein shown the wipers 72 are of such length as to operate on the upper substantially as far rearwardly along the sides of the shoe as the ball of the shoe or that portion of the margin of the insole that curves inwardly toward the shank, as indicated in Figs. 8 and 9, so as to wipe the margin of substantially the entire forepart of the upper inwardly against the rib of the insole. For clamping the marginal portion of the toe end of the upper upon the wipers 72 there are provided clamp members 88, these clamp members being operated by mechanism such as disclosed in the previously mentioned Letters Patent. As also disclosed in said Letters Patent, a toe band 89 is mounted below the wipers for wiping the upper heightwise of the toe as the last is moved downwardly and for thereafter clamping the upper about the toe. The machine herein shown is further provided with a pair of grippers 90 arranged to grip the margin of the upper outspread over the wipers in locations approximately at the opposite ends of the tip seam and yieldingly controlled to permit them to swing inwardly toward each other in response to the pull of the upper thereon as the upper is shaped over the last, substantially as disclosed in Letters Patent No. 1,706,474, granted on March 26, 1929 upon an application of W. C. Baxter.

The machine, as herein illustrated, is further provided with devices arranged to press the marginal portion of the upper upon the top faces of the wipers in locations at the rear of its toe-end portion and farther rearwardly than the grippers 90, to assist in tensioning the upper over the last. By reference to Figs. 1 and 2 it will be seen that a yoke 92 arranged to extend laterally of the shoe is mounted in a slot in the block 30 so as to rise and fall in the slot, and is controlled by a spring 94 which surrounds a rod 96 extending through the yoke and fixed in the block 30, the spring bearing at its lower end on the yoke and at its upper end on an adjustable nut 98 and tending to maintain the yoke at the bottom of the slot. Mounted on pivot pins 100 at the opposite ends of the yoke 92 are two depending arms 102. Associated with the arms 102 approximately midway between their opposite ends is a horizontal rod 104 which is carried by the block 30 and extends at its opposite ends through slots 106 (Fig. 1) in the arms. Nuts 108 on the rod 104 at the inner sides of the arms 102 determine the distance between the arms, a spring 110 being provided to hold the arms against the nuts. The rod 104 has on its opposite ends right and left threads for the nuts 108, so that by turning it with a screw driver inserted in a slot in one or the other of its ends the arms 102 may be made to approach or separate from each other in accordance with the width of the shoe being operated upon. Near their lower ends the arms 102 are provided with guideways in which are mounted slide members 112 for adjusting movements lengthwise of the shoe. The rear ends of the members 112 are turned down to provide pressers 114 having roughened lower faces for engaging the upper materials and pressing them upon the upper faces of the wipers 72. The pressers 114 are arranged to cooperate, as more particularly hereinafter described, with the members 40

and 52 in positioning a last correctly in the machine, and for this purpose they may be adjusted by the rod 104 to stand in comparatively close relation to the sides of the last when the last is presented to the machine. The members 112 are adjustable along their guideways in accordance with the size of the shoe being operated upon and are held in adjusted positions by clamping screws 116.

As above described, the yoke 92 which carries the pressers 114 is controlled by the spring 94 which tends to maintain it in its lowest position in the slot in the block 30. In order to lift the pressers 114 from the wipers earlier than they otherwise would be lifted in the return of the parts of the machine to their starting positions near the end of the cycle of operations, additional mechanism is provided. This comprises a latch 118 mounted on a pivot 120 on the front portion of the block 30 and controlled by a light spring 121 which tends to lift it, the upper end of this spring being connected to a pin 122 on the block 30. When the parts of the machine are in their starting positions the upward movement of the latch 118 is limited by contact with a fixed stop 124 on the frame of the machine, as shown in Figs. 1 and 2, and when the arm 24 is lowered from the position in which it is shown in these figures the upward movement of the latch is limited by contact with a pin 126 secured to the yoke 92. The latch 118 is provided on its upper face with a notch 128 (Fig. 2). It will be understood that when the arm 24 has completed a portion of its downward movement the yoke 92 comes to a stop by reason of contact of the pressers 114 with the upper, whereupon the latch 118 continues its downward movement with the arm until it is carried below the pin 126, the spring 121 then acting to swing that portion of the latch where the notch 128 is located into a position under the pin. With the parts in these positions, upward movement of the arm 24 and the block 30 at the end of the cycle of operations causes the latch to lift the yoke 98 through the pin 126 and thus to lift the pressers 114 at the beginning of such upward movement, so as to avoid possibility of objectionable interference with other parts of the machine. As the arm nears the end of its upward movement the stop 124 engages the tail end of the latch 118 and withdraws the latch from under the pin 126, so that the spring 94 may return the yoke 92 to the lower end of the slot in which it is mounted.

It is desirable that when the wipers 72 are moving inwardly the pressers 114 be permitted to approach each other to some extent, in order that they may approach more closely to the sides of the last if the width of the last diminishes near its bottom edge, or in order that they may move somewhat inwardly over the feather of the insole with the wipers. To this end, there is provided on the inner side of each of the depending arms 102 a depression or cam face 130. When, in the operation of the machine, the rod 104 and the nuts 108 are moved downwardly along the arms 102, after downward movement of the arms has been stopped by engagement of the pressers 114 with the work, the nuts 108 are carried into positions opposite the cam faces 130, the wipers by that time having started to move inwardly toward the shoe, and the pressers 114 are then drawn toward each other, by the spring 110 and by the action of the upper thereon, as far as permitted by engagement of the nuts 108 with the cam faces. The fact that the pressers 114 are thus arranged to move toward the shoe with the wipers during the early part of the inward wiping movement of the wipers permits the upper materials to be wrapped well around the shoe in locations opposite the pressers without being subjected to any substantial increased tension by the wipers until toward the end of the operative movement of the latter when, the pressers having ceased their inward movements, the upper is drawn from beneath them by further movement of the wipers. It has been found that by thus permitting the pressers to move with the wipers during the initial movement of the latter, danger of tearing the lining by sudden action of the wipers thereon is avoided. Among other advantages, the pressers, by pressing on the lining, act to clear the latter in an effective manner from folds or wrinkles.

In the use of the machine as thus far described in the manufacture, for example, of a welt shoe, a loose upper, including the lining, the counter, and a toe stiffener (for example, a heat-softened thermoplastic stiffener), is placed in the machine upside down with the margin of the forepart of the upper resting on the wipers 72 and extending beneath the raised clamp members 88 and between the jaws of the open grippers 90. The relation of the upper to the operating instrumentalities at this time is indicated by Figs. 4 and 5. Care is taken to see that the tip line (represented at 132 in Fig. 5) lies approximately over and parallel with the meeting line of the shoe support members 64 and 66. When the upper is thus presented its rear portion will sag downwardly, as indicated in Fig. 4, until its further downward movement is resisted either by stiffness of the upper or by the pads 70. Having thus presented the upper, the operator starts the power operation of the machine by a treadle, as disclosed in the above-mentioned Letters Patent No. 1,702,397, whereupon the arm 24 is swung downwardly by its operating mechanism, the arm continuing its downward movement until the parts of the machine are substantially in the positions illustrated in Figs. 6 and 7. At this stage the machine is brought auto-

matically to a stop by a suitable modification of the controlling mechanism. It will be observed that at this time the clamp members 88 have been lowered to clamp the upper upon the wipers and the jaws of the grippers 90 have been closed to grip the upper.

The operator then takes a last having a ribbed insole fastened thereon and presents the last and insole in a position in which the toe plate 40 is seated snugly against the inner face of the insole rib at the toe end, at the same time moving the heel end of the last laterally until the presser foot 52 is in substantial engagement with the inner face of the insole rib at the inner side of the shoe bottom, as indicated in Fig. 7. The operator also observes that the last is positioned with its opposite sides at substantially equal distances from the pressers 114, which will have been previously adjusted as close together as desired to cause the last, as it is inserted in the machine, to assume an approximately correct lateral position. At this time, with the last positioned as described, the relation between the last and the heel end of the upper will be such as to permit the latter to be pulled up easily around the heel end of the last, as shown in Fig. 6. In doing this the operator can readily assure himself that the desired amount of upper extends above the last bottom at the heel end for the best results in the later heel-seat lasting operation, and that the back strap or the back seam of the upper is accurately positioned. The parts, moreover, are so arranged that the operator has a good view of the heel-end portion of the upper and is also enabled readily to hold this portion of the upper in proper position, after it has been properly located as above described, until tensions applied to the upper during the further operation of the machine render this no longer necessary.

Having positioned the last as above described and adjusted the heel end of the upper about the last, the operator, while still supporting the last in the position determined by the toe plate 40 and the presser foot 52, depresses the starting treadle to start the machine again in operation, whereupon the arm 24 resumes its downward movement. It will be noted by reference to Fig. 6 that the toe-end portion of the last at this time projects somewhat forwardly over the wipers 72, so that it must be moved rearwardly as well as downwardly. Soon after this further downward movement of the arm 24 begins, the last and upper are pressed against the rear edge of the shoe support member 66 and in response to this pressure the shoe support begins to move downwardly against the resistance of the spring 68. The resistance of the shoe support to this downward movement of the last causes a relative movement between the arm 24 and the block 30 about the pivot 28 against the resistance of the spring 36, the lug 32 being thereby separated from the hook 34. The result of this relative movement is that the toe plate 40 and the presser foot 52 are moved in a direction lengthwise of the last toward the heel end of the last, and by reason of the fact that these members have roughened insole-engaging faces they serve by this movement to impart a rearward movement to the last and insole. Such relative movement of the arm 24 and the block 30 continues until the previously-mentioned stop faces on these parts contact with each other. As a result of such rearward movement of the last the upper, which is clamped around its forepart, is stretched longitudinally. It will be understood that in the course of the rearward movement of the last it is also forced downwardly until it arrives in the position indicated in Fig. 8, thereby causing the forepart of the upper controlled by the clamping means and the grippers 90 to be wrapped about the last under tension.

In the above-described downward and rearward movement of the last the pressers 114 come into contact with the marginal portion of the upper over the wipers 72 in locations near the ball of the shoe and press it yieldingly down upon the wipers under the influence of the spring 94 to assist in controlling and tensioning the upper. As the arm 24 arrives at its lowermost position, compressed air is admitted automatically through pipes 134 to the pads 70, which are thereupon inflated and conform the upper closely to the last over the area which they cover and thus insure that the sides of the upper in the vicinity of the waist portion and rearwardly to the heel-end portion, at the rear of the forepart support member 66, will be held in close conformity to the contour of the last during further lasting operations performed at the forepart. The upward pressure of the pads 70 is resisted by the plate 40 and the presser foot 52. It will also be observed that at this time the upper is pressed closely against the last in the hollow back of the toe by the support member 66. It will accordingly be evident that before the marginal portion of the upper around the forepart is wiped inwardly into lasted relation to the insole, the upper will have been positioned accurately around the heel end of the last, stretched fully lengthwise of the last and conformed closely to the top and side portions of the last by the shoe support members 64 and 66 and the pads 70, as well as by the tension applied by the members that clamp and grip the marginal portion of the upper.

As the operation of the machine continues, the wipers 72, which up to this point have been so far apart as not to press the upper directly against the last anywhere around the forepart, are advanced and closed to wipe

the upper over the insole, drawing the upper from under the clamp members 88 and from between the jaws of the grippers 90 before they complete their wiping movements, the clamp members and the grippers being so controlled as to permit such withdrawal of the upper. In this operation the marginal portion of the upper is wiped over the feather and against the rib of the insole, as indicated in Figs. 8 and 9. During the early part of this movement of the wipers the pressers 114 are caused by the action of the wipers on the upper to approach each other somewhat, as permitted by the cam faces 130, and after they have been moved inward nearly as far as the rib of the insole, they come to rest and serve thereafter to press on the upper hard enough to insure that it will be subjected to substantial further tension. At the time when the wipers arrive at the limit of their wiping movement they will usually have just drawn the upper out from beneath the pressers. At this point in the operation of the machine the arm 24 is raised a little, thus permitting the comparatively strong spring 68 which controls the forepart support 58 to force the shoe upwardly with increased pressure against the lower faces of the wipers. Before the wipers arrive at the limit of their wiping movement the clamps 88 will have been raised to the positions indicated in Fig. 8 to avoid contact with the wiper carriers 74.

After the parts have arrived in the positions indicated in Fig. 8 they maintain those positions during a dwell in the cycle of operations of the machine to permit the toe end of the upper materials, including the toe stiffener, to set in their lasted shape. The duration of this dwell in the operation of the machine is automatically determined by controlling mechanism not shown in the drawings but which may be of the same construction as disclosed in Letters Patent No. 1,853,126, granted on April 12, 1932 upon an application of E. A. Holmgren. During this dwell the operator drives a number of tacks, preferably three, at each side of the forepart by means of a hand tacker to assist in holding the upper in position, notches 136 being provided in the wipers to permit the forward two of the three tacks at each side to be positioned accurately. When the machine resumes its operation the arm 24 rises, carrying the block 30 with it, the pressers 114 being lifted by the latch 118 which has previously slipped beneath the pin 126. At this time also the air is automatically released from the pads 70. As the result of such movement of the parts toward starting positions the shoe is released and can be removed from the machine.

It has been found preferable in the return of the parts to starting positions to cause the block 30 to rise with the arm 24 as if it were secured rigidly to the arm, in order to avoid the possibility of interference between parts carried by the block and other parts of the machine. To this end there is pivoted at 138 (Fig. 1) on the arm 24 a latch member 140 which is hooked at its upper end and has an arm 142 carrying a pin 144 which extends into a slot in a link 146 pivoted at 148 to a lug on the table 22. A spring 150 connected to the arm 142 tends to turn the latch 140 in a counterclockwise direction. When the arm 24 is lowered and the relative turning movement of the arm and the block 30 about the pivot 28 takes place in the latter portion of the downward movement of the arm, as hereinbefore described, the hooked upper end of the latch 140 is moved by the spring 150 to a position over a shoulder (not shown) on the block 30, the pin 144 meantime traveling down the slot in the link 146, so that when the arm 24 is lifted the latch causes the block to rise with the arm without turning about the pivot 28. The block 30 is thus held by the latch until the arm 24 approaches the end of its upward movement, at which time the pin 144 arrives at the upper end of the slot in the link 146, and then during further upward movement of the arm the latch 140 is withdrawn from the shoulder on the block 30, permitting the latter to be swung by the spring 36 to the position determined by the hook 34.

The machine shown is also provided with means for trimming the margin of the upper around the toe after it has been wiped inwardly by the wipers. This trimming means is constructed and operated substantially as in the machine shown in Letters Patent No. 1,702,397, and comprises a knife 152 which is carried by a sleeve 154 surrounding the rod 38 and lies approximately in contact with the upper face of the toe plate 40. This knife is operated through pinions 156 and a rack and pinion device 158, the rack being reciprocated by a link 160 which is operated as disclosed in the last-mentioned Letters Patent. The knife 152 moves around the toe end of the shoe and shears off against the upper faces of the wipers the excess of upper material and any excess height of the insole rib. A rod 162 extending downwardly through the block 30 has a nut 163 on its upper end and is connected at its lower end to a lever 164 which is pivoted at 165 on an extension of the block 30 and projects at one end into a groove in the sleeve 154. A spring 166 tends to move the rod 162 downwardly, the downward movement being limited by engagement of the nut 163 with the block 30. In this manner the position of the knife 152 in relation to the plate 40 is determined. The nut 163 may be adjusted to position the knife in exactly the right relation to the top faces of the wipers.

When the shoe is removed from the ma-

chine it may next be taken to a bench where it is spindled and a binder wire is applied around the toe and anchored at its ends to two of the tacks previously driven, in order to hold this portion of the upper more securely in place. While the shoe is thus spindled any necessary pulling up of the upper materials and the ends of the counter at the front end of the heel seat may be effected and the upper and counter wings tacked down at each side, and a positioning tack also may be driven through the back strap and another through the margin of the upper bent over the extreme rear end of the insole, this tack being clinched on the heel-seat plate of the last. The heel end may next be lasted in any suitable machine. The shoe will now have been completely lasted at both the toe and heel ends and portions of the sides of the upper extending rearwardly from the toe end portion substantially to the ball line also will be maintained approximately in lasted position by the tacks driven while the wipers were holding the forepart of the upper in place. The lasting of the sides will next be completed by use of any suitable machine, for example a combined welt-sewing and lasting machine such as described in my previously-mentioned application Serial No. 325,839. The use of such a machine will be greatly facilitated by the fact that the lasting of the toe was performed with portions of the upper at the rear of the toe positioned and held in substantial conformity to the contour of the last in the manner hereinbefore described.

Additional means may, if desired, be applied to the machine to assist in determining quickly and easily the proper position of the upper, one form of such means being shown in Figs. 10 and 11. The positioning means there shown comprises fingers 168 formed of sheet metal and mounted for vertical swinging movements over the wipers 72 on horizontal pivot pins 170 which are supported on bosses on the frame of the machine. As shown in Fig. 11, these fingers are curved and their inner ends are positioned close to the rear sides of the grippers 90. The fingers are arranged to contact with the work approximately at the rearmost line of stitching by which the toe cap is secured to the vamp, as illustrated diagrammatically in Fig. 11. To permit this line of stitching to be easily seen, the lining of the shoe upper may have small pieces removed from it to expose the stitching to view. The fingers 168 may be swung upwardly from the position illustrated in Fig. 10 to permit a shoe upper to be placed upon the wipers beneath the fingers. For this purpose the fingers are connected at their outer ends to rods 172 the lower ends of which extend through trunnions mounted in the outer ends of levers 174. Springs 176 bearing at their lower ends on the trunnions and at their upper ends on collars on the rods 172 provide a yielding connection between the levers 174 and the rods. The levers 174 are mounted on pivot pins 178 which are secured to a plate 180 clamped to the fixed sleeve 69 which supports the cradle 60 and surrounds the rod 67 of the forepart shoe support. The inner ends of the levers 174 are arranged to overlap each other, as shown in Fig. 11, and one of them carries a pin 184 which projects into a slot in the end of the other lever. One of the levers is connected to a rod 186 which may be connected at its lower end, by means not herein shown, to the starting treadle of the machine The connections may be such that initial downward movement of the treadle, by pulling on the rod 186, causes the fingers 168 to be swung downwardly from a raised inoperative position into contact with the upper materials outspread on the wipers. If the upper materials are in proper relation to the fingers, the operator further depresses the treadle and starts the machine. If, however, the upper is not correctly positioned, the operator releases pressure on the treadle and readjusts the upper before starting the machine. To adjust the fingers in directions lengthwise of the upper to position them properly for operating on uppers of different sizes, the pivot pins 170 are threaded in their bosses and are provided on their front ends with knurled heads whereby they may be turned. It will be understood that the fingers 168 are so mounted on the pins 170 as to move with the latter in directions lengthwise of the upper, and that the connections between the fingers and the levers 174 are such as to permit this movement. The upper faces of the bosses in which the pins 170 are mounted are provided with graduations, as shown in Fig. 11, and the fingers carry pointers 188 which cooperate with the graduations to indicate the proper adjustments for uppers of different sizes.

Instead of the work-positioning or gaging means shown in Figs. 10 and 11, the forepart shoe support may be modified, as indicated at 190 in Figs. 12 and 13, to permit the use of gaging means of a different character. The support 190 comprises a pad similar in shape to the pad 66, but made of comparatively hard felt instead of rubber. Moreover, the base 192 on which this pad is fixed is mounted on the top of a modified stem or post 194 in such manner that it cannot rock laterally like the supports 64 and 66, but can be adjusted about the axis of a stud 196. In front of the support 190 is a metal plate 198 shaped in plan somewhat like the toe end of a shoe and having a plane upper face. The rear edge of this plate is straight and is adapted to lie parallel to and fairly close to the straight forward edge of the pad 190. A short rib 200 is provided on the rear edge of the plate 198 at each side thereof and projects upwardly from it as shown in Fig. 12.

Each rib is undercut to provide a comparatively sharp forward edge along its top. The plate 198 is secured to the upper end of a vertically movable stem 202 which is mounted in a groove in the post 194. The stem has a forwardly extending lower end 204 which is mounted in a recess 206 in the post 194. A vertical rod 208 is screwed into the lower end of the stem 202 and extends downwardly through a tube 210 which is screwed into the lower end of the post 194. The rod 208 extends below the tube 210, as shown in Fig. 14, and has a ball-shaped lower end. A lever 212 is arranged to engage the lower end of the rod 208 and is mounted to rock about a pivot 214 in a bracket 216 which is clamped to the tube 210. The lever 212 is connected by a chain 218 to a small treadle 220 which is mounted at the base of the machine close to the starting treadle 222, so that it can be depressed to raise the plate 198 to the position shown in Fig. 12 without depressing the starting treadle.

When the machine is provided with gagging means such as above described, the plate 198 will initially occupy a position well below that in which it is shown in Fig. 12, with the forwardly extending lower end 204 of the stem 202 resting on the post 194 at the lower end of the recess 206, the parts being held in this relation by a spring 224 (Fig. 14) connected to the lower end of the rod 208. When the operator wishes to present the shoe upper to the machine, he first depresses the treadle 220 and thereby lifts the plate 198 until the upper face of the plate is approximately at the same level as the wipers 72, so that the ribs 200 are in positions to engage the lower face of the upper outspread on the wipers. While holding the plate at this height the operator places the margin of the forepart of the upper on the wipers and between the jaws of the grippers 90, pressing portions of the upper downward slightly on the sharp forward edges of the ribs 200 and adjusting it until he can feel that the ends of the tip seam are over the front edges of the ribs. The operator next releases the treadle 220, thus permitting the plate 198 to drop to its lower position out of contact with the upper, and then depresses the starting treadle 222. The plate 198 is secured to a head on the upper end of the stem 202 by a stud 226 about which it can be turned slightly to bring the ribs 200 into proper position in operating on uppers of shoes of different styles.

In the modified construction above described more convenient means than illustrated in Fig. 1 is provided for adjusting the forepart support in directions lengthwise of the shoe. To this end the sleeve which supports the cradle 60, shown in Fig. 12 at 228, has a stem 230 which is movable forwardly and rearwardly in a bearing in a lug 232 secured to the head of the machine. The outer end of the stem is forked to receive the end of a flat horizontal lever 234 connected to it by a vertical pin 236. The opposite end of the lever is mounted on a vertical pivot 238 on the frame of the machine. Between its ends the lever 234 has pivoted to it a trunnion 240 in which the rear end of a rod 242 is threaded. At its forward end this rod extends through a bearing 244 in the frame of the machine and has shoulders which abut against opposite ends of this bearing to prevent lengthwise movement of the rod. At its front end the rod 242 is provided with a knurled head 246 by which it may be turned, and by such turning movement the lever 234 is swung about its pivot 238 forwardly or rearwardly to vary the position lengthwise of the shoe of the members 190 and 192. Any suitable indicating means may be associated with the head 246 to assist in making proper adjustments.

In Figs. 15 and 16 is shown a portion of mechanism which may be utilized for quickly and conveniently adjusting toward and from each other the grippers which grip and control the margin of the upper near the ends of the tip seam to position them properly for operating on uppers of shoes of different sizes, only one of the grippers being shown in these figures. For this purpose each gripper bar 248 is rigidly connected at its upper end to a forked lever 250 which is mounted on a horizontal pivot 252 on the head of the machine close to the upper end of the gripper bar. Each lever 250 is connected at its outer end by a link 254 and an arm 256 to a rock shaft 258 to which a depending lever 260 is secured, the rock shaft extending in directions lengthwise of a shoe in the machine and being mounted in fixed bearings on the head of the machine. Each lever 260 is connected at its lower end by a pin 262 to a block 264 which is movable in directions widthwise of the shoe. The two blocks 264 connected to the levers 260 at the opposite sides of the machine are associated with a rod 266 which extends through them and is provided on its opposite ends respectively with right and left hand threads, the threaded portions extending through enlarged holes in the blocks and engaging threads formed in non-rotatable blocks 268 positioned at the outer sides of the blocks 264. On one end of the rod 266 is a knurled head 270 by which the rod can be turned, and a lug 272, adjustably fixed to the machine frame, extends into a groove in the hub of the head 270 to hold this head and the rod 266 against lengthwise movement. A sleeve 274 which is adjustable in length is loosely mounted on the rod 266 and provides an abutment for the inner ends of two similar springs 276, the outer ends of which bear on the blocks 264. These springs serve to hold the blocks 264 normally in engagement with the blocks 268, but are yieldable to permit

the grippers to be swung toward each other by the pull of the upper thereon in the manner hereinbefore explained. Turning movement of the rod 266 causes the blocks 268 to move lengthwise of the rod toward or from each other, and since the blocks 264 move with the blocks 268, this results in adjustment of the grippers toward or from each other. A link 278 connects one of the blocks 268 to a finger 280 which cooperates with an indicator 282 to show when the grippers are properly adjusted for each size of upper.

The means for closing the jaws of the grippers in the construction shown in Figs. 15 and 16 is substantially the same as disclosed in Letters Patent No. 1,706,474, except that each rock shaft 284 which effects the closing of the jaws acts yieldingly through a spring 286 interposed between a lug 288 on the shaft and a lug 290 which carries the upper movable jaw of the gripper.

Instead of depending upon the resistance of the shoe-supporting means to the downward movement of the last and shoe to cause relative movement of the arm 24 and the block 30 for imparting to the last its rearward movement, as hereinbefore described, it may be desirable in operating upon shoes of certain styles to accomplish the result otherwise, so as to avoid undue friction of the support 66 on the upper in the rearward movement of the last, and mechanism for this purpose is illustrated in Fig. 17. As there indicated, the block 30 is provided with an upstanding lug 292 secured on its upper surface farther rearwardly of the machine than the pivot 28, the upper end of the lug being forked and provided with a pin 294 extending transversely across the opening in its forked end. A rod 296 is arranged with its front end portion in this opening and is provided with a slot 298 through which the pin 294 extends, the length of the slot being such as to afford provision for a substantial amount of relative movement between the rod and the pin in directions lengthwise of the rod. The rear end of the rod 296 extends through a block 300 which is pivotally mounted on a transverse rod 302 secured in uprights 304 fixed on the frame of the machine near the rear end of the latter and close to the pivot 26 about which the arm 24 swings. The rear end of the rod 296 is threaded and carries a wing nut 306 between which and the rear end of the block 300 is mounted a compression spring 308 which tends to pull the rod 296 rearwardly, such rearward movement being limited by contact of a nut 310 on the rod with the front end of the block 300. With the parts thus constructed and arranged, the initial downward movement of the arm 24 to bring the toe plate 40 and the presser foot 52 to the positions indicated in Fig. 6 causes the rod 296 to swing downwardly about the rod 302 and the pin 294 to travel toward the front end of the slot 298 in the rod. When the operator starts the machine the second time, after presenting the last in position to be operated upon, the pin 294 arrives at the front end of the slot 298 before the shoe is forced with any considerable pressure against the shoe support 66, whereupon the rod 296, acts through the pin 294 to cause relative swinging movement between the block 30 and the arm 24 about the pivot 28 as the arm 24 continues its downward movement. Accordingly the relative movement of the block and the arm is effected by the mechanism described in predetermined time relation to the movement of the arm, instead of in response to resistance to downward movement of the last. It will be understood that the spring 308 is yieldable to permit forward movement of the rod 296 in case the block 30 has been turned to the limit of its movement about the pivot 28 before the arm 24 completes its downward movement. The rod 296 is arranged to act as described before the shoe is forced with any substantial pressure against the forepart support 66, the toe end of the last being swept past the wipers into engagement with the upper in a curve direced both downwardly and rearwardly. When the last has reached the position indicated in Fig. 8 the pads 70 are inflated and the lasting operation continues in the manner previously described.

When the machine is provided with the mechanism shown in Fig. 17 for controlling the block 30, it is desirable to include additional means to assist in imparting to the last its rearward movement, in view of the fact that at the time when the block 30 begins to turn about the pivot 28 the insole-engaging members 40 and 52 are acting on the insole only with such pressure as is exerted by the operator in holding the work up against these members. Accordingly the trimming knife 152 is removed from the machine, and a lever 311, which takes the place of the lever 164 (Fig. 1), is mounted on the pivot 165 and is provided with a downturned lug 312 arranged to abut against the toe-end face of the last when the last is presented to the machine and thus to act as a gage to assist in determining the proper position of the last. The lug 312 remains in contact with the end of the last as the block 30 begins to turn about its pivot 28 and therefore serves positively to push the last in a rearward direction in cooperation with the insole-engaging members 40 and 52, obviating any tendency for these members to slip on the bottom face of the insole. The lug 312 is so positioned that it is over the upper faces of the wipers 72 during the final part of the downward movement of the arm 24, with its front face in vertical alinement with the front edges of the wipers, its downward movement being stopped by the wipers.

Downward movement of the block 30 relatively to the lug 312, as required to bring the last into proper position for the overwiping operation, is permitted by reason of the fact that the lever 311 is pivoted at 165 as described, the lever being controlled by a rod 162 in the same manner as the corresponding parts previously described for controlling the knife 152, the spring 166 shown in Fig. 1 having, however, been removed.

Means that may be quickly and conveniently used for adjusting the arm 24 relatively to its operating mechanism so as to vary the height of the toe plate 40 and the presser foot 52 at the limit of the downward movement of the arm and thus to position the insole in proper relation to the plane of the wipers as the thickness of the upper materials varies in operating on different kinds of shoes, is shown in Fig. 18. In that figure 314 represents one of a pair of links coupled to the arm 24 at its opposite sides respectively to move it downwardly. The upper ends of these links are provided with bearings in which fit collars 316 which are coupled together by a rod 318 arranged eccentrically of the collars, this rod extending through a bearing in the arm 24 and having a handle 320 secured on one end thereof. It will be understood that by turning this handle the eccentric collars 316 are rotated to adjust the arm 24 as desired. To hold the collars in any one of a number of different adjusted positions there are provided a plurality of holes 322 in the arm 24, and the handle 320 carries a spring-pressed plunger 324 adapted to enter any one of the holes or to be withdrawn therefrom.

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

1. In a machine for shaping uppers over lasts, means for positioning an upper before it is mounted on a last, and mechanism constructed and arranged to move a last toward the upper while the operator supports the last in position to be operated upon by said mechanism.

2. In a machine for shaping uppers over lasts, means for positioning an upper to receive a last from above, and mechanism constructed and arranged to control a last presented bottom upward by the operator and to move the last downwardly toward the upper while the operator supports the last in position to be operated upon by said mechanism.

3. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper before the upper is mounted on a last, and mechanism constructed and arranged to apply pressure to the bottom of a last presented thereto by the operator and thus to move the last toward the clamped upper while the operator supports the last in position to be operated upon by said mechanism.

4. In a machine for shaping uppers over lasts, means for controlling the forepart of an upper, and mechanism constructed and arranged to apply pressure to the bottom of the forepart of a last presented thereto by the operator and thus to move the forepart of the last toward the upper while the operator supports the last in position to be operated upon by said mechanism.

5. In a machine for shaping uppers over lasts, a device arranged to apply pressure to the bottom of a last supported by the operator, a device for positioning an upper before it is mounted on the last, and mechanism for effecting relative movement of said devices in a direction to apply the upper to the last while the operator supports the last.

6. In a machine for shaping uppers over lasts, a device arranged to apply pressure to the bottom of a last supported by the operator, a device for clamping the marginal portion of the toe end of an upper before the toe end of the upper is shaped over the last, and mechanism for effecting relative movement of said devices in a direction to apply the toe end of the upper to the last while the operator supports the last.

7. In a machine for shaping uppers over lasts, means for positioning an upper before it is mounted on a last, and mechanism constructed and arranged to control a last presented thereto by the operator in such a position as to permit the heel end of the upper to be applied by the operator about the heel end of the last, said mechanism being movable, after the heel end of the upper has been thus applied, to cause the forepart of the last to approach the upper while the operator supports the last in position to be thus operated upon.

8. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper before the upper is mounted on a last, and mechanism constructed and arranged to control a last presented in such a position as to permit the heel end of the upper to be applied by the operator about the heel end of the last, said mechanism being movable to force the last into the upper after the heel end of the upper has been thus applied.

9. In a machine for shaping uppers over lasts, power-operated means for clamping the marginal portion of the forepart of an upper and for holding it thus clamped with the machine at rest, and mechanism constructed and arranged to control a last presented thereto by the operator while the machine is thus at rest and to force the last into the upper when the machine is again started.

10. In a machine for shaping uppers over lasts, power-operated means for clamping

the marginal portion of the forepart of an upper and for holding it thus clamped with the machine at rest, and mechanism constructed and arranged to apply pressure to the bottom of a last presented thereto by the operator while the machine is thus at rest and by said pressure to move the last toward the upper while the operator supports the last in position to be thus operated upon.

11. In a machine for shaping uppers over lasts, power-operated means for clamping the marginal portion of the forepart of an upper before the upper is mounted on a last and for holding the upper thus clamped with the machine at rest, and means for positioning a last in such relation to the upper as to permit the heel end of the upper to be applied by the operator about the heel end of the last after the upper has been thus clamped, said last-positioning means being movable to force the last into the upper when the machine is again started.

12. In a machine for shaping uppers over lasts, means for positioning an upper before it is mounted on a last, and a device constructed and arranged to engage the bottom face of and insole on a last when the last and insole are presented thereto by the operator, said device being movable to force the last and insole toward the upper while the operator supports the last in position to be thus operated upon.

13. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper, a toe plate arranged to engage the bottom face of the toe end of an insole on a last supported by the operator, and means for moving said toe plate heightwise of the last to force the last toward the upper while the operator continues thus to support the last.

14. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper, and last-positioning means comprising members arranged to engage the bottom face of an insole on a last at the forepart and shank portions when the last and insole are presented thereto by the operator, said members being movable to force the last toward the upper while the operator supports the last in position to be thus operated upon.

15. In a machine for shaping uppers over lasts, wipers for wiping the marginal portion of the toe end of an upper inwardly against the rib of a welt shoe insole on a last, means for clamping the marginal portion of the upper on said wipers before the upper is mounted on the last, a toe plate formed and arranged to fit inside of the rib at the toe end of the insole as the last and insole are presented thereto by the operator after the upper has thus been clamped, and means for moving said toe plate to force the last into the upper.

16. In a machine for shaping uppers over lasts, wipers for wiping the marginal portion of the toe end of an upper inwardly over an insole on a last, power-operated means for clamping the marginal portion of the upper on said wipers and for holding it thus clamped with the machine at rest, and last and insole positioning means movable toward the upper and arranged to stop in such a position as to permit a last and insole to be presented thereto by the operator while the machine is thus at rest, said positioning means being movable to force the last into the upper when the machine is again started.

17. In a machine for shaping uppers over lasts, wipers for wiping the marginal portion of the toe end of an upper inwardly over an insole on a last, means for clamping the marginal portion of the upper on said wipers before the upper is mounted on a last, and means for effecting relative movement of a last and said wipers and clamping means to tension the upper over the last.

18. In a machine for shaping uppers over lasts, wipers for wiping the marginal portion of the toe end of an upper inwardly over an insole on a last, means for clamping the marginal portion of the upper on said wipers before the upper is mounted on a last, a device for engaging the bottom face of the insole, and means for operating said device to force the last and insole toward the clamped upper.

19. In a machine for shaping uppers over lasts, the combination with means for controlling an upper, of means for positioning a last presented to the machine separately from the upper and for moving the last to tension the upper over it, said means comprising a toe plate formed substantially to fit within the toe-end portion of the rib of an insole on the last and a member arranged to engage the insole at the rear of the ball portion of the shoe.

20. In a machine for shaping uppers over lasts, the combination with means for controlling an upper, of means for determining the position of a last presented to the machine separately from the upper and for moving the last to tension the upper over it, said means comprising a toe plate formed substantially to fit within the toe-end portion of the rib of an insole on the last and a presser foot arranged to contact with the inner face of the rib at one side of the shoe bottom in a location farther rearwardly on the insole to assist in determining the lateral position of the last.

21. In a machine for shaping uppers over lasts, the combination with means for clamping the marginal portion of the forepart of an upper before the upper is mounted on a last, of means for determining the position of a last presented by the operator and for moving the last to force it into the upper, said

means comprising a toe plate formed substantially to fit within the toe-end portion of the rib of an insole on the last and a presser foot arranged to engage the insole at the shank portion of the shoe bottom.

22. In a machine for shaping uppers over lasts, means for controlling the forepart of an upper, and means constructed and arranged to move a last first in the direction of its height toward the upper and then also in a lengthwise rearward direction to tension the upper longitudinally.

23. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper before the upper is mounted on a last, and means constructed and arranged to move a last first in the direction of its height toward the upper and then also in a lengthwise rearward direction to tension the upper longitudinally.

24. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper, and mechanism constructed and arranged to act by pressure applied over the bottom of a last to impart to the last first heightwise movement toward the upper and then also lengthwise rearward movement to tension the upper longitudinally.

25. In a machine for shaping uppers over lasts, a device for clamping the marginal portion of the forepart of an upper before the upper is mounted on a last, a device for controlling a last, and mechanism for effecting relative movement of said devices both heightwise and lengthwise of the last to apply the upper to the last and to tension the upper longitudinally.

26. In a machine for shaping uppers over lasts, means for positioning an upper before it is mounted on a last, and means constructed and arranged to move a last presented separately to the machine both in the direction of its height to force it into the upper and in a lengthwise rearward direction to tension the upper longitudinally.

27. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper before the upper is mounted on a last, and mechanism constructed and arranged to impart to a last heightwise movement toward the upper and also lengthwise rearward movement to tension the upper longitudinally.

28. In a machine for shaping uppers over lasts, a device for clamping the marginal portion of the forepart of an upper before the upper is mounted on a last, a device for positioning a last in such relation to the upper as to permit the heel end of the upper to be applied by the operator about the heel end of the last, and mechanism for effecting relative movement of said devices both heightwise and lengthwise of the last, after the heel end of the upper has been thus applied, to shape the upper over the last and to tension it longitudinally.

29. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper before the upper is mounted on a last, and means for positioning a last in such relation to the upper as to permit the heel end of the upper to be applied by the operator about the heel end of the last, said positioning means being movable to impart to the last, after the heel end of the upper has been thus applied, both heightwise and lengthwise movements to tension the upper over the last.

30. In a machine for shaping uppers over lasts, means for holding an upper in inverted position, and a device movable downwardly to force the forepart of a last into the upper, said device including a member movable also in a direction lengthwise of the last to impart to the last lengthwise rearward movement to tension the upper longitudinally.

31. In a machine for shaping uppers over last, means for holding an upper in inverted position, and a device movable downwardly in engagement with an insole on a last to force the forepart of the last into the upper, said device comprising a member arranged to act also by its contact with the insole to impart to the last lengthwise rearward movement to tension the upper longitudinally.

32. In a machine for shaping uppers over lasts, wipers for wiping the marginal portion of the toe end of an upper inwardly over an insole on a last, means for clamping the marginal portion of the upper on said wipers, and mechanism constructed and arranged to impart to a last heightwise movement relatively to the clamped upper and in the course of said heightwise movement also lengthwise rearward movement to tension the upper longitudinally.

33. In a machine for shaping uppers over lasts, wipers for wiping the marginal portion of the toe end of an upper inwardly over an insole on a last, means for clamping the marginal portion of the upper on said wipers before the upper is mounted on a last, and mechanism constructed and arranged to impart to a last heightwise movement relatively to the clamped upper and also lengthwise rearward movement to tension the upper longitudinally.

34. In a machine for shaping uppers over lasts, means for controlling an upper, and a device comprising parts movable as a unit in a direction heightwise of a last to force the last into the upper, said parts being also relatively movable to impart to the last lengthwise rearward movement to tension the upper longitudinally.

35. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper, and a device mounted to swing as a whole about an

axis to force a last into the upper in a direction heightwise of the last, said device comprising parts relatively movable about another axis to impart to the last lengthwise rearward movement to tension the upper longitudinally.

36. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper, a member for applying pressure to a last to force it into the upper, and an arm supporting said member as a whole and operatively movable in a direction heightwise of the last, said member and arm being relatively movable to cause the member to impart to the last lengthwise rearward movement to tension the upper longitudinally.

37. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an inverted upper, a member for engaging the bottom face of an insole on a last to force the last into the upper, a downwardly swinging arm on which said member is supported, and a pivotal connection between said member and the arm about which said member and arm are relatively movable to cause the member to impart to the last lengthwise rearward movement to tension the upper longitudinally.

38. In a machine for shaping uppers over lasts, means for controlling an upper, and mechanism constructed and arranged to impart to a last movement in the direction of its height to force it into the upper and to act in response to resistance to said heightwise movement of the last to impart to it also lengthwise rearward movement to tension the upper longitudinally.

39. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper, a member arranged to move a last in the direction of its height to force it into the upper, a yieldingly controlled shoe support movable with the last in response to pressure of the work thereon, and mechanism automatically operative in response to resistance of said shoe support to the heightwise movement of the last to impart to said member movement to force the last rearwardly and thus to tension the upper longitudinally.

40. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper, and mechanism movable in a direction heightwise of a last to force the last into the upper, said mechanism comprising parts relatively movable about an axis in response to resistance to the heightwise movement of the last to impart to the last lengthwise rearward movement to tension the upper.

41. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper, a member arranged to engage the bottom face of an insole on a last and to impart to the last movement in the direction of its height to force it into the upper, a yieldingly controlled shoe support movable with the last in response to pressure of the work thereon, and means arranged to act in response to resistance of said shoe support to the heightwise movement of the last to impart to said member movement to force the last rearwardly and thus to tension the upper longitudinally.

42. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper, mechanism for moving a last in the direction of its height to force it into the upper, said mechanism comprising parts relatively movable in response to resistance to the heightwise movement of the last to impart to the last lengthwise rearward movement to tension the upper longitudinally, and spring means arranged to position said parts normally in predetermined relation to each other and against the resistance of which they are thus relatively movable.

43. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper, a device for engaging the bottom face of an insole on a last, an arm supporting said device and movable heightwise of the last to cause the device to force the last into the upper, a pivotal connection between said device and the arm about which they are relatively movable in response to resistance to the heightwise movement of the last to cause the device to impart to the last also lengthwise rearward movement to tension the upper longitudinally, and spring means for normally positioning said device in predetermined relation to the arm and against the resistance of which said device and arm are thus relatively movable.

44. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper, mechanism movable in a direction heightwise of a last to force the last into the upper, said mechanism comprising parts relatively movable in response to resistance to said heightwise movement of the last to impart to the last also lengthwise rearward movement to tension the upper longitudinally, and a device constructed and arranged to prevent relative return movement of said parts until near the end of the cycle of operations of the machine.

45. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper, mechanism movable in a direction heightwise of a last to force the last into the upper, said mechanism comprising parts relatively movable in response to resistance to said heightwise movement of the last to impart to the last also lengthwise rearward movement to tension the upper longitudinally, a device for

locking said parts against relative return movement, and automatic means for releasing the parts from control of said locking device near the end of the cycle of operations of the machine.

46. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper in inverted position, a device for engaging the bottom face of an insole on a last and for forcing the last downwardly into the upper, a downwardly movable arm supporting said device, said device and the arm being relatively movable in response to resistance to the downward movement of the last to cause said device to impart to the last lengthwise rearward movement to tension the upper longitudinally, and automatic means for preventing said device from resuming its normal relation to the arm until after the arm has received a substantial portion of its return upward movement.

47. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper, a device movable in a direction heightwise of a last to force the last into the upper, and mechanism arranged to act on said device to initiate and impart to the last also lengthwise rearward movement to tension the upper longitudinally after a portion of its heightwise movement has been completed.

48. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper, a member arranged to act on a last to force it into the upper in a direction heightwise of the last, means for moving said member heightwise of the last, and additional means for operating said member in predetermined time relation to the heightwise movement of the last to impart to the last lengthwise rearward movement to tension the upper longitudinally.

49. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper, a member arranged to act on a last to force it into the upper, an arm supporting said member and operatively movable in a direction heightwise of the last, said member and arm being relatively movable to cause the member to impart to the last lengthwise rearward movement to tension the upper longitudinally, and mechanism for effecting the relative movement of said member and arm in predetermined time relation to the movement of the arm heightwise of the last.

50. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper, a device arranged to act on a last to force it into the upper, an arm supporting said device and mounted for swinging movement in a direction heightwise of the last, said device and the arm being pivotally connected for relative swinging movement to cause the device to impart to the last lengthwise rearward movement to tension the upper longitudinally, and mechanism arranged to act on said device in predetermined time relation to the movement of the arm to effect said relative swinging movement in response to the movement of the arm.

51. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper, a device arranged to act on a last to force it into the upper, an arm supporting said device and mounted for swinging movement in a direction heightwise of the last, said device and the arm being pivotally connected for relative swinging movement to cause the device to impart to the last lengthwise rearward movement to tension the upper longitudinally, and mechanism mounted to swing with the arm about a different axis and arranged to act on said device at a predetermined time in the movement of the arm to effect the relative swinging movement of the device and the arm.

52. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper, and a device comprising parts movable as a unit in a direction heightwise of a last to force the last into the upper, said parts being relatively movable in a direction lengthwise of the last and including a member for engaging the toe-end face of the last to move the last rearwardly by said relative movement.

53. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper, an arm mounted for movement in a direction heightwise of a last to force the last into the upper, and a member supported as a whole by said arm and arranged to engage the toe-end face of the last, said member and the arm being relatively movable to cause the member to impart to the last lengthwise rearward movement to tension the upper longitudinally.

54. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper, an arm mounted for movement in a direction heightwise of a last to force the last into the upper, a member carried by said arm for engaging the toe-end face of the last, said member and the arm being relatively movable to cause the member to impart to the last lengthwise rearward movement to tension the upper longitudinally, and mechanism for effecting such relative movement in response to the movement of the arm.

55. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper, an arm mounted for swinging movement in a direc-

tion heightwise of a last to force the last into the upper, a device pivotally mounted on said arm and provided with members for engaging the bottom face of an insole on the last and for engaging the end face of the last, said device and the arm being relatively movable about their pivotal connection to cause the member engaging the end of the last to impart to the last a lengthwise rearward movement, and mechanism for effecting such relative movement in predetermined time relation to the movement of the arm.

56. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper, a gage arranged to contact with the toe-end face of a last to position the last relatively to the upper, and means for imparting to the last a heightwise movement to carry it away from said gage and to force it into the upper.

57. In a machine for shaping uppers over lasts, means for clamping the marginal portion of the forepart of an upper, a device movable in a direction heightwise of a last to force the last into the upper, and a gage carried by said device and arranged to contact with the toe-end face of the last relatively to the upper, said gage being so controlled as to cause it to come to a stop while the movement of said device continues to carry the toe end of the last away from the gage.

58. In a machine for shaping uppers over lasts, wipers for wiping the marginal portion of the toe end of an upper inwardly over a last, a device movable heightwise of the last to force the toe end of the last past the wipers, and a gage movable with said device and arranged to contact with the toe-end face of the last to determine the lengthwise position of the last, the gage being movably mounted on said device and so arranged as to be stopped by the wipers while the movement of the device continues.

59. In a machine for shaping uppers over lasts, wipers for wiping the marginal portion of the toe end of an upper inwardly into lasted relation to an insole on a last, means for clamping the marginal portion of the upper on said wipers, and mechanism for imparting to the last in engagement with the heel end of the upper a lengthwise rearward movement to tension the upper, said mechanism being arranged to act thus on the last by pressure applied forwardly of the heel-end portion of the last.

60. In a machine for shaping uppers over lasts, wipers for wiping the marginal portion of the toe end of an upper inwardly into lasted relation to an insole on a last, means for clamping the marginal portion of the upper on said wipers, and mechanism for imparting to the last in engagement with the heel end of the upper a lengthwise rearward movement to tension the upper, said mechanism being arranged to act thus on the last solely through contact with the insole.

61. In a machine for shaping uppers over lasts, wipers for wiping the marginal portion of the toe end of an upper inwardly against the rib of a welt shoe insole on a last, means for clamping the marginal portion of the toe end of the upper on said wipers, and mechanism for imparting to the last in engagement with the heel end of the upper a lengthwise rearward movement to tension the upper, said mechanism comprising a toe plate arranged to engage the toe end of the insole inside of the rib and a presser foot arranged to engage the insole at the rear of the ball of the shoe.

62. In a machine for shaping uppers over lasts, wipers for wiping the marginal portion of the forepart of an upper inwardly over a last, means for clamping the marginal portion of the toe end of the upper upon said wipers, means for effecting relative movement of the last and said wipers and clamping means hightwise of the last to tension the clamped upper over the last, and members arranged to clamp the marginal portion of the upper upon the wipers farther rearwardly than the toe-end portion of the upper to assist in controlling the upper.

63. In a machine for shaping uppers over lasts, wipers for wiping the marginal portion of the forepart of an upper inwardly over a last means for clamping the marginal portion of the toe end of the upper upon said wipers, grippers arranged to grip the marginal portion of the upper in locations approximately at the ends of the tip line to assist in controlling the upper, and members arranged to clamp the marginal portion of the upper upon the wipers at the rear of said grippers to assist further in controlling it.

64. In a machine for shaping uppers over lasts, wipers arranged to extend around the toe end of a last and substantially as far rearwardly as the ball line for wiping the marginal portion of an upper inwardly over the bottom of the last, means for clamping the marginal portion of the toe end of the upper upon said wipers, and members arranged to clamp the marginal portion of the upper upon the wipers in locations near the ball of the last to assist in controlling the upper.

65. In a machine for shaping uppers over lasts, wipers movable to wipe the marignal portion of the forepart of an upper inwardly over a last, means for clamping the marginal portion of the toe end of the upper upon said wipers, a device movable in a direction heightwise of the last to force the last into the upper, and members carried by said movable device for clamping the marginal portion of the upper upon the wipers farther rearwardly than said toe-clamping means

prior to the inward wiping movement of the wipers.

66. In a machine for shaping uppers over lasts, wipers movable to wipe the marginal portion of the forepart of an upper inwardly over a last, means for clamping the marginal portion of the toe end of the upper upon said wipers, a device movable in a direction heightwise of the last to force the last into the upper, members carried by said movable device for clamping the marginal portion of the upper upon the wipers farther rearwardly than said toe-clamping means prior to the inward wiping movement of the wipers, and yieldable means arranged to control said members and to permit said device to continue its movement after the movement of the members has been stopped by the wipers.

67. In a machine for shaping uppers over lasts, wipers movable to wipe the marginal portion of the forepart of an upper inwardly over a last, a device movable in a direction transverse to the plane of the wipers to impart to the last heightwise movement relatively to the wipers, and means carried by said device and movable therewith into position to clamp the marginal portion of the upper yieldingly on the wipers as the device is operated to impart heightwise movement to the last prior to the inward wiping movement of the wipers.

68. In a machine for shaping uppers over lasts, wipers movable to wipe the marginal portion of the forepart of an upper inwardly over a last, means for clamping the marginal portion of the toe end of the upper upon said wipers, and members arranged to clamp the marginal portion of the upper upon the wipers at the rear of its toe-end portion prior to the inward wiping movement of the wipers to assist in controlling it in the wiping operation.

69. In a machine for shaping uppers over lasts, wipers movable to wipe the marginal portion of the forepart of an upper inwardly over a last, and means for clamping the marginal portion of the upper upon said wipers, said clamping means being movable inwardly with the wipers during a portion only of the wiping movement of the wipers.

70. In a machine for shaping uppers over lasts, wipers movable to wipe the marginal portion of the forepart of an upper inwardly over a last, means for clamping the marginal portion of the upper upon said wipers, and controlling mechanism constructed and arranged to permit said clamping means to move inwardly with the wipers during a portion of their wiping movement and then to stop said clamping means while the wipers continue their movement.

71. In a machine for shaping uppers over lasts, wipers movable to wipe the marginal portion of the forepart of an upper inwardly over a last, members arranged to clamp the marginal portion of the upper upon the wipers at the opposite sides of the last, said members being movable inwardly toward each other with the wipers, and controlling mechanism for stopping the inward movements of said members before the wipers complete their wiping movements.

72. In a machine for shaping uppers over lasts, wipers for wiping the marginal portion of the forepart of an upper inwardly over a last, members arranged to clamp the marginal portion of the upper upon the wipers at the opposite sides of the last, and a device arranged to control said members and movable to adjust them toward or from each other.

73. In a machine for shaping uppers over lasts, wipers for wiping the marginal portion of the forepart of an upper inwardly over a last, members arranged to clamp the marginal portion of the upper upon the wipers at the opposite sides of the last, arms supporting said members and mounted for swinging movements widthwise of the last, spring means tending to swing said arms toward each other, and means for engaging said arms to determine adjustably the distance between them.

74. In a machine for shaping uppers over lasts, wipers for wiping the marginal portion of the forepart of an upper inwardly over a last, a device movable in a direction transverse to the plane of the wipers to impart to a last heightwise movement relatively to the wipers, members carried by said device for clamping the marginal portion of the upper upon the wipers at the opposite sides of the last, and controlling means carried by said device for positioning the members initially at a predetermined distance from each other, said controlling means being movable after the clamping of the upper into position to permit said members to be moved inwardly toward each other with the wipers.

75. In a machine for shaping uppers over lasts, wipers for wiping the marginal portion of the forepart of an upper inwardly over a last, a device movable in a direction transverse to the plane of the wipers to impart to a last heightwise movement relatively to the wipers, members carried by said device for clamping the marginal portion of the upper upon the wipers at the opposite sides of the last, arms supporting said members and mounted for swinging movements toward each other, and controlling means for engaging the inner sides of said arms to determine the initial distance between said members, said controlling means being movable along the arms after the clamping of the upper into such a position as to permit the members to be moved inwardly toward each other with the wipers.

76. In a machine for shaping uppers over

lasts, wipers for wiping the marginal portion of the forepart of an upper inwardly over a last, and members arranged to clamp the marginal portion of the upper upon the wipers at the opposite sides of the forepart, said members being arranged to occupy positions near the opposite sides of the last when the last is presented to the machine to assist in determining the proper position of the last.

77. In a machine for shaping uppers over lasts, wipers for wiping the marginal portion of the forepart of an upper inwardly over a last, a member for engaging the toe-end face of the last to determine its lengthwise position when it is presented to the machine, and members arranged to clamp the marginal portion of the upper upon the wipers at the opposite sides of the forepart, said members being arranged to occupy positions near the opposite sides of the last when the last is presented to the machine to assist in determining the proper position of the last.

78. In a machine for shaping uppers over lasts, wipers for wiping the marginal portion of the forepart of an upper inwardly over an insole on a last, means for clamping the marginal portion of the toe end of the upper upon said wipers, a device movable in a direction transverse to the plane of the wipers and provided with means for engaging the bottom face of the insole to impart to the last heightwise movement relatively to the wipers, a member movable with said device and arranged to engage the toe-end face of the last when the last is presented to the machine, and additional members carried by said device and arranged to occupy positions near the opposite sides of the last and to be moved with said device into clamping engagement with the marginal portion of the upper upon the wipers.

79. In a machine for shaping uppers over lasts, means for tensioning an upper over a last and for wiping its marginal portion at the forepart inwardly into lasted relation to an insole on the last, and means constructed and arranged to conform the upper to the contour of the sides of the last substantially from the waist portion to the heel-end portion of the shoe prior to the completion of the inward wiping operation and for thereafter releasing the sides of the upper in an unfastened condition.

80. In a machine for shaping uppers over lasts, means for tensioning an upper over a last and for wiping its marginal portion at the forepart inwardly into lasted relation to an insole on the last, and fluid-pressure means arranged to press the opposite sides of the upper into conformity to the contour of the last substantially from the waist portion to the heel-end portion of the shoe prior to the completion of the inward wiping operation and thereafter to release the opposite sides of the upper in an unfastened condition.

81. In a machine for shaping uppers over lasts, means for tensioning an upper over a last and for wiping its marginal portion at the forepart inwardly into lasted relation to an insole on the last, and pads spaced from each other and expansible by fluid pressure to press the opposite sides of the upper in the vicinity of the waist portion of the shoe into conformity to the contour of the last prior to the completion of the inward wiping operation.

82. In a machine for shaping uppers over lasts, means for tensioning an upper over a last and for wiping its marginal portion at the forepart inwardly into lasted relation to an insole on the last, and fluid-pressure means arranged to press the opposite sides of the upper substantially from the waist to the heel-end portion of the shoe into conformity to the contour of the last after the upper-tensioning operation has been substantially completed but prior to the wiping of the marginal portion of the upper over the insole.

83. In a machine for shaping uppers over lasts, wipers constructed and arranged to wipe the marginal portion of an upper inwardly into lasted relation to an insole on a last around the toe end and substantially as far rearwardly as the ball of the shoe, and fluid-pressure means for pressing the sides of the upper at the rear of the ball portion of the shoe into conformity to the contour of the last prior to the completion of the inward wiping operation and for thereafter releasing the sides of the upper in an unfastened condition.

84. In a machine for shaping uppers over lasts, the combination with means for tensioning an upper over a last and for wiping its marginal portion at the forepart inwardly over the bottom of the last, of means for pressing the upper into conformity to the contour of the top of the forepart of the last at the rear of the toe-end portion, and fluid-pressure means for conforming to the last portions of the sides of the upper at the rear of the forepart.

85. In a machine for shaping uppers over lasts, the combination with means for tensioning an upper over a last and for wiping its marginal portion at the forepart inwardly over the bottom of the last, of a shoe rest arranged to press the upper into conformity to the contour of the top of the forepart of the last at the rear of the toe-end portion, and fluid-pressure means for conforming the sides of the upper to the contour of the last in locations extending substantially from said shoe rest to the heel-end portion of the shoe.

86. In a machine for shaping uppers over lasts, the combination with means for tensioning an upper over a last and for wiping its marginal portion at the forepart inwardly over the bottom of the last, of a shoe rest

arranged to press the upper into conformity to the contour of the top of the forepart of the last at the rear of the toe-end portion, and a pair of pads arranged to receive the shoe between them at the rear of said shoe rest and expansible by fluid pressure to conform the opposite side portions of the upper to the contour of the last.

87. In a machine for shaping uppers over lasts, the combination with wipers for wiping the marginal portion of the forepart of an upper inwardly over a last, means for clamping the marginal portion of the upper upon said wipers, and means for moving a last relatively to said wipers and clamping means to tension the upper, of a shoe rest arranged to press the forepart of the upper at the rear of its toe-end portion into conformity to the contour of the top of the last and yieldingly movable with the last, and fluid-pressure means at the rear of said shoe rest arranged to receive the last at the end of its movement and expansible to conform portions of the upper in the vicinity of the waist portion of the shoe to the contour of the sides of the last.

88. In a machine for shaping shoe uppers, the combination with toe-embracing wipers arranged to receive the marginal portion of the toe end of an upper outspread upon them, of mechanism mounted for movements toward and from said wipers for gaging the position of the upper relatively to the wipers.

89. In a machine for shaping shoe uppers, the combination with toe-embracing wipers arranged to receive the marginal portion of the toe end of an upper outspread upon them, of mechanism mounted for movements in directions transverse to the plane of the wipers into and out of position close to said plane for gaging the position of the upper relatively to the wipers.

90. In a machine for shaping shoe uppers, the combination with toe-embracing wipers arranged to receive the marginal portion of the toe end of an upper outspread upon them, of members mounted for movements into and out of positions in substantially contiguous relation to the upper on the opposite side thereof from the wipers for gaging by reference to the tip seam the position of the upper relatively to the wipers.

91. In a machine for shaping shoe uppers, the combination with toe-embracing wipers arranged to receive the marginal portion of the toe end of an upper outspread upon them, of fingers mounted for swinging movements over the wipers toward and from their top faces for gaging the position of the upper relatively to the wipers.

92. In a machine for shaping shoe uppers, the combination with toe-embracing wipers arranged to receive the marginal portion of the toe end of an upper outspread upon them, of members mounted for movements over the wipers toward and from their top faces for gaging the position of the upper relatively to the wipers, and connections for moving said members toward or from the wipers in unison.

93. In a machine for shaping shoe uppers, the combination with toe-embracing wipers arranged to receive the marginal portion of the toe end of an upper outspread upon them, of fingers mounted for movements over the wipers toward and from their top faces for gaging the position of the upper relatively to the wipers, and means for adjusting said fingers in directions lengthwise of the upper.

94. In a machine for shaping shoe uppers, the combination with toe-embracing wipers arranged to receive the marginal portion of the toe end of an upper outspread upon them, of a device mounted for movement into and out of a position close to the upper on the same side thereof as the wipers for gaging the position of the upper relatively to the wipers.

95. In a machine for shaping shoe uppers, the combination with toe-embracing wipers arranged to receive the marginal portion of the toe end of an upper outspread upon them, of a device arranged to engage the upper on the same side thereof as the wipers and against which the operator is enabled to press the upper to determine when the upper is in proper relation to the wipers.

96. In a machine for shaping shoe uppers, the combination with toe-embracing wipers arranged to receive the marginal portion of the toe end of an upper outspread upon them, of a device arranged to engage the upper on the same side thereof as the wipers and provided with an edge against which the operator is enabled to press the tip seam to position the upper in proper relation to the wipers.

97. In a machine for shaping shoe uppers, the combination with toe-embracing wipers arranged to receive the marginal portion of the toe end of an upper outspread upon them, of a device mounted for movement upwardly to a position substantially in the plane of the wipers and arranged to engage the lower face of the upper to determine its proper relation to the wipers.

98. In a machine for shaping shoe uppers, the combination with toe-embracing wipers arranged to receive the marginal portion of the toe end of an upper outspread upon them, of a device mounted for movement into and out of a position close to the upper on the same side thereof as the wipers for gaging the position of the upper relatively to the wipers, and means controlled by the operator for moving said device into gaging position and for withdrawing it from that position prior to the operation of the wipers on the upper.

99. In a machine for shaping shoe uppers,

the combination with toe-embracing wipers arranged to receive the marginal portion of the toe end of an upper outspread upon them, and a shoe rest for supporting the upper at the top of the forepart, of a device mounted for movement into and out of a position in front of said shoe rest for engaging the upper on the same side thereof as the wipers to determine its proper relation to the wipers.

100. In a machine for shaping shoe uppers, the combination with toe-embracing wipers or shaping the toe-end portion of an upper over a form, and opposite side grippers arranged to grip and control the marginal portion of the upper outspread over the wipers and movable inwardly toward each other in response to the pull of the upper thereon in the upper-shaping operation, of a device common to both said grippers for adjusting them toward or from each other to operate upon uppers of different sizes.

101. In a machine for shaping shoe uppers, the combination with toe-embracing wipers for shaping the toe-end portion of an upper over a form, and opposite side grippers arranged to grip and control the marginal portion of the upper outspread over the wipers and movable inwardly toward each other in response to the pull of the upper thereon in the upper-shaping operation, of a threaded rod arranged to extend laterally of the upper, and members controlled by said rod for adjusting said grippers toward or from each other by the turning of the rod.

102. In a machine for shaping shoe uppers, the combination with toe-embracing wipers for shaping the toe-end portion of an upper over a form, and opposite side grippers arranged to grip and control the marginal portion of the upper approximately at the opposite ends of the tip line, of a threaded rod arranged to extend laterally of the upper, members on said rod movable toward and from each other by the turning of the rod, and devices connected respectively to the different grippers and spring-pressed against said members to cause the grippers to be adjusted toward or from each other in response to the movements of said members.

103. In a machine for shaping shoe uppers, the combination with toe-embracing wipers for shaping the toe-end portion of an upper over a form, and opposite side grippers arranged to grip and control the marginal portion of the upper approximately at the opposite ends of the tip line and movable inwardly toward each other in response to the pull of the upper thereon in the upper-shaping operation, of a threaded rod arranged to extend laterally of the upper, spring means on said rod tending to move the grippers apart and against the resistance of which they are movable toward each other by the pull of the upper upon them, and members for adjusting the grippers toward each other against the resistance of said spring means by the turning of said rod.

104. In a machine for shaping shoe uppers, the combination with toe-embracing wipers for shaping the toe-end portion of an upper over a form, and opposite side grippers arranged to grip and control the marginal portion of the upper approximately at the opposite ends of the tip line and mounted for swinging movements inwardly toward each other in response to the pull of the upper upon them, of arms mounted to swing with said grippers, and an adjusting member arranged to control both said arms for adjusting the grippers toward or from each other.

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

ARTHUR BATES.