Dec. 31, 1963 J. S. KAMBORIAN ETAL 3,115,649

HEEL CLAMP

Original Filed May 2, 1961 5 Sheets-Sheet 1

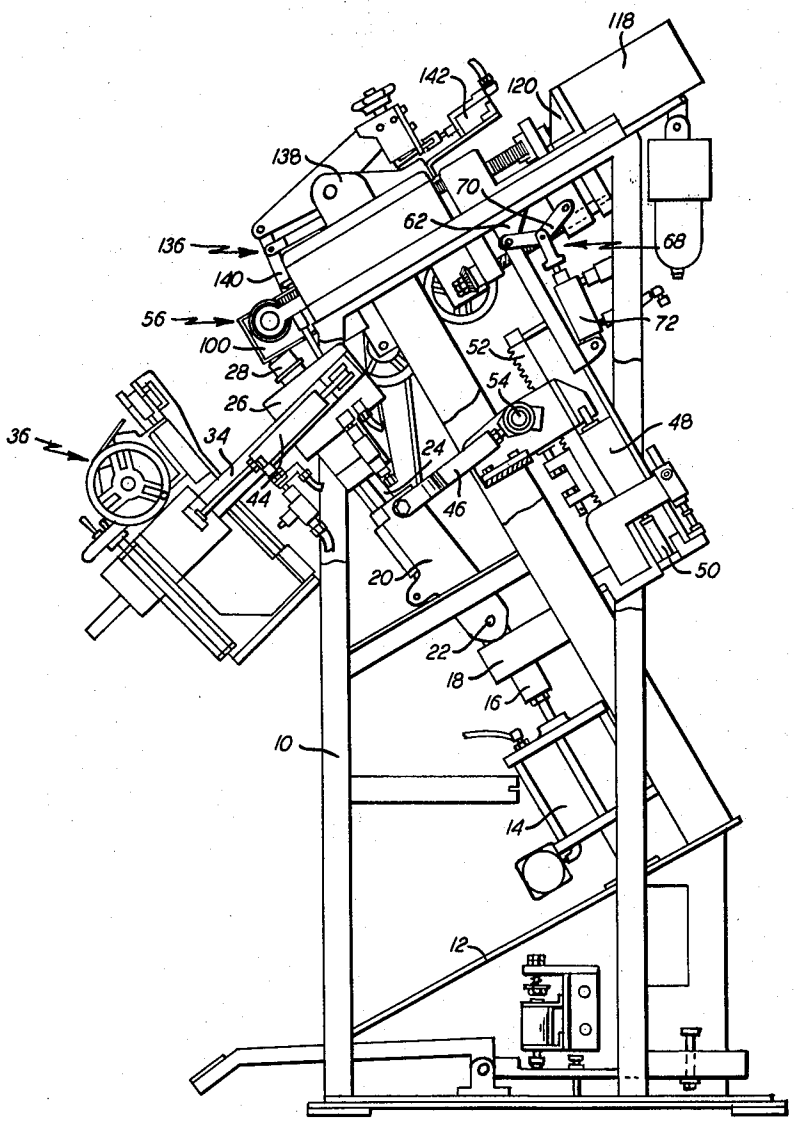

Fig. 1

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HEEL CLAMP

Original Filed May 2, 1961 5 Sheets-Sheet 2

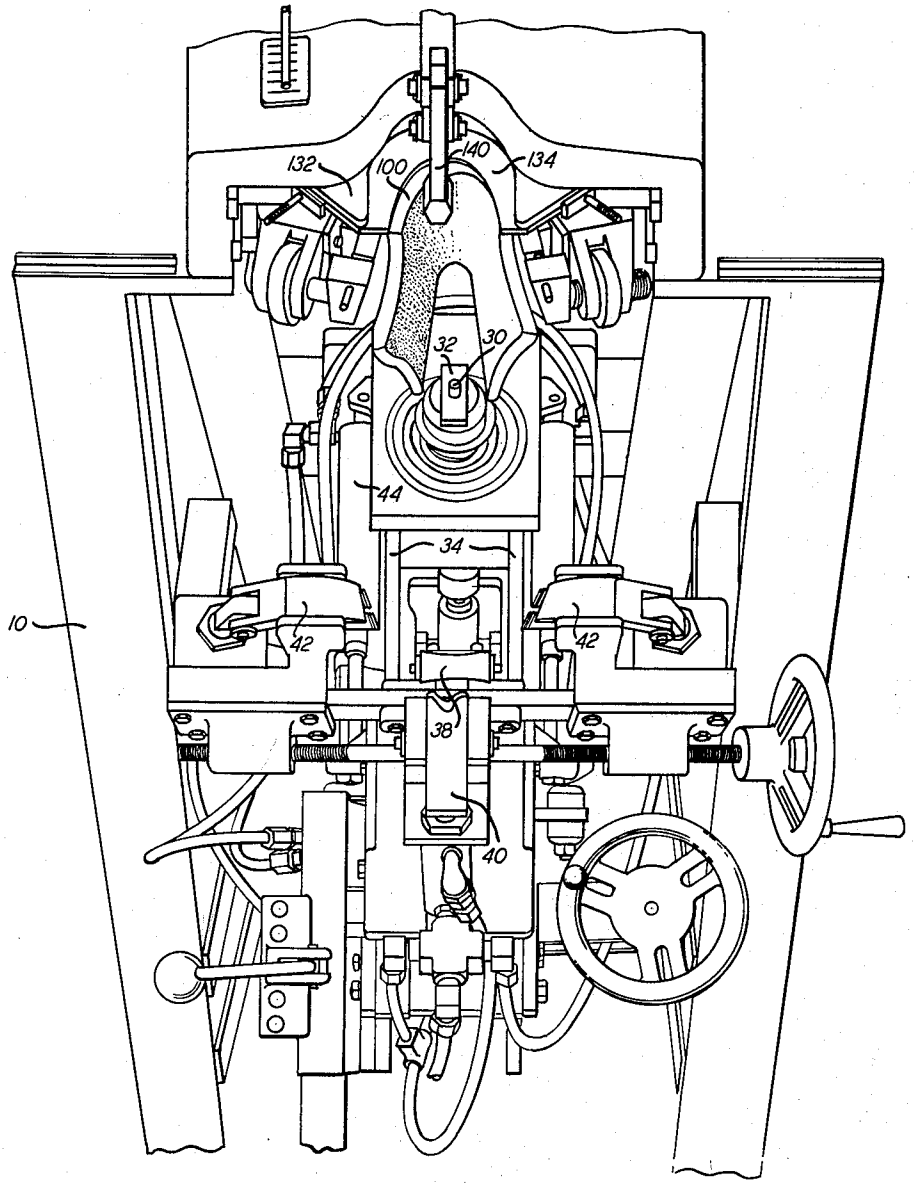

Fig. 2

HEEL CLAMP

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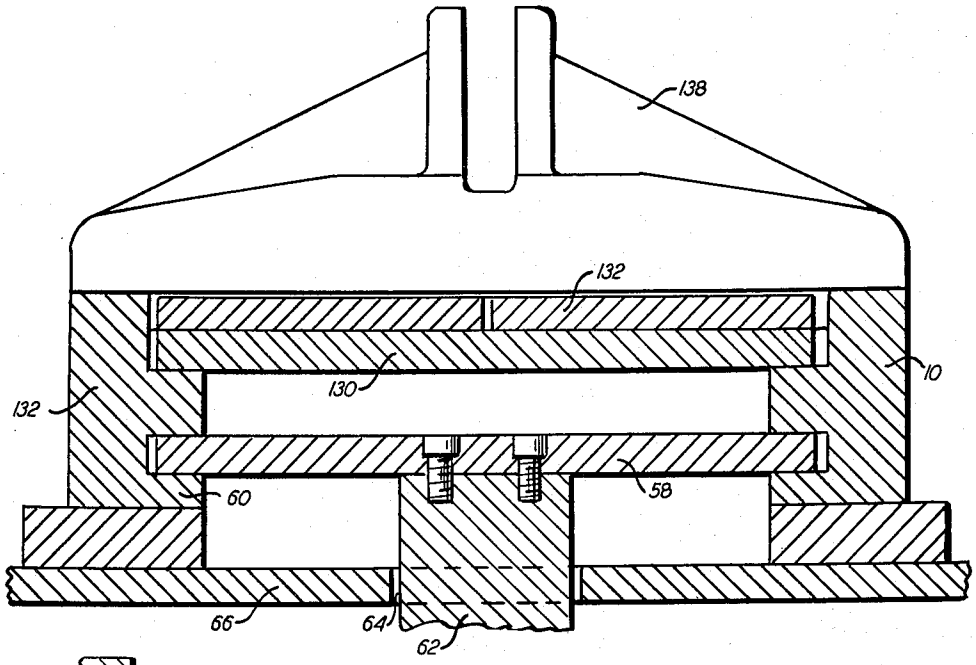

Fig. 3

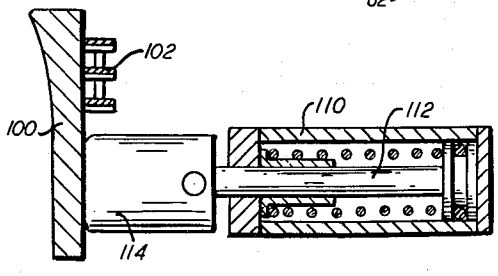

Fig. 6

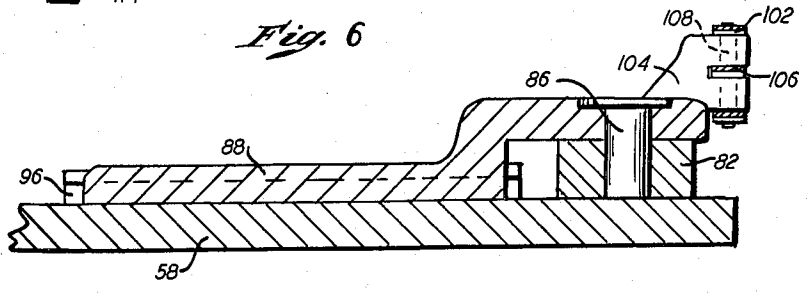

Fig. 7

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HEEL CLAMP

Original Filed May 2, 1961 5 Sheets-Sheet 4

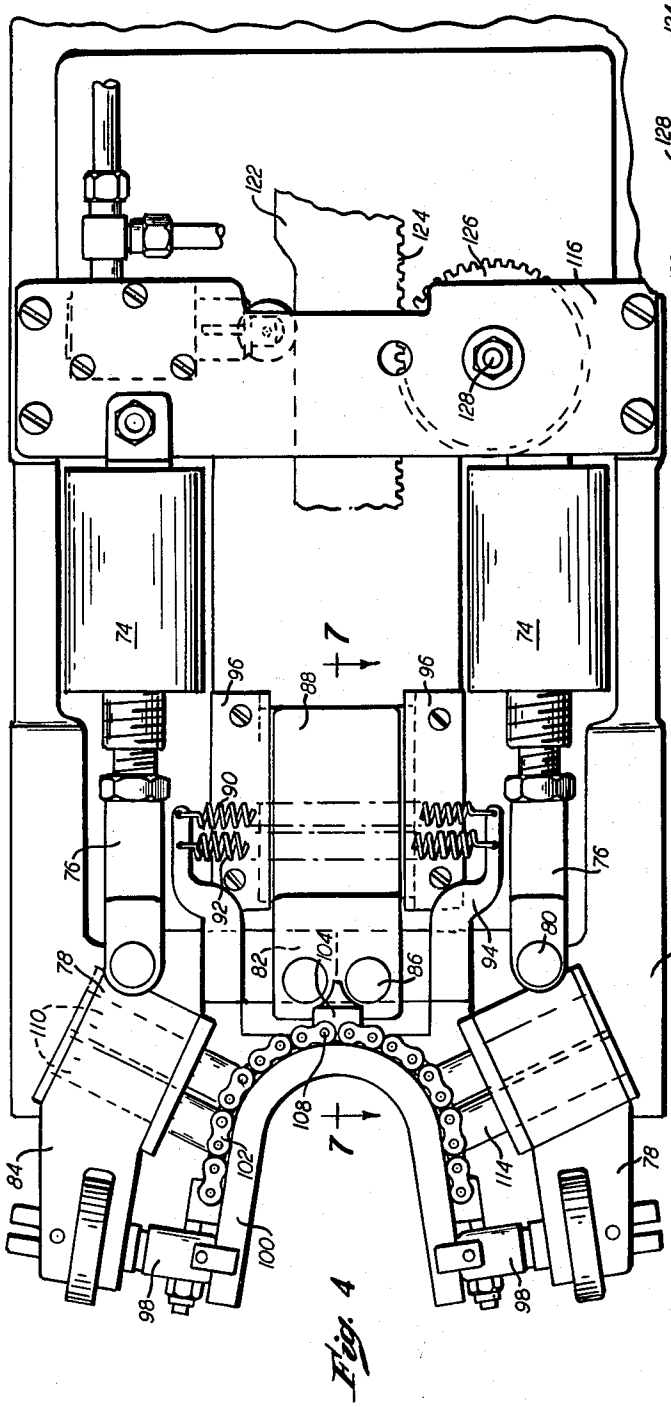

Fig. 4

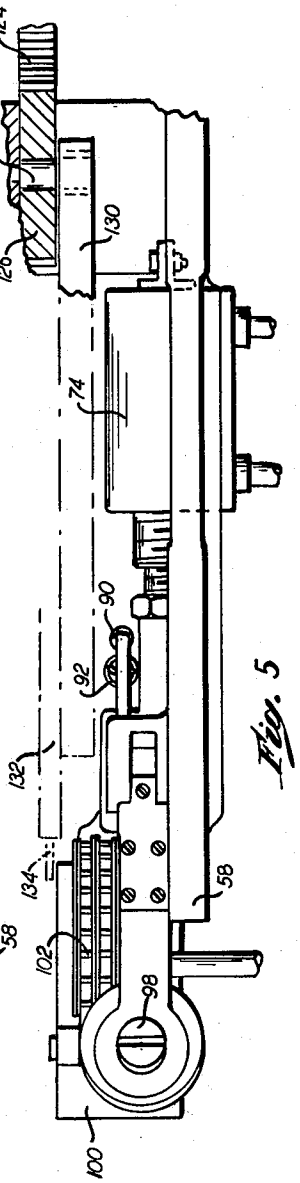

Fig. 5

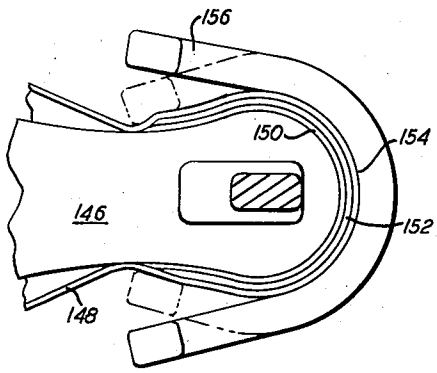

Fig. 8

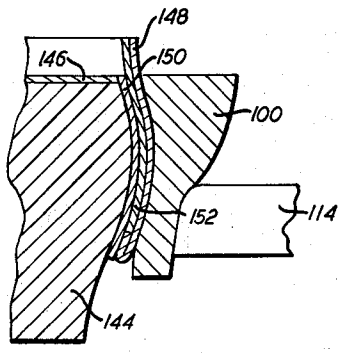

Fig. 9

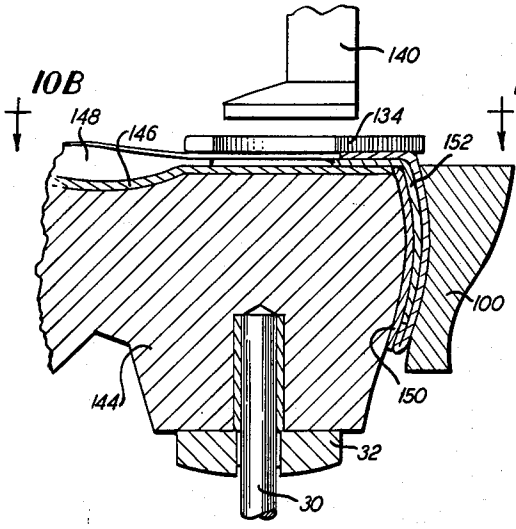

Fig. 10A

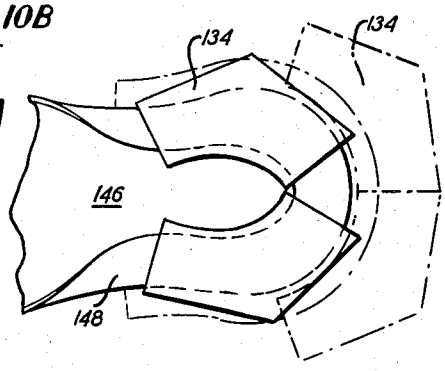

Fig. 10B

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3,115,649

HEEL CLAMP

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Original application May 2, 1961, Ser. No. 107,156. Divided and this application July 24, 1962, Ser. No. 211,974
7 Claims. (Cl. 12—14.4)

This application is a division of copending application Serial No. 107,156, filed May 2, 1961.

The parent application relates to a shoe lasting machine for stretching a shoe upper tightly on a last and heel seat lasting the shoe by wiping the heel of the upper against a shoe insole located on the last bottom. During the machine cycle, the heel of the upper is clamped by a pad against the last to ensure that the upper is held firmly in place during the lasting operation.

The principal object of this invention is to provide an improved heel clamp that effectively holds a shoe upper against a last during the wiping of the upper against an insole located on the bottom of the last. The clamp comprises a substantially U-shaped pad that is connected to drive means through a pair of levers so that the drive means will move the open pad toward the heel of the last until the bight of the pad bears against the last after which the legs of the pad are brought to bear against the last. Auxiliary presser members, which are movably mounted in the levers, can be brought to bear against the pad to assist in forcing the pad against the last.

In the accompanying drawings:

FIGURE 1 is a side elevation view of the machine;

FIGURE 2 is a front elevation view of the machine;

FIGURE 3 is a vertical section through a heel seat lasting unit that forms a part of the machine;

FIGURE 4 is a plan view of the heel clamping means;

FIGURE 5 is a side elevation of the heel clamping means;

FIGURE 6 is a detail of an auxiliary presser member;

FIGURE 7 is a section taken along the line 7—7 of FIGURE 4;

FIGURE 8 is a plan view of the shoe as it is about to be clamped by the heel clamping pad;

FIGURE 9 is a section showing the shoe after it has been clamped by the heel clamping pad;

FIGURE 10A is an elevation in section showing the heel portion of the shoe and last at the completion of the machine cycle; and

FIGURE 10B is a view taken along the line 10B—10B of FIGURE 10A.

Referring to FIGURES 1 and 2, the machine comprises a frame 10 having an inclined plate 12. An air actuated motor 14 mounted on the plate 12 has a piston rod 16 extending upwardly therefrom that is vertically guided in a guide bearing 18 secured to the frame. A post 20 is pivotally secured to the piston rod 16 by a pivot 22. A rod 24 is secured to and extends upwardly of the post 20, and a swivel block 26 is pivotally mounted on the rod for swinging movement about the axis of the rod. A last pin holder 28 is mounted on the upper end of the rod 24. A last pin 30 is anchored in the last pin holder 28 and projects upwardly thereof. A last supporting plate 32 is supported on the last pin holder 28 and has a hole therein through which the last pin 30 projects.

Parallel bars 34 are connected to and extend forwardly of the swivel block 26, and an upper tensioning unit 36 is slidably mounted on the bars 34. The unit 36 comprises a toe rest roller 38, a front pincers 40, and two side pincers 42. Air operated motors 44, mounted on bars 34, are operatively connected to the upper tensioning unit 36 to effect its movement along the bars 34, and means, not

shown, are provided to raise and lower the pincers 40 and 42 in unison.

The post 20 is pivotally connected to a pitman 46. An air actuated motor 48, mounted in the frame 10, has a piston rod 50 that is operatively connected to the post 20 through means that include a rack 52, a crank 54 and the pitman 46 whereby actuation of the motor 48 causes the post 20 and the parts carried thereby to swing about the pivot 22.

A heel seat lasting unit 56 is mounted in the frame 10 rearwardly of the upper tensioning unit 36. Referring to FIGURES 3, 4 and 5, the unit 56 comprises a main slide plate 58 slidably mounted for forward and rearward movement on gibs 60 in the frame 10 (see FIGURE 3). A block 62 is secured to the plate 58 and is slidable in a slot 64 formed in a table 66, which table forms a part of the frame 10. A floating actuator 68 (FIGURE 1) is secured to the block 62. The floating actuator comprises a toggle linkage 70 and an air actuated motor 72. The motor 72 is operative to cause the main slide plate 58 and the members carried thereby to move forwardly and rearwardly in the frame.

A pair of air actuated motors 74 are mounted in the plate 58. Each motor 74 has a piston rod 76 that is pivotally connected to a lever 78 by a pivot 80. The levers 78 have legs 82 extending toward each other from the pivots 80 and legs 84 extending forwardly and divergently from the pivots 80. The legs 82 are pivotally connected by pivots 86 to a slide 88. A pair of tension springs 90 and 92 are connected at their opposite ends to arms 94 that are fixed to the legs 82. The springs force the levers 78 about their pivots 80 to the position shown in FIGURE 4 where the contiguous faces of the legs 82 abut each other. The slide 88 is slidably mounted in gibs 96 mounted on the plate 58. The lever legs 84 have studs 98 adjustably mounted in their extremities, and the studs 98 are affixed to the ends of a U-shaped heel clamping pad 100 made of a flexible material such as leather. A pair of sprocket chains 102 are wrapped about the outer periphery of the pad 100. Each chain 102 is anchored at one end to a stud 98. The slide 88 has a projection 104 at its forward end (FIGURE 7), having a slot 106 in which the other end of each chain 102 is received. A pair of pins 108 mounted in the projection 104 extend across the slot 106 and through the ends of the chains 102 remote from the studs 98. A pair of spring return air actuated motors 110 are mounted in each of the lever legs 84 (FIGURES 4 and 6). The motors 110 have pistons 112 extending toward the pad 100 below the chains 102. A presser member 114 is affixed to each piston 112.

A bridge 116 (FIGURE 4) is anchored at its ends to the sides of the main slide plate 58 and extends thereover. An air operated motor 118 (FIGURE 1) is secured to a rib 120 at the rear of the main slide plate 58. The piston rod 122 of the motor 118 has a rack 124 thereon that is in mesh with a gear 126 rotatably mounted beneath the bridge 116 on a pin 128 fixed in the bridge. A wiper supporting slide plate 130 is slidably supported on gibs 132 in the frame (FIGURE 3), and wiper cams 132 rest on the plate 130 and are mounted so that they can be moved with respect to the plate. A wiper 134 (FIGURE 1) is mounted in each wiper cam. Reference is made to the parent application for a more detailed disclosure of the wipers and wiper driving mechanism.

A hold-down unit 136 is mountd on a frame cover 138 located above the plates 58 and 130 and the wiper cams 132. The unit 136 comprises a hold-down foot 140 that is mounted for upward and downward movement in response to actuation of an air actuated motor 142 (FIGURE 1) secured to the cover 138.

Although the apparatus of the instant invention can be

used in the assembling of an upper on a last and the heel seat lasting of the upper onto the insole, it has particular utility in carrying out the method disclosed in pending application Serial No. 80,919, filed January 5, 1961. In the referred to method, a flaccid counter coated on both of its surfaces with adhesive is inserted in a pocket formed between an upper and a liner at the heel end of the upper, the upper is draped about the last, tensioning forces are applied at the toe end of the upper to wrap the upper about the heel end of the last and initiate the molding of the counter to the shape of the last, the last is moved to a heel seat lasting position and forced upwardly against a hold-down, upward tensioning forces are applied at the toe end of the upper to assemble the upper on the last, a clamping force is applied at the heel of the last to maintain the upper stationary on the last and to complete the molding of the counter to the shape of the last, and the margins of the upper and counter are wiped down onto an insole located on the bottom of the last to thereby unite the lasted margin of the upper to the insole by adhesively bonding the counter to the upper and insole.

In setting up the machine for a particular size of last, the adjustments described in the parent application are made.

Referring to FIGURES 8 through 10B, a last 144 is provided having an insole 146 mounted on its bottom and an upper 148 draped thereon. A liner 150 is secured to the heel of the upper to engage the heel of the last, and a counter 152 is located in the pocket formed between the upper and the liner. The last is placed bottomup on the last supporting plate 32 with the pin 30 entering the conventional last pin hole in the last. The toe portion of the upper and last is supported on the toe roller 38, the toe end of the upper margin is inserted between the jaws of the front pincers 40, and the forepart portions of the upper margin are inserted between the jaws of the side pincers 42. At this time the upper end of the liner 150 is substantially level with the insole 146 and the upper margins of the counter 152 and upper 148 at the heel end of the last extend above the insole 146.

The control system disclosed in the parent application is now actuated to cause the machine to go through a cycle.

The pincers 40 and 42 are actuated to cause them to grip the margin of the upper. The motors 44 are now actuated to move the upper tensioning unit 36 forwardly (leftwardly in FIGURE 1) on the bars 34 to thereby horizontally stretch the upper in the direction of the toe of the last and cause a firm wrapping of the upper about the heel of the last and a tension force on the counter to start to mold it to the shape of the last. The motor 48 is now actuated to swing the post 20 clockwise (FIGURE 1) about the pivot 22 to a position where the shoe is adjacent to but not in engagement with the heel seat lasting unit 56 and the hold-down unit 136. In this position the post 20 is in alignment with the hold-down foot 140 but the insole 146 is below the bottom of the hold-down foot. In addition, in this position, the shoe upper and last are not in engagement with the heel clamping pad 100. In response to the lowering of the rack 52 caused by the actuation of the motor 48, the motor 14 is actuated to raise the post 20 and thus raise the last and shoe until the insole 146 bears against the hold-down foot 140. In this position the shoe and last are clamped between the hold-down foot 140 and the last supporting plate 32 with the upwardly facing surface of the insole slightly below the top surface of the clamping pad 100 and the bottom surface of the wipers 134. After the motor 14 is actuated, the pincers 40 and 42 are raised to thereby apply an upward tension to the margin of the upper 148 at its toe and forepart portions to thereby stretch the upper tightly on the last and assemble it in proper position for the subsequent heel seat lasting operation. Since the last and shoe are clamped at this time between the foot 140 and the plate 32, upward movement of the pincers will not shift the last. The motor 72 on the floating actuator 68 is now actuated to move the block 62 and the heel seat lasting unit 56 carried thereby from its normal out-of-the-way position to a position adjacent the shoe and last.

The motors 74 are now actuated to cause the piston rods 76 to move the levers 78 and the clamping pad 100 carried thereby toward the heel of the last with the slide 88 sliding in the gibs 96. During this movement the springs 90 and 92 maintain the lever legs 82 in abutting relation and the lever legs 84 in open position until the bight 154 of the pad 100 engages the shoe as indicated in FIGURE 8. At this time the bight of the pad and the slide 88 can no longer move forwardly so that continued forward movement of the piston rods 76 causes the levers 78 to swing toward each other about the pivots 86 to cause the legs 156 of the pad to move toward each other and engage the shoe as indicated in dotted lines in FIGURE 8. This arrangement provides for an initial contact of the pad 100 at the heel end of the shoe and then a progressive engagement of the pad along the sides of the shoe extending forwardly of the heel to ensure a smoothening out of any wrinkles there may be in the upper and a smooth, firm clamping of the upper against the last.

The motors 110 are now actuated to force the presser members 114 against the clamp pad 100 and thereby press the clamp pad against the shoe and last. As seen in FIGURE 9, the presser members 114 engage the pad 100 towards the bottom of the pad opposite the portion of the last that curves inwardly to form a last portion having a relatively narrow width. The presser members 114 ensure that all of the clamp pad 100 bears against the last 144 to thereby hold the upper firmly in place during the subsequent lasting operation, and to complete the molding of the counter 152 to the shape of the last.

Shortly after the actuation of the motors 110, the motor 118 is actuated to cause the wipers 134 to be moved from the dotted line position of FIGURE 10B to the solid line position and wipe or fold the margins of the upper 148 and counter 152 down against the insole 146. The wiping pressure completes the molding of the counter and causes the counter, through the adhesive on its surfaces, to bond the wiped-in margin of the upper to the insole. During the movement of the wipers the motor 142 is actuated to raise the hold-down foot 140 as indicated in FIGURE 10A. The motor 14 now applies upward pressure by the last directly against the wipers to provide an overwiping and bedding pressure between the wipers and the wiped-in margin of the upper during the latter part of the wiper stroke and also after the termination of the wiper stroke.

This concludes the working phase of the machine cycle, and the control is now actuated by the operator to cause all of the parts of the machine to return to their original positions in the manner described in the parent application.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

We claim:

1. A heel clamp, for clamping the heel portion of a shoe upper against a last, comprising: a substantially U-shaped clamping pad having a bight and a pair of legs extending forwardly of the bight on opposite sides of the bight; a pad mounting leg extending alongside of and exteriorly of each pad leg; joining means connecting each pad mounting leg to a pad leg; means mounting the pad mounting legs for inward movement to thereby provide for inward movement of the pad legs and cause the pad legs to bear against the upper; and at least one presser member mounted in each pad mounting leg rearwardly of said joining means for movement against its associated pad leg to press the pad portion contacted thereby against the upper.

2. A heel clamp, for use in a lasting machine, comprising: a substantially U-shaped clamping pad; a plate; a slide mounted in the plate for forward and rearward movement; a pair of levers pivotally connected to said slide for swinging movement about axes transverse to the plane of movement of the slide, said levers having legs extending forwardly and divergently from said axes; joining means connecting each lever leg to said pad adjacent the ends of the pad; spring means connected to said levers for yieldably urging the lever legs apart; and drive means pivotally connected to said levers between said axes and said joining means.

3. The heel clamp according to claim 2 further comprising: at least one presser member mounted in each of said lever legs; and means for moving the presser members against the clamping pad.

4. A heel clamp, for use in a lasting machine, comprising: a substantially U-shaped clamping pad; a plate; a slide mounted in the plate for forward and rearward movement; a pair of levers pivotally connected to said slide for swinging movement about axes transverse to the plane of movement of the slide, said levers having legs extending forwardly and divergently from said axes; joining means connecting each lever leg to said pad adjacent the ends of the pad; an arm extending rearwardly of each lever; spring means connected to and extending between said arms for yieldably urging the lever legs apart; and a pair of fluid actuated motors mounted in said plate, each of said motors having a piston rod pivotally connected to a lever between said axes and said joining means.

5. The heel clamp according to claim 4 further comprising: at least one fluid actuated motor in each lever leg having a piston rod directed toward the clamping pad; and a presser member connected to the last mentioned piston rod.

6. A heel clamp, for use in a lasting machine, comprising: a substantially U-shaped clamping pad; a plate; a slide mounted in the plate for forward and rearward movement; a pair of levers pivotally connected to said slide for swinging movement about axes transverse to the plane of movement of the slide, said levers having legs extending forwardly and divergently from said axes; a stud at the forward end of each lever; means connecting each stud to an end of the pad; a projection at the forward end of the slide; a chain extending from each stud to the projection exteriorly of the pad; an arm extending rearwardly of each lever; spring means connected to and extending between said arms for yieldably urging the lever legs apart; a fluid actuated motor mounted in said plate rearwardly of each lever; a piston rod extending from each motor to a lever; and means pivotally connecting each piston rod to a lever between said axes and said studs.

7. The clamp according to claim 6 further comprising: at least one fluid actuated motor in each lever leg having a piston rod directed toward the clamping pad alongside a chain; and a presser member connected to the last mentioned piston rod.

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