

[54] **TOE WIPING WITH INSOLE UNSECURED TO LAST BOTTOM**

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[51] Int. Cl. **A43d 21/00**

[58] Field of Search **12/7, 7.8, 8.5, 8.8, 10-10.8, 12/12-12.5, 123, 21**

[56] **References Cited**

UNITED STATES PATENTS

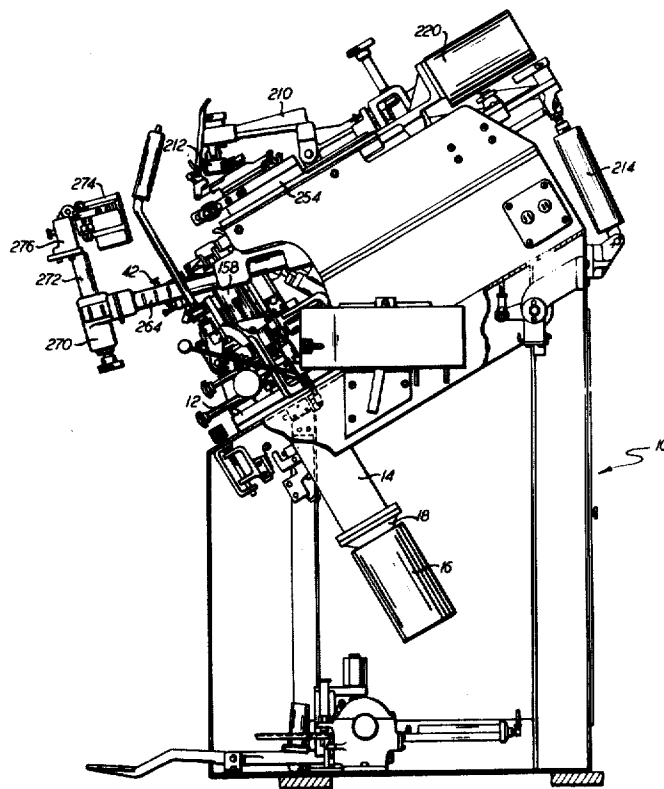
2,607,057	8/1952	Alderman.....	12/21
3,397,417	8/1968	Kamborian et al.	12/123
3,477,079	11/1969	Bergeron et al.	12/145
3,626,533	12/1971	Benken et al.	12/10.5

Primary Examiner—Patrick D. Lawson
Attorney—Albert Gordon

[57] **ABSTRACT**

The wiping of the toe portion of the margin of an upper, mounted on a last, against the corresponding portion of an insole located on the last bottom, wherein the insole is unsecured to the last bottom. An insole is first placed on insole rests and then the last bottom is placed on the insole with the toe portions of the insole and last bottom bearing against abutments to retain them in registration. A suction cup, engaged with the heel portion of the insole, constrains the insole against movement on the insole rests during the placement of the last bottom on the insole. A pulling over mechanism pulls the upper about the last in a heel to toe direction to cause the heel portion of the upper margin, that is extending downwardly of the last, to form a cup about the heel portion of the last bottom which retains the heel portion of the insole in registration with the heel portion of the last bottom. The toe portion of the upper margin is wiped against and attached to the insole while the registrations are maintained.

12 Claims, 26 Drawing Figures



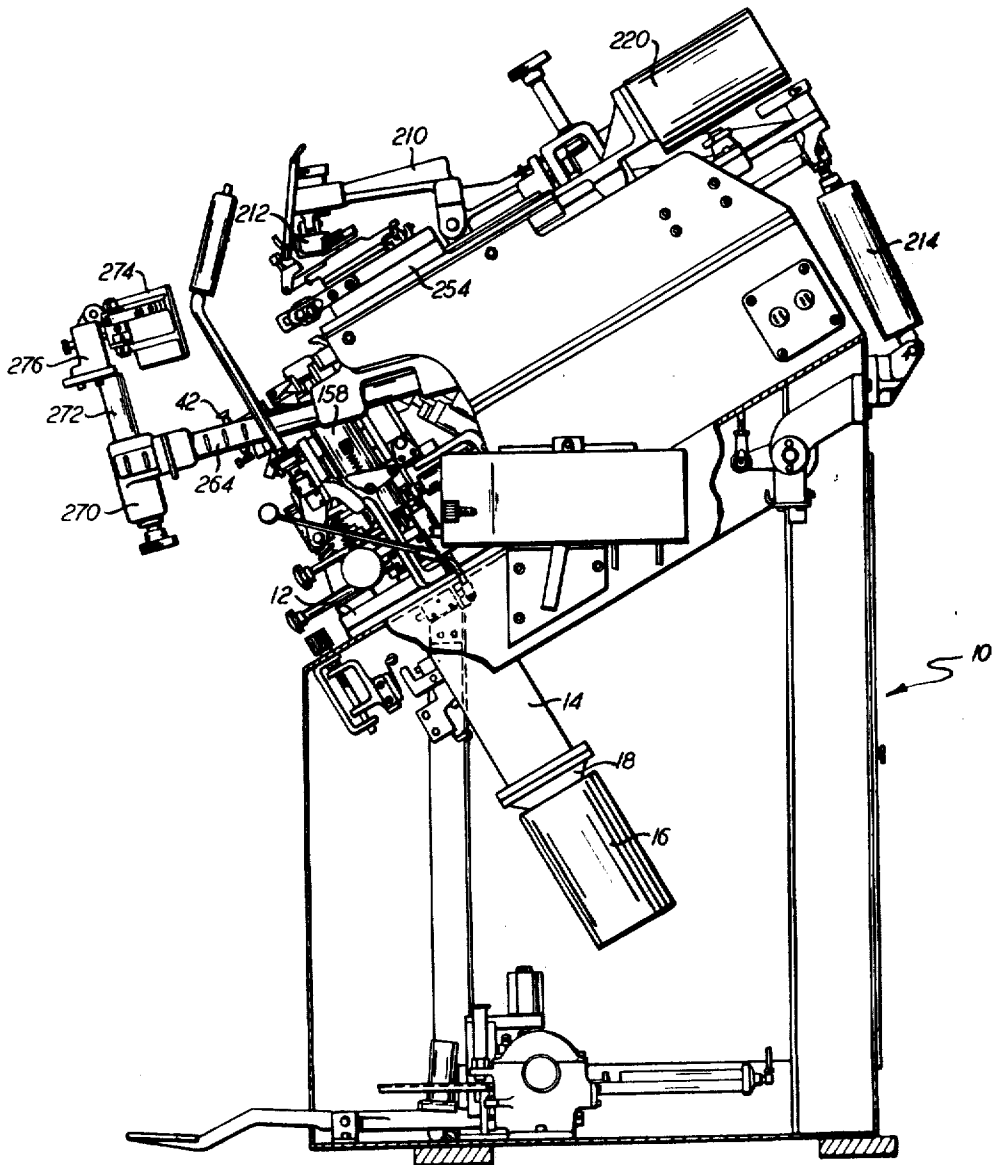


FIG. - 1

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BY *Albert Gordon*
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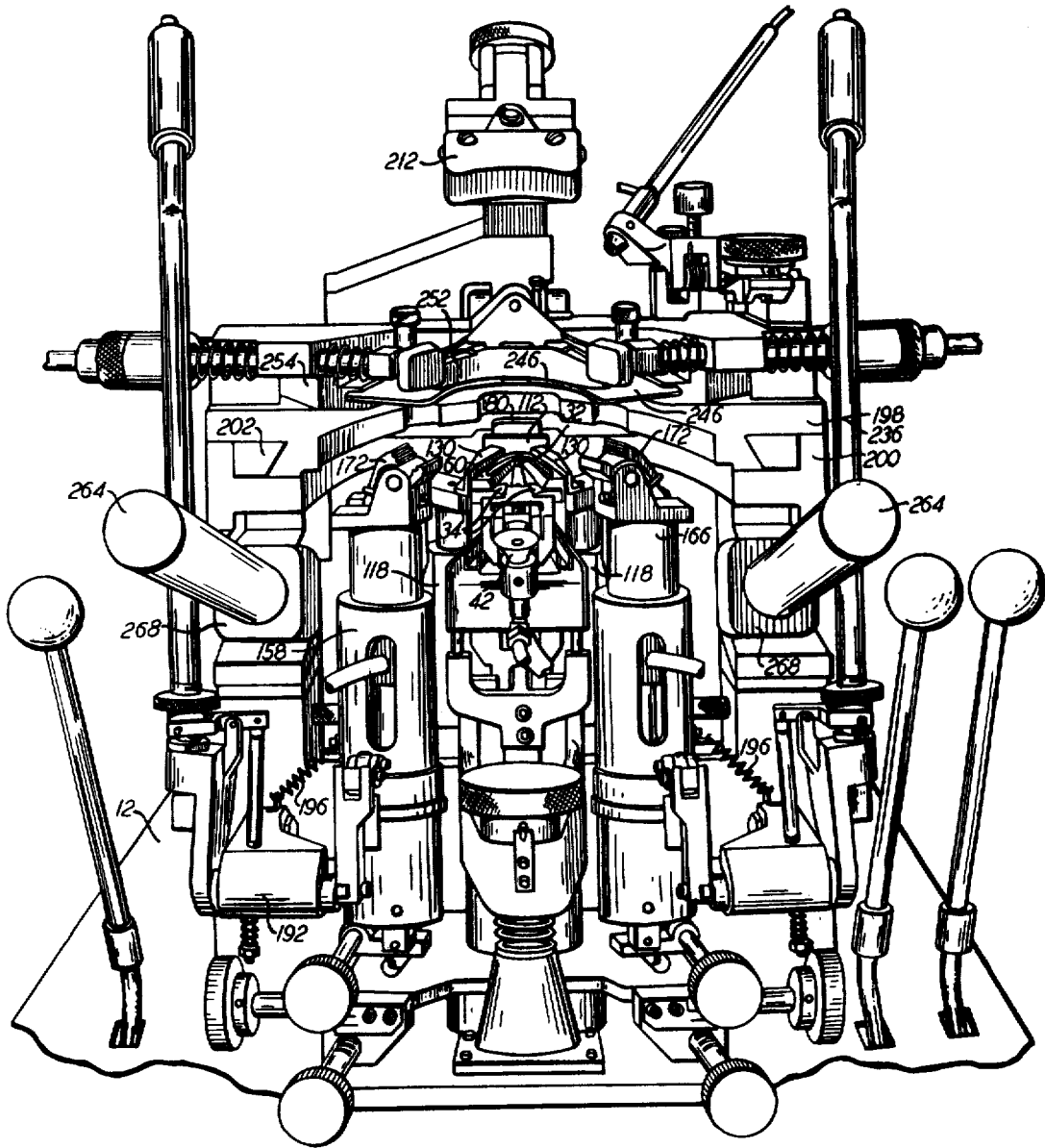


FIG-2

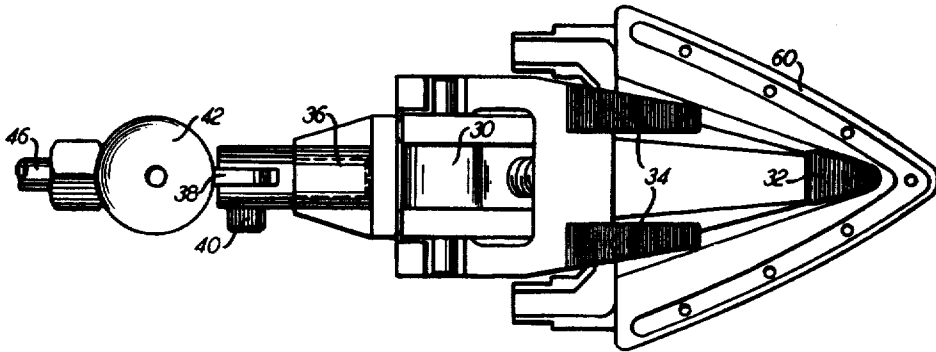


FIG-5

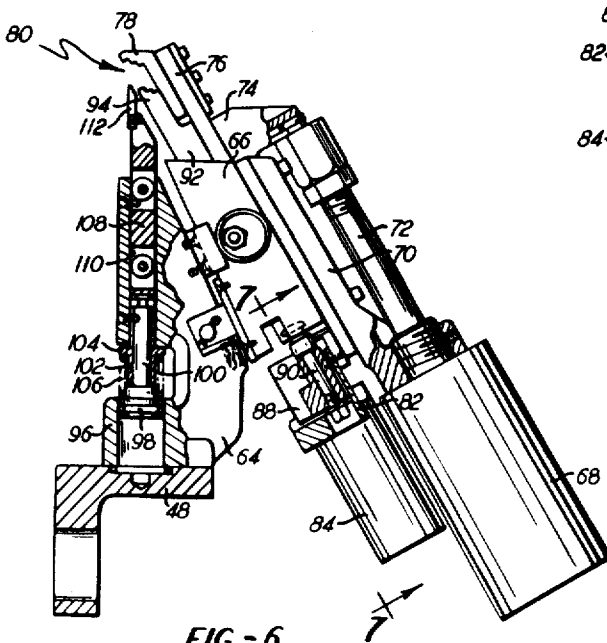


FIG-6

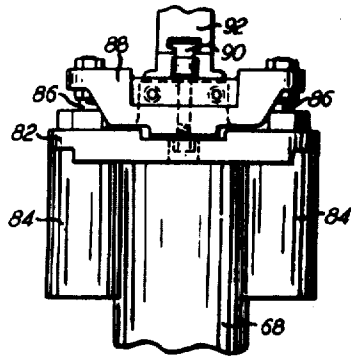
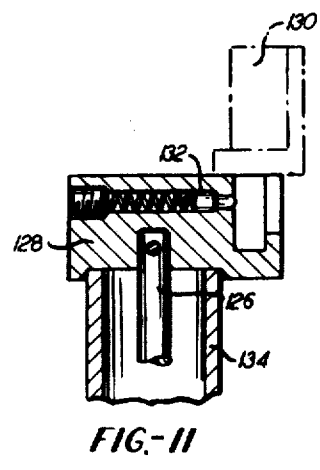
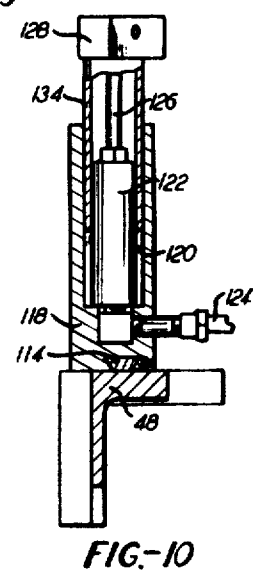
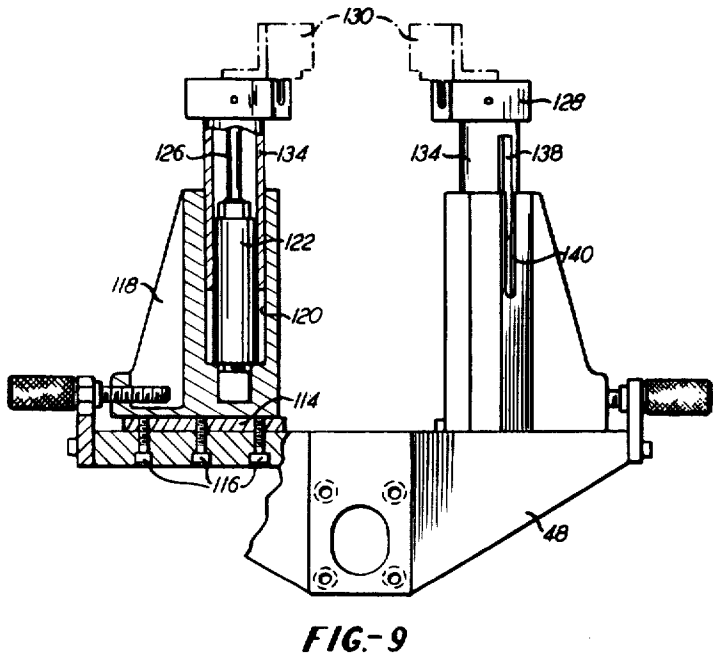
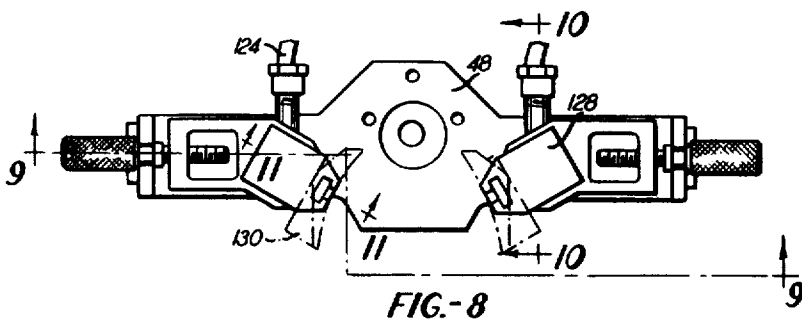


FIG-7



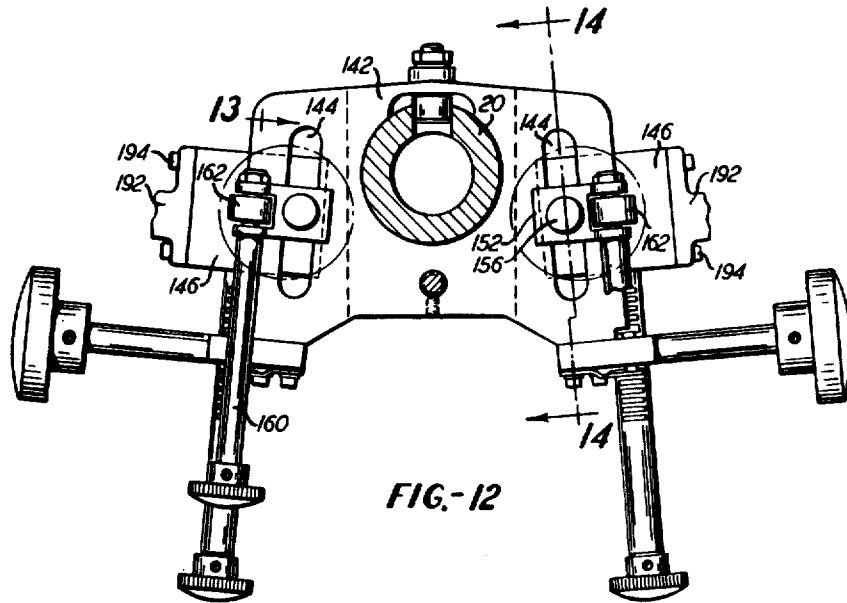


FIG-12

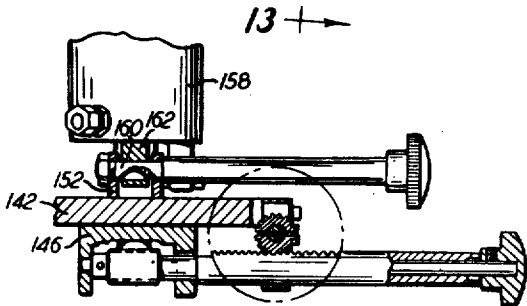


FIG-13

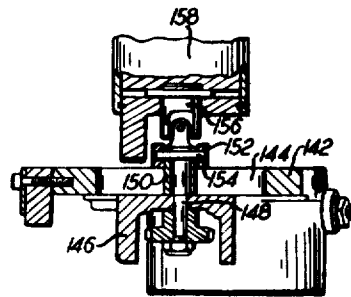


FIG-14

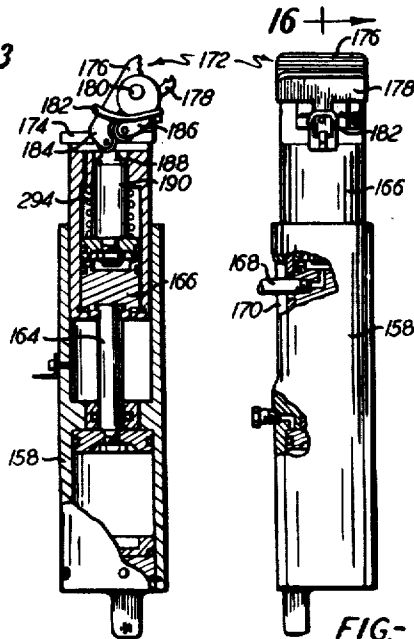
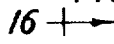


FIG-15

FIG-16



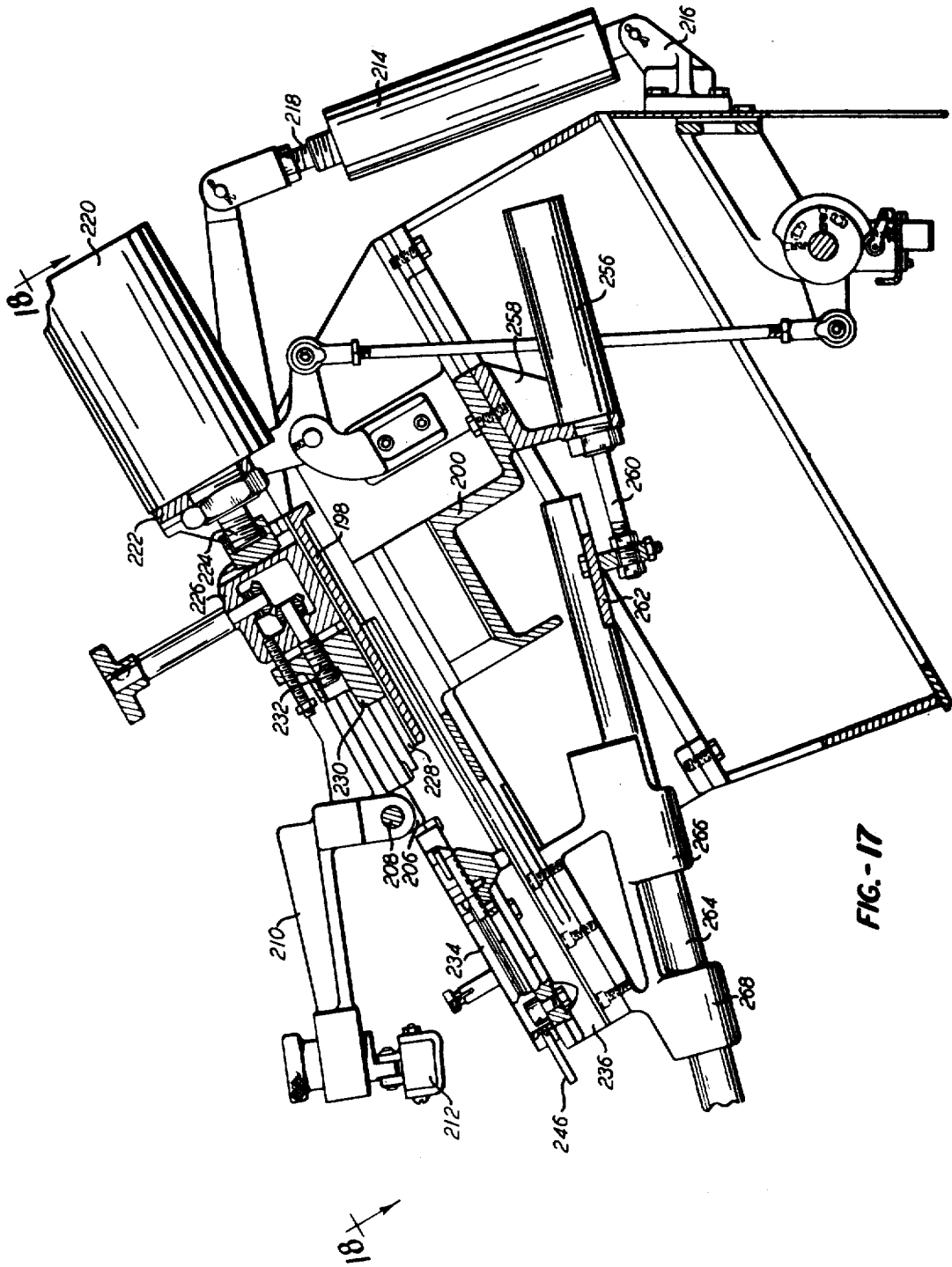


FIG. - 17

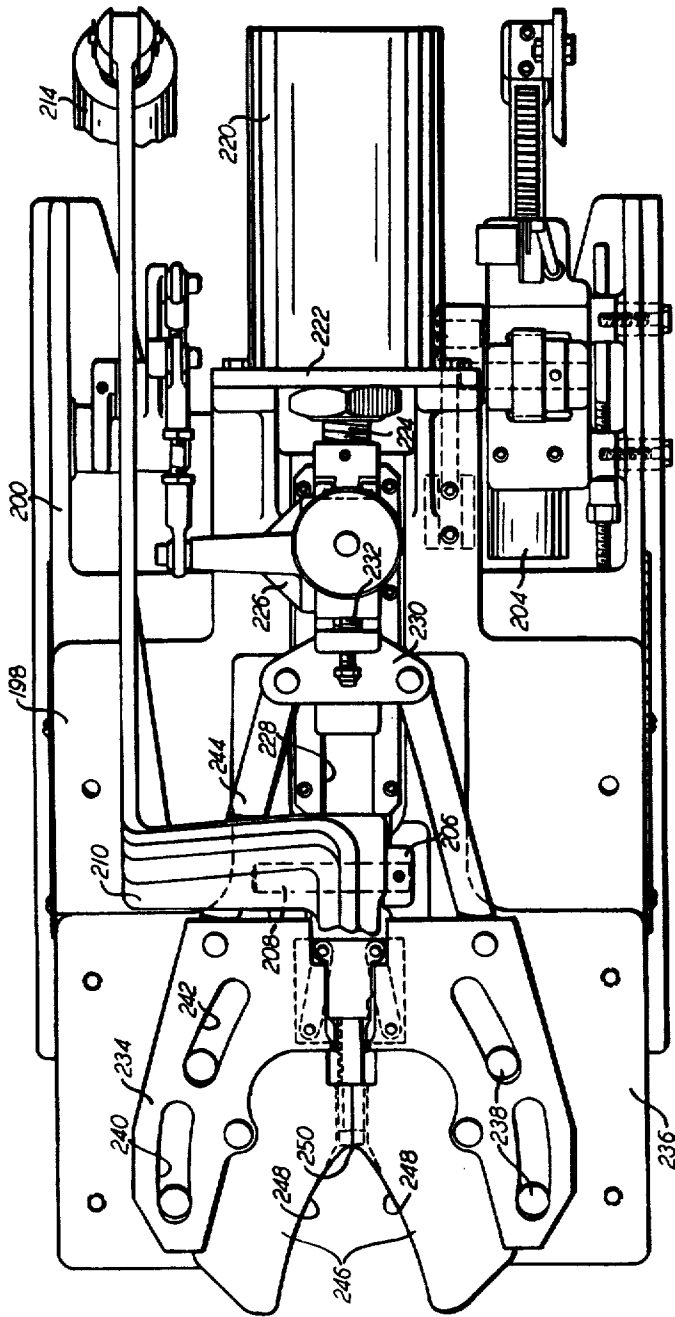


FIG. - 18

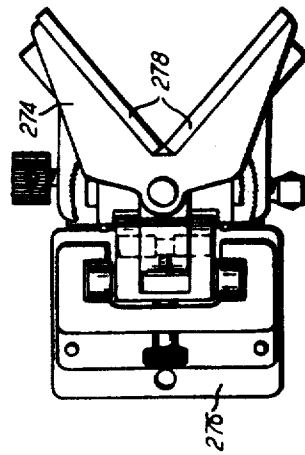
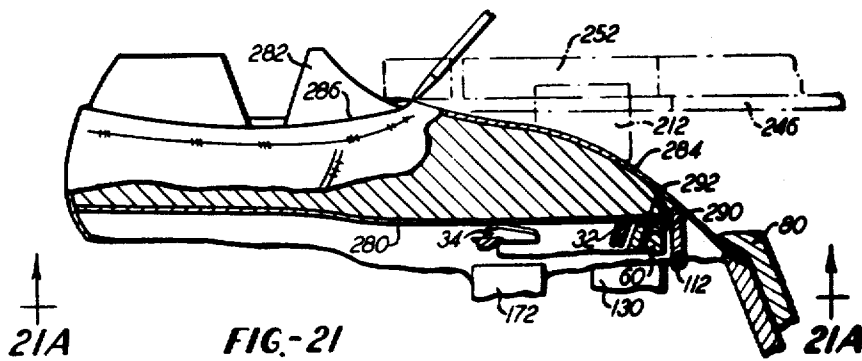
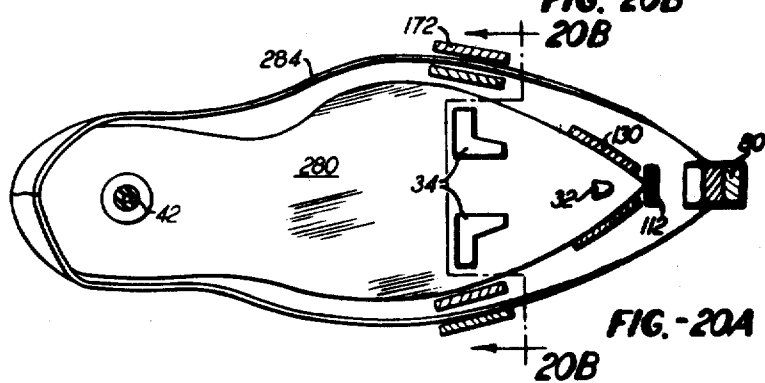
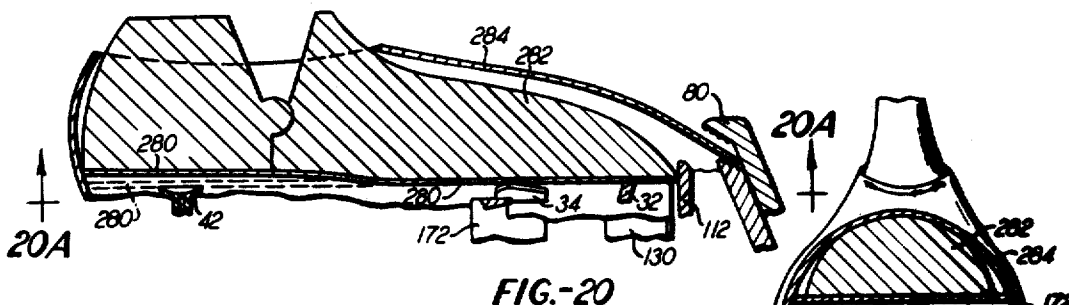


FIG. - 19



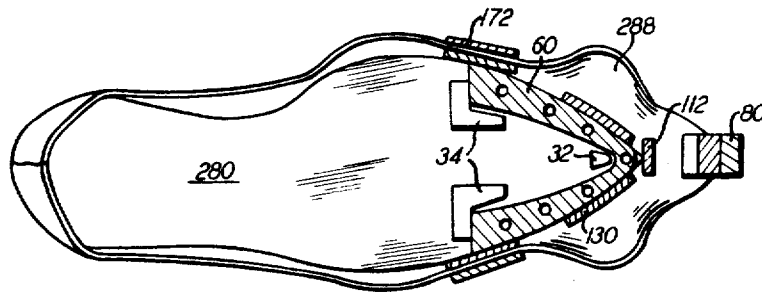


FIG. - 21A

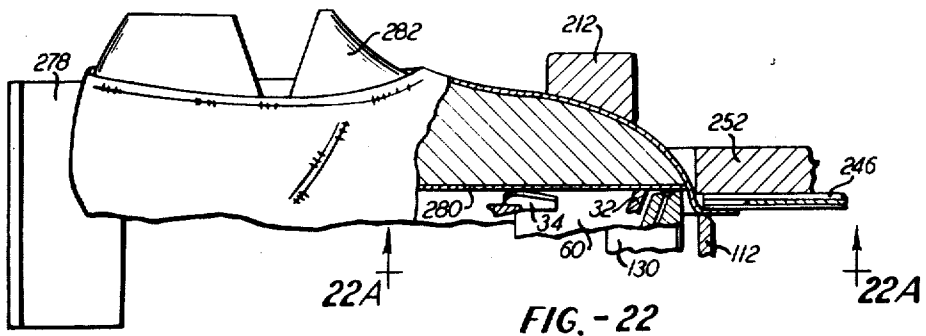


FIG. - 22

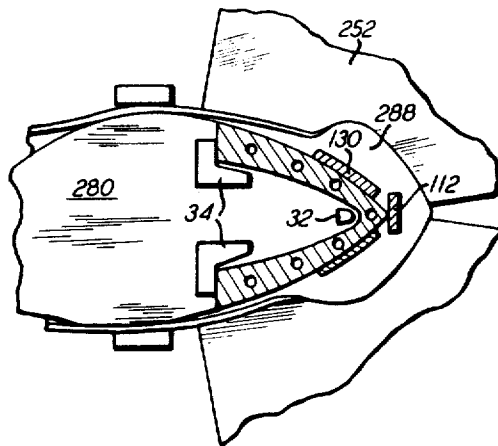


FIG. - 22A

TOE WIPING WITH INSOLE UNSECURED TO LAST BOTTOM

It is standard practice in a lasting machine to secure an insole to a last bottom by tacks to thereby retain the insole and the last bottom in registration during the lasting operation. This necessitates a tacking operation prior to lasting and the removal of the tacks subsequent to lasting and the resultant marring of the last bottom by the tacks. This invention enables the shoe to be lasted without securing the insole to the last bottom by tacks, or by any other means, thereby eliminating the securing of the insole by tacks or by any other means.

The invention is carried out in an arrangement wherein the last and the insole are supported bottom-down on a support. The insole is first placed on the support, after which, while the insole is constrained against movement on the support, the last bottom is placed on the insole while the portion of the insole to be lasted is maintained in registration with the corresponding portion of the last bottom. Subsequently, and while this registration is maintained, the portion of the upper to be lasted, which is mounted on the last, is wiped against the corresponding portion of the insole.

In its broadest aspects, the invention can be practiced on any portion of the shoe, but the illustrative embodiment of the invention shows it as being carried out in a toe lasting operation. As illustrated, a toe lasting machine of the type shown in U.S. Pat. Nos. 3,397,417 and 3,477,079 and pending application Ser. No. 74,347 filed Sept. 22, 1970 has been modified. These disclosures show a support, on which a last having an insole secured to its bottom and an upper mounted thereon, is placed. Abutments located outwardly of the support serve to hold the insole-last assembly in proper registration in the machine. Wiping means are provided to wipe the toe portion of the upper margin against the insole.

This machine has been modified to provide a constraining device, in the form of a suction cup, that is engageable with the insole to constrain the insole against movement on the support. This modification enables the insole to first be placed on the support with its toe portion bearing against the abutments after which the last, having the upper mounted thereon, is placed bottom-down on the insole with its toe portion bearing against the abutments so that the insole and the last bottom are in registration. The constraining device constrains the insole against movement on the support during the placement of the last on the insole to thereby maintain the insole and the last bottom in registration. After this the machine is operated to wipe the toe portion of the upper margin against and attach it to the insole while the registration between the insole and the last bottom is maintained.

In the drawings:

FIG. 1 is a side elevation of the machine;

FIG. 2 is a front elevation of the upper portion of the machine;

FIG. 3 is a vertical section of a portion of the machine that includes a toe post;

FIG. 4 is a vertical section of the last support and the suction cup;

FIG. 5 is a view taken on the line 5—5 of FIG. 4;

FIG. 6 is an elevation, partly in section, of a front pincers and a front retarder which forms one of the abutments;

FIG. 7 is a view taken on the line 7—7 of FIG. 6; FIG. 8 is a plan view of the side retarders which form two of the abutments;

FIG. 9 is a view taken on the line 9—9 of FIG. 8;

FIG. 10 is a view taken on the line 10—10 of FIG. 8;

FIG. 11 is a view taken on line 11—11 of FIG. 8;

FIG. 12 is a plan view of a portion of the machine showing the mounting of side pincers;

FIG. 13 is a section taken on the line 13—13 of FIG. 12;

FIG. 14 is a section taken on the line 14—14 of FIG. 12;

FIG. 15 is an elevation of a side pincers;

FIG. 16 is a view taken on the line 16—16 of FIG. 15;

FIG. 17 is a side elevation, partially in section, showing heel clamp and wiper operating mechanisms;

FIG. 18 is a view taken on the line 18—18 of FIG. 17;

FIG. 19 is a plan view of a heel clamp and heel clamp holder;

FIG. 20 is a representation of the last, insole and upper after they have been placed in the machine;

FIG. 20A is a view taken on the line 20A—20A of FIG. 20;

FIG. 20B is a view taken on the line 20B—20B of FIG. 20A;

FIG. 21 is a representation of a shoe assembly in the machine after a pulling over operation has been completed;

FIG. 21A is a view taken on the line 21A—21A of FIG. 21;

FIG. 22 is a representation of the shoe assembly in the machine just prior to the toe wiping operation; and

FIG. 22A is a view taken on the line 22A—22A of FIG. 22.

Referring to FIGS. 1-3, the machine includes a frame 10 that incorporates a base plate 12 that has a sleeve 14 extending downwardly therefrom. For convenience of operation, the machine is inclined about 30 degrees from the horizontal. However, parts extending in the direction of the plate 12 will hereafter be referred to as extending horizontally and parts extending in the direction of the sleeve 14 will hereafter be referred to as extending vertically. The operator is intended to be located to the left of the machine as seen in FIG. 1, and a direction extending toward the operator (right to left in FIG. 1) will be referred to as "forward" while a direction extending away from the operator (left to right in FIG. 1) will be referred to as "rearward."

An air operated motor 16 is secured to a cap 18 at the bottom of the sleeve 14, and a toe post 20 is secured to the piston rod 22 of the motor 16 to extend vertically and be slidable within the sleeve 14. A roller 24, bolted to the sleeve 14, is received in a vertical slot 26 in the post 20 to preclude rotation of the post about the axis of the sleeve. A toe post extension 28 (FIG. 4) is secured to the upper end of the post 20. A bar 30, which serves as an insole rest mount, is secured to the post extension 28. Insole rests 32 and 34 (see FIG. 2) are mounted to the bar 30. A bracket 36 (FIGS. 4 and 5) is secured to and extends forwardly of the bar 30. A sleeve 38 is connected to the bracket 36 by a pin 40 and a suction cup 42 is mounted in the sleeve 38 by a screw 44. The suction cup 42 is connected by a hose 46 to an aspirator (not shown) to provide a source of suction for the suction cup.

A rearwardly extending ledge 48 of the post extension 28 has a hanger 50 depending therefrom. An air operated motor 52 is pivoted to the hanger 50. The piston rod 54 of the motor 52 is connected by a toggle linkage 56 to the post extension 28 and to a slide 58. The slide 58 is guided for vertical sliding movement by the post extension 28. The toggle linkage 56 is so constructed as to raise the slide 58 from the FIG. 4 position in response to the projection of the piston rod 54 from the motor 52. An applicator-support 60 is mounted to a mount 62 that is secured to the slide 58. The applicator-support 60 lies outwardly and rearwardly of the insole rests 32, 34 and has a configuration corresponding to the periphery of the toe portion of the insole of a shoe to be lasted.

Referring to FIGS. 6 and 7, a housing 64 is secured to and extends upwardly of the ledge 48. A bracket 66 is located rearwardly of and connected to the housing 64. An air operated motor 68 is secured to a block 70 that is secured to the bracket 66. The motor 68 has a piston rod 72 extending upwardly and forwardly thereof. A block 74 is secured to the piston rod 72 and a bar 76 is rigidly connected to the block 74. The bar 76 is slidably mounted in a guideway in the bracket 66. The upper jaw 78 of a front pincers 80 is secured to the upper end of the bar 76. The lower end of the bar 76 is secured to a bracket 82 on which a pair of air operated motors 84 are mounted. The piston rods 86 of the motors 84 are connected to a hanger 88, and a pin 90 is threaded into the hanger to extend upwardly thereof. The pin 90 is connected to a bar 92 that is slidable in ways formed in the bar 76. The lower jaw 94 of the pincers 80 is mounted to the upper end of the bar 92.

Above the ledge 48 the housing 64 is formed into a cylinder 96 in which a piston 98 is vertically movable. A piston rod 100, extending upwardly of the piston 98, is slidable in a bushing 102 that in turn is slidably mounted on the piston rod 100. A shoulder 104 is provided at the upper end of the bushing 102 and bears against the housing 64. A compression spring 106, interposed between the shoulder 104 and the piston 98, yieldably seats the shoulder against the housing bottom and yieldably urges the piston 98 downwardly against the force of the pressurized air that is normally in the cylinder 96. A bar 108, connected to and extending upwardly of the rod 100, is slidable in a vertical guideway 110 formed at the front end of the housing 64 above the cylinder 96, and a front retarder blade 112 is affixed to the top of the bar 108. The pincers 80 and the retarder blade 112 are both positioned rearwardly of the applicator-support 60 and the insole rests 32, 34.

Referring to FIGS. 2 and 8-11, a gib 114 is bolted to the ledge 48 forwardly of the housing 64 on each side of the applicator 60 and insole rests 32,34 by means of headed bolts 116. A column 118 is mounted on each gib 114. A cavity 120 is provided in each column 118 and an upwardly extending air actuated motor 122 is mounted in each cavity. A line 124 is connected to the bottom of each motor 122 to thereby enable pressurized air to force the piston rods 126 of the motors 122 upwardly. Each of the piston rods 126 is pinned to a block 128 and a side retarder blade 130 is secured in each block 128 to extend upwardly thereof by a spring pressed detent 132. A sleeve 134 is welded to each block 128. Each sleeve 134 extends downwardly of a

block 128 into a cavity 120 between a motor 122 and a column 118. A spline 138, secured to each sleeve 134, extends into a vertical groove 140 provided in each of the columns 118 whereby the blocks 128 and retarder blades 130 are precluded from movement about the vertical axes of the sleeves 134 during their vertical movement in response to actuations of the motors 122.

Referring to FIGS. 12-14, a base 142 is secured to the toe post 20 below the toe post extension 28 (see FIG. 4). The base 142 has a pair of slots 144 extending therethrough on opposite sides of the post 20. A block 146 is located below the base 142 straddling each slot 144. A pin 148 is mounted in each block 146 to extend through a slot 144. A sleeve 150, extending through each slot 144, embraces each pin 148 with the bottoms of the sleeves lying on the blocks 146. A plate 152 is located above the base 142 to straddle each slot 144 on opposite sides of each pin 148 and sleeve 150. A cross-pin 154 extends through each associated plate 152, sleeve 150 and pin 148 to prevent relative movement of these members about the axes of the pins 148. A universal joint 156 is connected, as by welding, to the upper ends of each pin 148 and sleeve 150. An air actuated motor 158, which acts as a side pincers carrier, is connected to and extends upwardly of the top of each universal joint 156. A shaft 160, rotatably mounted in each plate 152, has an eccentric cam 162 mounted thereto.

Referring to FIGS. 15 and 16, the piston rod 164 of each motor 158 has a spring return air actuated motor 166 connected thereto that is slidably mounted in the motor 158. The inlet pipe 168 of each motor 166 rides in a slot 170 formed in the motors 158 and to preclude rotation of the motors 166 with respect to the motors 158. A side pincers 172 is mounted in a bracket 174 that is affixed to the top of each motor 166. Each pincers 172 comprises an upper jaw 176 and a lower jaw 178, both jaws being swingable about a pin 180 mounted in the bracket 174. Elastic bands 182 extending about the jaws 176 and 178 serve to yieldably urge the jaws to open position. The jaws 176 and 178 respectively have downwardly extending legs 184 and 186 having rollers thereon that are positioned above a cone-shaped cam 188 formed at the top of the piston rod 190 of each motor 166.

Referring to FIGS. 2 and 12, a bracket 192 is attached to the outer side of each block 146 by bolts 194. A tension spring 196 extends between each bracket 192 and each motor 158 to thereby yieldably urge the motors 158 outwardly on the universal joints 156 against the cams 162 with the bottoms of the motors bearing against the cams as indicated in FIG. 13.

Referring to FIGS. 2, 17 and 18, a slide plate 198 is slidably mounted for forward-rearward movement, rearwardly of the insole rests 32, 34, the applicator-support 60, the pincers 80, 172 and the retarders 112, 130, in a head 200, that forms a part of the frame 10, on gibs 202. A motor 204 is connected to the slide plate 198 by means, not shown, to effect forward-rearward movement of the slide plate. Trunnions 206 upstanding from the slide plate 198 mount a pin 208 on which is swingably mounted the mid-portion of a hold-down lever 210 that extends forwardly and rearwardly of the pin 208. A toe hold-down 212 is secured to the front end of the lever 210. An air actuated motor 214,

pivoted to a bracket 216 secured to the frame 10, has a piston rod 218 that is pivoted to the rear of the lever 210.

An air actuated motor 220 is secured to a flange 222 secured to the rear of the slide plate 198. The piston rod 224 of the motor 220 is connected to a housing 226 that is slidably mounted in gibs 228 formed in the slide plate 198. A block 230 is slidably mounted in the gibs 228 forwardly of the housing 226 and is connected to the housing by a bolt 232. A pair of symmetrically disposed wiper cams 234 are slidably supported on a thickened block 236 that forms the forward end of the slide plate 198. The block 236 has pins 238 upstanding therefrom that extend into slots or cam tracks 240 and 242 formed in the wiper cams 234. Forwardly divergent links 244 are pivotally connected at their rear ends to the block 230 and at their forward ends to the wiper cams 234. Wipers 246 are connected to and extend forwardly of the wiper cams 234. The wipers are flat plates having forwardly divergent edges 248 that diverge forwardly from a vertex 250.

As shown in FIG. 2, a U-shaped shoe conforming yoke 252 is mounted to a cover block 254 that is secured to the block 236, the yoke 252 being located above the wipers 246.

Referring to FIGS. 1, 2, 17 and 19, a fluid actuated motor 256 is secured to a hanger 258 depending from the head 200. The piston rod 260 of the motor 256 is connected by way of a plate 262 to a pair of bars 264 that are slidably guided in bosses 266 and 268 affixed to the frame 10. A yoke 270 is secured to and straddles the front ends of the bars 264. A post 272 is mounted to the yoke 270. A heel clamp 274 is mounted to a mount 276, the mount 276 being secured to the top of the post 272. The heel clamp 274 comprises a pair of rearwardly divergent clamp pads 278.

In the idle condition of the machine: the motor 16 and the insole rests 32, 34 carried thereby are in a lowered position; the motor 52 is in the FIG. 4 position so that the applicator-support 60 is in the lower position shown in FIG. 4; the front pincers 80 is in a raised position with the jaw 78 in its uppermost position due to the projection of the piston rod 72 upwardly of the motor 168 and the retraction of the piston rods 86 into the motors 84; pressurized air is entering the cylinder 96 to raise the piston rod 100 and the front retarder 112 with respect to the housing 64 against the resistance of the spring 106; the side retarders 130 are yieldably held in raised positions by the motors 122; the motors 158 are held in outward positions against the cams 162 by the springs 196 and are held by gravity in a forward position due to the inclination from the vertical of the motors 158 and the side pincers 172 carried thereby (FIG. 1); the piston rods 164 of the motors 158 are in an elevated position and the motors 166 are in a lowered position with respect to the piston rods 164 so that the side pincers 172 are in raised positions with their jaws open; the slide plate 198 and the parts carried thereby are caused by the motor 204 to be in a rearward out-of-the-way position; the piston rod 218 is retracted into the motor 214 so that the hold-down 212 is in an elevated position; the piston rod 224 is retracted into the motor 220 so that the wipers 246 are in their retracted open position; and the piston rod 260 is projected out of the motor 256 so that the heel clamp 274 is in a forward position.

Referring to FIGS. 20, 20A and 20B an insole 280 is placed on the support formed by the insole rests 32, 34 with the periphery of its toe portion bearing against the abutments formed by the front retarder 112 and the side retarders 130.

The heel portion of the insole is pressed against and held by the suction cup 42 as indicated in phantom in FIG. 20.

A last 282, having an upper 284 draped thereon, is placed on the insole 280 with its toe portion resting on the insole and the periphery of the toe portion of the last is brought to bear against the retarders 112 and 130 in registry with the corresponding portions of the insole. During the placement of the last on the insole, the toe end of the upper margin is placed between the open jaws of the front pincers 80 and the side pincers 172. At this time the heel portion of the insole, as indicated in phantom in FIG. 20, is spaced from the heel portion of the last bottom. The constraint against movement by the insole on the insole rests 32, 34 afforded by the suction cup 42 retains the insole bearing against the retarders 112, 128 and in registration with the bottom of the last during the placement of the last on the insole.

The operator now raises the heel portion of the insole from the suction cup 42 against the bottom of the last to the solid line position of FIG. 20. At about the same time, the motors 84 are actuated to close the jaws of the front pincers 80 on the toe end portion of the upper margin, the motors 172 are actuated to raise the cams 188 to close the jaws of the side pincers 172 on the sides of the toe portion of the upper margin, and the motors 68 and 158 are actuated. The actuation of the motor 68 causes the front pincers 80 to move downwardly and rearwardly away from the last and the actuation of the motors 158 causes these motors to move the side pincers 172 downwardly to thereby stretch the toe portion of the upper about the last. The downward and rearward movement of the front pincers 80 causes the upper 284 to be pulled in a heel to toe direction on the last so as to cause the heel portion of the upper to be stretched about the heel portion of the last with the upper margin extending downwardly and inwardly of the heel portion of the last periphery, as shown in FIG. 21. The upper margin thus forms a cup extending about the heel portion of the last periphery which acts to retain the insole in registration with the last bottom after the operator has raised the insole from the suction cup 42 against the bottom of the last. The downward and rearward movement of the front pincers 80 also causes the upper margin to drag about the front retarder 112.

The downward movement of the side pincers 172 causes the upper to be stretched tightly about the last 282 with the universal joints 156 enabling the motors 158 and the side pincers 172 carried thereby to swing rearwardly towards the toe end of the shoe assembly, formed by the upper, insole and last, and inwardly of the shoe assembly during the downward movement of the side pincers in the manner described in U.S. Pat. No. 3,477,079. The result of the aforesaid pincers movements is a tight stretching of the upper about the toe portion of the last with the topline 286 (FIG. 21) of the upper stretched tightly on the last. During the movements of the pincers 80 and 172, the toe end portion of the upper 284 is forced about the front retarder 112 (FIG. 21) and forces the front retarder down to

some extent against the yieldable force provided by the pressurized air in the cylinder 96, and the sides portions of the upper are forced about the side retarders 130 and force the side retarders down to some extent against the yieldable forces urging them upwardly. The front retarder 112, by engaging the toe end of the insole and last, prevents rearward or toeward movement of the insole and last during the stretching movement of the front pincers 80, and the side retarders 130, by engaging the sides of the insole and last, prevent lateral movement of the insole and last during the stretching movement of the side pincers 172. Since the front pincers 80 and the side pincers 172 are driven in their stretching movements by yieldable forces created by air under pressure, they terminate these movements when the stretching forces are equalized by the resistance to stretching of the upper. The portions of the stretched upper margin between the front and side pincers are outspread into dog ears 288 (FIG. 21A).

Now the motor 52 is actuated to raise the slide 58 and cause the applicator-support 60 to bear against the periphery of the toe portion of the insole outwardly of the insole rests 32, 34, as indicated in FIG. 21 and 21A, to prevent the insole periphery from drooping downwardly of the last during the below-described wiping operation. This is followed by an actuation of the motor 204 to move the slide plate 198 forwardly from its rearward out-of-the-way position to a forward working position where the parts carried by the slide plate assume the position indicated in phantom in FIG. 21. When the slide plate 198 has completed its forward movement, the motor 16 is actuated to raise the post 20 together with the applicator-support 60, the insole rests 32, 34, the pincers 80 and 172 and the retarders 112, 130 to a level such that the bottom of the insole 280 is above the level of the tops of the wipers 246 an amount that is approximately equal to the thickness of the margin of the upper 284. At about the beginning of the rise of the applicator-support 60, a quantity of cement is extruded through holes 290 and a groove 292 (FIGS. 4 and 21) in the applicator-support 60 against the bottom of the periphery of the insole 280. Shortly after the shoe assembly has commenced its rise, air is admitted to the motor 214 to actuate this motor to force the hold-down 212 against the top of the rising shoe assembly. The hold-down 212 rides upwardly with the shoe assembly during the rise of the shoe assembly.

The shoe assembly was initially so placed on the applicator-support 60 that when the yoke 252 was moved to its forward working position the edges of the last 282 overlapped the inner wall of the yoke. When the shoe assembly is forced upwardly by the motor 16, the yoke 252 snugly engages the upper 284 and constrains the upper to snugly conform to the shape of the last 282.

The parts are so constructed that the raising of the side retarder blades 130 during the rise of the post 20 causes the side retarders to press the dog ears 288 against the bottoms of the wipers 246 and the raising of the front retarder to press the portion of the upper stretched by the front pincers 80 against the bottoms of the wipers 246 immediately to the rear of the vertex 250 of the wipers under the force exerted by the pressurized air in the cylinder 96. During the final increment of the rising movement of the toe post 20, after the retarders 112 and 130 have pressed the upper mar-

gin against the wiper bottoms, the upper is stretched further about the last, and when the upper can no longer be stretched, the pressed margin portions slip between the wiper bottoms and the retarders.

At or near the end of the rise of the toe post 20 and at or near the time that the front retarder 112 has forced the upper margin against the wiper bottoms, the motors 84 are actuated to open the front pincers 80 to release the toe end portion of the upper margin and the pincers 80 can now be moved downwardly and rearwardly to its lowermost position by the motor 68. This arrangement permits the front pincers to be lowered before it can interfere with the wipers and enables the front retarder 112 to engage the upper margin without losing any of the stretch in the upper that had been provided by the front pincers 78. At about the same time, the motor 256 is actuated to move the heel clamp 274 against the heel portion of the shoe assembly. After this, the flow of pressurized air to the motors 166 is cut off and the air in these motors is exhausted to atmosphere to thereby enable the springs 294 (FIG. 15) of these motors to lower the piston rods 190 so that the jaws of the side pincers 172 may open under the influence of the elastic bands 182 and thus release the side portions of the upper margin that have been gripped by the pincers 172. After the pincers 172 release the upper margin, they are lowered by further downward movement of the piston rods 164 of the motors 158.

At this time the parts assume the position shown in FIGS. 22 and 22A.

Now the motor 220 is actuated to move the wipers 246 in their wiping stroke. The actuation of the motor 220, through the housing 226, the block 230 and the links 244, causes the wiper cams 234 and the wipers 246 carried thereby to move with respect to the block 236 with the pins 238 riding in the cam tracks 240 and 242 in a path determined by the configuration of the cam tracks such that the wipers have both inward swinging movement about the vertex 250 and forward translatable movement. The wiper movement causes the wipers to engage the upper margin while the upper is stretched about the last to wipe or fold the upper margin against the insole 280 and bond the upper margin to the insole by means of the cement on the insole.

As the wipers perform their wiping stroke, the motor 52 is actuated to cause the lowering of the applicator-support 60 out of the path of the wipers, the flow of pressurized air to the motors 122 is shut off so as to terminate the application of pressure by the side retarders 130 of the upper margin against the wiper bottoms, the flow of pressurized air to the cylinder 96 is cut off so that the spring 106 can lower the retarder 112 away from the wiper bottoms and the motor 16 is actuated to lower the post 20 and thus lower the insole rests 32, 34 out of the path of the wipers. Towards the end of the wiper stroke, the motor 214 is actuated to force the hold-down 212 downwardly against the forepart of the shoe assembly under greater pressure than had heretofore been applied.

Thus, during the wiping stroke, the applicator-support 60 is first lowered out of the path of the oncoming wipers. After this, the pressures applied by the front retarder 112 and the side retarders 130 forcing the upper margin against the wiper bottoms is relieved, the timing

being such that this takes place after the wipers have crossed under the insole and have started to wipe the upper margin against the insole. This is followed by the lowering of the insole rests 32, 34 out of the path of the oncoming wipers so that the shoe assembly is supported on its bottom solely by the wipers thus enabling the hold-down 212 to press the shoe assembly downwardly directly against the wipers and provide an overwiping pressure. Toward the end of the wiping stroke the hold-down is forced downwardly under relatively heavy pressure for a predetermined length of time to iron the now wiped upper margin against the insole and to enable the cement that is between the wiped upper margin and the insole to bond the upper margin to the insole.

This completes the machine cycle and the machine parts are now returned to their idle position to release the shoe assembly from the machine.

As described above, the insole and last bottom were retained in registration by the bearing of the toe and forepart portions of the insole and last against the abutments constituted by the front retarder 112 and the side retarders 130 and the retention of the heel portion of the insole in the cup formed by the upper margin about the heel portion of the last periphery. When, pursuant to the rise of the shoe assembly by the motor 16, the retarders are pressed against the bottoms of the wipers 246 and thus move out of abutting relation with respect to the toe portion of the shoe assembly, the registration of the insole and the last bottom is retained as a result of the above referred to further stretching of the upper about the last caused by the pressing of the upper margin against the bottoms of the wipers 252 by the retarders 112, 130. This stretching action causes the toe and forepart portions of the upper margin to be stretched downwardly of the last periphery, as indicated in FIG. 22, and thus retains the toe portion of the insole in registration with the corresponding portion of the last bottom.

Upon completion of the machine cycle, the insole is retained in registration with the last bottom as a result of the attachment, by the cement, of the wiped toe portion of the upper margin to the insole. The remainder of the upper margin may therefore be wiped against and attached to the insole by conventional lasting equipment without the use of tacks or other instrumentalities to temporarily secure the insole to the last bottom.

I claim:

1. A method of wiping a selected portion of the margin of an upper, mounted on a last, against the corresponding portion of an insole located on the last bottom comprising: placing the insole on a support; then placing the last, bottom down, on the insole with the selected portion of the insole and the corresponding portion of the last bottom in registration; constraining the insole against movement on the support during the placement of the last on the insole to thereby maintain said portions of the insole and the last bottom in registration; and wiping said portion of the upper margin against and attaching it to the insole while said registration is maintained.

2. A method of wiping the toe portion of the margin of an upper, mounted on a last, against the corresponding portion of an insole located on the last bottom comprising: placing the insole on a support with its toe por-

tion bearing against at least one abutment; then placing the last, bottom down on the insole with the toe portion of the last bearing against said abutment so that said portion of the insole and the corresponding portion of the last bottom are in registration; constraining the insole against movement on the support during the placement of the last on the insole to thereby maintain said portions of the insole and the last bottom in registration; and wiping the toe portion of the upper margin against and attaching it to the insole while said registration is maintained.

3. A method of wiping the toe portion of the margin of an upper, mounted on a last, against the corresponding portion of an insole located on the last bottom comprising: placing the insole on a support with its toe portion bearing against at least one abutment; then placing the last, bottom-down, on the insole with the toe portion of the last bearing against said abutment to place the toe portion of the insole and the corresponding portion of the last bottom in registration; constraining the insole against movement on the support during the placement of the last on the insole to thereby maintain said registration; pulling the upper about the last so as to impart a heel to toe movement to the upper to cause the heel portion of the upper margin to extend downwardly of and form a cup about the heel portion of the last bottom; retaining the heel portion of the insole against the corresponding portion of the last bottom within the cup to thereby maintain the heel portions of the insole and the last bottom in registration; and wiping the toe portion of the upper margin against and attaching it to the insole while said registrations are maintained.

4. The method set forth in claim 3 further comprising: retaining the heel portion of the insole spaced from the corresponding portion of the last bottom while the insole is being constrained against movement during the placement of the last on the insole; and moving the heel portion of the insole against the last bottom prior to the formation of the cup.

5. A machine for wiping a selected portion of the margin of an upper, mounted on a last, against the corresponding portion of an insole located on the last bottom comprising: a support on which first the insole may be placed and then the last may be placed bottom-down on the insole with the selected portion of the insole and the corresponding portion of the last bottom in registration; constraining means, engageable with the insole, to constrain the insole against movement on the support during the placement of the last on the insole to thereby maintain said portions of the insole and the last bottom in registration; and means for wiping said portion of the upper margin against and attaching it to the insole while said registration is maintained.

6. The machine as defined in claim 5 wherein said constraining means comprises: a cup, connected to a source of suction, so located as to be engaged by the insole when the insole is placed on the support.

7. A machine for wiping the toe portion of the margin of an upper, mounted on a last, against the corresponding portion of an insole located on the last bottom comprising: a support on which first the insole may be placed and then the last may be placed bottom-down on the insole; at least one abutment located outwardly of the support for placing said portion of the in-

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sole and the corresponding portion of the last bottom in registration; constraining means, engageable with the insole, to constrain the insole against movement on the support during the placement of the last on the insole to thereby maintain said portions of the insole and the last bottom in registration; and means for wiping the toe portion of the upper margin against and attaching it to the insole while said registration is maintained.

8. The machine as defined in claim 7 wherein said constraining means comprises: a cup, connected to a source of suction, so located as to be engaged by the insole when the insole is placed on the support.

9. A machine for wiping the toe portion of the margin of an upper, mounted on a last, against the corresponding portion of an insole located on the last bottom comprising: a support on which first the insole may be placed and then the last may be placed bottom-down on the insole; at least one abutment located outwardly of the support for placing the toe portion of the insole and the corresponding portion of the last bottom in registration; constraining means, engageable with the insole, to constrain the insole against movement on the support during the placement of the last on the insole to thereby maintain said portions of the insole and

the last bottom in registration; means for pulling the upper about the last so as to impart a heel to toe movement to the upper to cause the heel portion of the upper margin to extend downwardly of and form a cup about the heel portion of the last in which the heel portion of the insole is retained to thereby maintain the heel portions of the last bottom and insole in registration; and means for wiping the toe portion of the upper margin against and attaching it to the insole while said registrations are maintained.

10. The machine as defined in claim 7 wherein said constraining means comprises: a cup, connected to a source of suction, so located as to be engaged by the insole when the insole is placed on the support.

11. The machine as defined in claim 7 wherein the insole and the last are so placed on the support that their toe ends extend rearwardly and their heel ends extend forwardly; and means locating the constraining means forwardly of the support whereby the constraining means engages the heel portion of the insole.

12. The machine as defined in claim 11 wherein said constraining means comprises: a cup connected to a source of suction.

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