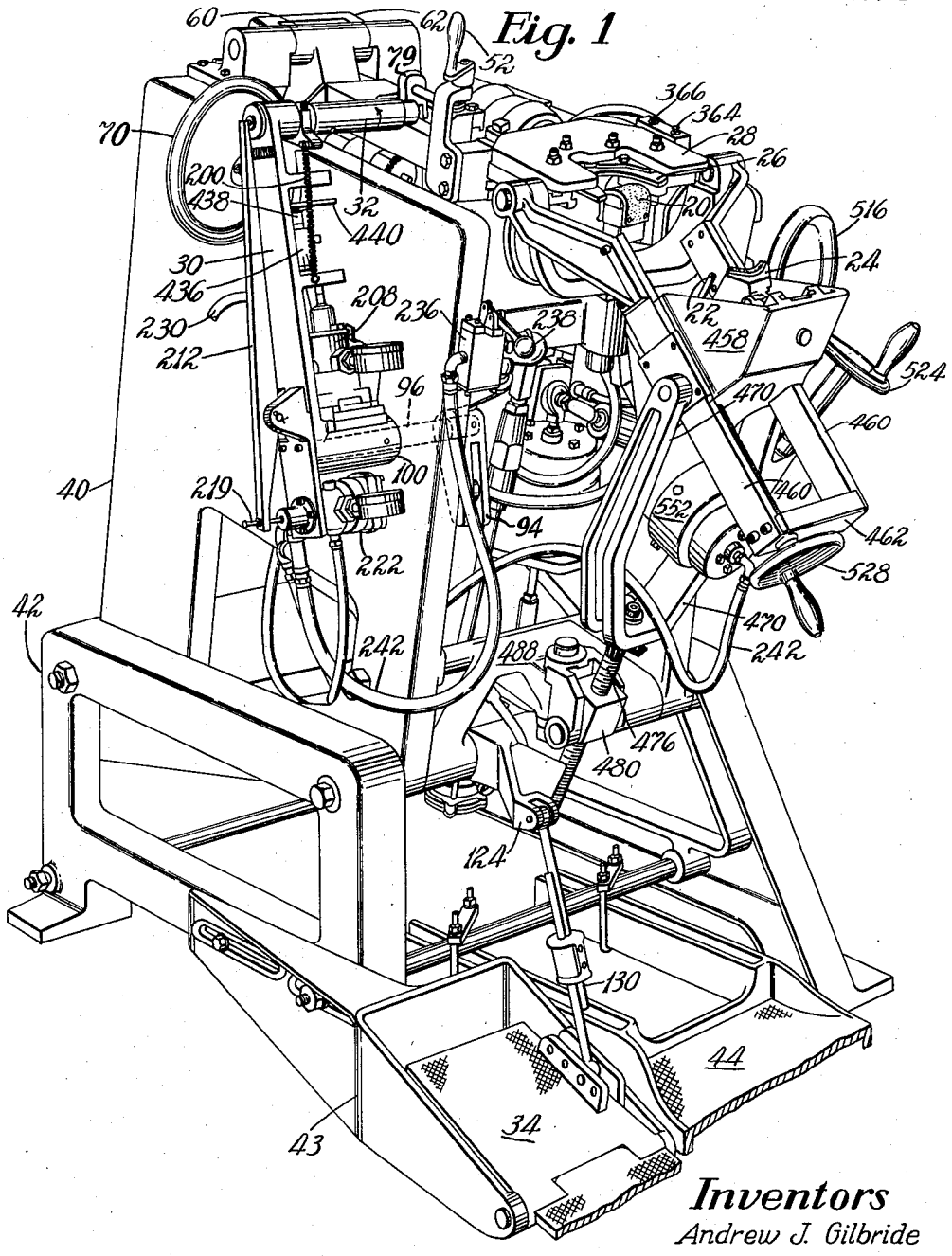
March 1, 1960 A. J. GILBRIDE ET AL 2,926,367

MACHINES FOR SHAPING UPPERS OVER LASTS

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Fig. 1



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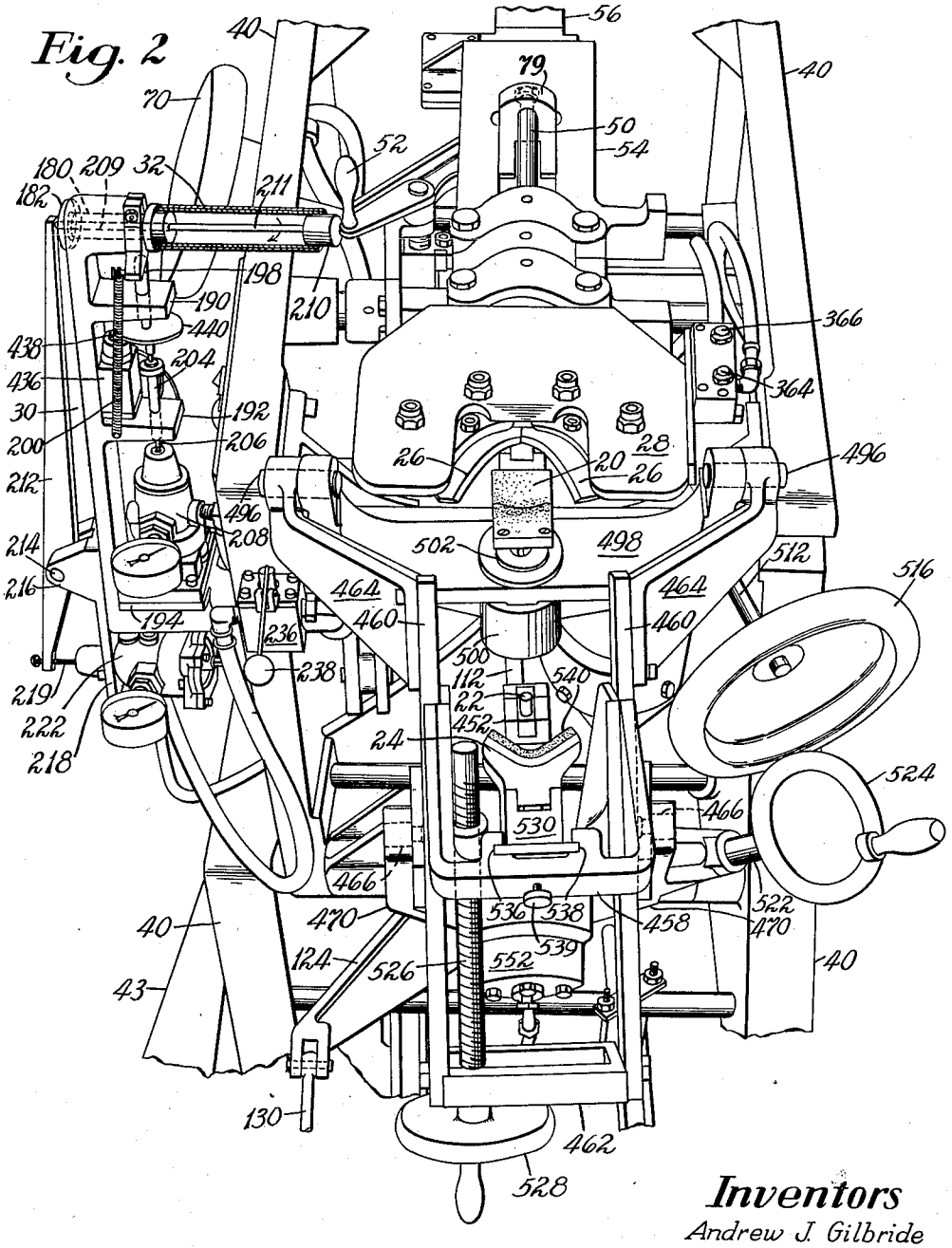
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MACHINES FOR SHAPING UPPERS OVER LASTS

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Fig. 2



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MACHINES FOR SHAPING UPPERS OVER LASTS

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Fig. 3

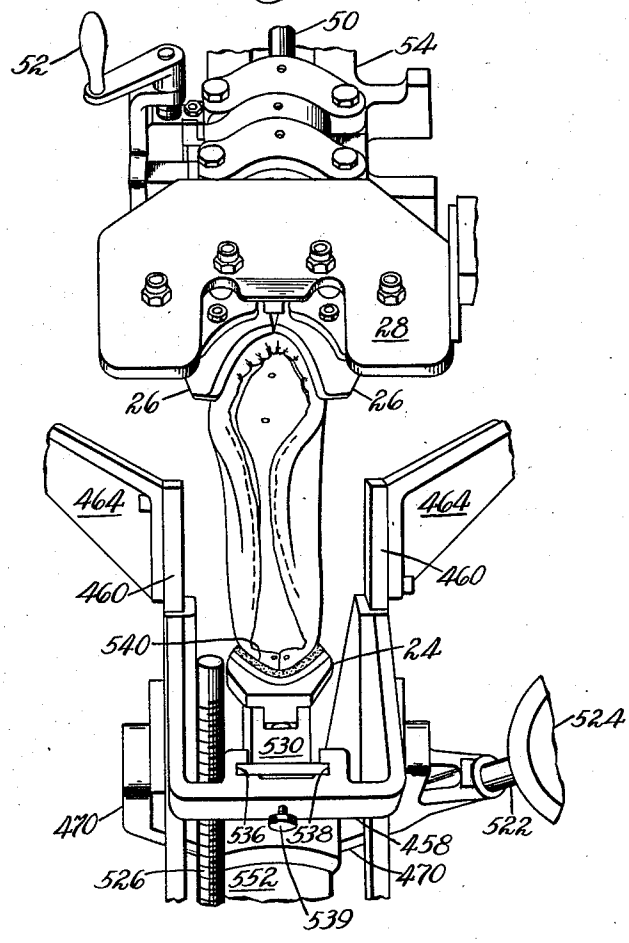


Fig. 4

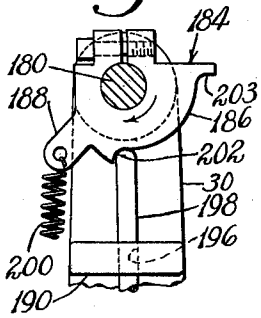
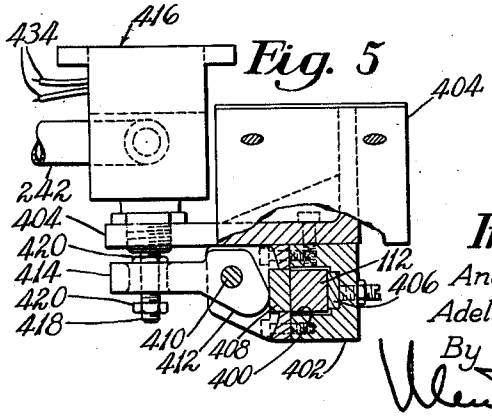


Fig. 5



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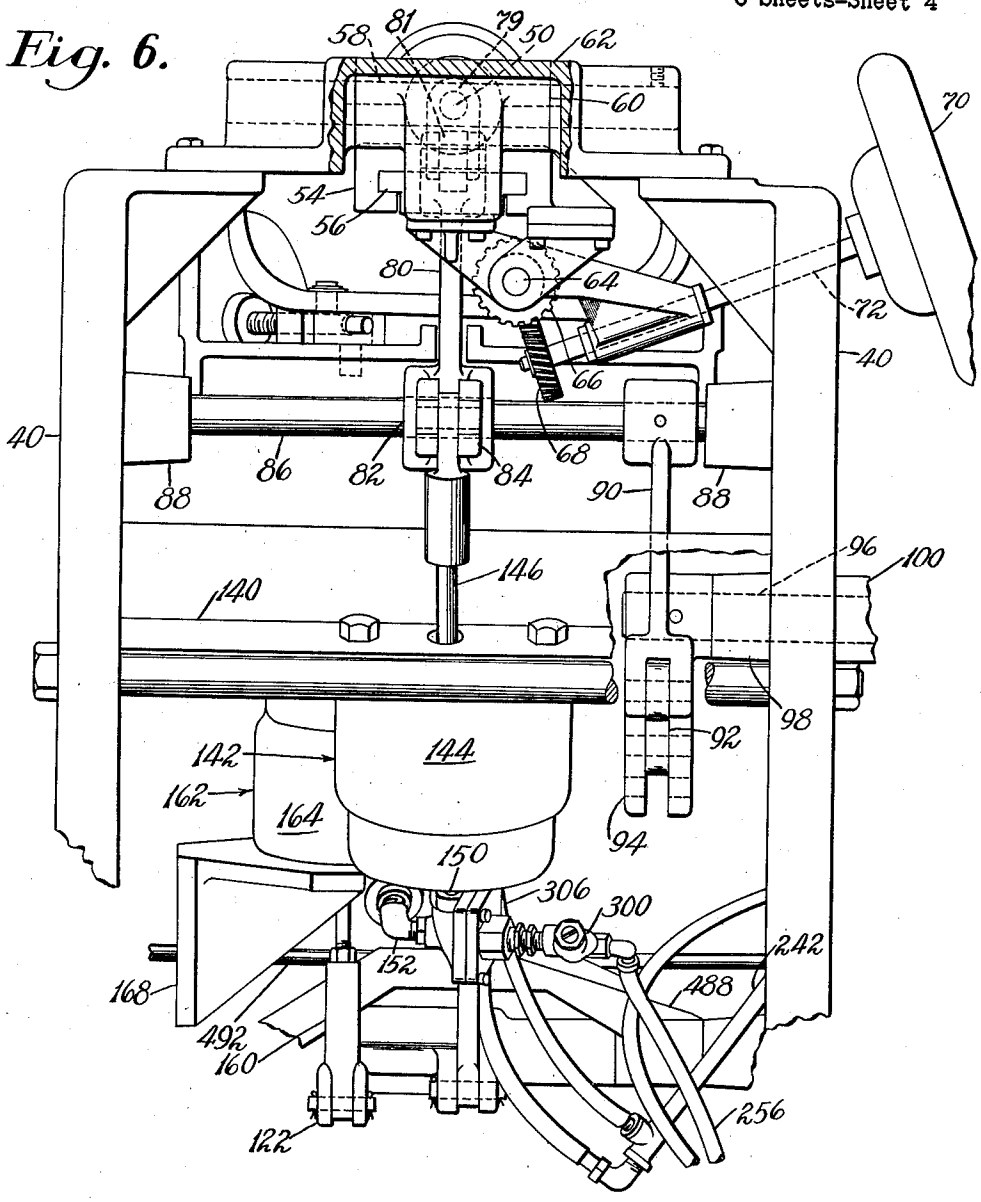
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MACHINES FOR SHAPING UPPERS OVER LASTS

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Fig. 6.



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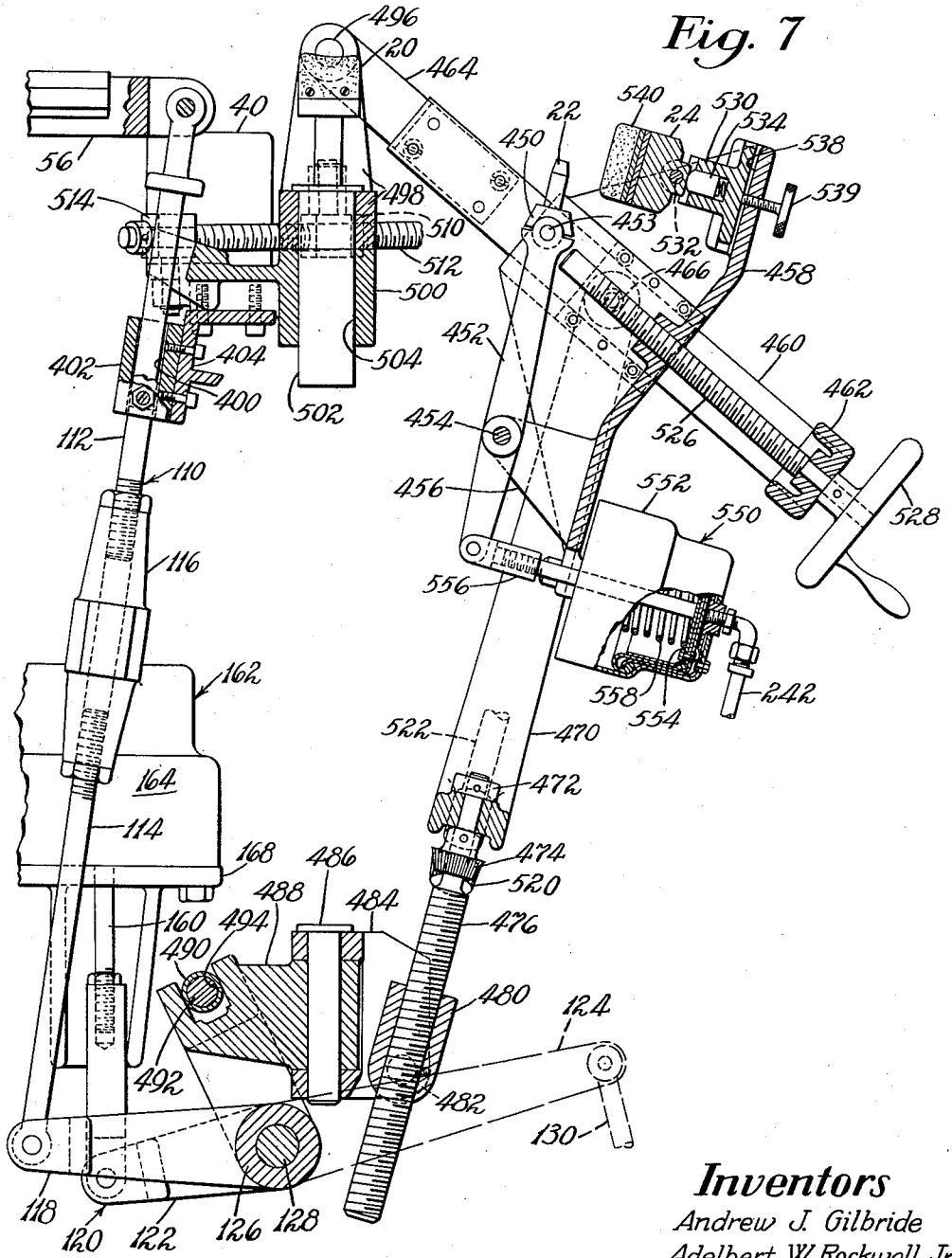
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MACHINES FOR SHAPING UPPERS OVER LASTS

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Fig. 7



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MACHINES FOR SHAPING UPPERS OVER LASTS

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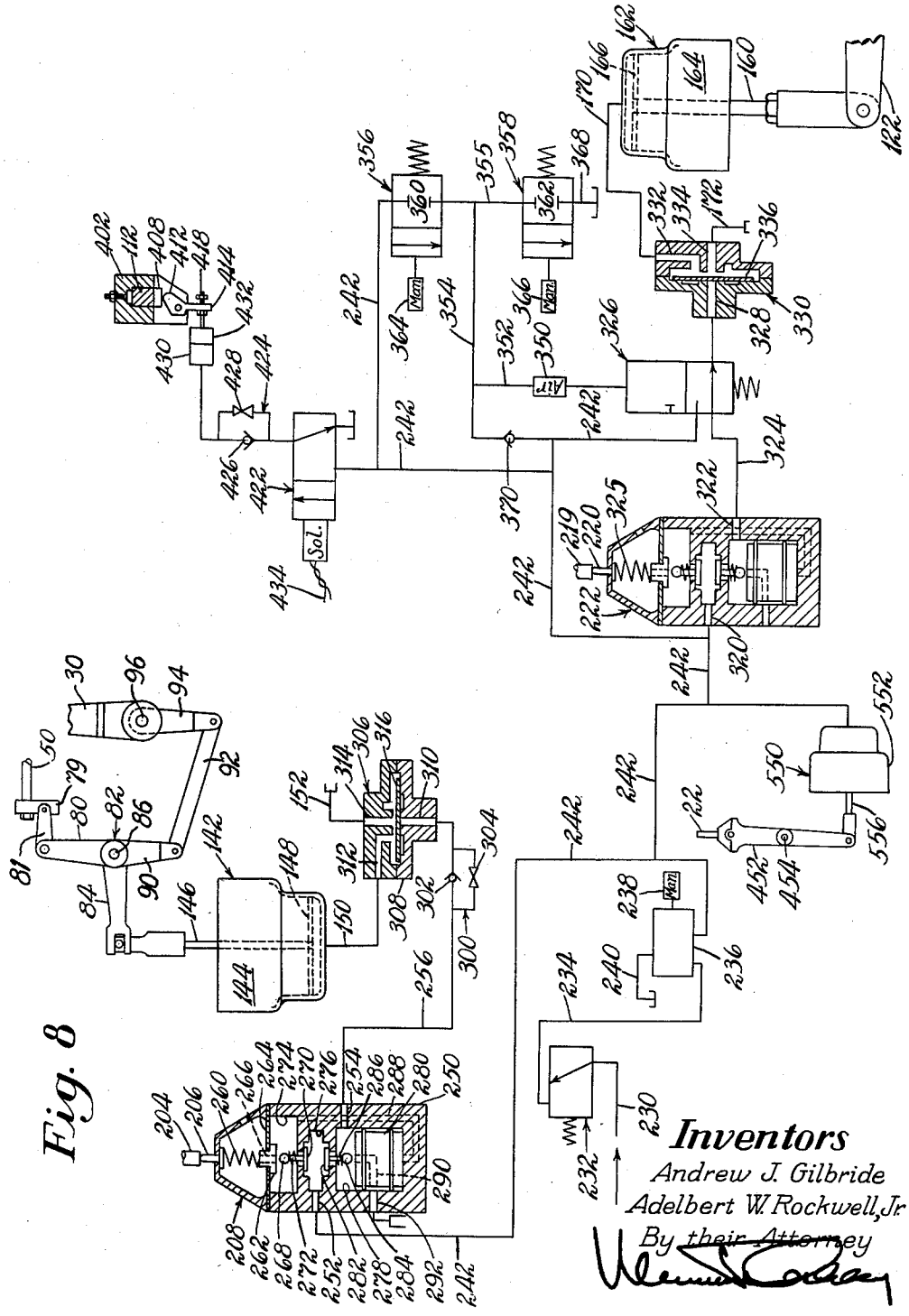


Fig. 8

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United States Patent Office 2,926,367
Patented Mar. 1, 1960

2,926,367

MACHINES FOR SHAPING UPPERS OVER LASTS

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Application February 14, 1957, Serial No. 640,106

40 Claims. (Cl. 12—12.4)

This invention relates to machines for shaping uppers over lasts and is herein illustrated as embodied in a toe lasting machine having a support for a shoe on its last and wipers for working the upper materials of the shoe into lasted position around the toe portion of the last and for thereafter wiping the lasting margin of the upper materials inwardly over and for pressing said lasting margin against the bottom of an insole on the last of the type shown, for example, in U.S. Letters Patent No. 2,146,762, granted February 14, 1939 on an application filed in the names of Arthur F. Pym and Rene E. Duplessis. It will be understood, however, that features of this invention are of broader utility and thus not necessarily limited to use in a toe lasting machine or to embodiment in the specific mechanical construction herein shown.

In toe lasting machines of the above-mentioned type, the shoe on its last is mounted on the shoe support and clamped in place thereon and the upper materials are worked into lasted position around the toe end of the last by means of heightwise movements of the wipers relatively to the toe end of the shoe. These wipers are thereafter utilized to wipe the lasting margin of the upper materials inwardly over the bottom of an insole on the last by means of advancing and closing movements of the wipers relatively to the shoe, and finally the lasting margin which has thus been wiped inwardly is pressed firmly against the bottom of the insole by an additional heightwise movement of the wipers relatively to the shoe. For effecting the heightwise movements of the wipers relatively to the shoe a foot treadle operated mechanism is provided, while the advancing and closing movements of the wipers, relatively to the shoe, are produced by operating mechanism connected to a hand lever.

In view of the considerable amount of physical labor involved in the operation of a toe lasting machine of the mentioned type, various different arrangements involving manually controlled power operated means for effecting both the heightwise movements of the wipers relatively to the shoe and the advancing and closing movements of the wipers have been hitherto proposed. However, although these prior arrangements do purport greatly to reduce the amount of physical labor involved in the toe lasting operation, they all have the serious disadvantage of eliminating the sense of "feel," by means of which the operator was enabled accurately to control the movements of the wipers relatively to the toe end of the shoe being lasted, especially during the so-called upwiping operation and at least the initial stages of the overwiping operation.

In view of the above circumstances, it is a principal object of the present invention to provide, in a machine of the type mentioned above, power operated means for effecting movements of the wipers to reduce the physical labor involved while at the same time retaining for the operator a complete sense of feel for controlling the movements of the wipers relatively to the toe end of the

shoe being lasted. To that end, and in the herein illustrated machine which has a support for a shoe on its last and toe lasting wipers movable relatively thereto to perform the toe lasting operation, the movements of the wipers heightwise relatively to the toe end of the shoe are effected manually by means of a foot treadle directly connected to the wiper head, while the advancing and closing movements of the wipers are effected manually by a hand lever directly connected to the wiper advancing and closing mechnism, and, in addition, power operated means under the direct control of the operator are provided for effecting each of the mentioned wiper movements at the will of the operator at any time during movements of the wipers by the manual means. More particularly, in the case of the heightwise movements of the wipers relatively to the shoe, the power operated means comprises a fluid pressure operated device which is directly connected to the wiper head for moving the head in a direction relatively to the shoe being lasted to cause the wipers, after they have been advanced and closed to wipe the lasting margin of the upper materials inwardly over the insole, to press the lasting margin firmly against the insole, this device being normally free to move with the wiper head during its movements by the foot treadle and arranged to be actuated in response to movement of a control member by the operator. Similarly, in the case of the advancing and closing movements of the wipers, the power operated means comprises a fluid pressure operated device, which is directly connected to the wiper advancing and closing mechanism and normally freely movable with the advancing and closing mechanism when it is being operated by the aforementioned hand lever and which is arranged to be activated in response to movement of a second control member by the operator.

In the herein illustrated machine, these two control members are conveniently mounted on the hand lever which is provided for advancing and closing the wipers for operation by the same hand which is used by the operator to actuate this hand lever, and the means for controlling each fluid pressure operated device includes a valve having a displaceable element connected to one of the control members and arranged to vary the pressure of the operating fluid to vary the force exerted by the device in proportion to the amount of displacement by its associated control member. More particularly, the member for controlling the power operated device associated with the advancing and closing mechanism includes a handle which is rotatably mounted on the mentioned hand lever, and the arrangement is such that the pressure of the fluid admitted to this operating device is proportional to the angular displacement of this handle, while the control member which is associated with the mechanism for moving the wipers heightwise in a direction to press the wipers against the lasting margin of the upper materials comprises a member movable axially of the mentioned control handle, and the arrangement is such that the pressure of the fluid admitted to the last-mentioned operating device is proportional to the amount of axial displacement of this member. Accordingly, during the upwiping of the upper materials around the toe end of the last, which involves relatively little physical labor, the movement of the wipers heightwise relatively to the shoe is effected by the foot treadle and the advancing and closing movements of the wipers are controlled by the hand lever and the highly desirable sense of "feel" for the operator hitherto provided in machines of this type is retained. However, when the overwiping operation is commenced and resistance to the advancing and closing of the wipers becomes greater, the power operated means associated with the wiper advancing and closing

mechanism may be activated to assist the operator in this overwiping action and to the extent desired by the operator. Also, during the overwiping action and/or at the conclusion thereof, when the operator wishes to increase the pressure of the wipers on the over-lasted margin, the power operated means associated with the wiper head may be activated to assist the operator in this "bedding down" action and to the exact extent desired by the operator. Preferably, and in the herein illustrated machine, a second control valve is associated with the fluid pressure operated device for moving the wiper head heightwise relatively to the shoe, this valve being arranged upon initial actuation by the operator through a suitable control device to admit fluid under pressure to the last-mentioned device, independently of the first-mentioned control valve, until again actuated by the operator, thus making it possible to apply and maintain "bedding pressure" on the overlasted margin of the upper materials for a continued period without any special attention by the operator.

As the wipers are advanced and closed to wipe the lasting margin of the upper materials inwardly over the insole at the toe end of the shoe, and more especially just at the beginning of this overwiping operation, it is imperative that the heightwise movement of the wipers be substantially prevented in order that a definite wiping plane may be established so as to assure a well-defined feather line at the toe end of the shoe. To accomplish this solely by means of the foot treadle, which is provided for effecting heightwise movement of the wipers relatively to the shoe, is very difficult and, in fact, practically impossible. This difficulty is avoided in the herein illustrated machine by the provision of means for locking the wipers against heightwise movement during the so-called overwiping operation. More particularly, a fluid pressure operated friction locking device is associated with an operating member which is directly connected to the wiper carrying head and this friction locking device is arranged to be rendered operative simultaneously with the fluid pressure operated means for advancing and closing the wipers and in response to the initial rotation of the above-mentioned control handle. Thus, with this arrangement, just as soon as the wipers are advanced and closed by the power operated means, this locking means becomes effective to prevent heightwise movement of the wipers.

As previously suggested, during the toe lasting operation the shoe is mounted on a support and the upper materials are shaped to the toe end of the last by means of the wipers which move relatively to the toe end of the shoe. Because of the forces applied by the wipers, it is essential that the shoe be quite firmly clamped on the support, and in order to facilitate the toe lasting operation, it is especially desirable that the toe end of each shoe occupy substantially the same longitudinal position relatively to the wipers and also that it be exposed so that the operator may readily observe the progress of the lasting operation and, if he so desires, supplement the action of the wipers by means of hand pincers or other suitable lasting tool. Therefore, there are provided, in the herein illustrated machine, which has the usual toe rest for engaging and supporting the toe end of the shoe being lasted, a heel abutment and a last spindle mounted for movement to press the heel end of a shoe mounted thereon against the heel abutment, and as a result of such pressure to cause the spindle and shoe to be swung in a direction to clamp the toe end of the shoe firmly against the toe rest. More particularly, the heel abutment and the mentioned spindle are mounted for adjusting movements, toward and away from the toe rest, to accommodate shoes of different sizes; heightwise relatively to the toe rest to accommodate shoes on lasts of different heel heights, and angularly about a vertical axis extending through the toe rest to accommodate right and left shoes, as well as shoes on lasts of different styles, and fluid pressure operated means are provided for effecting movement of the last spindle to press the heel end of a shoe thereon against the heel abutment. In the herein illustrated machine, a manually operable valve is provided for controlling the flow of fluid under pressure to the last-mentioned fluid pressure operated device and preferably this valve is also adapted to control the flow of fluid under pressure to the three other control valves mentioned above and provided for controlling power movements of the wipers. Novel features of this improved shoe supporting and clamping mechanism are being claimed in a copending application Serial No. 776,279, filed November 25, 1958, as a division of the present application.

The above and other objects and features of the invention will appear in the following detailed description of a preferred embodiment thereof which is illustrated in the accompanying drawings and will be pointed out in the claims.

In the drawings,

Fig. 1 is a view in perspective of a toe lasting machine embodying the features of this invention;

Fig. 2 is another perspective view of the machine showing only a portion thereof and at a somewhat enlarged scale;

Fig. 3 is a view similar to that of Fig. 2, but with a number of the parts omitted or broken away and with a shoe shown in the machine;

Figs. 4 and 5 are detail views of two different parts of the machine;

Fig. 6 is still another perspective view of the machine looking at the rear portion thereof;

Fig. 7 is a view in side elevation of portions of the machine with some parts omitted and others shown in vertical section; and

Fig. 8 is a diagrammatic view of the fluid pressure operating and control system of the machine.

Referring to these drawings, and particularly to Fig. 1, the toe lasting machine which is therein illustrated is provided with shoe supporting means comprising a toe rest 20 on which the toe end of a shoe to be lasted is clamped by means of a shoe supporting last pin 22 and a heel abutment 24, see also Fig. 7, while the operating elements of the machine comprise two wipers 26, 26 mounted for advancing and closing movements in a wiper carrying head 28 which is movable heightwise relatively to the toe end of the shoe being lasted.

In common with toe lasting machines of this general type, the herein illustrated machine has manually operated means for advancing and closing the wipers and also for moving the wiper carrying head heightwise relatively to a shoe being lasted, the former comprising a hand lever including an operating arm 30 having a handle 32 mounted thereon while the latter includes a foot treadle 34. The aforementioned parts of the machine are associated with and supported on a main frame construction comprising an upper portion indicated generally by the reference character 40 and a lower portion indicated generally by the reference character 42. As is shown in Fig. 1, there is secured to the lower frame portion 42 a bracket 43 on which the foot treadle 34 is pivotally supported and an auxiliary platform 44 adjacent to the treadle.

The wiper carrier 28, which contains a well-known type of mechanism for advancing and closing the wipers 26, 26 in response to axial movement of an operating rod 50, Figs. 2 and 3, is mounted for angular adjusting movements about a longitudinal axis, in the usual manner by means including a handle 52, on a supporting frame 54, which, in turn, is slidably mounted on a guide member 56, see also Fig. 6. This guide member is pivotally supported on a cross shaft 58 which extends through an upstanding hub portion 60 formed on the guide member and which is supported at its opposite ends on a bracket member 62 secured to the upper side of the frame

construction 40. For effecting relative movement between the guide member 56 and the wiper head supporting frame 54, for the purpose of adjusting the position of the wipers in a longitudinal direction relatively to the toe end of a shoe being lasted, an adjusting screw 64 is provided and arranged to be rotated by means including two spiral gears 66, 68 and a hand wheel 70 carried on the outer end of a shaft 72 which extends outwardly through an opening in the frame construction 40, which opening accommodates movements of this shaft transversely to its own axis when the guide member 56, frame member 54, and the wiper carrier 28 which is mounted thereon are swung about the pivotal axis provided by the shaft 58.

The wiper operating rod 50 has fastened to it a block 79, Figs. 1, 2, 6 and 8, which is connected by means of a link 81, Figs. 6 and 8, to the upper end of an upwardly extending arm 80 of a bell-crank lever 82 which has a rearwardly extending arm 84, Figs. 6 and 8, this bell-crank lever being secured to a cross shaft 86 which is journaled in suitable bearings in bosses 88, 88 formed on the frame construction 40. Also secured to this cross shaft is a downwardly extending arm 90 which is connected, by means of a link 92, to another downwardly extending arm 94, which is secured to the inner end of a shaft 96. The shaft 96, which is journaled in a suitable bearing bore in a boss 98 formed on the frame construction 40, projects outwardly therebetween, and secured to this outwardly projecting portion of the shaft 96 is a hub 100 formed integrally with the above-mentioned arm 30. As will be apparent, the operator may manually advance and close or retract and open the wipers 26, 26 by grasping the handle 32 and swinging the arm 30 toward or away from the front of the machine.

Connected to a forwardly extending portion of the guide member 56 and extending downwardly therefrom is an operating link, indicated generally by the reference character 110, Fig. 7, and comprising an upper portion 112 which is substantially square in cross section, and a lower rod-like portion 114 joined together by a threaded adjusting sleeve 116. The rod 114 is connected to one arm 118 of a three-armed lever, indicated generally by the reference character 120, and having two other arms 122 and 124. This three-armed lever has a hub portion 126 by means of which it is rotatably mounted on a fixed cross shaft 128 associated with the frame construction 40. Extending between the arm 124 of the lever 120 and the foot treadle 34 is an adjustable link 130, Fig. 1. With the arrangement which has so far been described, the herein illustrated machine may be operated to last the toe end of a shoe in exactly the same manner as is done in prior manually operated machines of this general type, effecting the heightwise movement of the wiper carrying head 28 and wipers 26, 26 by means of the foot treadle 34 and advancing and closing or retracting and opening the wipers 26, 26 by means of the arm 30 and handle 32 thereon. However, in the herein illustrated machine, the following improvements are provided which greatly facilitate the lasting operation.

Referring to Fig. 6 there is mounted on a cross member 140 which forms a portion of the upper frame construction 40, a fluid pressure operated device, indicated generally by the reference character 142, and including a cylinder 144 and an operating rod 146 which is connected to a diaphragm 148 within the cylinder, see Fig. 8. The rod 146 is connected to the arm 84 of the bell-crank lever 82 and the arrangement is such that when fluid under pressure, e.g., compressed air is admitted to the lower portion of the cylinder 144 through a pipe 150, Fig. 8, the bell-crank lever 82 will be rotated in a direction to advance and close the wipers 26, 26. On the other hand, when the supply of compressed air to the cylinder 144 is shut off and the lower portion of this cylinder connected to atmosphere, through a pipe 152, the diaphragm 148 of the fluid pressure operated device 142 will be unrestrained so that the wipers 26, 26 may be retracted and opened or advanced and closed at the will of the operator by means of the arm 30 and the handle 32 in the usual manner.

Similarly, the operating rod 160 of a second fluid pressure operated device, indicated generally by the reference character 162, and including a cylinder 164 and a diaphragm 166, see Fig. 8, is connected to the arm 122 of the bell-crank lever 120, Fig. 7, this cylinder being supported on a bracket 168 associated with the frame construction 40, see also Fig. 6. Thus, when fluid under pressure, e.g., compressed air, is admitted to the upper portion of the cylinder 164 through a pipe 170, Fig. 8, the bell-crank lever 120 will be rocked in a direction to move the wiper carrying head downwardly while when the upper end of the cylinder 164 is connected to the atmosphere through a pipe 172, the diaphragm 166 of the fluid pressure operated device 162 will be unrestrained so that the wiper head 28 and wipers 26, 26 carried thereby may be moved upwardly or downwardly, relatively to the toe end of a shoe being lasted, at the will of the operator by means of the foot treadle 34.

Referring to Fig. 2, the handle 32 is formed as a hollow tube which is mounted on a spindle member 180 which is journaled in the upper end of the arm 30 and held in place by a thrust washer 182. Secured to this spindle member is a cam 184 having a cam surface 186 cut thereon and an arm 188 formed integrally therewith, Fig. 4. The arm 30 is provided with three shelf-like projections 190, 192 and 194, Fig. 2, and extending through the shelf-like projection 190 is a guide bore 196 for an operating plunger 198, Fig. 4. At its upper end, this plunger is rounded off into a spherical shape for engagement with the cam surface 186, and a coil spring 200, stretched between the arm 188 and an anchor pin secured to the shelf-like projection 192, normally holds the cam 184 in the angular position shown in Fig. 4 and as determined by the engagement of one of two stop surfaces 202 and 203 on the cam with the plunger 198. At its lower end the plunger 198 bears against the upper end of a second plunger 204 which is guided for vertical sliding movement in a suitable guide bore formed in the shelf-like projection 192, Fig. 2, while the lower end of the plunger 204 contacts the operating stem 206 of a combined control and pressure regulating valve indicated generally by the reference character 208, see also Fig. 8, this valve being supported on the third shelf-like projection 194 on the arm 30, Fig. 2. As will presently appear, the valve 208 is adapted to control the flow of air under pressure to the cylinder 144 of the fluid pressure operated device 142 which is associated with the operating rod 50 for advancing and closing the wipers 26, 26.

As is also shown in Figure 2 of the drawings, there is slidably mounted in the open end of the handle 32 a plunger 210 having an elongated stem 211 secured thereto and extending outwardly through a guide bore 209 in the spindle member 180 on which the handle is mounted. This stem engages the upper end of one arm of a lever 212 which is pivotally mounted on a pin 214 carried by upstanding side plates 216 formed on a bracket member 218 which is secured to the arm 30. Threaded through the other arm of this lever is an elongated screw 219 which bears against the operating stem 220 of a second combined control and pressure regulating valve 222, see Fig. 8, exactly similar in construction to the valve 208 mentioned above. The valve 222 is mounted on the bracket 218, Fig. 2, and is adapted to control the flow of air under pressure to the cylinder 164 of the fluid pressure operated device 162 which is associated with the operating link 122 for effecting heightwise movement of the wiper carrying head 28.

Turning to Fig. 8, air under pressure from a suitable source such, for example, as a factory supply line, is conducted through a pipe 230 to a main pressure regulating valve 232 of conventional construction and diagrammatically illustrated in Fig. 8 of the drawings, this valve having an outlet connected to a pipe 234. A manually operable two-way valve 236 having a manually actuatable plunger connected to an operating handle 283, see also Fig. 2, and adapted in one position to connect the pipe 234 to a main pressure line or pipe 242 having various branches, as diagrammatically illustrated in Fig. 8, and in its other position to connect the pipe 242 to an exhaust line 240, is provided. The valve 208 has a casing 250 provided with an inlet 252 connected to one branch of the pipe 242, and an outlet 254 which is connected to a pipe 256. The operating plunger 206 has an enlarged head which bears against the upper end of a control spring 260 the lower end of which contacts a valve operating member 262 which is mounted on a diaphragm 264 and which has a bore 266 therein. Directly below this valve operating member is a ball-like end 268 on the stem of a valve member 270 which is normally held closed by a spring 272 to shut off communication between two chambers 274, 276, one located above and the other below the valve member 270. Directly below the chamber 276 is a third chamber 278 in which there is slidably mounted a piston 280, and a valve member 282 having a stem with a ball-like end 284 is normally held closed by a spring 286 to shut off communication between the chamber 276 and the chamber 278. Formed in the casing 250 is a passageway 288 which connects the chamber 274 with the chamber 278 at a point beneath the piston 280 thereon, and the piston 280 is formed with a passage 290 having an upwardly extending portion in alinement with the ball-like end 284 of the stem of the valve 282 and a laterally extending portion which is always in communication with an outlet 292.

The valve construction which has just been described is a commercial type available in the market and operates in the following manner. With the parts in the positions shown in Fig. 8, air under pressure admitted through the inlet 252 from the main pressure line 242 is trapped within the chamber 276 by the closed valve members 270 and 282. When the plunger 206 is moved downwardly in response to rotation of the handle 32 in the direction of the arrow, it will operate through the spring 260 to depress the valve operating member 262 and eventually to open the valve 270, the ball-like end 268 on the stem of the valve 270 now closing exhaust through the bore 266 in the valve operating member 262. Air under pressure will now flow from the chamber 276 through passageway 288 to the chamber 278 and elevate the piston 280 therein. This rising piston will open the valve 282 and thus admit air under pressure to the chamber 278 above the piston, and since the ball end 284 on the stem of the valve 282 will close the passage 290, this air under pressure will flow out through the outlet 254 to the pipe 256. However, as soon as the pressure of the air in the pipe 256 builds up to a point determined by the force exerted by the spring 260, the diaphragm 264 will be elevated enough to permit the exhausting of some air through the passage 266, thus permitting the piston 280 to drop slightly and enough to cause valve 282 to close without, however, opening passage 290 to the chamber 278. Closure of the valve 282 shuts off the flow of air under pressure to the outlet 254 and thus to the pipe 256. Therefore, it will be apparent that the depression of the operating plunger 206 of the valve 208 not only serves to control the flow of air under pressure by admitting it to the pipe 256 but also operates to regulate the pressure of the air thus admitted to the pipe 256 in accordance with the amount the spring 260 is compressed by the operating plunger 206.

The pipe 256 is connected to the pipe 150 which leads to the lower end of the cylinder 144, Fig. 8, through a commercial type of flow control valve, indicated generally by the reference character 300 and including a check valve 302 and a restriction 304, and a commercial type of quick release valve indicated generally by the reference character 306 and including a casing 308 having an inlet passage 310, an outlet passage 312 and an exhaust passage 314, together with a control diaphragm 316, this quick release valve operating to connect the outlet passage 312 to the exhausted passage 314 when there is no air under pressure in the inlet 310 and to shut off this exhaust passage and connect the inlet passage 310 to the outlet passage 312 when air under pressure from the pipe 256 is admitted to the inlet 310. Therefore, when the operator rotates the handle 32 in the direction indicated by the arrows, Figs. 1, 2 and 4, air under pressure will be admitted to the cylinder 144 of the fluid pressure operated device 142, and this air acting through the diaphragm 148, operating rod 146, and lever 82 will apply a force to the wiper operating rod 50 in a direction tending to advance and close the wipers 26, 26. Moreover, the intensity of the force thus applied to the rod 50 will be proportional to the pressure of the air as determined by the amount of angular displacement of the handle 32. Hence, by suitable rotation of the handle 32, the operator may control the admission of air to the cylinder 144 and also regulate its pressure.

The valve 222, referred to above, is in every respect exactly like the valve 208, the construction and operation of which has just been described, and therefore a complete description of this second combined control and pressure regulating valve is deemed unnecessary. It may, however, be noted that this valve has an inlet 320 which is connected to one branch of the main pressure pipe 242, an outlet 322 which is connected to a pipe 324, and a compression spring 325 which is adapted to be compressed more or less by the operating plunger 220 of the valve to control the flow of air under pressure to the pipe 324 and to regulate its pressure. The pipe 324 is connected through a pilot-operated two-way valve 326 which is of conventional construction and diagrammatically illustrated in Fig. 8, to the inlet passage 328 of a second quick release valve, indicated generally by the reference character 330 and exactly similar to the valve 306 referred to above. This quick release valve has an outlet passage 332 connected to the pipe 170 which, as previously explained, leads to the cylinder 164 of the fluid pressure operated device 162, an exhaust passage 334 connected to the exhaust pipe 172, and a control diaphragm 336. As will be apparent, by pushing the plunger 210 with the thumb of the hand which is grasping the handle 32, the operator may cause air under pressure to be admitted to the cylinder 164 and this air under pressure, acting through the diaphragm 166, rod 160, lever 120, and link 110, will apply a force tending to move the wiper head downwardly, thereby causing the wipers 26, 26 to exert a downward pressure on the lasting margin of the upper at the toe end of a shoe and the intensity of the pressure so exerted will be proportional to the pressure of the air as determined by the extent of movement imparted to the plunger 210.

In the case of the handle 32, when it is released the spring 200 will return it to its original position, see Fig. 4, thereby immediately discontinuing the flow of air under pressure to the pipe 256 and causing the cylinder 144 to be connected to the exhaust pipe 152, while in the case of the plunger 210, the spring 325 of the valve 222 is sufficient to return this plunger to its original position, thus shutting off the flow of air under pressure to the pipe 324 and connecting the cylinder 164 to the exhaust pipe 172. However, if desired, an additional spring means, for example a coil spring surrounding stem 211

and interposed between the spindle 180 and plunger 210, may be provided for this purpose. Hence, just as soon as the flow of air under pressure to the pipes 256 and 324 is shut off by the return of the handle 32 and plunger 210 to their original positions, the diaphragms 148 and 166 are free to move with the wipers and wiper carrying head as they are manually actuated by the operator by means of the handle 32 and treadle 34.

At the conclusion of the lasting operation and when the overwiping operation has been completed, the operator may wish to apply a so-called "bedding down" pressure to the overlasted margin of the upper materials by the wipers for a continued period without any attention on his part. For this purpose, the following arrangement is provided. The pilot operated valve 326, which has been referred to above, is, as diagrammatically illustrated in Fig. 8, adapted to be operated by air under pressure to shut off the pipe 324 from the quick release valve 330 and, instead, to connect a branch of the main pressure pipe 242 to the quick release valve. For thus operating the valve 326, a cylinder 350 is provided, as diagrammatically illustrated in Fig. 8, this cylinder being connected by pipes 352, 354 and 355 to two manually operable off-on valves 356 and 358 having, respectively, spring returned operating plungers 360, 362 and operating buttons 364, 366. The valve plunger 360 of the valve 356 normally shuts off the flow of air under pressure from a branch of the main pressure pipe 242 to the pipe 355, while the plunger 362 of the valve 358 normally shuts off the pipe 355 from an exhaust pipe 368. Thus, by pushing the button 364, which, together with the button 366, is conveniently located on the wiper carrying head 28, see Fig. 2, the operator can admit air to the cylinder 350 and thus cause the valve 326 to connect the main pressure line to the quick release valve 330. Air from the main pressure line will now be supplied to the cylinder 164 after the plunger 360 is released and permitted to return to its original position. To release the air from the cylinder 164, the operator pushes the button 366, thus connecting the lines 352 and 354 to exhaust and permitting the valve 326 to return to its original position, whereupon, if the plunger 210 has been returned to its original position, the cylinder 164 will be connected to exhaust. The same result will also be obtained if the operator moves the valve 236 so as to connect the main pressure line 242 to the exhaust line 240, inasmuch as a ball check valve 370, Fig. 8, will open to permit the return of the valve 326 to its original position. Now, when the valve 236 is next operated to connect the main pressure line 242 to the pipe 234, no "bedding down" action will be obtained until the valve 326 is reset by pushing the button 364.

For locking the wiper carrying head against upward movement during the overwiping operation, the upper portion 112 of the link 110 is loosely received within a U-shaped opening 400 formed on a member 402 which is secured to a bracket 404 associated with the upper portion of the frame construction 40, Figs. 5 and 7. At one side, the portion 112 of the link 110, which as noted above is generally square in cross section, bears against a friction plate 406, while resting against the opposite side of the portion 112 is a locking plate 408. Pivotally mounted on the member 402 by means of a pin 410 is a locking cam 412 having an operating arm 414, Fig. 5. Also mounted on the bracket 404 is an electrically controlled fluid operated actuating device, indicated generally by the reference character 416 and having an operating rod 418 which is operatively connected to the arm 414 by means of nuts 420, 420. As shown diagrammatically in Fig. 8 of the drawings, this actuating device includes a solenoid operated valve, indicated generally by the reference character 422, arranged, when the solenoid is energized, to connect a branch of the main pressure line 242, through a conventional flow control valve, indicated generally by the reference character 424, and including a check valve 426 in a restriction 428, to a cylinder 430 within which there is an operating piston 432 carrying the above-mentioned operating rod 418. The solenoid of the valve 422 is connected through suitable leads 434 and a microswitch 436, having an operating plunger 438 and mounted on the arm 30, to a suitable source of electrical energy, not shown. Secured to the plunger 198, which has been mentioned above, and extending outwardly over the operating plunger 438 of the microswitch 436, is a disk 440, and the arrangement is such that the initial downward movement of this disk, together with the plunger 198, in response to angular movement of the handle 32, closes the switch 436 and energizes the solenoid, thus shifting the valve 422 to a position to admit air under pressure to the cylinder 430. This causes the cam 412 to press the locking plate 408 firmly against the portion 112 of the link 110, thus frictionally locking the wiper head against heightwise movement relatively to the shoe being lasted.

The last pin 22 has a base portion 450 and is pivotally mounted on the upper end of a lever 452, by means of a pin 453, Fig. 7. This lever, in turn, is pivotally mounted on a cross shaft 454 carried by forwardly extending portions 456 formed on a frame-like member 458 which is shaped as shown in Figs. 1, 2, 3 and 7. The frame-like member 458 is mounted for sliding movement on two spaced supporting arms 460, 460 which are joined together at their outer ends by a cross piece 462 and which carry at their inner ends arm extensions 464, 464, see Figs. 2 and 3. Pivoted at its upper ends on two studs 466, 466, mounted on the opposite sides of the member 458, is a yoke-like member 470, Fig. 2. Rotatably mounted in the lower end of this yoke-like member and held against axial movement relatively thereto by means of a collar 472 and a bevel gear 474 is a supporting and adjusting screw 476 which is threaded through a block 480, Fig. 7. This block is mounted for swinging movement about a substantially horizontal axis by means of trunnions 482 on an intermediate member 484 which, in turn, is mounted for swinging movement about a substantially vertical axis, by means of a pin 486, on a supporting member 488. This supporting member is mounted on the cross shaft 128, on the opposite sides of the lever 120, and is held against rotation thereon by means of a sleeve 490 carried by a second cross shaft 492 and engaging a recess 494 formed in the member 488. At their outer ends, the arm extensions 464 are pivotally mounted, by means of stub shafts 496, 496 on the oppositely extending arms of a yoke 498 for swinging movement about a horizontal axis extending substantially transversely of the machine and tangent to the operating surface on the toe rest. This yoke is journaled for swinging movement about a substantially vertical axis on a transversely extending portion 500 of the upper frame construction 40 by means of a post 502 which is keyed to the yoke member and rotatably mounted in a bore 504 formed in the frame portion 500. Supported on an upwardly extending portion of the post 502 is the toe rest 20.

For swinging the yoke 498 about the axis of the post 502, thereby to locate the last pin 22 and heel abutment 24, which, as will be presently explained, is supported on the frame-like member 458, in different lateral positions to accommodate shoes on lasts of different styles and/or rights and lefts, there is pivoted on the under side of one of the arms of the yoke a threaded block 510 which receives an adjusting screw 512, Fig. 7. The inner end of this adjusting screw is rotatably mounted and held against axial movement in a block 514, pivotally mounted on the aforementioned frame portion 500, and secured to the outer end of this screw is a hand wheel 516, Fig. 2, by means of which the screw may be rotated. The frame-like member 458 may be raised or lowered in order to accommodate shoes on lasts of various different heel heights, by rotating the supporting and adjusting screw 476 by means of a bevel gear 520 which is in mesh with

the bevel gear 474, mentioned above, and which is secured to the lower end of a shaft 522, Fig. 7. This shaft is journaled in an offset portion formed integrally with one side of the yoke-like member 470 and carried at its upper end is a hand wheel 524, Figs. 2 and 3. The frame-like member 458 may also be moved toward or away from the toe rest 20 to accommodate shoes of different sizes by means of an adjusting screw 526 which is threaded through a portion of the frame-like member 458, Fig. 7. At one end, this adjusting screw is journaled and held against axial movement in the cross member 462 and secured to this end of the shaft is a hand wheel 528.

As shown in Fig. 7, the heel abutment is mounted for swinging movement, about a substantially horizontal axis extending transversely of a shoe in the machine, on a carrier block 530 by means of a pivot pin 532 and a spring-pressed plunger 534 is provided for holding the heel abutment in the mid position in which it is shown in Fig. 7. The block 530 has flanges 536 formed thereon by means of which it is mounted for vertical adjusting movement in guideways 538 formed in the frame-like member 458 when a clamp screw 539 is loosened, see Figs. 2 and 3.

The shoe to be lasted is clamped against the toe rest 20 by moving the last pin 22 rearwardly to bring the heel end of the shoe against the heel abutment 24, this abutment being shaped to receive the heel end of the shoe, see Figs. 2 and 3, and provided with a resilient shoe engaging pad 540. For thus moving the last pin, the lever 452 is swung about the axis of shaft 454 by means of a fluid pressure operated device, indicated generally by the reference character 550, and comprising a cylinder 552 containing a diaphragm 554 having an operating rod 556 which is connected to the lower end of the lever 452. As is shown in Fig. 8, a branch of the main pressure pipe 242 is connected to the cylinder 552. Accordingly, when the valve 236, mentioned above, is operated, by means of its handle 238, to connect the supply pipe 234 to the main pressure pipe 242, the diaphragm 554 will be moved to the left, Fig. 7, against the slight resistance of a return spring 558, thereby moving the last pin 22, carried by the upper end of the lever 452, and with it the shoe mounted thereon, to the right, Fig. 7, to press the heel end of the shoe against the heel abutment 24. As a result of this movement of the shoe by the last pin, and inasmuch as rearward movement of the shoe is arrested by the heel abutment, the shoe will be swung in a counterclockwise direction to clamp its forepart firmly against the toe rest 20.

Although the operation of the machine should be apparent from the above description of its various elements, it will be briefly outlined below. Assuming that the last pin 22 and heel abutment 24 have been initially adjusted laterally, heightwise and lengthwise respectively, by means of the hand wheels 516, 524 and 528, to positions suitable for the shoe to be lasted, the shoe is placed on the last pin by the operator who then actuates the valve 236 to admit air under pressure to the main pressure pipe 242 thereby causing the shoe to be clamped in place on the toe rest 20 and at the same time located in a definite lengthwise position in the machine by virtue of the engagement of its heel end with the abutment 24. If desired, additional adjusting movements may be imparted to the shoe by means of the aforementioned hand wheels. However, once the correct positions of the last pin and heel abutment have been determined for one size of shoe of a particular style, successive shoes of the same size and style will each be located in the correct lengthwise position in the machine regardless of variations in the location of the last pin hole inasmuch as the lengthwise position of the shoe is determined by the fixed heel abutment 24.

With further reference to the shoe supporting means, as just noted, the positions of the last pin 22 and heel abutment 24 may be varied, by means of the hand wheels 524 or 528 if desired, even after the shoe has been clamped against the toe rest 20. Thus, the hand wheel 516 may be rotated to shift the last pin and heel abutment laterally of the machine and during such adjusting movement the toe rest will turn with the shoe thereby avoiding any danger of scuffing or otherwise marking the upper materials. Also the hand wheel 524 may be rotated to raise or lower the last pin and heel abutment and as this adjusting movement is being effected the arms 460, 460 will swing about an axis extending substantially transversely of the machine and tangent to the operating surface of the toe rest so that the toe end of the shoe in effect will roll on the toe rest without any tendency for the upper materials to be stressed or otherwise disturbed. Preferably, the various parts of the shoe supporting means are so proportioned, see Fig. 7, that for any given style of last and within certain limits, as the heel abutment is adjusted by means of the hand wheel 528 to accommodate shoes of different sizes, the last pin and heel abutment will be automatically raised or lowered, relatively to the toe rest, to accommodate the corresponding change in the heightwise position of the top cone of the last. It will also be observed that during the up wiping and over wiping operations, the shoe being lasted is very securely held against rearward movement in response to the substantial forces exerted thereon by the wipers by virtue of the rigid and substantially unyielding support which is provided for its heel end by the heel abutment 24.

Having located and clamped the shoe in the machine, the operator performs the usual upwiping operation manually by means of the handle 32 and the treadle 34 in the same way as in prior bed lasting machines and during this critical operation he has the same control over the wipers and the same sense of feel as before. Depending on the nature of the upper materials, the shape of the last, etc., this upwiping operation may be repeated one or more times before the operator is satisfied that the upper materials are properly shaped to the toe end of the last. When that has been done, the wipers 26, 26 are brought up to the so-called "wiping plane" by means of the foot treadle 34 and while being held against heightwise movement out of this plane the wipers are advanced and closed by the operator to wipe the lasting margin of the upper materials inwardly over the bottom of an insole on the last. This requires the exertion of a considerable force by the wipers to break down and to wipe the upper materials inwardly and, to obtain this force without any extra effort on his part, the operator merely rotates the handle 32, with which he previously has been manually advancing and closing the wipers, thereby rendering the fluid pressure operated device 142 effective to advance and close the wipers with a force determined by the angular displacement of this handle from its initial position.

As the wipers are thus advanced and closed by power, the operator may regulate their movement by pushing rearwardly on the handle 32 and/or by varying the angular position of this handle. Should he wish to retract the wipers and then repeat the overwiping operation, the handle 32 may be returned to its original position thereby releasing the diaphragm 148 of the fluid pressure operated device 142 so that the wipers can be easily retracted manually by means of the handle. During this overwiping operation, just as soon as the handle 32 is rotated to render the fluid pressure operated device 142 effective to advance and to close the wipers, the fluid pressure operated friction locking device discussed above is also rendered operative to resist upward movement of the wiper carrier and wipers thereby making it very easy for the operator to maintain the wipers in the so-called "wiping plane." Also, by momentarily returning the handle 32 to its initial position, the operator may release the aforementioned locking means to permit varying the heightwise position of the wipers in any desired manner by manipulation of the treadle 34.

When the overwiping operation has been completed,

the wipers 26, 26 will have been fully advanced and closed to wipe the lasting margin of the upper materials inwardly over the bottom of an insole at the toe end of the last. Now, the so-called "bedding down" pressure is applied to press the lasting margin of the upper materials firmly and smoothly against the bottom of the insole. Ordinarily and in prior bed lasting machines this pressure would be applied manually by the operator bringing his weight to bear on the heel portion of the treadle 34. With the present machine, however, this presure is applied by the fluid pressure operated device 162 which the operator renders effective by pushing inwardly on the plunger 210 and the force thus applied will be determined by the extent of inward movement of this plunger. Inasmuch as the overwiping operation will have been completed, the operator may return the handle 32 to its original position so as to release the fluid pressure locking device while the "bedding down" pressure is being applied. However, even if he fails to do this the force applied by the fluid pressure operated device 162 is more than sufficient to move the wiper carrier downwardly against the resistance of the friction locking device.

With some kinds of work the "bedding down" pressure need be continued only for a relatively short period while the operator holds the plunger 210 pushed inwardly with his thumb at the end of which period the plunger is released to terminate the "bedding down" pressure. On the other hand, with different kinds of work it may be desirable to continue the "bedding down" pressure for a longer period and without the attention of the operator. To do this, when the wipers have been fully advanced and closed, the operator merely pushes the button 364 whereupon air under pressure from the main pressure pipe 242 will be admitted to the fluid pressure operated device 162 to render it effective to apply the "bedding down" pressure until the operator connects this device to exhaust by pushing the button 366. While the "bedding down" pressure is thus being applied the operator has both hands free for other duties such, for example, as the use of a hand tacker to drive tacks through the overlasted margin of the upper materials just inwardly of the wipers which are holding the upper in lasted position.

At the conclusion of the lasting operation and after the "bedding down" pressure has been applied for the desired length of time and/or the hand tacking operation has been performed, the shoe may be released by movement of the valve 326 to a position to connect the main pressure line 242 to the exhaust line 240, the wipers retracted and opened by the return of the handle 32 to the position in which it is shown in Fig. 1, and the last pin 22 returned by the spring 558 to its original position.

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

1. A machine for shaping uppers over lasts having a support for a shoe on its last, toe wipers mounted for movement heightwise relatively to a shoe on the support and for advancing and closing movements longitudinally relatively to the shoe, manual means for directly effecting said movements of the wipers, a power operated means for effecting each of said movements of the wipers, and means under the direct control of the operator for selectively rendering each of said power operated means operative to effect its particular movement of the wipers relatively to the shoe at any time during movement of the wipers by said manual means.

2. A machine for shaping uppers over lasts having a support for a shoe on its last, toe wipers mounted for movement heightwise relatively to a shoe on the support and for advancing and closing movements longitudinally relatively to the shoe, manual means for directly effecting said movements of the wipers, a fluid pressure operated means for effecting each of said movements of the wipers, and means under the direct control of the operator for selectively rendering each of said fluid pressure operated means operative to effect its particular movement of the wipers relatively to the shoe at any time during movement of the wipers by said manual means.

3. A machine for shaping uppers over lasts having a support for a shoe on its last, toe wipers mounted for movement heightwise relatively to a shoe on the support and for advancing and closing movements longitudinally relatively to the shoe, manual means including a foot treadle for effecting movement of said wipers heightwise relatively to the shoe and a hand lever for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe, a power operated means for effecting each of said movements of the wipers, and means including two control members mounted on said hand lever and under the direct control of the operator for selectively rendering each of said power operated means operative to effect its particular movement of the wipers relatively to the shoe at any time during movement of the wipers by said manual means.

4. A machine for shaping uppers over lasts having a support for a shoe on its last, toe wipers mounted for movement heightwise relatively to a shoe on the support and for advancing and closing movements longitudinally relatively to the shoe, manual means including a foot treadle for effecting movement of said wipers heightwise relatively to the shoe and a hand lever for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe, a fluid pressure operated means for effecting each of said movements of the wipers, and means including two control members mounted on said hand lever and under the direct control of the operator for selectively rendering each of said fluid pressure operated means operative to effect its particular movement of the wipers relatively to the shoe at any time during movement of the wipers by said manual means.

5. A machine for shaping uppers over lasts having a support for a shoe on its last, toe wipers mounted for movement heightwise relatively to a shoe on the support and for advancing and closing movements longitudinally relatively to the shoe, manual means including a foot treadle for effecting movement of said wipers heightwise relatively to the shoe and a hand lever for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe, a power operated means for effecting each of said movements of the wipers, and means under the direct control of the operator for selectively rendering each of said power operated means operative at any time during movement of the wipers by said manual means to effect its particular movement of the wipers relatively to the shoe and for regulating the action of the power operated means to vary the force exerted thereby.

6. A machine for shaping uppers over lasts having a support for a shoe on its last, toe wipers mounted for movement heightwise relatively to a shoe on the support and for advancing and closing movements longitudinally relatively to the shoe, manual means including a foot treadle for effecting movement of said wipers heightwise relatively to the shoe and a hand lever for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe, a fluid pressure operated means for effecting each of said movements of the wipers, and means under the direct control of the operator for selectively rendering each of said fluid pressure operated means operative at any time during movement of the wipers by the manual means to effect its particular movement of the wipers relatively to the shoe and for regulating the action of the fluid pressure operated means to vary the force exerted thereby.

7. A machine for shaping uppers over lasts having a support for a shoe on its last, toe wipers mounted for movement heightwise relatively to a shoe on the support and for advancing and closing movements longitudinally relatively to the shoe, manual means including a foot

treadle for effecting movement of said wipers heightwise relatively to the shoe and a hand lever for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe, a power operated means for effecting each of said movements of the wipers, and means including two control members mounted on said hand lever under the direct control of the operator for selectively rendering each of said power operated means operative at any time during movement of the wipers by said manual means to effect its particular movement of the wipers relatively to the shoe and for regulating the action of the power operated means to vary the force exerted thereby.

8. A machine for shaping uppers over lasts having a support for a shoe on its last, toe wipers mounted for movement heightwise relatively to a shoe on the support and for advancing and closing movements longitudinally relatively to the shoe, manual means including a foot treadle for effecting movement of said wipers heightwise relatively to the shoe and a hand lever for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe, a fluid pressure operated means for effecting each of said movements of the wipers, and means including two control members mounted on on said hand lever and under the direct control of the operator for selectively rendering each of said fluid pressure operated means operative at any time during movement of the wipers by said manual means to effect its particular movement of the wipers relatively to the shoe and for regulating the action of the fluid pressure operated means to vary the force exerted thereby.

9. A machine for shaping uppers over lasts having a support for a shoe on its last, toe lasting wipers, manual means for effecting relative heightwise movements of said wipers and a shoe on the support, manual means for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe, power operated means for effecting said relative heightwise movements of the wipers and the shoe in one direction, and means under the direct control of the operator for selectively rendering said power operated means operative to effect its particular relative movement of the wipers and the shoe at any time during relative movement of said wipers and the shoe by said manual means.

10. A machine for shaping uppers over lasts having a support for a shoe on its last, toe lasting wipers, manual means for effecting relative heightwise movements of said wipers and a shoe on the support, manual means for effecting advancing and closing movements of said wipers relatively to the shoe, fluid pressure operated means for effecting said relative heightwise movements of the wipers and shoe in one direction, and means under the direct control of the operator for selectively rendering said fluid pressure operated means operative to effect its particular relative movement of the wipers and the shoe at any time during relative movement of said wipers and the shoe by said manual means.

11. A machine for shaping uppers over lasts having a support for a shoe on its last, toe lasting wipers, a foot treadle for effecting relative heightwise movements of said wipers and a shoe on the support, manual means including a hand lever for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe, power operated means for effecting said relative heightwise movements of the wipers and the shoe in one direction, and means including a control member mounted on said hand lever under the control of the operator for selectively rendering said power operated means operative to effect its particular relative movement of the wipers and the shoe at any time during relative movement of said wipers and the shoe by said manual means.

12. A machine for shaping uppers over lasts having a support for a shoe on its last, toe lasting wipers, a foot treadle for effecting relative heightwise movements of said wipers and a shoe on the support, manual means including a hand lever for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe, fluid pressure operated means for effecting said relative heightwise movements of the wipers and the shoe in one direction, and means including a control member mounted on said hand lever under the direct control of the operator for selectively rendering said fluid pressure operated means operative to effect its particular relative movement of the wipers and the shoe at any time during relative movement of said wipers and the shoe by said manual means.

13. A machine for shaping uppers over lasts having a support for a shoe on its last, toe lasting wipers, manual means for effecting relative heightwise movements of said wipers and a shoe on the support, manual means for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe, power operated means for effecting said relative heightwise movements of the wipers and the shoe in one direction, and means under the direct control of the operator for selectively rendering said power operated means operative to effect its particular relative movement of the wipers and the shoe at any time during relative movement of said wipers and the shoe by said manual means and for regulating the action of the power operated means to vary the force exerted thereby.

14. A machine for shaping uppers over lasts having a support for a shoe on its last, toe lasting wipers, manual means for effecting relative heightwise movements of said wipers and a shoe on the support, manual means for effecting advancing and closing movements of said wipers relatively to the shoe, fluid pressure operated means for effecting said relative heightwise movements of the wipers and shoe in one direction, and means under the direct control of the operator for selectively rendering said fluid pressure operated means operative to effect its particular relative movement of the wipers and the shoe at any time during relative movement of said wipers and the shoe by said manual means and for regulating the action of the fluid pressure operated means to vary the force exerted thereby.

15. A machine for shaping uppers over lasts having a support for a shoe on its last, toe lasting wipers, a foot treadle for effecting relative heightwise movements of said wipers and a shoe on the support, manual means including a hand lever for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe, power operated means for effecting said relative heightwise movements of the wipers and the shoe in one direction, and means including a control member mounted on said hand lever under the control of the operator for selectively rendering said power operated means operative to effect its particular relative movement of the wipers and the shoe at any time during relative movement of said wipers and the shoe by said manual means and for regulating the action of the power operated means to vary the force exerted thereby.

16. A machine for shaping uppers over lasts having a support for a shoe on its last, toe lasting wipers, a foot treadle for effecting relative heightwise movements of said wipers and a shoe on the support, manual means including a hand lever for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe, fluid pressure operated means for effecting said relative heightwise movements of the wipers and the shoe in one direction, and means including a control member mounted on said hand lever under the direct control of the operator for selectively rendering said fluid pressure operated means operative to effect its particular relative movement of the wipers and the shoe at any time during relative movement of said wipers and the shoe by said manual means and for regulating the action of the fluid pressure operated means to vary the force exerted thereby.

17. A machine for shaping uppers over lasts having a support for a shoe on its last, toe lasting wipers, manual means for effecting relative heightwise movements of said wipers and a shoe on the support, manual means for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe, power operated means for effecting said advancing and closing movements of the wipers, and means under the direct control of the operator for selectively rendering said power operated means operative to effect advancing and closing movements of the wipers and the shoe at any time during relative movement of the wipers and the shoe by said manual means.

18. A machine for shaping uppers over lasts having a support for a shoe on its last, toe lasting wipers, a foot treadle for effecting relative heightwise movements of said wipers and a shoe on the support, a hand lever for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe, power operated means for effecting said advancing and closing movements of the wipers, and means under the direct control of the operator for selectively rendering said power operated means operative to effect advancing and closing movements of the wipers and the shoe at any time during relative movement of the wipers and the shoe by said manual means.

19. A machine for shaping uppers over lasts having a support for a shoe on its last, toe lasting wipers, a foot treadle for effecting relative heightwise movements of said wipers and a shoe on the support, manual means including a hand lever for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe, power operated means for effecting said advancing and closing movements of the wipers, and means including a control member mounted on said hand lever under the control of the operator for selectively rendering said power operated means operative to effect advancing and closing movements of the wipers and the shoe at any time during relative movement of the wipers and the shoe by said manual means.

20. A machine for shaping uppers over lasts having a support for a shoe on its last, toe lasting wipers, a foot treadle for effecting relative heightwise movements of said wipers and a shoe on the support, manual means including a hand lever for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe, fluid pressure operated means for effecting said advancing and closing movements of the wipers, and means including a control member mounted on said hand lever under the direct control of the operator for selectively rendering said fluid pressure operated means operative to effect advancing and closing movements of the wipers and the shoe at any time during relative movement of the wipers and the shoe by said manual means.

21. A machine for shaping uppers over lasts having a support for a shoe on its last, toe lasting wipers, manual means for effecting relative heightwise movements of said wipers and a shoe on the support, manual means for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe, power operated means for effecting said advancing and closing movements of the wipers, and means under the direct control of the operator for selectively rendering said power operated means operative to effect advancing and closing movements of the wipers and the shoe at any time during relative movement of the wiper and the shoe by said manual means and for regulating the action of the power operated means to vary the force exerted thereby.

22. A machine for shaping uppers over lasts having a support for a shoe on its last, toe lasting wipers, manual means for effecting relative heightwise movements of said wipers and a shoe on the support, manual means for effecting advancing and closing movements of said wipers relatively to the shoe, fluid pressure operated

means for effecting said advancing and closing movements of the wipers, and means under the direct control of the operator for selectively rendering said fluid pressure operated means operative to effect advancing and closing movements of the wipers and the shoe at any time during relative movement of the wiper and the shoe by said manual means and for regulating the action of the fluid pressure operated means to vary the force exerted thereby.

23. A machine for shaping uppers over lasts having a support for a shoe on its last, toe lasting wipers, a foot treadle for effecting relative heightwise movements of said wipers and a shoe on the support, manual means including a hand lever for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe, power operated means for effecting said advancing and closing movements of the wipers, and means including a control member mounted on said hand lever under the control of the operator for selectively rendering said power operated means operative to effect advancing and closing movements of the wipers and the shoe at any time during relative movement of the wiper and the shoe by said manual means and for regulating the action of the power operated means to vary the force exerted thereby.

24. A machine for shaping uppers over lasts having a support for a shoe on its last, toe lasting wipers, a foot treadle for effecting relative heightwise movements of said wipers and a shoe on the support, manual means including a hand lever for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe, fluid pressure operated means for effecting said advancing and closing movements of the wipers, and means including a control member mounted on said hand lever under the direct control of the operator for selectively rendering said fluid pressure operated means operative to effect advancing and closing movement of the wipers and the shoe at any time during relative movement of the wiper and the shoe by said manual means and for regulating the action of the fluid pressure operated means to vary the force exerted thereby.

25. A machine for shaping uppers over lasts having a support for a shoe on its last, toe wipers, means for effecting relative heightwise movements between said wipers and said support in one direction to cause the wipers to wipe the upper materials heightwise around the toe end of the last and in the opposite direction for pressing the lasting margin of the upper materials against the bottom of an insole on the last, means for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe on the support to wipe the lasting margin of the upper materials inwardly over the bottom of the insole, and power operated means for effecting relative heightwise movements between said wipers and said support in said last-mentioned direction for causing the wipers to press the lasting margin of the upper materials firmly against the bottom of the insole after they have been wiped inwardly thereover by said wipers including a manually actuatable control device arranged upon actuation by the operator to render said power operated means operative to effect said heightwise movement and to continue the operation of said power operated means until said device is again actuated.

26. A machine for shaping uppers over lasts having a support for a shoe on its last, toe wipers, means for effecting relative heightwise movements between said wipers and said support in one direction to cause the wipers to wipe the upper materials heightwise around the toe end of the last and in the opposite direction for pressing the lasting margin of the upper materials against the bottom of an insole on the last, means for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe on the support to wipe the lasting margin of the upper materials inwardly over the bottom of the insole, and fluid pressure operated

means for effecting relative heightwise movement between said wipers and said support in said last-mentioned direction for causing the wipers to press the lasting margin of the upper materials firmly against the bottom of the insole after they have been wiped inwardly thereover by said wipers including a manually actuatable control device arranged upon actuation by the operator to render said fluid pressure operated means operative to effect said heightwise movement and to continue the operation of said fluid pressure operated means until said device is again actuated.

27. A machine for shaping uppers over lasts having a support for a shoe on its last, toe wipers, means for effecting relative heightwise movements between said wipers and said support in one direction to cause the wipers to wipe the upper materials heightwise around the toe end of the last and in the opposite direction for pressing the lasting margin of the upper materials against the bottom of an insole on the last, means for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe on the support to wipe the lasting margin of the upper materials inwardly over the bottom of the insole, and fluid pressure operated means for effecting relative heightwise movement between said wipers and said support in said last-mentioned direction for causing the wipers to press the lasting margin of the upper materials firmly against the bottom of the insole after they have been wiped inwardly thereover by said wipers including a valve for admitting fluid under pressure to said fluid pressure operated device, and a manually actuatable control device for said valve arranged upon actuation by the operator to render said fluid pressure operated means operative to effect said heightwise movement and to continue the operation of said fluid pressure operated means until said control device is again actuated.

28. A machine for shaping uppers over lasts having a support for a shoe on its last, toe wipers, means for effecting relative heightwise movements between said wipers and said support in one direction to cause the wipers to wipe the upper materials heightwise around the toe end of the last and in the opposite direction for pressing the lasting margin of the upper materials against the bottom of an insole on the last, means for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe on the support to wipe the lasting margin of the upper materials inwardly over the bottom of the insole, and fluid pressure operated means for effecting relative heightwise movement between said wipers and said support in said last-mentioned direction for causing the wipers to press the lasting margin of the upper materials firmly against the bottom of the insole after they have been wiped inwardly thereover by said wipers including a valve for admitting fluid under pressure to said fluid pressure operated means, and a manually actuatable pilot control device for said valve arranged upon actuation by the operator to render said fluid pressure operated means operative to effect said heightwise movement and to continue the operation of said fluid pressure operated means until said device is again actuated.

29. A machine for shaping uppers over lasts having a support for a shoe on its last, toe wipers, a foot treadle for effecting relative heightwise movements between said wiper and said support in one direction to cause the wipers to wipe the upper materials heightwise around the toe end of the last and in the opposite direction for pressing the lasting margin of the upper materials against the bottom of an insole on the last, a hand lever for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe on the support to wipe the lasting margin of the upper materials inwardly over the bottom of the insole, and power operated means for effecting relative heightwise movements between said wipers and said support in said last-mentioned direction for causing the wipers to press the lasting margin of the upper materials firmly against the bottom of the insole after they have been wiped inwardly thereover by said wipers including a manually actuatable control device arranged upon actuation by the operator to render said power operated means operative to effect said heightwise movement and to continue the operation of said power operated means until said device is again actuated.

30. A machine for shaping uppers over lasts having a support for a shoe on its last, toe wipers, a foot treadle for effecting relative heightwise movements between said wiper and said support in one direction to cause the wipers to wipe the upper materials heightwise around the toe end of the last and in the opposite direction for pressing the lasting margin of the upper materials against the bottom of an insole on the last, a hand lever for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe on the support to wipe the lasting margin of the upper materials inwardly over the bottom of the insole, fluid pressure operated means for effecting relative heightwise movement between said wipers and said support in said last-mentioned direction for causing the wipers to press the lasting margin of the upper materials firmly against the bottom of the insole after they have been wiped inwardly thereover by said wipers including a manually actuatable control device arranged upon actuation by the operator to render said fluid pressure operated means operative to effect said heightwise movement and to continue the operation of said fluid pressure operated means until said device is again actuated.

31. A machine for shaping uppers over lasts having a support for a shoe on its last, toe wipers, a foot treadle for effecting relative heightwise movements between said wiper and said support in one direction to cause the wipers to wipe the upper materials heightwise around the toe end of the last and in the opposite direction for pressing the lasting margin of the upper materials against the bottom of an insole on the last, a hand lever for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe on the support to wipe the lasting margin of the upper materials inwardly over the bottom of the insole, and fluid pressure operated means for effecting relative heightwise movement between said wipers and said support in said last-mentioned direction for causing the wipers to press the lasting margin of the upper materials firmly against the bottom of the insole after they have been wiped inwardly thereover by said wipers including a valve for admitting fluid under pressure to said fluid pressure operated device, and a manually actuatable control device for said valve arranged upon actuation by the operator to render said fluid pressure operated means operative to effect said heightwise movement and to continue the operation of said fluid pressure operated means until said device is again actuated.

32. A machine for shaping uppers over lasts having a support for a shoe on its last, toe wipers, a foot treadle for effecting relative heightwise movements between said wiper and said support in one direction to cause the wipers to wipe the upper materials heightwise around the toe end of the last and in the opposite direction for pressing the lasting margin of the upper materials against the bottom of an insole on the last, a hand lever for effecting advancing and closing movements of said wipers longitudinally relatively to the shoe on the support to wipe the lasting margin of the upper materials inwardly over the bottom of the insole, and fluid pressure operated means for effecting relative heightwise movement between said wipers and said support in said last-mentioned direction for causing the wipers to press the lasting margin of the upper materials firmly against the bottom of the insole after they have been wiped inwardly thereover by said wipers including a valve for admitting fluid under pressure to said fluid pressure operated means, and a

manually actuatable pilot control device for said valve arranged upon actuation by the operator to render said fluid pressure operated means operative to effect said heightwise movement and to continue the operation of said fluid pressure operated means until said device is again actuated.

33. A machine for shaping uppers over lasts having a support for a shoe on its last, toe embracing wipers, a wiper head on which said wipers are mounted for advancing and closing movements longitudinally relatively to a shoe on the support, said wiper head being mounted for movement heightwise relatively to said support to cause the wipers to wipe the upper materials around the toe end of the last, manual means for advancing said wipers, manual means for effecting said heightwise movements of the wiper head, locking means operable to resist heightwise movement of the wiper head, and means under the direct control of the operator for rendering said locking means operative to resist heightwise movement of the wiper head as the upper materials are wiped inwardly over the bottom of an insole on the last by the wipers as they are advanced and closed.

34. A machine for shaping uppers over lasts having a support for a shoe on its last, toe embracing wipers, a wiper head on which said wipers are mounted for advancing and closing movements longitudinally relatively to a shoe on the support, said wiper head being mounted for movement heightwise relatively to said support to cause the wipers to wipe the upper materials around the toe end of the last, manual means for advancing said wipers, manual means for effecting said heightwise movements of the wiper head, fluid pressure operated locking means operable to resist heightwise movement of the wiper head, and means under the direct control of the operator for rendering said fluid pressure operated locking means operative to resist heightwise movement of the wiper head as the upper materials are wiped inwardly over the bottom of an insole on the last by the wipers as they are advanced and closed.

35. A machine for shaping uppers over lasts having a support for a shoe on its last, toe embracing wipers, a wiper head on which said wipers are mounted for advancing and closing movements longitudinally relatively to a shoe on the support, said wiper head being mounted for movement heightwise relatively to said support to cause the wipers to wipe the upper materials around the toe end of the last, manual means for advancing said wipers, manual means for effecting said heightwise movements of the wiper head, power operated means for advancing and closing the wipers, friction locking means operable to resist heightwise movement of the wiper head, and means under the direct control of the operator for rendering said power operated means operative to advance and close the wipers and for simultaneously rendering said friction locking means operative to resist heightwise movement of the wiper head as the upper materials are wiped inwardly over the bottom of an insole on the last by the wipers as they are advanced and closed.

36. A machine for shaping uppers over lasts having a support for a shoe on its last, toe embracing wipers, a wiper head on which said wipers are mounted for advancing and closing movements longitudinally relatively to a shoe on the support, said wiper head being mounted for movement heightwise relatively to said support to cause the wipers to wipe the upper materials around the toe end of the last, manual means for advancing said wipers, manual means for effecting said heightwise movements of the wiper head, power operated means for advancing and closing the wipers, fluid pressure operated locking means operable to resist heightwise movement of the wiper head, and means under the direct control of the operator for rendering said power operated means operative to advance and close the wipers and for simultaneously rendering said fluid pressure operated locking means operative to resist heightwise movement of the wiper head as the upper materials are wiped inwardly over the bottom of an insole on the last by the wipers as they are advanced and closed.

37. A machine for shaping uppers over lasts having a support for a shoe on its last, toe embracing wipers, a wiper head on which said wipers are mounted for advancing and closing movements longitudinally relatively to a shoe on the support, said wiper head being mounted for movement heightwise relatively to said support to cause the wipers to wipe the upper materials around the toe end of the last, manual means for advancing said wipers, manual means for effecting said heightwise movements of the wiper head, fluid pressure operated means for advancing and closing the wipers, locking means operable to resist heightwise movement of the wiper head, and means under the direct control of the operator for rendering said fluid pressure operated means operative to advance and close the wipers and for simultaneously rendering said locking means operative to resist heightwise movement of the wiper head as the upper materials are wiped inwardly over the bottom of an insole on the last by the wipers as they are advanced and closed.

38. A machine for shaping uppers over lasts having a support for a shoe on its last, toe embracing wipers, a wiper head on which said wipers are mounted for advancing and closing movements longitudinally relatively to a shoe on the support, said wiper head being mounted for movement heightwise relatively to said support to cause the wipers to wipe the upper materials around the toe end of the last, manual means for advancing said wipers, manual means for effecting said heightwise movements of the wiper head, fluid pressure operated means for advancing and closing the wipers, friction locking means operable to resist heightwise movement of the wiper head, and means under the direct control of the operator for rendering said fluid pressure operated means operative to advance and close the wipers and for simultaneously rendering said friction locking means operable to resist heightwise movement of the wiper head as the upper materials are wiped inwardly over the bottom of an insole on the last by the wipers as they are advanced and closed.

39. A machine for shaping uppers over lasts having a support for a shoe on its last, toe embracing wipers, a wiper head on which said wipers are mounted for advancing and closing movements longitudinally relatively to a shoe on the support, said wiper head being mounted for movement heightwise relatively to said support to cause the wipers to wipe the upper materials around the toe end of the last, manual means for advancing said wipers, manual means for effecting said heightwise movements of the wiper head, fluid pressure operated means for advancing and closing the wipers, fluid pressure operated locking means operable to resist heightwise movement of the wiper head, and means under the direct control of the operator for rendering said fluid pressure operated means operative to advance and close the wipers and for simultaneously rendering said fluid pressure operated locking means operable to resist heightwise movement of the wiper head as the upper materials are wiped inwardly over the bottom of an insole on the last by the wipers as they are advanced and closed.

40. A machine for shaping uppers over lasts having a support for a shoe on its last, toe embracing wipers, a wiper head on which said wipers are mounted for advancing and closing movements longitudinally relatively to a shoe on the support, said wiper head being mounted for movement heightwise relatively to said support to cause the wipers to wipe the upper materials around the toe end of the last, manual means for advancing said wipers, manual means for effecting said heightwise movements of the wiper head, fluid pressure operated means for advancing and closing the wipers, fluid pressure operated friction locking means operable to resist heightwise movement of the wiper head, and means under the

direct control of the operator for rendering said fluid pressure operated means operative to advance and close the wipers and for simultaneously rendering said fluid pressure operated friction locking means operable to resist heightwise movement of the wiper head as the upper materials are wiped inwardly over the bottom of an insole on the last by the wipers as they are advanced and closed.

References Cited in the file of this patent

UNITED STATES PATENTS

1,083,596	Crisp	Jan. 6, 1914
1,957,581	Duplessis	May 8, 1934
2,011,682	Jorgensen	Aug. 20, 1935
2,012,634	Miller	Aug. 27, 1935
2,098,358	Pym	Nov. 9, 1937