

Nov. 7, 1939.

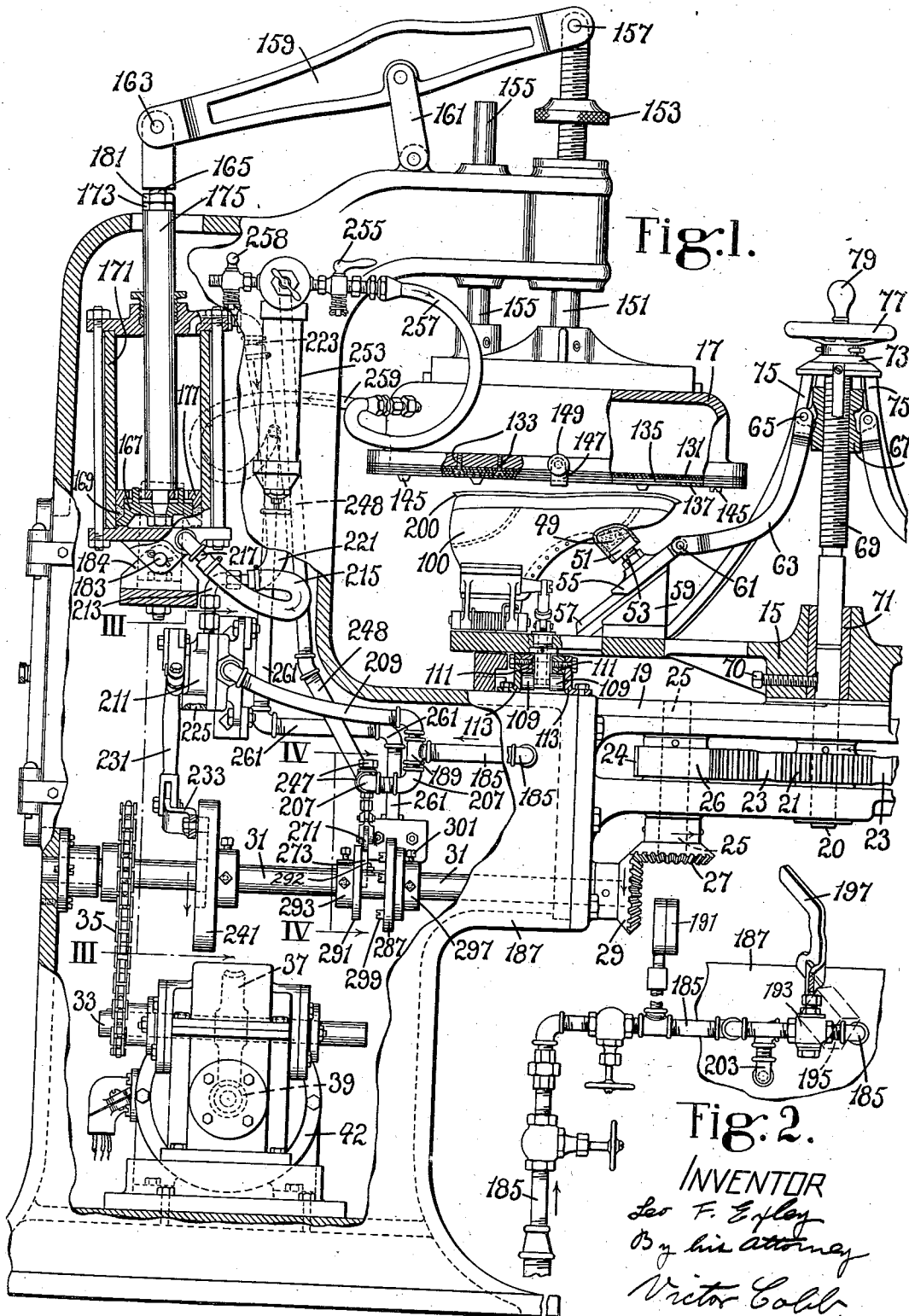
L. F. EXLEY

2,178,990

SOLE-PRESSING MACHINE

Filed May 28, 1936

3 Sheets-Sheet 1



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SOLE-PRESSING MACHINE

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3 Sheets-Sheet 2

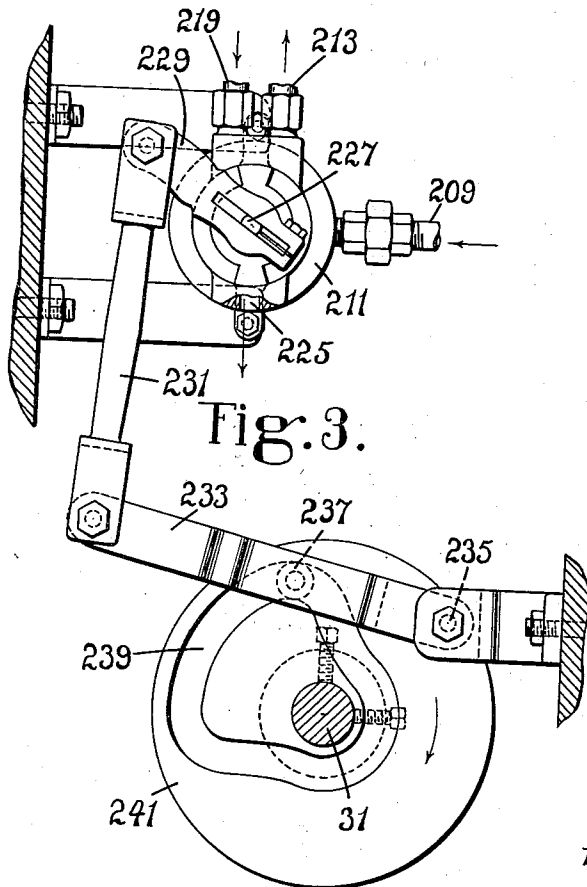


Fig. 3.

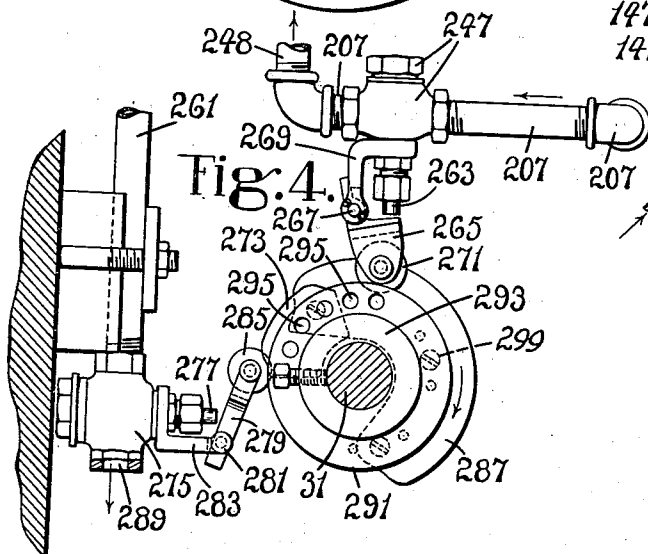


Fig. 4.

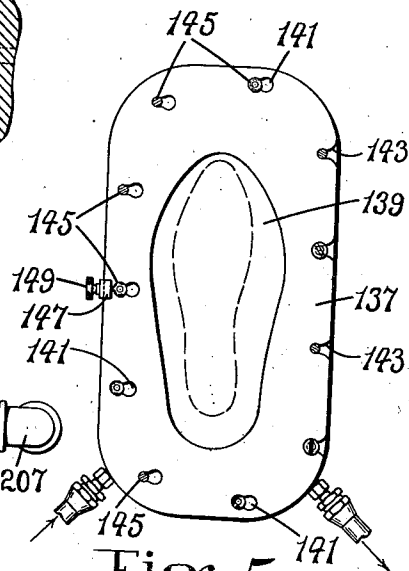


Fig. 5.

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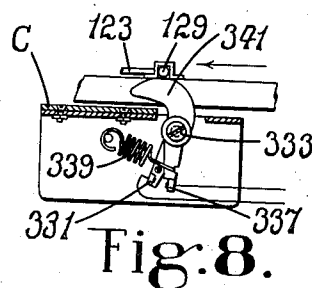
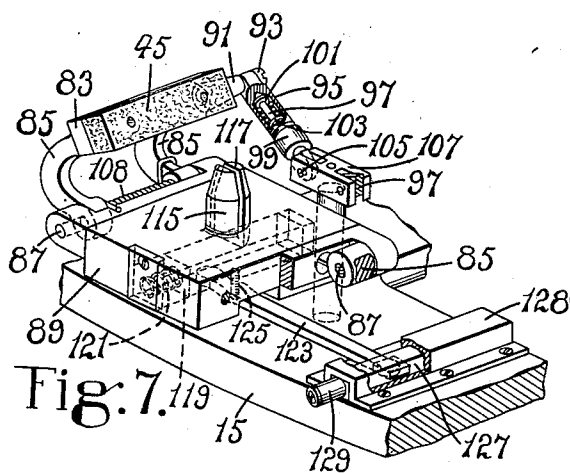
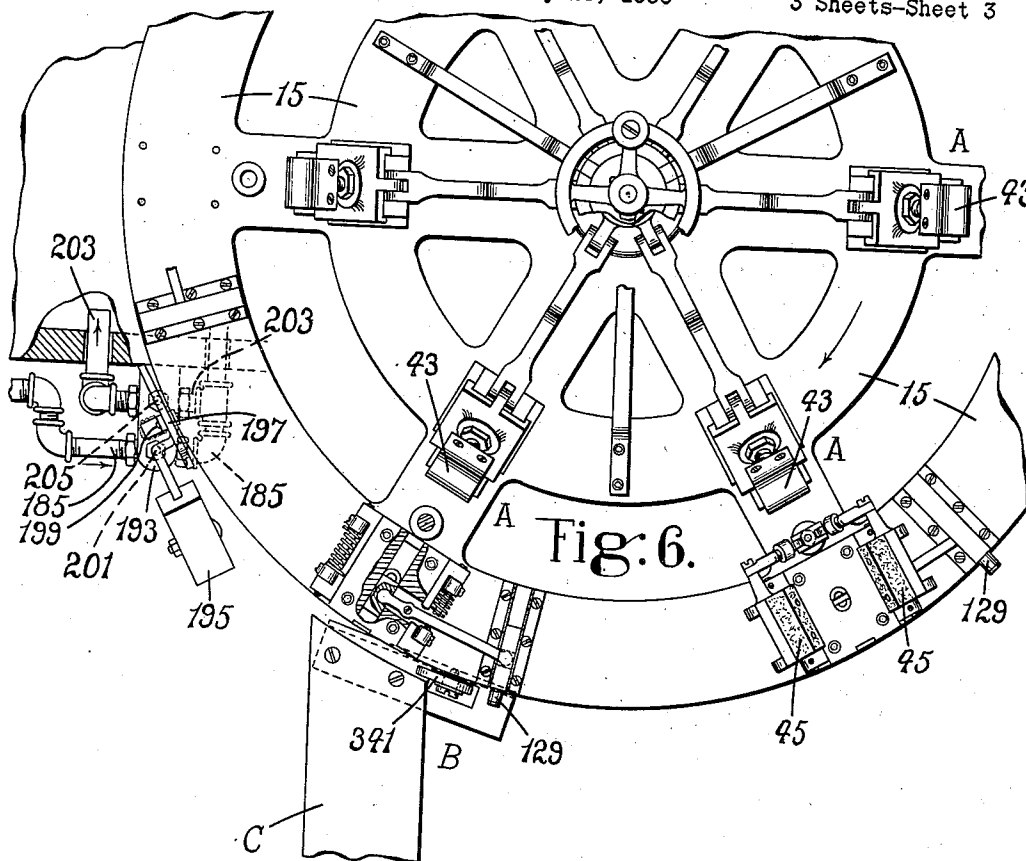
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L. F. EXLEY
SOLE-PRESSING MACHINE

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3 Sheets-Sheet 3



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2,178,990

SOLE-PRESSING MACHINE

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Application May 28, 1936, Serial No. 82,290

36 Claims. (Cl. 12—37)

This invention relates to the manufacture of footwear and is herein illustrated as embodied in a machine for laying or pressing soles upon the bottoms of lasted shoes.

5 Machines for performing this operation commonly comprise a support or jack for a lasted shoe upon which a sole has been properly located, a presser, and means for causing relative movement of approach between the jack and the
10 presser to cause the sole to be pressed firmly into place. In order to facilitate this operation there is provided in accordance with one feature of the invention a carrier provided with a plurality
15 of jacks for supporting lasted shoes, a presser including a distensible diaphragm, means for moving the carrier intermittently to bring jacks successively to rest in operative relation to the presser, and means for producing relative movement of approach between the presser and a jack
20 thus brought to rest and for distending the diaphragm. In the illustrated machine the carrier takes the form of a turret rotatable intermittently in a horizontal plane and having mounted thereon a plurality of jacks each comprising a
25 toe-rest, a last pin and means for gripping the rear portion of the shoe, the turret being rotated intermittently to bring the lasted shoes to rest successively beneath a presser, said presser consisting of a pressure box one wall of which is a
30 flexible diaphragm. The pressure box is moved down to force the diaphragm against the sole, and then fluid is forced into the box to distend the diaphragm and to cause it to press the sole into place, after which fluid is permitted to
35 escape from the box and the box is raised to initial position ready to operate in the same manner on the next shoe. The machine is designed particularly to press or lay an unvulcanized sole upon a shoe prior to vulcanization.
40 A loading operator places shoes, each with a sole properly located upon its bottom, successively upon the jacks as they reach the loading station; and, after the shoes have been operated upon, they are removed successively preferably
45 at another or other stations. With a machine of this type in which a carrier, such as a turret, brings a work support into operative relation to a member which operates upon the work, it is desirable that the movement of the carrier
50 should be stopped if at any time a piece of work fails to be placed upon the work support. To this end, according to another feature of the invention, there is provided a carrier, means for moving the carrier, a work support mounted on
55 the carrier, and means associated with the work

support when empty for stopping the carrier when the work support reaches a certain position. In the illustrated machine, in which a plurality of work supports are mounted on a rotating carrier, each work support has associated
5 with it a member which normally projects into a position to open a switch and thereby cut off the current to the motor which drives the turret. This switch is located near the loading station in such position that, if the loading operator fails to
10 place a shoe on a work support, the switch will be opened and the turret stopped. As soon as a shoe is placed on the jack, the switch is closed and the motor starts again.

It is desirable that the loading operator should
15 not be obliged to exercise any great care in placing the shoes on the jacks as they arrive successively at his station. It is, however, very desirable that each shoe be held accurately in a predetermined position on the jack during the
20 sole-pressing operation. According to another feature of the invention, each jack comprises a pair of grippers which are normally open and between which a shoe may be placed somewhat carelessly so that the shoe may be somewhat
25 askew on the jack. As the jack approaches the sole-laying station, however, the grippers are closed to straighten the shoe and hold it firmly.

In machines of the general type of the one shown, it is desirable that the operating mem-
30 ber should not go through its operating movements if for any reason a work support which is empty is brought to rest in position to be operated upon. According to another feature of the invention, a construction is provided for accom-
35 plishing this result. In the illustrated machine, the same members, each associated with a jack which acts when a jack is empty to cut off the current from the motor which drives the turret, are adapted, when an empty jack approaches the
40 operating station, to operate a valve to cut off the supply of air to the pressure box operating mechanism so that, when the empty jack comes to rest beneath the pressure box, the pressure box will remain in raised position, and no dis-
45 tention of the diaphragm will take place.

These and other features of the invention including certain details of construction and combinations of parts will be described as embodied in an illustrated machine and pointed out in
50 the appended claims.

Referring now to the accompanying drawings,

Fig. 1 is a front view partly in section and 55

partly in elevation of a machine in which the present invention is embodied;

Fig. 2 is a detail principally in elevation showing the main air supply pipe and exhaust;

Fig. 3 is a vertical section on the line III—III of Fig. 1 showing the mechanism for controlling the flow of air to and from the cylinder to lower and raise the pressure box;

Fig. 4 is a vertical section on the line IV—IV of Fig. 1 showing the mechanism for controlling the flow of air into and out of the pressure box;

Fig. 5 is a view looking up upon the bottom of the pressure box;

Fig. 6 is a plan of a portion of the turret, the jacks and the automatic mechanism for bringing the turret to rest, certain parts having been omitted and certain others shown in section;

Fig. 7 is a detail in perspective showing more particularly a part of a jack; and

Fig. 8 is a detail principally in elevation showing the switch which is opened when the operator fails to place a shoe on a jack at the loading station.

Before proceeding to a detailed description of the machine, a general description of its mode of operation will be given. The purpose of the machine, as has been explained, is to lay or press soles of unvulcanized rubber upon the bottoms of lasted shoes. The machine comprises an intermittently rotated turret 15 on which are located six equally spaced jacks or shoe supports indicated as a whole at A in Fig. 6 on which, as they arrive one by one at a loading station B, an operator places lasted shoes bottom side up, each with an unvulcanized rubber sole properly located on its bottom. The lasted shoes, together with the soles, may be taken by the loading operator from a bench C, the soles located on the bottoms of the shoes and the shoes placed on the jacks in the manner described above. The intermittent movements of the turret are each one-sixth of a revolution; and between each intermittent movement there is a pause of sufficient length to permit the sole 200 of a shoe 100 (Fig. 1) to be pressed into place. This pressing is done by a pressure box 17 the lower operative wall of which comprises a rubber diaphragm. When a lasted shoe is moved into position beneath the pressure box and brought to rest, the pressure box is moved down so that the bottom of the shoe is pushed into the diaphragm, and compressed air is forced into the pressure box to distend the diaphragm and wrap it about the lower part of the shoe. After the pressing of the sole has been completed, air is exhausted from the pressure box, the pressure box rises, and the turret makes another intermittent movement. An operator, or operators, at a station, or stations, on the other side of the machine from the loading station B, remove the shoes preparatory to the performance of the next operation upon them.

The hub of the turret 15 (Fig. 1) is supported on a suitable bearing member on an overhanging bracket 19 carried by the frame of the machine and is fast to an upright shaft 20 to which is also fast a large mutilated gear 21, the mutilations being shown at 23, said gear being located in the space between the upper and lower parts of the bracket 19. A driving pinion 24, which meshes with the large gear 21 and has a smooth portion 26 to cooperate with the mutilated portions of the gear 21, is fast to a short vertical shaft 25 mounted in bearings in the bracket and having at its lower end a bevel gear 27, said last-named

gear meshing with a bevel gear 29 on one end of a horizontal countershaft 31 near the other end of which is fastened a sprocket around which and around a sprocket on a short horizontal shaft 33 passes a chain 35. A worm gear 37 on the shaft 33 meshes with a worm 39 on the shaft of a motor 42. Thus, when the motor is running, the turret 15 is rotated intermittently in the manner which has been described above.

The six jacks or shoe supports A carried by the turret are all alike. Referring to Fig. 6 each jack comprises a toe-rest 43 for engaging the toe portion of a shoe in the manner indicated in Fig. 1, and two grippers each comprising a rubber block 45 for engaging the sides of the shoe near the top thereof. Each toe-rest (Fig. 1) comprises a rubber core 49 mounted upon a base 51 and a piece of leather extending over the core and having its ends fastened to the base. The base is mounted on the upper end of a stem 53 threaded into a slide 55 which is slidable on two spaced inclined guides 57 carried by a block 59 which is fast to the turret. Pivoted at 61 to a lug on the upper end of the slide 55 is the lower forked end of a link 63, the upper forked end of which is pivoted at 65 to a sleeve 67 through which is threaded a vertical adjusting screw 69. The lower end of the screw 69 is rotatable in a socket in a sleeve 71 which, together with the turret, is fastened to the shaft 20 by screws one of which is shown at 70; and the upper end of the screw 69 is rotatably mounted in a bearing member 73 supported by three curved bars 75 fast at their upper ends to the bearing member 73 and at their lower ends to the turret. A hand wheel 77 fast to the screw 69 is provided with a handle 79. By grasping the handle 79 and turning the screw 69 the toe-rests may be adjusted simultaneously in their inclined paths to provide for shoes of different sizes and styles.

The grippers are normally held swung apart into open position to permit the rear end of the top of a lasted shoe to be placed between them with a last pin (to be described later) in the last-pin hole of the last and the toe portion of the shoe resting upon a toe-rest A. By the time the shoe reaches a position beneath the pressure box, the grippers have been swung toward each other to straighten the shoe and to hold it firmly in place as indicated in Fig. 1. The grippers are in pairs, each one of each pair comprising a block of rubber 45 (Fig. 7), each block being fast to a bar 83 which has integral with it two curved arms 85 the hubs of which are rotatably mounted on a rod 87 carried by two spaced ears formed on a base 89 which is fastened to the turret 15. Extending inwardly toward the axis of the turret from each bar is a generally conical bracket 91 having a threaded hole into which is threaded a shouldered screw 93, the portion of the stem of the screw between its head and the beginning of the threads being smooth and cylindrical to extend loosely through a bore in the upper end of the sleeve member 95 of an extension link, the other member of which is a rod 97 which is slidable through a bore in a cap 99 threaded on the sleeve member 95. The rod carries a collar 101, and between the collar and the bottom of the cap 99 is a compression spring 103. The rod 97 is pivoted at its lower end at 105 in a slot in the hub of a T-shaped actuating member 107 the cylindrical stem of which is vertically slidable in a bore in the turret. A torsion spring 108 having one end hooked over one of the arms 85 and the other extended over the top of the base 75

89 normally holds the gripper in the position shown. The other gripper of the pair is identical with the one which has just been described, there being shown in Fig. 7 the hub of one of its arms 85, the rod 87 on which the hub is rotatably mounted, and one end of its extensible link member 97. The grippers are thus normally held swung apart as shown in Figs. 6 and 7 so that a lasted shoe may be placed bottom side up between them. Just before the turret comes to rest with the shoe beneath the pressure box in the position indicated in Fig. 1, the T-shaped member 107 is pulled down to cause the grippers to straighten the shoe and grip it firmly, the extension links being extended somewhat according to the size of the last. To accomplish this pulling down of the T-shaped member 107, its stem (Fig. 1) carries near its lower end two small rolls 109 which engage and are pulled down by two stationary spaced cams 111 carried by angle irons 113 which are bolted to the frame.

Returning to Fig. 6, when the shoe is placed bottom side up with the upper portion of its forepart resting on the toe-rest 43 and its top near the rear end extending down between the open grippers, the last-pin hole is caused to receive a last pin. This last pin, for a purpose presently to be described, consists of two parts (Fig. 7), a part 115 integral with the base 39 and a part 117 integral with a block 119 slidably mounted in a guideway in the base 39 and normally held in the position shown by a compression spring 121. Extending into a recess in the side of the block 119 is one end of a lever 123 pivoted at 125, the other end of said lever being located in a recess in a plunger 127 slidable in a guide 123 which is fast to the turret, said plunger carrying at its outer end an actuating member in the form of a roll 129 which projects beyond the periphery of the turret 15 when no shoe is on the jack. This roll, when in the projecting position shown, operates one or the other of two safety devices later to be described. As soon as a lasted shoe is placed with the split last pin 115, 117 in the last-pin hole, the part 117 is moved toward the periphery of the turret, and the roll 129 is withdrawn into a position in which it no longer projects beyond the periphery of the turret. If it happens that a jack with no shoe upon it leaves the loading station, its roll 129 will be projecting as shown in Fig. 7 and will operate a safety device to stop the rotation of the turret, and if the device fails to operate the roll 129 will operate another safety device to prevent the pressure box from being operated. Ordinarily, with the turret rotating as indicated by the arrow in Fig. 6, a jack as it approaches the loading station B is empty, and its roll 129 is projecting beyond the periphery of the turret. As soon as a shoe is placed on the turret the roll is withdrawn, and the jack proceeds to the operating station beneath the pressure box, the grippers having been caused to grip the top of the shoe. After the shoe passes beyond the operating station, one of the receiving operators on the other side of the machine from the loading station B removes the shoe, whereupon the roll 129 again projects beyond the periphery of the turret. It should be noted that the swinging grippers, when in their open position at the loading station, permit the loading operator to place a shoe quickly and somewhat carelessly on the jack since all he has to do is to see that the last pin of the jack enters the last-pin hole of the last and that the toe

portion of the shoe engages the toe-rest. The shoe may be askew on the jack; but, as soon as the grippers close on the shoe, it is straightened on the jack and firmly gripped so that, when the pressure box descends to lay or press the sole, the shoe is in proper position to receive the pressure.

The pressure box (Figs. 1, 5) has rigid side and top walls. The bottom wall is a rubber diaphragm 131 (herein shown as comprising two layers of rubber) fastened by its margin to the rim of the opening in the bottom of the box by a metal gasket 135 and screws 133 which pass through the gasket and are threaded into the rim of the box. In order to prevent ballooning of the diaphragm about the sides of the shoe when the pressure box is brought down upon the shoe and the diaphragm is distended, guard plates having in them openings of different sizes to accommodate different sizes of shoes are provided, said guard plates being readily removable and replaceable. In Fig. 5 there is shown one of these guard plates 137 with its opening 139. This plate is provided along one side and the two ends with a series of key-hole slots 141, and along the other side with open-ended slots 143. Projecting down from the metal gasket 135 are headed studs 145. In Fig. 5, which is a view looking up upon the underside of the pressure box, some of these studs are shown in cross-section. To remove the guard plate 137 it is necessary merely to slide it to the left and move it toward the observer and away from the box. To replace the plate the movements just described are reversed. In order to ensure that the guard plate shall not be moved to the left accidentally, a fastening is provided in the form of a small angle iron 147, the lower horizontal arm of which extends beneath the guard plate 137 and the upwardly extending arm of which is fastened to one wall of the pressure box by a screw 149. The screw is withdrawn and the angle iron removed whenever it is desired to remove and replace the plate.

The pressure box 17 (Fig. 1) is carried at the lower end of a heavy rod 151 which is vertically slidable in an overhanging arm of the frame, the upper end of said rod being threaded to receive a stop nut 153 the position of which determines the extent of downward movement of the pressure box; and the box is prevented from turning by a guide-rod 155 fast to the box and vertically slidable in the overhanging arm of the frame. Pivoted at 157 to the upper end of the screw threaded rod 151 is one end of a lever 159 supported near its middle by a link 161 pivoted at its upper end to the lever and at its lower end to a lug on the frame. The left-hand end of the lever is pivoted at 163 to the upper end of a piston rod 165 which carries at its lower end a piston 167, the packing 169 of which may be forced against the wall of the cylinder 171 in which the piston travels by screwing down a nut 173, which is threaded on the piston rod, and thus, through a sleeve 175, pushing down a washer 177. A locknut 181 holds the adjusting nut 173 firmly in position. The cylinder 171 is pivoted at 183 to two spaced ears on a bracket carried by the frame, one of these ears being indicated at 184. The piston is operated by compressed air from a source of supply which enters (Fig. 2) through a main supply pipe 185, said pipe passing through a wall 187 of the frame of the machine and continuing to a T 189 (Fig. 1) inside the frame. Connected with that part of the pipe 185 (Fig. 2) which is

outside the frame is a pressure gage 191; and located in the same part of the pipe 185 are two hand valves and an automatically operated valve the casing of which is indicated at 193. This automatic valve is normally held open by a weight 195 carried by a valve-control member 197 (see also Fig. 6) pivoted at 199 to a stationary bracket. When the parts are in the position shown, the stem 201 of the valve is being held down in its open position by the weight 195 against the action of a spring, not shown. Referring to Fig. 6, there is connected to the pipe 185 at a point beyond the valve casing 193 a short exhaust pipe 203 in which is another automatically operated valve the stem of which is indicated at 205. This valve is urged up at all times into the closed position by a spring, not shown, and normally occupies this position. The purpose of these automatic valves is to cut off the supply of compressed air by closing the valve 201 and to exhaust various pipes, later to be described, by opening the valve 205 in the exhaust pipe 203 if at any time an empty jack on the turret—that is a jack having no shoe upon it—approaches a position beneath the pressure box. If there is no shoe on such a jack, its roll 129 will project beyond the periphery of the turret; and, as the turret moves along, the roll will ride upon the valve-control member 197 to rock it and thereby cause the valve in the supply pipe 185 to close and the valve in the exhaust pipe 203 to open. As will later appear, the result will be that the pressure box 17 will not be moved down and no air will be forced into the box to distend the diaphragm.

Returning now to Fig. 1 the pipe 185 ends in the T 189. Here the current of air divides. From the lower part of the T leads a pipe 207 through which air passes, through valves presently to be described, into the interior of the pressure box, while from the upper end of the T a pipe 209 leads into the casing of a three-way valve 211. From the top of the casing 211 a pipe 213 leads to one end of a flexible tube 215, the other end of which is connected to a pipe 217 which leads into the lower end of the cylinder 171. Directly behind the pipe 213, as viewed in Fig. 1, another pipe 219 (Fig. 3) leads from the three-way valve casing 211 into the lower end of a flexible tube 221 (Fig. 1) the upper end of which is connected with a pipe 223 which leads into the upper part of the cylinder 171. In the position of parts shown a shoe 190, with a sole properly located thereon, has come to rest beneath the pressure box and air has just begun to flow into the lower end of the cylinder. Air is flowing through the pipe 209, the three-way valve in the casing 211 and the flexible tube 215 into the lower end of the cylinder; and the air above the cylinder is flowing out through the flexible tube 221, through the three-way valve casing 211 and through the exhaust opening 225 (Fig. 3) in the bottom of the valve casing. The three-way valve may be of any well-known construction, and consequently no detailed description of it will be given. Referring to Fig. 3, the stem of the oscillating member of this valve is indicated at 227, said stem being clamped in the forked end of an arm 229, said arm being pivoted to the upper end of a link 231 the lower end of which is pivoted to the outer end of a lever 233 pivoted at its inner end at 235 to a bracket on the frame and carrying a roll 237 which runs in a suitably-shaped cam track 239 formed in a cam 241 adjustably fastened to the countershaft 31. The valve, as

shown, occupies its extreme clockwise position in which the pipe 209 is connected to the pipe 213 to force air into the lower end of the cylinder 171, and the pipe 219 is connected to the exhaust opening 225 to permit air from above the piston 167 in the cylinder 171 to flow out through this opening. The valve will be held in this position for an interval. The piston will therefore move up, and the pressure box 17 will move down to cause the lower portion of the shoe 100 with its sole 290 to be pushed somewhat through the opening 139 (Fig. 5) in the guard plate. Air is forced into the pressure box and later allowed to escape therefrom in a manner presently to be described. The pressure box is then raised. This raising is accomplished (Fig. 3) by the swinging of the lever 233 to its down position. At this time the pipe 219 is connected with the air supply pipe 209 to force air into the top of the cylinder 171, and the pipe 213 (Fig. 3) is connected to the exhaust opening 225 to permit air from below the piston to flow out of the cylinder. The shape of the cam track 239 and its relation to the countershaft 31 and the lever 233 are such that when a shoe on a jack is brought beneath the pressure box, the box is brought down to force the diaphragm against the sole 200 of the shoe and is held in that position for an interval, after which it rises again preparatory to being brought down upon another shoe.

While the diaphragm is in contact with the bottom of the shoe, air under pressure is forced into the pressure box to distend the diaphragm and wrap it about the lower portion of the shoe, and is then allowed to escape. Returning now to Fig. 1, it has been explained that the pipe 185, which leads from the source of supply of compressed air, ends at the T 189 and that from the bottom of this T leads a pipe 207 through which air flows to the pressure box 17. The pipe 207 leads into a valve casing 247 having in it an automatically controlled valve. The pipe 207, beyond the valve casing 247, leads into an upwardly extending pipe 248 (Fig. 1) which in turn leads up into a pressure control valve 253. From one side of this pressure control valve a pipe having in it a hand valve 255 is connected to one end of a flexible tube 257 the other end of which communicates with the interior of the pressure box. Extending from the left-hand side of the pressure control valve 253 is an exhaust pipe having a hand valve 258 which is normally kept closed but provides convenient means whereby the pressure in the pressure box may be readily relieved at any time if desired. Leading from the interior of the pressure box 17 is a flexible tube 259 connected to the upper end of an exhaust pipe 261.

Referring now to Fig. 4, there is shown a portion of the pipe 207 which conducts air through the valve casing 247 into the pressure box, the lower portion of the pipe 261 through which air is exhausted from the pressure box, and two valves which are automatically operated to control the inlet and outlet of air to and from the pressure box. In the valve casing 247 is a valve the stem of which is indicated at 263, said valve being normally held down in its closed position by a spring, not shown, and being raised at the proper time to open it by a pusher 265 pivoted at 267 to a rigid bracket 269 and carrying a roll 271 adapted to be engaged at intervals by a cam 273 fast to the countershaft 31 which acts to raise the roll 271 and thereby to open the valve and keep it open for an interval. This allows 75

compressed air to flow into the pressure box 17 to inflate the diaphragm and press the sole into place on the bottom of the shoe. When the roll 271 rides down from off the cam 273, the supply of compressed air is cut off from the pressure box. In order to relieve the pressure in the pressure box, the exhaust pipe 261 leads into a valve casing 275 containing a valve normally held to the right in closed position by a spring, not shown, the projecting stem 277 of this valve being engaged and pushed to the left at the proper times by a lever 279 pivoted at 281 to a rigid bracket 283 and carrying a roll 285 adapted to be engaged by a cam 287 adjustably mounted on the countershaft 31, said cam acting to swing the lever 279 to the left to put the exhaust pipe 261 into communication with the exhaust opening 289 in the valve casing. This cam holds the valve 277 in open position for an interval to exhaust the air from the pressure box and then permits the valve to close. It will be noted that the air supply cam 273 is adjustably fastened to a flange 291 on a hub 293, which is adjustably fastened to the countershaft 31 by set screws, by screws 292 (Fig. 1) which pass through holes in the cam and may be threaded into selected threaded holes 295 in the flange; and that the air exhaust cam 287 is similarly fastened to a flange on a hub 297 (Fig. 1) by screws 299, said hub being adjustably fastened to the countershaft 31 by set screws 301. It is thus possible to vary the time at which the distention of the diaphragm begins and the time when the exhaust pipe is opened. Preferably, for pressing a sole on a tennis shoe, the distention will begin just as the descending pressure box causes the diaphragm to contact with the sole on the shoe, will reach its maximum (determined by the setting of the pressure control valve 253) at about the time the pressure box reaches its lowest position and will be maintained at a maximum for a short interval, after which the air supply to the pressure box will be cut off, the exhaust pipe opened, and the pressure box raised. It will be understood, however, that these details may be varied somewhat according to the type of shoe being operated upon.

It has been stated above that if the operator at the loading station B fails to place a shoe on a jack, the rotation of the turret will be stopped. This is accomplished by automatically cutting off electric current to the motor; and, to this end, use is made of the rolls 129 (Fig. 6) which, as has been explained, project beyond the periphery of the turret when there are no shoes on the jacks. A jack which is approaching the loading station is normally empty, and its roll is projecting beyond the periphery of the turret. At the loading station a shoe is normally placed on the jack, and the roll is thereby withdrawn. If no shoe is placed on the jack, the projecting roll 129 will shortly encounter the rounded upper edge of a control member in the form of a lever 341 (Figs. 6 and 8) which is pivoted at 333 to a bracket 335, said bracket being carried by the bench C. The lever 341 carries at its lower end a contact member 337; and a tension spring 339 normally holds the contact member 337 against a contact member 331. The switch, briefly described above, through a remote control magnetic switch, not shown, of any suitable and well-known type, controls the flow of current to the motor 42, the switch herein shown being in the push-button circuit. When this switch (Fig. 8) is opened, the current is cut off from the motor and the turret comes to rest and remains at rest

until a shoe is placed on the jack, whereupon the roll 129 is withdrawn, the switch is closed and the motor begins its rotation once more. In the position of parts shown in Fig. 6, the motor is running, the turret is at rest during one of its intermittent pauses, there is a shoe on the jack at the station beneath the pressure box, and the pressure box has begun to descend. If now the loading operator fails to put a shoe on the jack at the loading station, the machine will function as usual until the roll 129 of the jack at the loading station swings the lever 341 and opens the switch as shown in Fig. 8, whereupon the current to the motor will be cut off, the switch being so located that, when the turret comes to rest, the pressure box will be in raised position and the valves which admit air to the cylinder 171 and to the pressure box will be closed. The loading operator may now reach over the bench and place a shoe on the jack which has just passed that station whereupon the machine will once more function as usual. In case the automatic mechanism, which has been described above, fails to operate, the roll 129 of the jack will ride up on the valve-control member 197 and shut off the supply of compressed air so that the pressure box will not be moved down toward the empty jack, and the diaphragm will not be distended.

The shoe supporting structure which comprises a plurality of jacks the toe rests of which are simultaneously adjustable is not claimed herein but forms the subject-matter of a divisional application Serial No. 198,397, filed March 28, 1938.

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

1. A machine for pressing soles on shoes having, in combination, a turret, a plurality of jacks carried thereby and adapted to support lasted shoes, a pressure box one wall of which comprises a flexible diaphragm, means for moving the turret intermittently to bring jacks to rest successively in operative relation to the pressure box, and means for producing relative movement of approach between the pressure box and a jack thus brought to rest and for distending the diaphragm.

2. A machine for pressing soles on shoes having, in combination, a turret, a plurality of jacks carried thereby and adapted to support lasted shoes, a pressure box one wall of which comprises a flexible diaphragm, means for moving the turret intermittently to bring jacks to rest successively in operative relation to the pressure box, and fluid operated means both for producing relative movement of approach between the pressure box and a jack thus brought to rest and for distending the diaphragm.

3. A machine for pressing soles on shoes having, in combination, a turret, a plurality of jacks carried thereby and adapted to support lasted shoes, a pressure box one wall of which comprises a flexible diaphragm, means for moving the turret intermittently to bring jacks to rest successively in operative relation to the pressure box, means including a cylinder and a piston for moving the pressure box toward a jack thus brought to rest, and means for forcing a fluid into the cylinder to move the pressure box and into the pressure box to distend the diaphragm.

4. A machine for pressing unvulcanized soles on shoes having, in combination, a turret rotatable about a vertical axis and having a substantially horizontal upper face, a plurality of jacks mounted on said face, a pressure box for a fluid the bottom wall of which comprises a flexible diaphragm,

- means for moving the turret intermittently to bring jacks to rest successively beneath the pressure box, means for moving the pressure box toward a jack thus brought to rest to cause the lower part of the shoe to push a portion of the diaphragm into the pressure box, and an apertured plate overlying the diaphragm to restrict flexing of the diaphragm to a narrow area about the sides of the shoe.
5. A machine for pressing soles on shoes having, in combination, a turret rotatable about a vertical axis and having a substantially horizontal upper face, a plurality of jacks mounted on said face, a pressure box the bottom wall of which comprises a flexible diaphragm, means for moving the turret intermittently to bring jacks to rest successively beneath the pressure box, and means for moving the pressure box toward a jack thus brought to rest and for distending the diaphragm.
6. A machine for pressing soles on shoes having, in combination, a traveling work support, mechanism for operating upon the supported work, an actuating member movable with respect to the work support, said actuating member being held, when no work is on the work support, in operative position in which it acts during the travel of the work support to prevent the operation of the operating mechanism, and means responsive to placing a piece of work on the work support for moving said actuating member into and holding it in inoperative position.
7. A machine for pressing soles on shoes having, in combination, a traveling work support, mechanism for operating upon the work, a member normally occupying an operative position in which, during the travel of the work support, it prevents the operating mechanism from operating upon the work, and means for moving said member into and holding it in inoperative position.
8. A machine for pressing soles on shoes having, in combination, a carrier, a plurality of jacks carried thereby, a pressing member, means for moving the carrier intermittently to bring the jacks to rest successively in operative relation to the pressing member, mechanism for producing relative movement of approach between the pressing member and a jack thus brought to rest, and means for preventing the operation of said mechanism when no shoe is on the jack.
9. A machine for pressing soles on shoes having, in combination, a carrier, a plurality of jacks carried thereby, a pressing member, means for moving the carrier intermittently to bring the jacks to rest successively in operative relation to the pressing member, mechanism for producing relative movement of approach between the pressing member and a jack thus brought to rest, and means becoming operative only when a shoe is carried by the jack for causing said mechanism to operate.
10. A machine for pressing soles on shoes having, in combination, a carrier, a plurality of jacks carried thereby, a pressing member, means for moving the carrier intermittently to bring the jacks to rest successively in operative relation to the pressing member, fluid-operated mechanism for producing relative movement of approach between the pressing member and a jack thus brought to rest, and automatically operated means for cutting off the supply of fluid and thereby preventing the operation of said mechanism when no shoe is on the jack.
11. A machine for pressing soles on shoes having, in combination, a traveling work support, mechanism for operating upon the supported work, a control member located adjacent to the path of travel of the work support movement of which prevents the operating mechanism from operating, a member movable with the work support and normally held in operative position such that during the movement of the work support toward the operating mechanism, said member will move the control member, and means responsive to the placing of a piece of work on the work support for moving said member into and holding it in inoperative position.
12. A machine for operating upon lasted shoes having, in combination, an operating member, mechanism for causing said member to operate, a control member actuation of which prevents the operation of the operating member, a turret, means for rotating the turret, a plurality of jacks carried by the turret, an actuating member for the control member associated with each jack, each jack comprising a two-part last pin, means for causing relative movement of the parts when the two-part pin is caused to enter the last-pin hole of a last, and means operated by said relative movement for moving the actuating member into and holding it in inoperative position.
13. A machine for operating upon lasted shoes having, in combination, a carrier, a plurality of jacks carried thereby, an operating member, means for moving the carrier to bring the jacks successively to rest in operative relation to the operating member, a control member normally held in position to cause the operating member to operate upon a shoe on a jack brought to rest, and an actuating member associated with each jack, said actuating member being urged at all times to project into a position in which movement of the carrier will cause it to move the control member to prevent operation of the operating member, and means responsive to placing a shoe on a jack for withdrawing said actuating member into inoperative position.
14. A machine for operating upon lasted shoes having, in combination, a turret, a plurality of jacks carried thereby, an operating member at an operating station, means for rotating the turret intermittently to bring the jacks to rest successively in operative relation to the operating member, a control member normally held in position to cause the operating member to operate upon a shoe on a jack brought to rest, said control member when moved preventing the operating member from operating, and an actuating member associated with each jack, said actuating member being in operative position to move the control member and thus prevent the operation of the operating member whenever a jack having no shoe upon it approaches the operating station.
15. A machine for pressing soles on shoes having, in combination, a carrier, a plurality of jacks carried thereby, a pressure box one wall of which comprises a flexible diaphragm, means for moving the carrier intermittently to bring jacks to rest successively in operative relation to the pressure box, mechanism for producing relative movement of approach between the pressure box and a jack thus brought to rest, and means for preventing the operation of said mechanism when no shoe is on the jack.
16. A machine for pressing soles on shoes having, in combination, a carrier, a plurality of jacks carried thereby, a pressure box one wall of which comprises a flexible diaphragm, means for moving the carrier intermittently to bring jacks to rest successively in operative relation to the pres-

sure box, fluid-operated mechanism including a fluid-supply pipe for producing relative movement of approach between the pressure box and a jack thus brought to rest and for distending the diaphragm, and automatically operated means for closing the pipe and thereby preventing the operation of said mechanism when no shoe is on the jack.

17. A machine of the class described having, in combination, a work support, an operating member at an operating station, means for moving the support into operative relation to the operating member at the operating station, fluid controlled means for causing the operating member to operate, and means becoming operative when a work support is empty for cutting off the supply of fluid and thereby preventing the operation of the operating member.

18. A machine of the class described having, in combination, a work support, an operating member at an operating station, means for moving the support into operative relation to the operating means at the operating station, fluid controlled means including a fluid-supply pipe for causing the operating member to operate, a valve in said pipe normally held in open position, a valve control member movement of which closes the valve, and an actuating member associated with each work support, said member occupying a position to move the control member and close the valve whenever a work support having no work upon it approaches the operating station.

19. A machine for pressing soles on lasted shoes having, in combination, a carrier, a jack carried thereby, a pressure box one wall of which comprises a flexible diaphragm, means for moving the carrier to bring the jack to rest in operative relation to the pressure box, means for distending the diaphragm, and automatically operated means operating when no shoe is on the jack for preventing the operation of the diaphragm distending means.

20. A machine for pressing soles on lasted shoes having, in combination, a work support, a carrier therefor, means for moving said carrier in a predetermined path, means associated with the work support for causing the carrier to stop when the work support reaches a predetermined position, and means responsive to the placing of a piece of work on the work support when the work support is in predetermined position for starting the movement of the carrier.

21. A machine for pressing soles on lasted shoes having, in combination, a turret, a work support carried thereby, means for rotating the turret, means associated with the work support for stopping the rotation of the turret when a work support reaches a predetermined position, and means responsive to the placing of a piece of work on the work support when the work support is in said predetermined position for starting the rotation of the turret.

22. A machine for pressing soles on lasted shoes having, in combination, a turret, a work support carried thereby, means for rotating said turret, a member associated with the work support and adapted during the rotation of the turret to render the rotating means inoperative, and means responsive to the placing of a piece of work upon the work support for withdrawing said member from operative position and thus rendering the rotating means operative.

23. A machine for pressing soles on lasted shoes having, in combination, a carrier, a work support carried thereby, an operating member, means

for moving the carrier to cause it to bring the work support to rest at the operating station, mechanism for causing the operating member to operate, and means responsive to movement with the carrier of the work support when empty for rendering inoperative the means for moving the carrier and the mechanism for causing the operating member to operate.

24. A machine for pressing soles on shoes having, in combination, a carrier, a plurality of jacks carried thereby, a presser at a pressing station, means for moving the carrier intermittently to bring jacks successively to rest at the pressing station, mechanism for causing relative movement of approach between the presser and the jack during pauses in the movement of the carrier, and means responsive to movement with the carrier of a jack having no shoe upon it for stopping the carrier-moving means and the presser-actuating mechanism.

25. A machine for pressing soles on shoes having, in combination, a turret, a plurality of jacks carried thereby, a presser at a pressing station, means for rotating the turret intermittently to bring jacks to rest successively at the pressing station, mechanism for actuating the presser during pauses in the movement of the turret, and means responsive to the movement with the turret of a jack having no shoe upon it for stopping the turret-rotating means and the presser-actuating mechanism.

26. A machine for operating upon a lasted shoe having, in combination, a jack comprising normally open grippers between which the shoe may be placed, means for causing the jack to travel, mechanism for operating upon the shoe, and means responsive to travel of the jack toward the operating mechanism for causing the grippers to close on the shoe.

27. A machine for operating upon a lasted shoe having, in combination, a jack comprising a toe-rest for engaging the forepart of the shoe and normally open grippers for receiving the rear part of the shoe, means for causing the jack to travel, mechanism for operating upon the shoe, and means operated by travel of the jack toward the operating mechanism for causing the grippers to close on the shoe.

28. A machine for operating upon lasted shoes having, in combination, a carrier, a jack carried thereby comprising a toe-rest for engaging the forepart of the shoe, and a pair of normally open grippers for engaging the sides of the shoe, mechanism for operating upon the shoe at an operating station, means for moving the carrier to bring the shoe to rest at said station, and means responsive to movement of the jack toward the operating station for causing the grippers to close upon the shoe.

29. A machine for operating upon lasted shoes having, in combination, a carrier, a jack carried thereby comprising a toe-rest for engaging the forepart of the shoe, and a pair of normally open grippers for engaging the sides of the shoe, mechanism for operating upon the shoe at an operating station, means for moving the carrier to bring the shoe to rest at said station, means responsive to movement of the jack toward the operating station for causing the grippers to close upon the shoe, and means responsive to movement of the jack away from the station for opening the grippers.

30. A machine for operating upon lasted shoes having, in combination, a jack comprising a toe-rest for engaging the forepart of a shoe, a last

pin for entering the last-pin hole in the last, and a pair of normally open grippers for engaging the sides of the shoe, mechanism for operating upon the shoe at an operating station, means for moving the jack to bring the shoe to rest at said station, and means responsive to movement of the jack toward the operating station for causing the grippers to close on the shoe.

31. A machine for operating upon lasted shoes having, in combination, a jack comprising a toe-rest for engaging the forepart of a shoe, a last pin for entering the last-pin hole in the last, and a pair of normally open grippers for engaging the sides of the shoe, mechanism for operating upon the shoe at an operating station, means for moving the jack to bring the shoe to rest at said station, means responsive to movement of the jack toward the operating station for causing the grippers to close on the shoe, and means responsive to movement of the jack away from the operating station for opening the grippers.

32. A machine for operating upon a lasted shoe having, in combination, a jack comprising a pair of grippers, yielding means for holding said grippers open, means connecting said grippers to cause them when actuated to move equally in opposite directions, means for causing the jack to travel, mechanism for operating upon the shoe, and means responsive to travel of the jack toward the operating mechanism for actuating the grippers to cause them to close yieldingly upon the shoe.

33. A machine for operating upon a lasted shoe having, in combination, a jack comprising a pair of grippers, yielding means for holding said grippers open, means connecting said grippers to cause them when actuated to move equally in

opposite directions, said connecting means including yieldable members, means for causing the jack to travel, mechanism for operating upon the shoe, and means responsive to travel of the jack toward the operating mechanism for actuating the grippers to cause them to close yieldingly upon the shoe.

34. A machine for operating upon a lasted shoe having, in combination, a carrier, a plurality of jacks carried thereby, mechanism for operating upon the shoe, means for moving the carrier to bring the jacks successively into operative relation to the operating mechanism, each jack comprising a pair of grippers, an actuating member, links connecting the grippers respectively to the actuating member, and means located near the operating mechanism for engaging successively the actuating members and moving them to cause the grippers to close and hold the shoe in proper position while it is being operated upon.

35. A shoe sole attaching machine comprising a cushioning member for the sole of a shoe, a cylinder, a piston in the cylinder, means connecting the piston with the cushioning member, and means for supplying the interior of the cylinder and the interior of the cushion member with a pressure fluid.

36. A shoe sole attaching machine consisting of a cushioning member adapted to be applied to the sole of the shoe, a movable support for the cushioning member, a piston for the cushioning member, a cylinder for the piston, means for supplying a pressure fluid to the cylinder to move the piston and the movable support, and means for supplying a pressure fluid to the cushioning member.

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