Nov. 10, 1942. S. J. FINN 2,301,205

MACHINE FOR PRESSING SOLES UPON SHOE BOTTOMS

Filed July 25, 1940 6 Sheets-Sheet 1

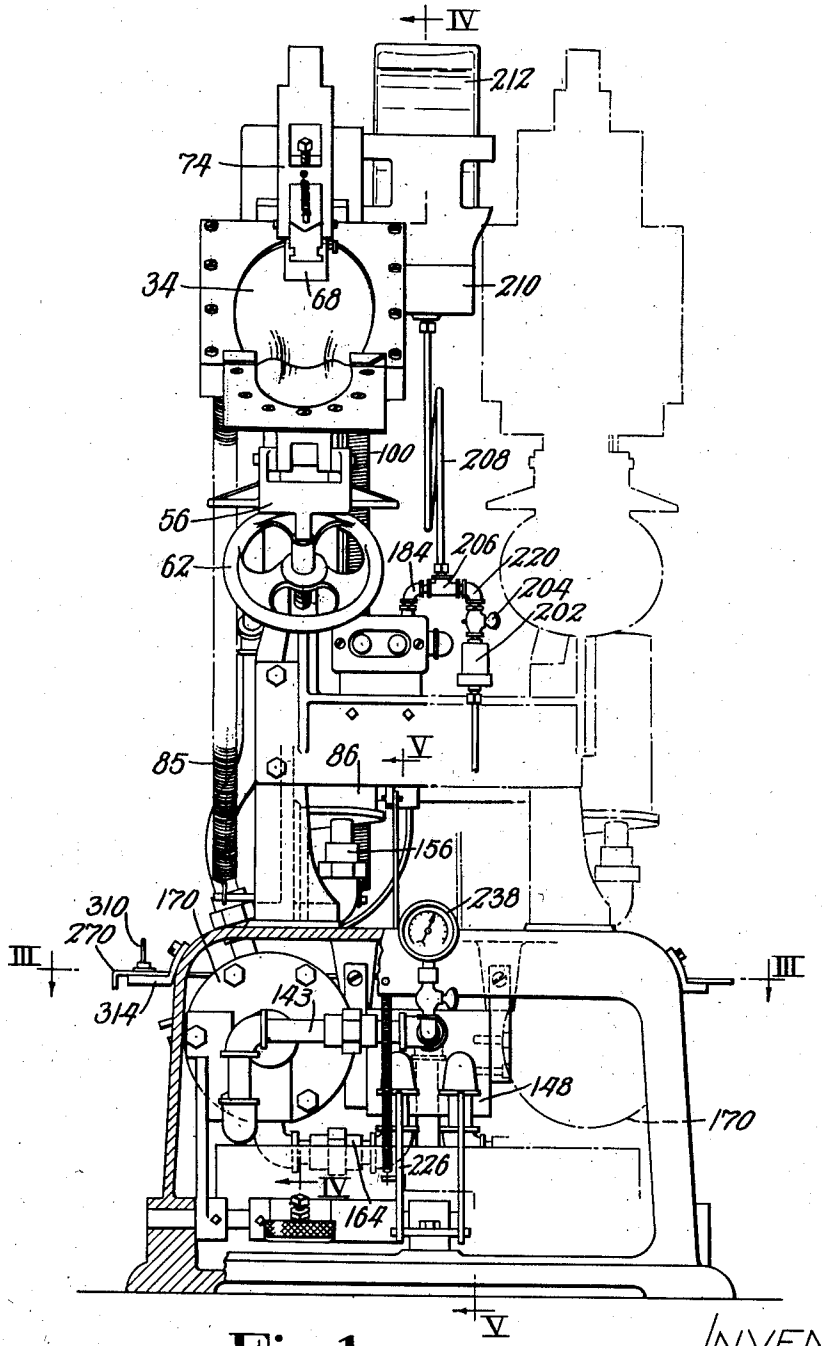


Fig.1.

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MACHINE FOR PRESSING SOLES UPON SHOE BOTTOMS

Filed July 25, 1940 6 Sheets-Sheet 2

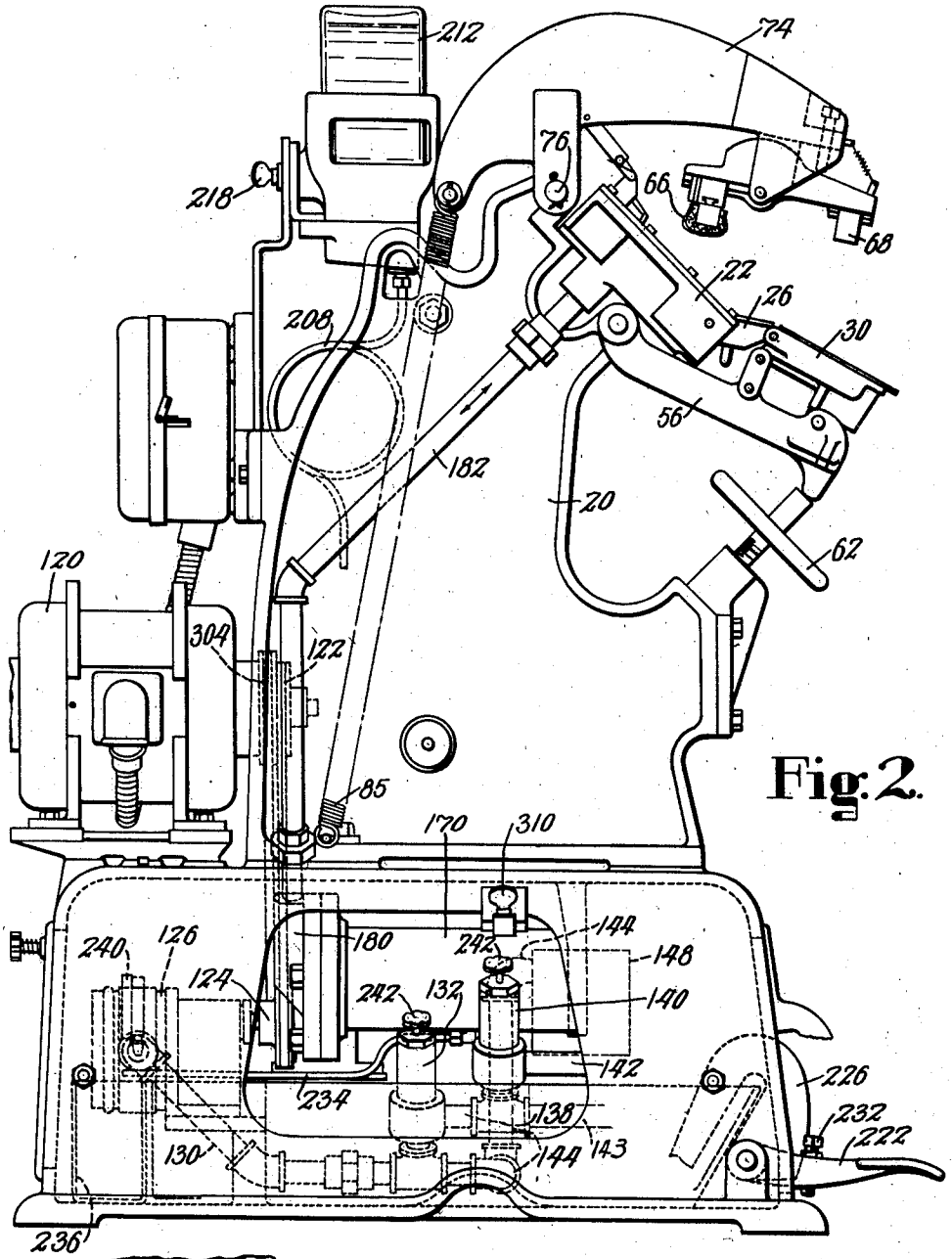


Fig. 2.

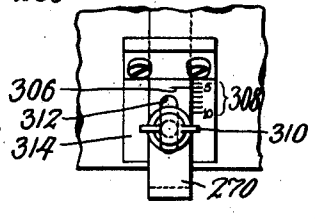


Fig. 3.

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MACHINE FOR PRESSING SOLES UPON SHOE BOTTOMS

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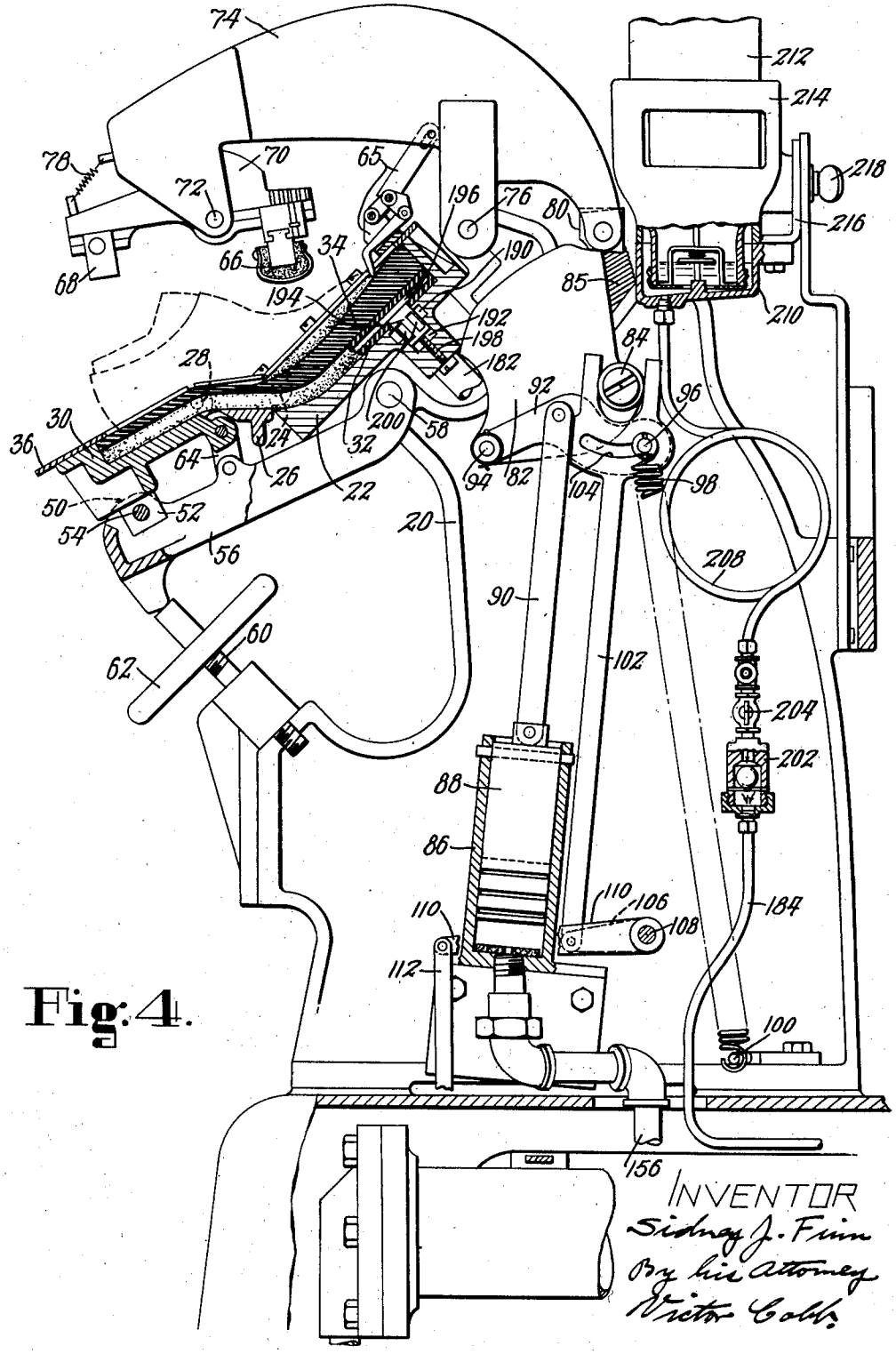


Fig. 4.

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Nov. 10, 1942. S. J. FINN 2,301,205

MACHINE FOR PRESSING SOLES UPON SHOE BOTTOMS

Filed July 25, 1940 6 Sheets-Sheet 4

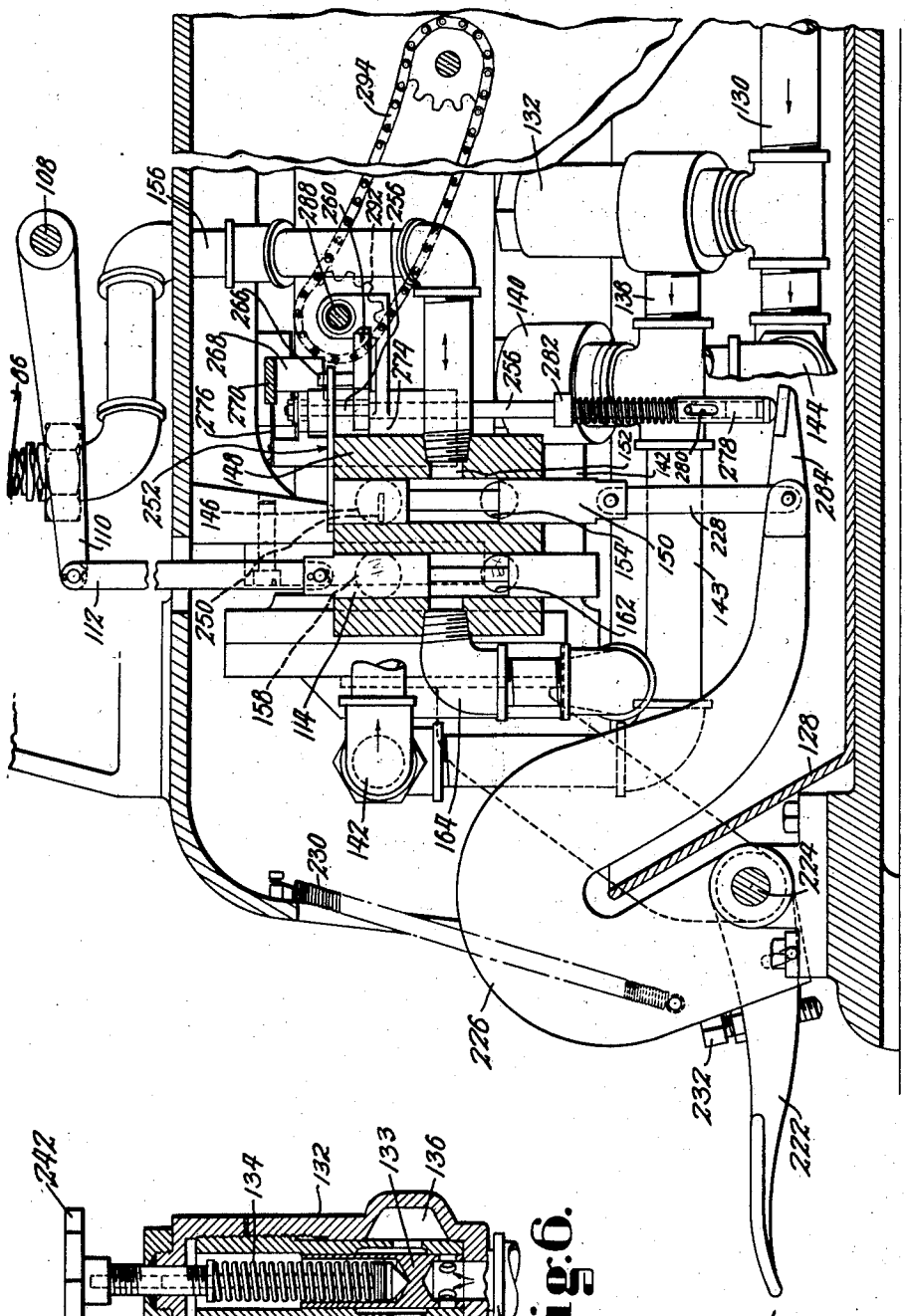


Fig. 5.

Fig. 6.

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MACHINE FOR PRESSING SOLES UPON SHOE BOTTOMS

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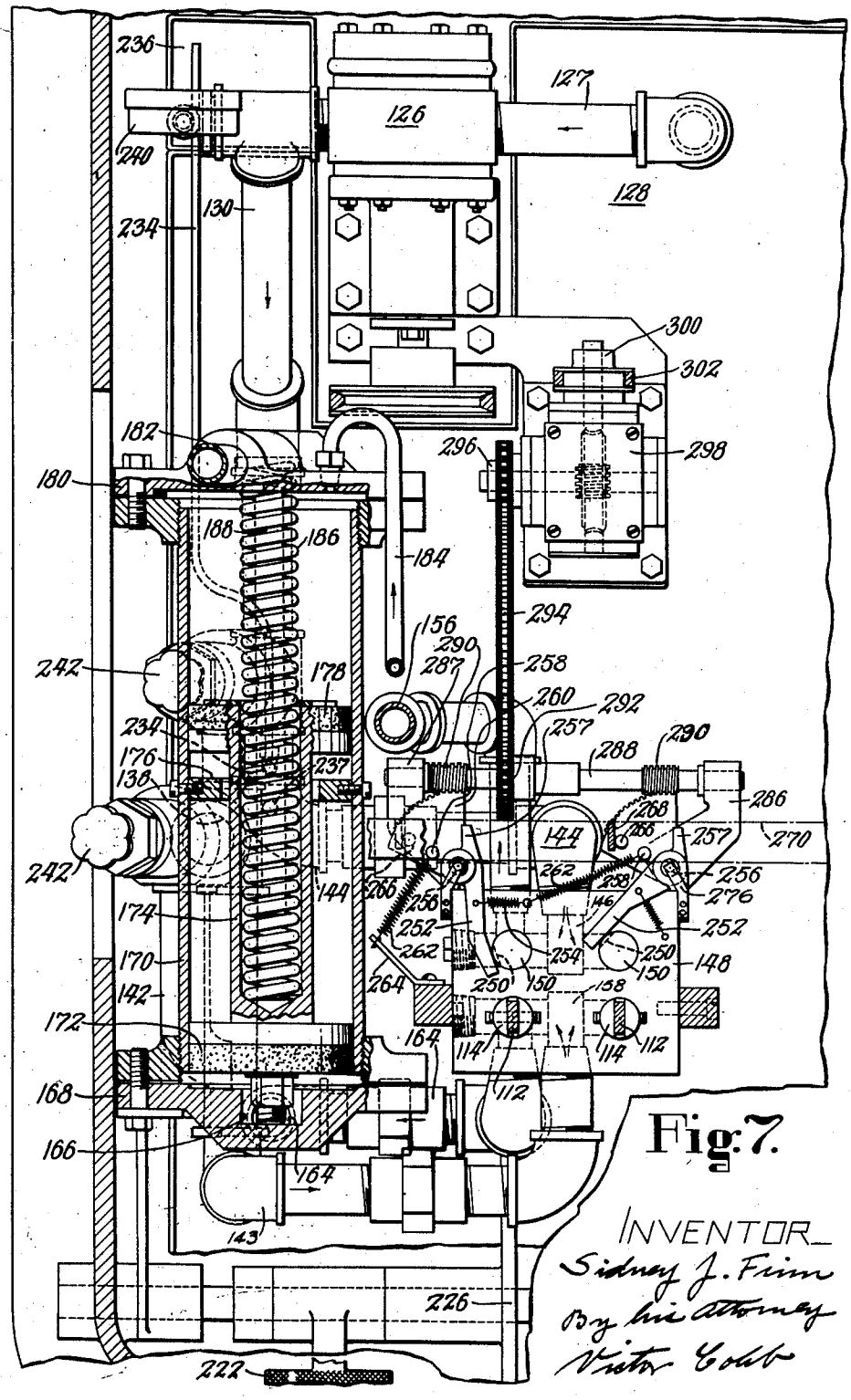


Fig. 7.

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Nov. 10, 1942. S. J. FINN 2,301,205

MACHINE FOR PRESSING SOLES UPON SHOE BOTTOMS

Filed July 25, 1940 6 Sheets-Sheet 6

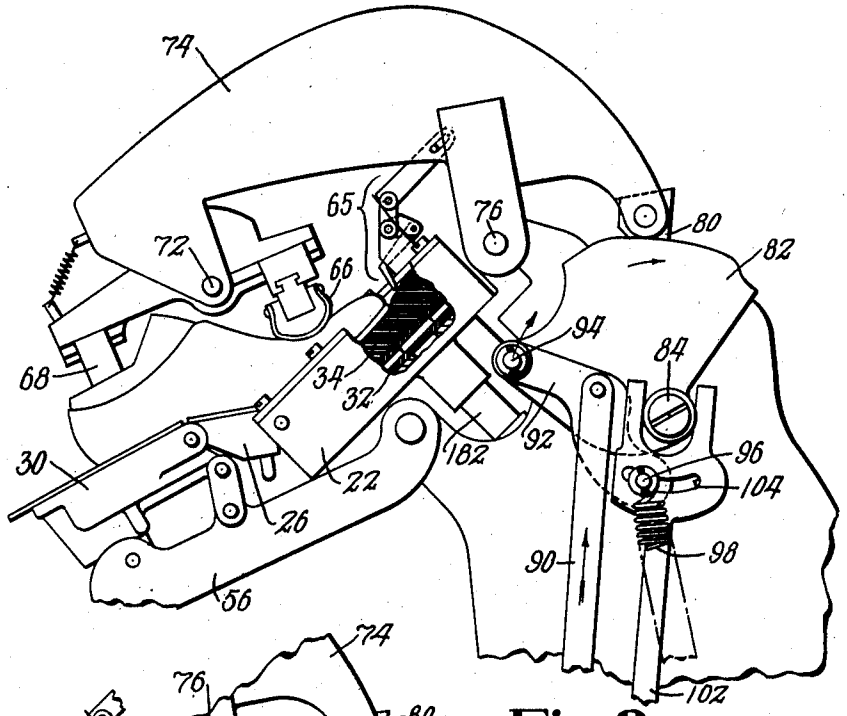


Fig. 8.

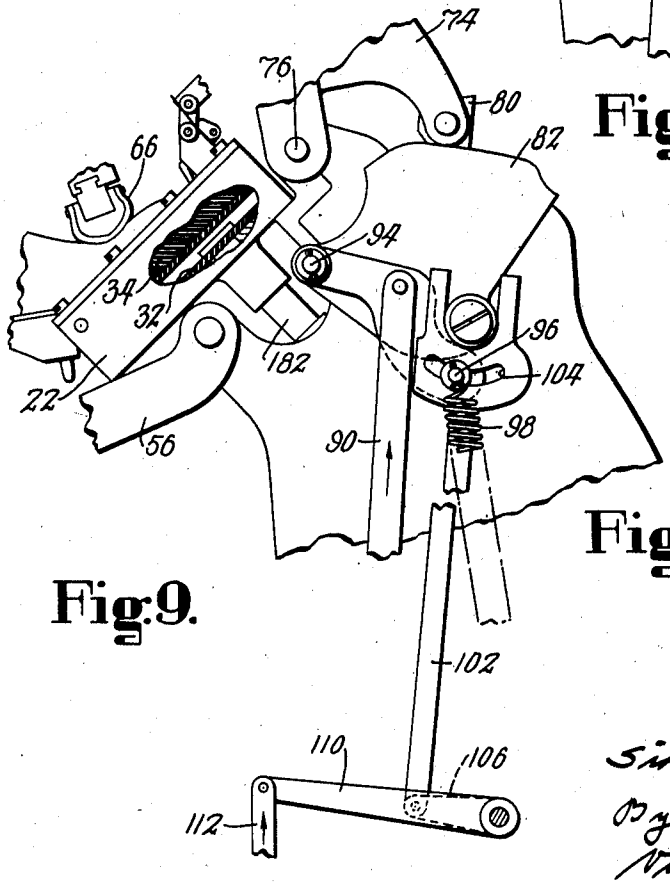


Fig. 9.

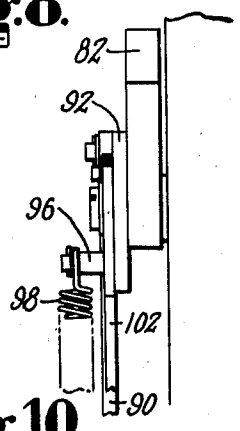


Fig. 10.

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Patented Nov. 10, 1942 2,301,205

UNITED STATES PATENT OFFICE

2,301,205

MACHINE FOR PRESSING SOLES UPON SHOE BOTTOMS

Sidney J. Finn, Beverly, Mass., assignor to United Shoe Machinery Corporation, Borough of Flemington, N. J., a corporation of New Jersey

Application July 25, 1940, Serial No. 347,502

36 Claims. (Cl. 12—36)

This invention relates to machines for pressing soles upon shoe bottoms and is adapted for operations such as sole laying and cement sole attaching.

Objects of the invention are to provide adequate and uniform pressure in the operation of pressing soles upon shoes and to provide an improved means for applying this pressure.

The illustrated machine comprises an inflatable pad which may be completely collapsed and upon which a shoe and sole are pressed with considerable pressure and thereafter the pad is inflated to cause the pressure to be increased and more uniformly distributed over the shoe bottom. The inflatable pad in this machine, like other pads in common use in pressure-applying machines of this type, is susceptible to damage by certain pressure mediums which, however, because of inherent advantages, are used in the fluid pressure system. For example, many of these machines are equipped with rubber pads and with oil pressure systems, but because oil is deleterious to rubber it has not heretofore been possible to utilize the oil pressure to inflate the pads. This difficulty is overcome, in accordance with one feature of this invention, by the illustrated pad-inflating means which comprises a system connected with the inflatable pad and containing a pressure medium that is not deleterious to the pad, a second pressure fluid system associated with the first system, and means responsive to the pressure in the second system for forcing the non-deleterious pressure medium from the first system into the pad. Thus, with this arrangement in a machine equipped with rubber pads for example, water can be used in the system which is connected to the pads and oil or any other desired medium in the other system. The illustrated means for transmitting pressure from one system to the other consists of a pair of connected pistons which are spaced from each other so that the leakage around either piston can be isolated and disposed of separately, the isolation of the leakage being facilitated by the arrangement of a partition between the pistons. The water system, that is, the water cylinder, the water pad and the pipe leading to it, is kept constantly full of water by connecting it with a reservoir higher than the highest point in the system.

A further feature of this invention relates to the mechanism for pressing a shoe into the pad and to the control exercised by this mechanism over the pad-inflating means. As illustrated, the preliminary pressure of the shoe against the pad is produced by the action of a cam which is operated by fluid pressure. When, by reason of the resistance of the shoe, movement of the cam ceases, its fluid-pressure-operated mechanism acts automatically to open a valve to cause inflation of the pad.

It is desirable that the shoes remain under pressure for a predetermined time and accordingly a timing device which is set in operation when the pressure is applied is provided, this mechanism acting to release the pressure after a predetermined time has elapsed.

In the illustrated machine, oil supplied by a gear pump is utilized at two pressures, the higher pressure being used to apply preliminary pressure to the shoe and the lower pressure to operate the piston which causes water to be forced into the pad.

In the drawings,

Fig. 1 is a front elevation of the machine;

Fig. 2 is a side elevation of the left-hand side of the machine;

Fig. 3 is a detail of the means for adjusting the timing mechanism;

Fig. 4 is a side elevation, partly in section, of the right-hand side of the machine;

Fig. 5 is a side elevation, partly in section, of the base of the machine showing the controlling valves and the timing mechanism;

Fig. 6 is a sectional detail of one of the pressure control valves used in the machine;

Fig. 7 is a plan view, partly in section, taken through the base of the machine;

Fig. 8 is a side elevation of the head of the machine during the application of preliminary pressure, a portion of the pad box being shown in section;

Fig. 9 is a view of a portion of the pad and the cam-operating mechanism shown in Fig. 8 after the pad has been inflated to apply final pressure, the pad being shown partly in section; and

Fig. 10 is a rear view of the cam-operating parts shown in Figs. 8 and 9.

As indicated in Fig. 1, the machine may comprise two substantially identical pressure-applying mechanisms arranged side by side on the same frame, the same motor, oil pump and oil and water supply being common to the two machines. The machines may be utilized, of course, one for operating upon a right shoe and the other upon a left shoe and, since the machines are substantially identical, only the one at the left will be described in detail and it will be understood that the other is substantially similar.

As illustrated in Fig. 4, the machine comprises a frame **20** to which is fixedly secured a forepart pad box **22**. To the stationary forepart pad box **22** is pivoted at **24** a part **26** which constitutes the shank portion of the box and to the part **26** is pivoted at **28** a part **30** which constitutes the heel end of the box. In the box comprising the sections **22**, **26** and **30** is mounted first an inflatable pad **32** upon which lies a rubber pad **34** the forepart of which is considerably thicker than its shank and

rear part. The pad is held in the box by usual plates 36 secured to the pad box and overhanging the pad. The rear part 30 of the pad box has on its under side a flat surface 50 which rests on a block 52 pivoted at 54 to a lever 56. The lever 56 is pivoted at 58 to the machine frame 20 at a point under the forepart pad box 22. A screw 60 threaded through a lug on the frame is arranged to engage a downward projection on the front end of the lever 56. Turning of the screw 60 by its hand wheel 62 will adjust the lever 56 about the center 58 and raise and lower the rear end 30 of the pad box, the pad of which is maintained substantially parallel to the lever 56 by a link 64 connecting the front end of the part 30 of the pad box with the lever 56. The link permits the lengthwise sliding of the surface 50 on the block 52 which is necessary as the sections 26, 30 move relatively to the lever 56 about the pivots 24, 28 in response to movement of the lever 56. The pad box is similar in construction to that disclosed in United States Letters Patent No. 2,124,654, granted July 26, 1938, on my application, and may be provided with a mask plate and means for automatically adjusting the mask plate in accordance with the length of the shoe, as disclosed in the above-mentioned patent. Such automatic means is indicated at 65 in Figs. 4 and 8.

To apply pressure to the shoe, a forepart abutment 66 for engaging the forepart of the shoe and a heel abutment 68 for engaging the cone of the last are provided, the abutments 66, 68 being mounted for lengthwise adjustment on a lever 70 pivoted at 72 to a lever 74 which is pivoted at 76 to the frame 20. The lever 70 is held with its toe abutment 66 normally depressed by a spring 78. The rear end of the lever 74 has pivoted thereto a block 80 which engages the edge of a cam 82 which is pivoted to the frame at 84, and connected between the rear end of the lever 74 and the frame is a tension spring 85 (Fig. 1) which lifts the front end of the lever when released by the cam. The operating face of the cam 82 is so shaped that clockwise movement of the cam acting on the block 80 will swing the lever 74 counterclockwise about its pivot 76, thus moving the abutments 66, 68 against the shoe and applying pressure thereto determined by the force which operates the cam. After pressing the shoe into the pad the surface of the cam 82 cooperates with the block 80 to support the shoe against pressure from the pad, the part of the cam which at that time engages the block being nearly concentric with the pivot 84 of the cam.

The cam is operated by a fluid pressure cylinder 86 the piston 88 of which is connected by a link 90 to a lever 92 pivoted to the cam 82 at 94 and having at its rear end a pin 96 to which the upper end of a strong spring 98 is connected, the lower end of the spring being connected at 100 to the frame. When fluid under pressure is applied to the cylinder 86 the link 90 pushes on the lever 92 between its ends. Since at that time there is little resistance to movement of the cam 82, it will be moved about its pivot 84 and will operate the lever 74 about the pin 76 as a fulcrum to apply pressure to the shoe as described. However, when the resistance of the shoe reaches a predetermined amount, the spring 98 yields, allowing the lever 92 to turn on the pivot 94 and the rear end of the lever to go up. This movement is utilized to control the introduction of fluid pressure to the pad. A forked member 102 embraces at its upper end a roll on the pivot screw 84 of the cam 82 and has therein a slot 104 through which the pin 96 projects, the slot accommodating the movement of the pin 96 about the center 84. When the rear end of the lever 92 rises against the tension of the spring 98, the pin 96 will impart upward movement to the member 102 which, at its lower end, is pivoted to an arm 106. The arm 106 is fixed to a rockshaft 108 journaled in the frame and having (Figs. 4 and 5) an arm 110 connected by a link 112 to a valve 114 by which admission of water to the pad 32 is controlled.

The fluid pressure system of the machine is arranged as follows: A motor 120 (Fig. 2) mounted at the rear end of the base portion of the machine has a pulley 122 belted to a pulley 124 on a gear pump 126. The pump 126 takes oil through a pipe 127 from a tank 128 (Fig. 7) at the base of the machine and forces it through a pipe 130 (Fig. 2) to a pressure control valve 132. The valve 132 has the construction indicated in Fig. 6. The fluid under pressure entering from the pipe 130 presses against a piston 133 until the tension of a spring 134 is overcome, permitting the piston 133 to slide and open ports therein leading to a chamber 136 connected with a pipe 138. A more detailed description of this type of valve may be found in Letters Patent of the United States No. 2,047,185, granted July 14, 1936, upon application of M. H. Ballard et al. In the present arrangement, the pipe 138 leads from the pressure control valve 132 to another similar pressure control valve 140 the overflow pipe 142 from which is connected to what is termed the low pressure system of the machine which operates the pad-inflating mechanism, while an extension 144 of the pipe 130 beyond the pressure control valve 132 is connected to the high pressure system which is utilized to operate the piston 88.

The pipe 144 leads to a port 146 in a valve casing 148 (Fig. 5). The port 146 is closed by the upper portion of a cylindrical slide valve 150 which has its intermediate portion reduced in diameter to permit, in the position of the valves shown, communication between a port 152 in the casing 148 and an exhaust port 154 communicating with the tank 128. The port 152 is connected by a pine 156 to the cylinder 86 and, of course, with the valve in the position shown the cylinder would be exhausted. When the valve 150 is lifted communication is established between the high pressure port 146 and the pipe 156, thereby supplying high pressure fluid to the piston 88 which operates in the manner already described to apply pressure to the shoe. The pipe 142 of the low pressure system is connected (Fig. 5) to a port 158 in the casing 148. The port 158 is normally closed by the cylindrical slide valve 114 having an intermediate reduced portion which permits communication between an exhaust port 162 and a pipe 164 (Fig. 7) leading to a port 166 in a head 168 secured to a large horizontal cylinder 170.

An oil piston 172 in the cylinder carries a hollow stem 174 which passes loosely through a partition 176 in the center of the cylinder and at its front end is connected to a water piston 178. The rear end of the cylinder 170 is closed by a head 180 to which are connected for communication with the cylinder a large pipe 182 and a small pipe 184. To move the pistons 172, 178 forwardly or toward the head 168 when the oil pressure is relieved, there is provided a long compression spring 186 the forward end of which engages the bottom of the hole of the hollow stem 174 and the other end of which engages the head 180, the spring being prevented from buckling

by a rod 188 secured to the head 180 and extending lengthwise of the spring 186 inside the coils thereof. The large pipe 182 (Fig. 2) leads directly from the cylinder head 180 to the hollow pad 32 where it is connected to the pad, as shown in Fig. 4. The pipe 182 communicates with an enlargement 190 of a cylindrical recess 192 in the lower part of the forepart pad box 22. In the recess 192 is a hollow sleeve 194 having at its upper end a projecting flange 196 bearing against the lower wall of the hollow pad 32. The lower end of the sleeve 194 is closed and a screw 198 passes loosely through a hole in the forepart pad box 22 and is threaded into the closed end of the sleeve so that the screw when rotated moves the sleeve downwardly and causes its flange 196 to clamp the lower wall of the hollow pad 32 against the bottom of the pad box. Ports 200 permit passage of water from the enlargement 190 through the sleeve into the hollow pad 32.

The small pipe 184 connected to the head 180 of the cylinder extends, as shown in Fig. 4, through a check valve 202 and a stop cock 204 to a T 206 (Fig. 1) from which a pipe 208 leads to a reservoir 210 the water level in which is kept at a uniform height by means of an inverted bottle 212 having its neck immersed in the water in the reservoir 210. This bottle 212 may be of the construction disclosed in Letters Patent of the United States No. 2,013,853, granted September 10, 1935, in the name of E. J. Ray. The bottle 212 is surrounded by a casing 214 mounted for vertical adjustment on a bracket 216 by means of a thumb screw 218. From the T 206 another pipe 220 leads through the stop cock 204 and the check valve 202 to the cylinder 170 on the right-hand side of the machine.

A lasted shoe and sole having been placed upon the pad 34, the operation of the machine is initiated by depression of a treadle 222 (Fig. 5) pivoted at 224 to the base of the machine and having a long gooseneck portion 226 which extends from the treadle 222 up over the edge of the oil tank 128 and down beneath the oil level to a point under the slide valve 150 to which it is connected by a link 228. The treadle is raised by a tension spring 230 connected at one end to the gooseneck 226 forward of its pivot 224 and at the other end to a pin on the machine frame. Downward movement of the treadle 222 is limited by a stop screw 232 threaded through the treadle and engaging the base when the treadle is depressed.

Depression of the treadle 222 will move the slide valve 150 upwardly sufficiently to close the exhaust port 154 and open the port 146, thus connecting the high pressure system with the pipe 156 communicating with the cylinder 86. Movement of the piston 88 in response to such pressure first turns the cam 82 clockwise, its contoured edge engaging the block 80 and turning the lever 74 counterclockwise (as viewed in Fig. 4) about its pivot to cause the abutments 66, 68 to apply pressure to the shoe, thereby pressing it firmly upon the pad 34 and causing the underlying hollow pad 32 to collapse almost completely. When resistance of the shoe prevents further movement of the cam 82, the lever 92 will turn on its pivot 94 against the tension of the spring 98, causing the forked member 102 to move upwardly and operate the arms 106, 110. The arm 110 thereupon raises the slide valve 114 sufficiently to close the exhaust port 162 and open the low pressure inlet port 158, thereby admitting low pressure fluid to the port 166 (Fig. 7) in the head 168 of the large cylinder 170. Pressure on the piston 172 forces water in the rear end of the cylinder through the pipe 182 into the hollow pad 32, passage of the water through the small pipe 184 being prevented by the check valve 202. When the treadle 222 is allowed to return in response to its spring 230, the slide valve 150 is lowered, cutting off the supply of oil through the port 146 and opening the exhaust port to allow oil in the cylinder 186 to be exhausted, whereupon the spring 98 contracts, moving the forked member 102 downwardly, thus lowering the slide valve 114 and causing its inlet port 158 to be closed and its exhaust port 162 to be opened, thus allowing the reaction of the spring 188 to move the piston 172 forwardly and exhaust the oil from the front portion of the cylinder. At the same time the water piston 178 moves forwardly under the influence of the spring 186 and allows the water to flow out of the hollow pad 32. In case of leakage, more water will be supplied through the pipe 184 from the reservoir 210. The leakage of water by the piston 178 is carried by a pipe 234 (Figs. 2 and 7) to a drip tank 236 located in one corner of the machine base. The pipe 234 is connected to the chamber between the partition 176 and the piston 178. Similarly, an opening 237 in the lower side of the cylinder 170 at the front of the partition 176 will permit any oil which passes the piston 172 to drain back into the oil tank 128 beneath it.

The amount of pressure in the low pressure system is indicated by a gage 238 connected to the pipe 142 and the amount of pressure in the high pressure system is indicated by a pressure gage 240 (Fig. 7) connected to the pipe 130, the pressure control valves 132, 140 being, of course, adjusted by their hand wheels 242 to maintain the desired pressure respectively in the high and low pressure systems.

In order that the pressure on a given shoe may be retained for a predetermined time and then released, timing mechanism is provided which will now be described with particular reference to Figs. 3, 5 and 7. The upper portion of the slide valve 150 is provided with a horizontal notch 250 (Fig. 5) which, when the valve is fully raised, is engaged by a locking lever 252 which prevents descent of the valve when the treadle is released. Inasmuch as the valve is connected to the treadle by the link 228, the treadle will be held depressed until the lever 252 is disengaged from the valve and permits the latter to descend. The lever 252 is biased by a spring 254 in a direction to engage the notch 250 and is pivoted on the upper end of an upright rod 256. A rearward projection 257 (Fig. 7) of the lever 252 beyond its pivot 256 is in position to be engaged by a pin 258 carried by a segment 260 secured to the upright rod 256. A tension spring 262 connected between the pin 258 and a stationary bracket 264 swings the segment 260 in a counterclockwise direction until a pin 266 thereon engages a downwardly projecting plate 268 on a horizontal bar 270 extending transversely of the machine.

The rod 256 slides vertically through a bearing 274 (Fig. 5) and when the rod is depressed the segment rests on the top face of the bearing 274. The rod 256 is urged downwardly by gravity and by a leaf spring 276. On the lower end of the rod 256 is a sliding sleeve 278 having a slot 280 engaging a pin in the rod to limit movement of the sleeve. A compression spring is mounted on the rod between the upper end of the sleeve and

a collar 282, and a rearward extension 284 of the treadle lever 226 lies under the lower end of the sleeve 278 so that upon depression of the treadle the rod 256 and the segment 260 will be yieldingly raised.

Mounted in bearings 286, 287 secured to opposite sides of the valve casing 148 is a horizontal shaft 288, the shaft being located (Fig. 5) just above and to the rear of the segment 260 so that when the segment is raised its teeth will mesh with screw threads 290 on the shaft 288. Secured to the shaft 288 is a sprocket wheel 292 connected by a sprocket chain 294 to a sprocket wheel 296 on a 10 to 1 reducing gear 298 having a pulley 300 driven by a belt 302 which leads to a pulley 304 (Fig. 2) on the shaft of the motor 120. Thus the shaft 288 is driven at a slow speed.

When the treadle is depressed to apply pressure to the shoe, the extension 284 of the treadle lever acting on the sliding sleeve 278 yieldingly raises the rod 256 (Fig. 5) and the segment 260 until the segment engages the lower side of the locking lever 252 which limits its upward movement to a position where its teeth are in mesh with the screw threads 290 on the shaft 288. Since the shaft 288 is turning continuously, the segment at once starts to travel in a clockwise direction (Fig. 7) and, when the pin 258 engages the rearward projection 257 of the locking lever 252, it moves the lever out of the notch 250 in the slide valve 150, allowing the valve to drop and exhaust the cylinder 86. Of course the time during which the shoe remains under pressure will depend upon the distance the pin 258 has to travel before it engages the projection 257 of the locking lever. This may be varied by changing the location of the plate 268 engaged by the stop pin 266. This plate 268 and a similar one which controls the other side of the machine are secured to the under side of the bar 270 and may be adjusted to similar settings by longitudinal movement of the bar which, as shown in Fig. 3, extends beyond the machine frame and has thereon an index mark 306 which cooperates with a fixed scale 308 to indicate the setting of the bar, the divisions of the scale in the present instance indicating seconds. The bar may be held in adjusted position by a thumb screw 310 extending through a slot 312 in the bar 270 and threaded into a bracket 314 on the frame.

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

1. A machine for applying pressure to shoe bottoms having, in combination, an inflatable pad to receive a shoe and sole, means for applying pressure to the shoe to seat it upon the pad, and means controlled by application of a predetermined amount of pressure to the shoe to cause the pad to be inflated.

2. A machine for applying pressure to shoe bottoms having, in combination, an inflatable pad to receive a shoe and sole, fluid-operated means for applying pressure to the shoe to seat it upon the pad, and means set in operation automatically by the building up of a predetermined amount of pressure in said fluid-operated means to cause the pad to be inflated.

3. A machine for applying pressure to shoe bottoms having, in combination, an inflatable pad, a lever having means to engage a shoe and press it upon the pad, a cam for operating the lever to apply pressure to the shoe, fluid-pressure-operated means for moving the cam, and means acting after a predetermined force has been applied to the cam for causing inflation of the pad.

4. A machine for applying pressure to shoe bottoms having, in combination, an inflatable pad, a lever arranged to press a shoe upon the pad, a cam for operating the lever to apply pressure to the shoe, fluid-pressure-operated means for moving the cam, a yieldable connection between the fluid-pressure-operated means and the cam, and means acting when said connection yields to cause inflation of the pad.

5. A machine for applying pressure to shoe bottoms having, in combination, an inflatable pad, a lever arranged to press a shoe upon the pad, a cam for operating the lever to apply pressure to the shoe, a lever pivoted to the cam, fluid-pressure-operated means connected to the last-mentioned lever, a spring connected to the lever on the cam and acting to oppose movement of the lever by said fluid-operated means, and means acting when said spring yields to cause inflation of the pad.

6. A machine for applying pressure to shoe bottoms having, in combination, a pad to receive a sole, means for pressing a shoe against the sole to seat the shoe and sole upon the pad, and means dependent upon the application of a predetermined pressure to the shoe to cause pressure to be applied to the pad to force the pad against the sole.

7. A machine for applying pressure to shoe bottoms having, in combination, a pad to receive a sole, means for pressing a shoe against the sole to seat the shoe and sole on the pad, said means being arranged to hold the shoe and sole against the pad after it has applied a predetermined pressure to the shoe, and means dependent upon the application of said predetermined pressure to the shoe for forcing the pad against the sole, said last-named means being arranged automatically to apply pressure to the pad as a consequence of the operation of the predetermined pressure to the shoe.

8. A machine for applying pressure to shoe bottoms having, in combination, an inflatable pad, a lever arranged to press a shoe upon the pad, a cam for operating the lever to apply pressure to the shoe, a cam-operating lever having a fulcrum arranged to yield when the resistance of the cam to further movement reaches a predetermined point, and means acting when the fulcrum yields to cause inflation of the pad.

9. A machine for applying pressure to shoe bottoms having, in combination, an inflatable pad, a lever arranged to press a shoe upon the pad, a cam for operating the lever to apply pressure to the shoe, means for operating the cam, said means including a member arranged to move in one direction to operate the cam and in a different direction when the resistance of the cam to further movement reaches a predetermined point, and mechanism responsive to the movement of the lever in said different direction for causing inflation of the pad.

10. A machine for applying pressure to shoe bottoms having, in combination, an inflatable pad to receive the sole of a shoe, means for supporting a lasted shoe and a sole on the pad, means for inflating the pad to apply pressure to the shoe and sole to cement-attach the sole and shoe, and means for automatically exhausting the pad after the shoe has been under pressure for a predetermined time.

11. A machine for applying pressure to shoe

bottoms having, in combination, an inflatable pad to receive a shoe sole, means for applying pressure to a lasted shoe and the sole on the pad, means for inflating the pad to press the shoe and sole together, and timing mechanism set in operation when pressure is applied and said pad is inflated to release pressure on the shoe and exhaust the pad after a predetermined time has elapsed.

12. A machine for applying pressure to shoe bottoms having, in combination, an inflatable rubber pad, means for holding a shoe on the pad, a contractible water-containing vessel communicating with said pad, a source of oil under pressure, a vessel arranged to be expanded by the oil under pressure, and connections for causing expansion of the oil vessel to contract the water vessel and force water into the pad.

13. A machine for applying pressure to shoe bottoms having, in combination, an inflatable pad, means for holding the shoe on the pad, and a cylinder having two heads and containing two pistons, one head communicating with the pad and the other head communicating with a source of liquid under pressure, the application of fluid pressure to one piston causing the other piston to force fluid into the pad.

14. A machine for applying pressure to shoe bottoms having, in combination, an inflatable pad, means for holding a shoe on the pad, a water-containing vessel the cubic content of which may be reduced by pressure, said vessel communicating with said pad, a vessel arranged to be expanded by oil under pressure, connections for causing the expansion of the oil vessel to reduce the cubic content of the water vessel and force water into the pad, and a source of oil under pressure communicating with said oil vessel.

15. A machine for applying pressure to shoe bottoms having, in combination, an inflatable pad, means for holding a shoe on the pad, a source of liquid under pressure, a cylinder having two heads and containing piston means between the heads, one head communicating with the pad and the other head communicating with the source of liquid under pressure, and means for controlling the application of the pressure liquid to cause a movement of said piston means to force fluid into the pad.

16. A machine for applying pressure to shoe bottoms having, in combination, an inflatable rubber pad, means for holding a shoe on the pad, a contractible water-containing chamber communicating with said pad, an expansible chamber containing oil, means for supplying oil under pressure to expand the oil chamber, and means for causing expansion of the oil chamber to contract the water chamber to force water into the pad.

17. A machine for applying pressure to shoe bottoms having, in combination, an inflatable pad, means for holding a shoe on the pad, a cylinder having a head at each end and containing a movable member therein, one head communicating with the pad and the other head communicating with a source of liquid under pressure, and means for supplying liquid under pressure through said head to move said movable member and force liquid through the head connected with said pad.

18. A machine for applying pressure to shoe bottoms having, in combination, an inflatable pad, means for holding a shoe on the pad, a water-containing vessel the cubic content of which may be reduced by pressure, said vessel communicating with said pad, a vessel arranged to be expanded by oil under pressure, connections for causing expansion of the oil vessel to reduce the cubic content of the water vessel and force water into the pad, a source of oil under pressure communicating with said oil vessel, and a valve for controlling admission of oil to the oil vessel.

19. A machine for applying pressure to shoe bottoms having, in combination, an inflatable pad, means for holding a shoe on the pad, a cylinder closed at each end, two pistons spaced apart in said cylinder, one end of the cylinder communicating with the pad and the other end communicating with a source of liquid under pressure, and means for supplying liquid under pressure through said last-mentioned end to apply pressure to one of said pistons and cause the other piston to force liquid through the end connected with the pad into the pad.

20. A machine for applying pressure to shoe bottoms having, in combination, an inflatable pad, means for holding a shoe on the pad, a system containing a pressure medium which is not deleterious to the pad connected with the pad, a pressure fluid system, and means responsive to the pressure in the pressure fluid system for forcing the pressure medium from the first-mentioned system into the pad.

21. A machine for applying pressure to shoe bottoms having, in combination, an inflatable rubber pad, means for holding a shoe on the pad, a system containing water connecting with the pad, a piston for forcing water from the system into the pad, and a pressure fluid system arranged to apply pressure to the piston to displace the same and inflate the pad.

22. A machine for applying pressure to shoe bottoms having, in combination, an inflatable pad, means for holding a shoe on the pad, a contractible water-containing chamber communicating with the pad, means for contracting said chamber to force water into the pad, a reservoir higher than the pad and connected thereto, and means permitting flow of water from the reservoir into the pad when the water from the pad is not under pressure and for preventing the flow of water from the pad to the reservoir when the water in the chamber and pad is under pressure.

23. A machine for applying pressure to shoe bottoms having, in combination, an inflatable rubber pad, means for holding a shoe on the pad, a contractible water-containing chamber communicating with the pad, means for contracting said chamber to force water into the pad, a reservoir higher than the pad, a pipe leading from the reservoir to the pad, and a check valve in the pipe permitting flow of water by gravity to the pad and chamber when the water therein is not under pressure and preventing flow of water to the reservoir when the water in the chamber and pad is under pressure.

24. A machine for applying pressure to shoe bottoms having, in combination, an inflatable pad, means for holding a shoe on the pad, a cylinder closed at each end, two pistons spaced apart in said cylinder, one end of the cylinder communicating with the pad and the other end communicating with a source of liquid under pressure, means for supplying liquid under pressure through said last-mentioned end to apply pressure to one of said pistons and cause the other piston to force liquid through the end connected with the pad into the pad, and means for separately disposing of the leakage of water by

one of the pistons and leakage of oil by the other piston.

25. A machine for applying pressure to shoe bottoms having, in combination, an inflatable pad, means for holding a shoe on the pad, a cylinder closed at each end, two spaced pistons in the cylinder, a partition between the pistons, one end of the cylinder communicating with the pad and the other end communicating with a source of liquid under pressure, means for supplying liquid under pressure through the last-mentioned end to move said pistons to force liquid through the end connected with the pad into the pad, a pipe opening between one of the pistons and the partition to dispose of leakage by said piston, and an opening between the other piston and the partition to dispose of leakage by the other piston.

26. A machine for applying pressure to shoe bottoms having, in combination, a pad, fluid-pressure-operated means for pressing the shoe upon the pad, a valve for controlling operation of the fluid-operated means, means for locking the valve in its pressure-applying position, and means acting after a predetermined time has elapsed for releasing the valve to release the pressure on the shoe.

27. A machine for applying pressure to shoe bottoms having, in combination, a pad, fluid-operated means for pressing a shoe upon the pad, a valve movable from an exhaust position to a position to supply fluid under pressure to said fluid-operated means, means for locking the valve in said pressure-applying position, a continuously rotating screw, a toothed segment arranged to be brought into engagement with said screw in conjunction with the opening of the valve, and means on said segment for releasing the valve-locking means after a predetermined time has elapsed.

28. A machine for applying pressure to shoe bottoms having, in combination, a pad, fluid-operated means for pressing a shoe upon the pad, a valve movable from exhaust position to a position to supply fluid under pressure to said fluid-operated means, means for biasing the valve to exhaust position, means for locking the valve in said pressure-applying position, a continuously rotating screw, a toothed segment arranged to be brought into engagement with said screw in conjunction with the opening of the valve, and means on said segment for releasing the valve-locking means after a predetermined time has elapsed to cause release of pressure on the shoe.

29. A machine for applying pressure to shoe bottoms having, in combination, an inflatable pad to receive a shoe and sole, fluid-operated means for applying pressure to the shoe to seat it upon the pad, means acting automatically to inflate the pad after a predetermined amount of pressure has been applied to the shoe, and means acting after the shoe has been under pressure for a predetermined time to release the pressure on the shoe and deflate the pad.

30. A machine for applying pressure to shoe bottoms having, in combination, an inflatable pad, fluid-pressure-operated means for pressing a shoe upon the pad, means actuated automatically after a predetermined pressure has been applied to the shoe to inflate the pad, a valve for controlling operation of the fluid-operated means, means yieldingly holding the valve in exhaust position, means for locking the valve in pressure-applying position, means acting after a predetermined time has elapsed for releasing the valve to relieve pressure on the shoe, and means actuated by relief of pressure on the shoe for exhausting the pad.

31. A machine for applying pressure to shoe bottoms having, in combination, a pad, fluid-operated means for applying pressure to the shoe, a valve normally biased to exhaust position and movable from exhaust position to a position to supply fluid under pressure to said fluid-operated means, manually controlled means for moving the valve to pressure-applying position, means for locking the valve in said position, a continuously rotating screw, a toothed segment arranged to be brought into engagement with said screw when the manually controlled means is operated, and means on said segment for releasing the valve-locking means after a predetermined time has elapsed to cause pressure on the shoe to be relieved.

32. A machine for applying pressure to shoe bottoms having, in combination, a pad, fluid-pressure-operated means for pressing a shoe upon the pad, a valve for controlling operation of the fluid-operated means, means for biasing the valve to exhaust position, means for locking the valve in position to operate said fluid-operated means, and means acting after a predetermined time has elapsed for releasing the valve to permit it to move to exhaust position and release pressure on the shoe.

33. A machine for applying pressure to shoe bottoms having, in combination, an inflatable pad to receive a shoe and sole, means for applying pressure to the shoe to seat it upon the pad, means acting automatically to inflate the pad after a predetermined amount of pressure has been applied to the shoe, and means acting after the shoe has been under pressure for a predetermined time to release the pressure on the shoe and deflate the pad.

34. A machine for applying pressure to shoe bottoms having, in combination, an inflatable pad to receive a shoe sole, means for supporting a lasted shoe and the sole on the pad, means for inflating the pad to apply pressure to the shoe to cement-attach the shoe and sole, and a timing mechanism set in operation when the pad is inflated and acting after a predetermined time to cause deflation of the pad.

35. A machine for applying pressure to shoe bottoms having, in combination, a pad, fluid-pressure-operated means for pressing the shoe upon the pad, a valve for controlling operation of the fluid-operated means, means for biasing the valve to exhaust position, means for locking the valve in position to operate said fluid-operated means, and a timing mechanism set in operation by movement of said valve to locked position and acting after a predetermined time has elapsed for releasing the valve-locking means for permitting it to move to exhaust position and release pressure on the shoe.

36. A machine for applying pressure to shoe bottoms having, in combination, an inflatable pad to receive a sole, means for pressing a shoe against the sole to seat the shoe and sole upon the pad, a high pressure fluid-operated system for operating the shoe-pressing means, a low pressure fluid system for applying pressure to the pad, and means responsive to the pressure in the high pressure system for admitting pressure fluid in the low pressure system to the pad.

SIDNEY J. FINN.

CERTIFICATE OF CORRECTION.

Patent No. 2,301,205. November 10, 1942.

SIDNEY J. FINN.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, second column, lines 44, 45 and 47, for "machines" read --mechanisms--; page 2, second column, lines 31 and 32, for "which is connected" read --which spills back into the tank 128. The pipe 138 is connected by a pipe 143--; line 46, for "pine" read --pipe--; line 54, for the reference numeral "142" read --143--; page 3, second column, line 10, for "cylinder 186" read --cylinder 86--; line 15, for "188" read 186--; line 34, for "pipe" 142" read --pipe 143 (Fig. 1)--; page 4, second column, line 43, claim 7, for "operation" read --application--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 5th day of January, A. D. 1943.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)