

May 25, 1954

J. W. PERKINS ET AL
SHOE SOLE LAYING PRESS

2,679,059

Filed July 26, 1952

3 Sheets-Sheet 1

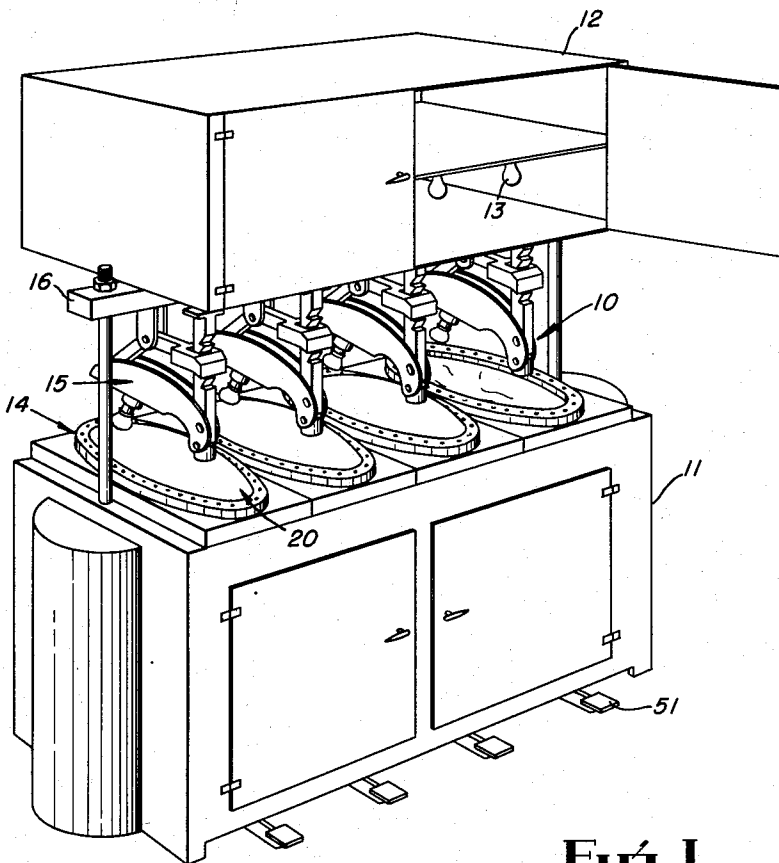


Fig 1

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3 Sheets-Sheet 2

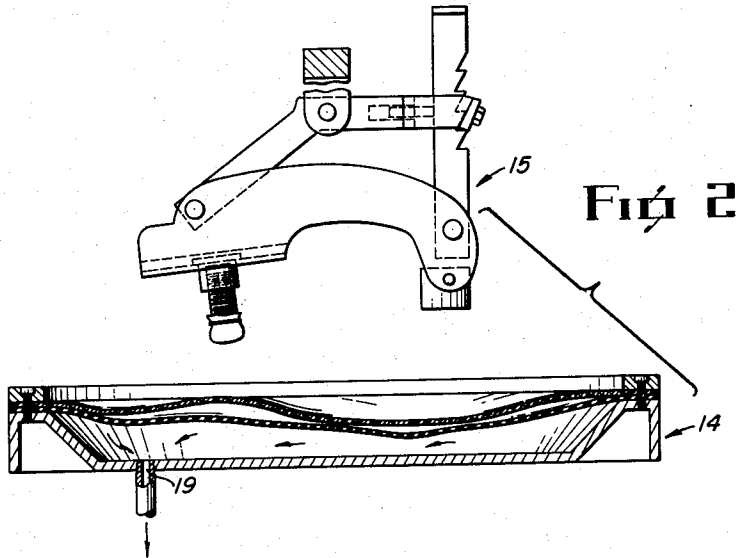


FIG 2

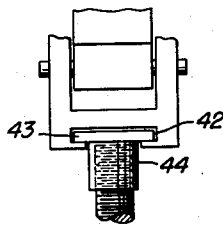


FIG 4

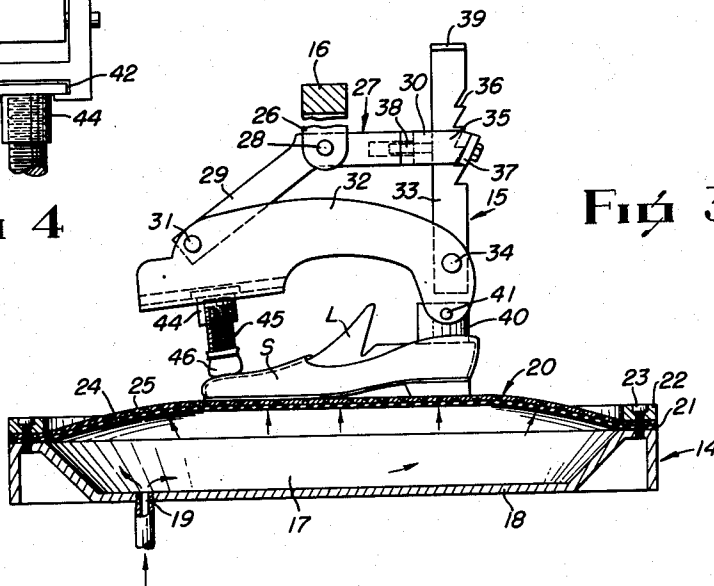


FIG 3

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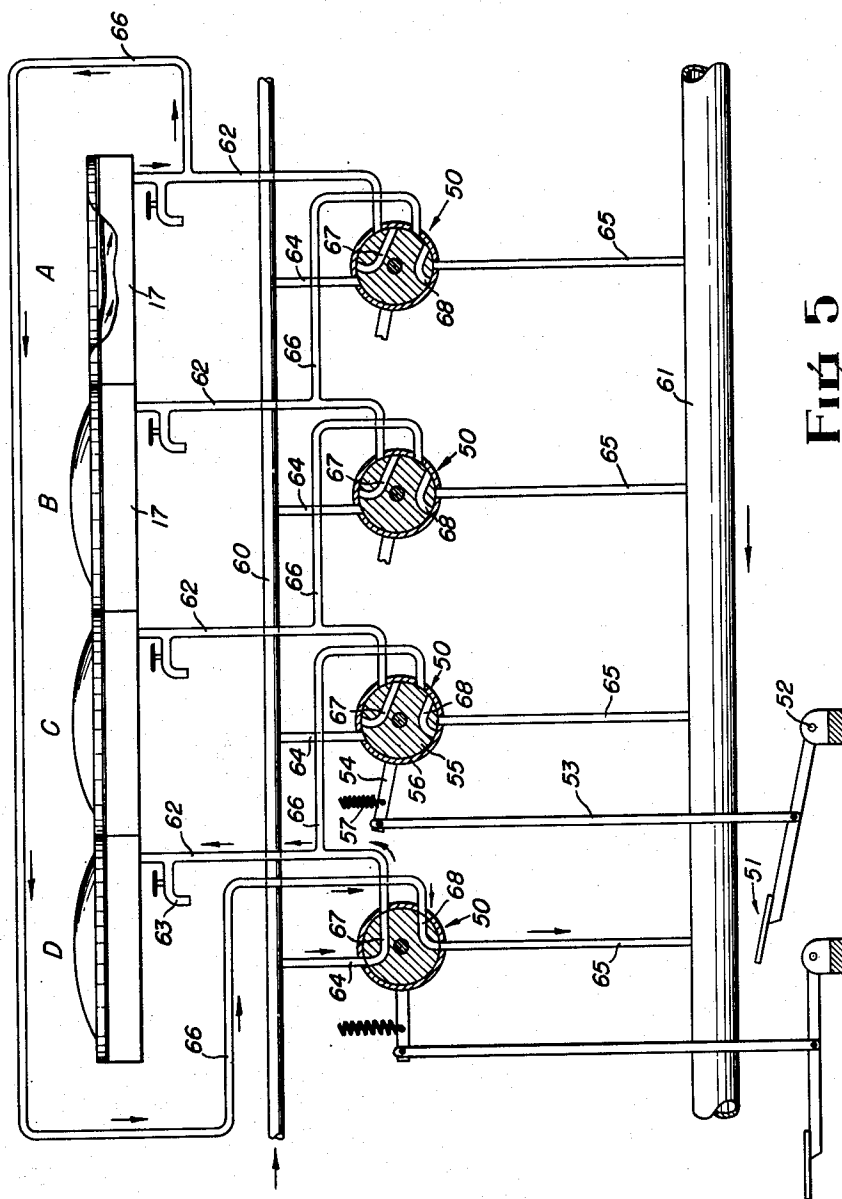


Fig 5

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UNITED STATES PATENT OFFICE

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SHOE-SOLE LAYING PRESS

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7 Claims. (Cl. 12—36)

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Our invention relates to a shoe-sole laying press. It has to do, more particularly, with a press for pressing or laying a sole on the bottom of a shoe after cement has been disposed between such members.

Various machines have been provided in the past for laying a sole on a shoe bottom so that the sole will be retained firmly on the shoe bottom by cement disposed between such members. Considerable pressure must be developed in such a machine and the pressing member engaging the sole must be flexible so that the sole, during pressing, can be caused to conform to the bottom of the shoe. Therefore, prior art presses have usually consisted of a lower pressing unit including a flexible upper wall and a fixed rigid pressing unit spaced above the flexible wall of the lower unit. The shoe, with the sole attached thereto temporarily by cement, is disposed upright on the flexible wall of the lower pressing unit and when fluid pressure is supplied thereto, such flexible wall will be expanded upwardly to cause the shoe to be engaged by the upper fixed pressing unit. The resulting pressure on the shoe and sole disposed between the two pressing units will lay or press the sole firmly on the shoe bottom.

One disadvantage of prior art presses of this general type has been due to the fact that there is no positive means for exhausting the pressure from the flexible pressing unit and the operator must wait until the pressure bleeds therefrom before he can dispose another shoe thereon. He often hits the flexible wall with a shoe to speed-up deflation but obviously this is an undesirable procedure. Obviously, this slow deflation of the flexible pressing unit slows up production. These prior art machines further are usually very complicated and of the rotatable turret type and are difficult to fit into a straight-line production system. Furthermore, prior art machines are difficult to adjust for different sizes and types of shoes.

It is the main object of our invention to provide an efficient sole-laying press which will readily fit into a straight-line production system and which will have increased productive capacity as compared to the complicated prior art sole-laying machines.

Another object of our invention is to provide a sole-laying press of the general type indicated which is provided with positive means for quickly exhausting the fluid from the flexible pressing unit as soon as the pressing operation is completed.

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A further object of our invention is to provide a sole-laying press of the type indicated wherein the upper pressing unit can be adjusted readily to receive shoes of widely different sizes and of different types and will adjust itself automatically during the pressing operation to some extent depending on the type of shoe being pressed.

Still another object of our invention is to provide a sole-laying press which is very simple and has a minimum number of moving parts and, therefore, is relatively inexpensive in original cost and relatively inexpensive to maintain.

Various other objects will be apparent.

The machine of our invention preferably comprises a series of presses arranged in a straight line. Each press includes the lower pressing unit, with the flexible wall, and the upper unit which is rigidly supported above and spaced from the flexible wall. The lower pressing unit is composed of a fluid pressure chamber which has the flexible shoe-supporting wall attached to the top thereof. A fluid system is provided for supplying fluid under pressure into said chamber to expand the flexible wall upwardly and press the shoe against the fixed upper pressing unit. To exhaust the fluid from said chamber to retract the wall and permit removal of the shoe from the press, we do not rely merely upon a bleeding of the air from the chamber, but provide a vacuum source connected in the fluid system for positively withdrawing the air from the chamber. This will deflate or retract the flexible wall quickly to permit another shoe to be supported immediately on the flexible wall. Each press is controlled by a single valve and it is preferred that the fluid system be so arranged that actuation of the valve of one press to supply pressure to the fluid chamber thereof will connect the fluid chamber of the succeeding press to positively withdraw the fluid therefrom and deflate or retract the flexible wall thereof. Normally the valve of each press is held in closed position with the fluid chamber of such press supplied with fluid to keep the flexible wall expanded. The upper pressing unit includes members for engaging the toe and heel portions of the shoe, these members being so supported that they can be adjustably positioned to compensate for differences in sizes and types of shoes. Furthermore, these members will automatically relatively adjust themselves to some extent during the pressing operation depending upon the nature of the shoe.

The preferred embodiment of our invention is illustrated in the accompanying drawings where-

in similar characters of reference designate corresponding parts and wherein:

Figure 1 is a perspective view showing a series of presses constructed according to our invention.

Figure 2 is a vertical sectional view through one of the presses showing the flexible wall of the lower pressing unit deflated or retracted.

Figure 3 is a similar view but showing the flexible wall expanded and a shoe being pressed between the two pressing units.

Figure 4 is a detail in front elevation of the means for adjustably supporting the toe-engaging portion of the upper pressing unit.

Figure 5 is a diagrammatic view of the fluid system for controlling the series of presses.

With reference to the drawings, in Figure 1, we have illustrated a machine in which a series of presses 10 are incorporated. In this figure, we have illustrated four presses but it is to be understood that any desired number may be provided. The presses are arranged in a straight line and the machine can be associated readily with a straight line conveyor system.

The machine is shown as including a lower cabinet 11 in which most of the operating mechanism can be disposed and an upper cabinet 12 which may serve as a drying cabinet for the shoes and which may be provided with infra-red heating lamps 13. Each press comprises a lower pressing unit 14, which is disposed partially within the lower cabinet 11, and an upper pressing unit 15 which is spaced above the lower unit 14 and is supported by means of a beam 16 which also supports the upper cabinet 12.

The units 14 and 15 are illustrated best in Figures 3 and 4. The unit 14 comprises a fluid chamber 17 provided within a flat disk-like metal casting 18. The bottom of the chamber 17 is provided with an opening 19 for passage of fluid. A top flexible wall 20 is clamped to a flat seat 21, on the upper edge of casting 18, by means of a clamping band 22 which is removably bolted to casting 18 by means of the cap screws 23. The flexible wall 20 is composed of an inner or lower rubber sealing sheet 24 and an upper or outer wearing sheet 25 which may be of flexible leather. When the laminated flexible wall 20 is clamped in position on the casting 18, it is loose as shown in Figure 2 since it is of larger size than the casting.

The upper unit 15 is suspended from the beam 16 by means of a bifurcated bracket 26. Between the bracket 26, a supporting lever 27 is pivoted for vertical swinging movement for means of a transverse pin 28. The lever 27 includes a downwardly inclined rear section 29 and a horizontal forward section 30. The end of the rear section 29 is pivoted at 31 between the two parallel parts of a supporting arm 32. The forward end of this arm 32 receives between its two parallel parts the lower end of a ratchet bar 33 which is pivoted thereto at 34. The upper end of this ratchet bar passes through a guide portion 35 formed on the forward section 30 of lever 27. This upper portion of the bar 33 is provided with ratchet teeth 36 which are adapted to engage the lower edge of the forward inclined wall 37 of the guide portion 35. A spring-pressed plunger 38 is mounted on the arm section 30 and extends into the guide portion 35, normally forcing the bar 33 resiliently into engagement with the ratchet-retaining wall 37. With this arrangement, it is obvious that the upper end of the ratchet bar can be pulled rearwardly to disengage the ratchet

teeth so that the bar can be slipped downwardly or upwardly in guide portion 35 relative to the section 30 of lever 27. When the bar is released, it will be automatically locked in adjusted position. Obviously, this raises and lowers the forward end of arm 32 relative to the forward end 30 of lever 27. A transversely extending T-shaped head 39 is provided on the upper end of the bar 33 to prevent the bar from passing down through the guide portion 35.

The forward end of the bar is provided with a cylindrical contact member 40 pivoted between the portions thereof by means of a transverse pin 41. This member 40 is provided with a flat lower end adapted to engage the upper surface of the heel of the last L which is provided in the shoe S to be pressed, as shown in Figure 3. The rear end of the arm 32 is provided with an undercut guide channel 42 which receives the head 43 of a socket member 44. The socket 44 depends from the arm 32 and is adapted to receive a toe contacting screw 45. The lower end of the screw 45 is flat and may be provided with a flexible cover 46 to prevent injury to the toe of the shoe. It will be apparent that the socket member 44 can be moved to various positions along the channel 42 depending on the size of the shoe to be pressed. Furthermore, the screw 45 may be screwed further into or down from the socket 44 depending upon the height of the toe and the pressure to be applied thereto. The heel member 40 may be adjusted up or down merely by moving the ratchet bar 33 upwardly or downwardly within the guide portion 35 on lever 27. Furthermore, as will later appear, during the pressing operation the lever 27 can adjust itself about the pivot 28 in accordance with the type of shoe being pressed.

The fluid system for actuating the various presses is illustrated diagrammatically in Figure 5. It is preferred that the presses be actuated successively in the direction of movement of the conveyor with which our machine is associated. For example, the conveyor may move in the direction of the large arrow at the bottom of Figure 5 and the presses will be actuated successively from right to left. In this figure, we have illustrated the presses by the letters A, B, C and D and they are actuated in this order. After the press D is used, the operator again uses press A. Each press is controlled by a four-way valve 50 which is controlled by a foot pedal 51. It will be noted from Figure 1 that these pedals extend from the cabinet near the bottom edge thereof. Each pedal 51 is in the form of a lever pivoted at its rear end at 52 to a stationary support on the cabinet 11. Intermediate its ends, the foot pedal lever is connected to an actuating rod 53 which extends upwardly to the associated valve 50 and which is pivoted to the actuating arm 54 thereof. This arm will rotate core 55 of the valve within the sleeve-like housing 56 thereof. A spring 57 is connected to the valve actuating arm 54 and is anchored to a suitable support on the cabinet 11. This spring will normally keep the arm 54 and pedal 51 in uppermost positions so that the valve 50 will be closed normally. The valves 50 are preferably so designed and arranged in the fluid system that when one valve 50 is actuated, it will operate the press with which it is associated to supply fluid pressure into the chamber 17 thereof and will withdraw fluid from the chamber 17 of the succeeding press. In other words, when the machine is actuated to clamp the shoe in one press, it is actuated to release the shoe in the

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succeeding press. This is true even when the press D is operated to grip the shoe since the shoe in press A will then simultaneously be released.

The fluid system includes the main air pressure line 60 which may supply fluid pressure, for example, air pressure, from a suitable source. It also includes the main vacuum line 61 which may be connected to any suitable vacuum producing means, for example, a vacuum fan. The fluid chamber 17 of each of the presses is connected by a line 62 to the associated valve 50, it being understood that the lines 62 are connected to the openings 19 of the various chambers 17. In the line 62, a bleedcock 63 may be provided but is normally not used. Each valve 50 is connected to the pressure line 60 by means of a line 64. Furthermore, each valve 50 is connected to the main vacuum line 61 by means of a line 65. Each line 62 is connected to the valve 50 of the preceding press (in sequence of operation) by means of a line 66, this also being true of the valve 50 of press A which is connected to the valve 50 of the preceding press D.

The core 55 of each valve is provided with a passageway 67 and with a second passageway 68. Normally, with the foot pedal 51 pulled upwardly by spring 57, the ends of the passageways 67 and 68 of each valve are closed by the housing 56 thereof. If the pedal 51 is pushed downwardly, the passageway 67 connects the lines 64 and 62 together and the lines 65 and 66 together, as shown in Figure 5, where the valve 50 of press D is open. This supplies air pressure from line 60, through line 64, valve passageway 67 and line 62 into the chamber 17 of press D. At the same time, it permits the vacuum and line 61 to act through line 65, passageway 68, line 66 and line 62 of the preceding press A to positively exhaust the chamber 17 thereof.

Thus, it will be apparent from the above description of the fluid system that actuation of the valve 50 of one press will supply fluid to such press and exhaust the fluid from the press which is the next succeeding in point of operation. Thus, if the conveyor is moving to the left of Figure 5, the press A will be first actuated to grip the shoe placed therein and the press B will be actuated to release the shoe previously placed therein, then press B will be actuated to grip a shoe placed therein and press C will be actuated to release the shoe therein, etc.

When the shoe is to be placed in the press, the two units will be in the position shown in Figure 2. The upper flexible wall 20 will be exposed on top of the cabinet 11 as shown in Figure 1. The shoe S with the sole temporarily cemented thereto will be received by the conveyor and will be placed on the exposed wall 20. Then when the pedal 51 of that press is depressed fluid pressure is supplied to the chamber 17 thereof and the wall 20 is expanded to lift the shoe so that the heel contacting member 40 engages the heel of the last L and the toe contacting member 46 engages the toe of the shoe. As previously indicated, the position of the toe member 46 may be adjusted readily with one change in setting to compensate for a change in size of the shoes being pressed. Furthermore, the vertical position of member 40 may be adjusted by one change in setting of the ratchet bar 33 to compensate for different height heels. Supplying pressure into the chamber 17 to lift the wall 20 of the lower pressing unit will press the shoe between the upper and lower pressing units 14 and 15 and will exert sufficient pressure to cause the sole to

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conform to the bottom of the shoe and to firmly adhere thereto. During the pressing operation, the entire upper pressing unit 15 can tilt about the supporting pivot 28 to compensate for differences in types of shoes.

It will be apparent from the above description that we have provided a hole pressing machine which is of simple construction and will be economical in operation and maintenance. The machine will have much greater capacity than prior art machines because of the ease of mounting the shoe thereon and removing it therefrom and because the fluid will be withdrawn positively from the fluid chamber of each press upon completion of the pressing operation. Thus, the press will be restored quickly in proper condition for receiving the next shoe. One change in setting of the upper pressing unit will compensate for a change in size of the shoe and another change in setting of such unit will compensate for a change in heel height. The machine will occupy a minimum amount of floor space and can be readily adapted to straight line production.

Various other advantages will be apparent.

Having thus described our invention, what we claim is:

1. A shoe sole laying press comprising a lower pressing unit and an upper pressing unit spaced above said lower unit, said lower pressing unit having a fluid chamber with an upper flexible wall upon which the shoe with its sole in contact therewith is adapted to rest, said upper pressing unit having shoe-engaging portions, means for supplying fluid into said chamber to expand said flexible wall so that the shoe will be lifted into engagement with the shoe-engaging portions of the upper unit, said means comprising a source of fluid under pressure, and means for positively withdrawing the fluid from said chamber to retract said flexible wall downwardly to permit removal of the shoe, said last named means comprising a vacuum source connected to said chamber, said upper pressing unit comprising a supporting member mounting the said portions for engaging the front and rear portions of the shoe, and means for supporting said member for limited vertical tilting movement.

2. A press according to claim 1 wherein one of said engaging portions is adapted to engage the heel of the shoe, and means for supporting said portion on said supporting member for vertical adjustment.

3. In a shoe press, a lower pressing unit and an upper pressing unit, said upper pressing unit comprising a supporting lever pivoted intermediate its ends for vertical swinging movement, a supporting arm pivoted to the one end of said lever and adjustably suspended from the other end of said lever, a heel-engaging portion pivoted to the latter end of said arm and a toe-engaging portion carried by the other end of said arm, and said toe-engaging portion being both longitudinally and vertically adjustable relative to said arm.

4. A shoe press according to claim 3 wherein the supporting arm is adjustably suspended from the other end of said lever by means which comprises a ratchet bar adjustable relative to said end of the lever and pivoted to the corresponding end of said arm.

5. A shoe press according to claim 4 wherein a plunger normally keeps the ratchet bar in locking engagement.

6. In combination a series of shoe sole laying presses, each of said presses comprising a lower

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pressing unit and an upper pressing unit spaced above said lower unit, said lower pressing unit having a fluid chamber with an upper flexible wall upon which the shoe with its sole in contact therewith is adapted to rest, said upper pressing unit having shoe-engaging portions, means for supplying fluid into said chamber to expand said flexible wall so that the shoe will be lifted into engagement with the shoe-engaging portions of the upper unit, means for positively withdrawing the fluid from said chamber to retract said flexible wall downwardly to permit removal of the shoe, a valve for controlling each of said presses, each said valve being connected to said fluid supplying and fluid withdrawing means and to said chamber, means for actuating each valve, said valve having fluid passageways which are normally closed but which are so arranged that upon actuation of the valve of one press the fluid is supplied to the chamber of said press and is withdrawn from the chamber of the succeeding press.

7. In combination with a series of shoe sole laying presses, each of said presses comprising an upper pressing unit and a lower pressing unit having a fluid chamber with an upper flexible

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wall upon which the shoe with its sole in contact therewith is adapted to rest, a fluid system for controlling said series of presses, said fluid system comprising a source of fluid under pressure and a source of vacuum, a valve for controlling each of said presses, each of said valves being connected to the chamber of its respective press and to the sources of fluid and vacuum, each of said valves being also connected to the chamber of the succeeding press, each of said valves being so designed that upon actuation it will connect the chamber of the press with which it is associated to the source of pressure and the chamber of the succeeding press to the source of vacuum.

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