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S. J. CAMPIONE

2,594,728

SHOE SOLE PRESS

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3 Sheets-Sheet 2

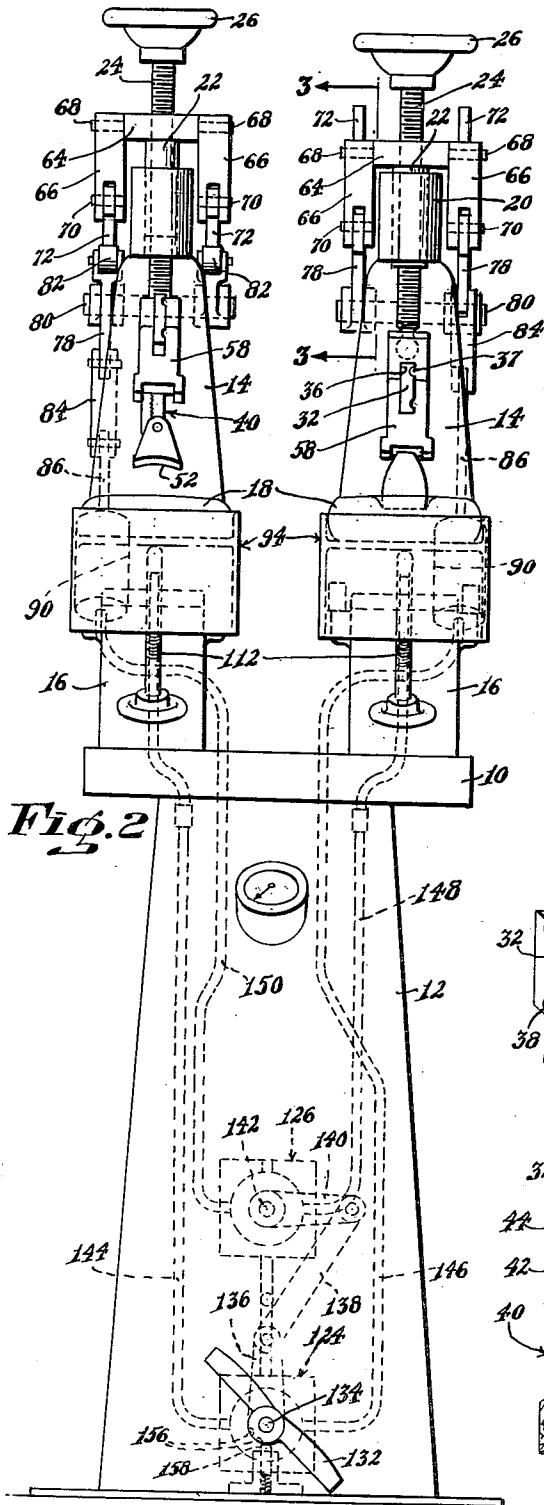


Fig. 2

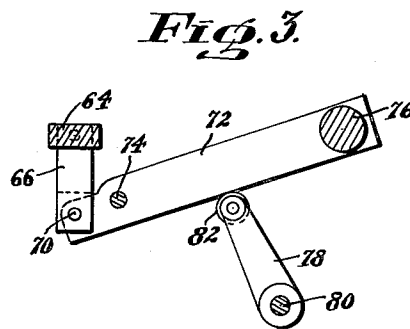


Fig. 3

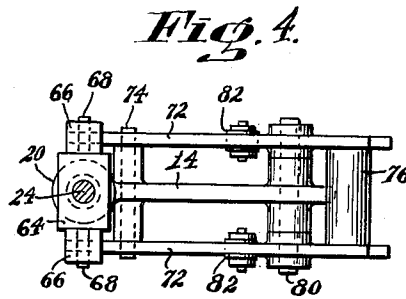


Fig. 4

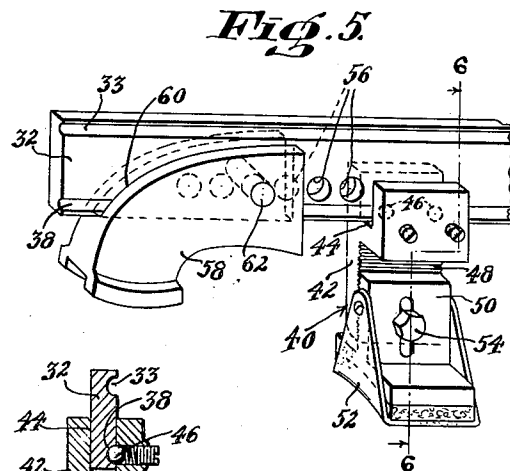


Fig. 5

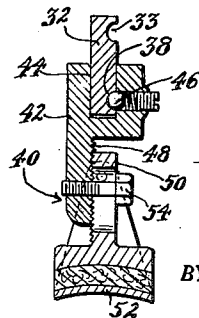


Fig. 6

INVENTOR.
Saverio J. Campione
BY his Att.
John H. McNamee

UNITED STATES PATENT OFFICE

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SHOE SOLE PRESS

Saverio Joseph Campione, North Andover, Mass.,
 assignor to Allied Shoe Machinery Corp.,
 Haverhill, Mass., a corporation of Massachu-
 setts

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This invention relates to improvements in presses of the general type wherein the work to be acted upon is inserted between coacting members of which one is an inflatable and deflatable bag whose inflation effects a pressing of the work against the other member or members. More particularly it relates to such presses which are designed and adapted for applying the combining pressure in the process of shaping and attaching of sole elements to shoe uppers.

A press of the general type to which the invention relates is disclosed in United States Patent No. 2,420,972, granted May 20, 1947, wherein a generally horizontally disposed pivoted arm is manually adjustable toward and from an inflatable bag and carries an abutment member between which and the bag the work is pressed when the bag is inflated. However, in the patented structure, the abutment member is adapted to receive the work thereon and is mounted for lateral swinging of the work between a loading position and a position in operative relation to the bag; and a relatively large inflating movement of the active surface of the bag is relied upon to bring that surface into pressing engagement with the work. Also, in the patented structure, permissible deformation of the bag, under pressure, is relied upon to accommodate variations in the shape, and heel heights, of work being acted upon by the press.

It is among the objects of the present invention to provide a press generally comparable to the said patented press but having provision for substantial preliminary adjustment of the shape of the inflatable bag, whereby the press more readily and effectively may accommodate shoe structures of widely differing base contours and having widely varying heel heights. According to the invention, one substantial portion of the bag rests on a fixed support and another substantial portion thereof rests on a support which is adjustable to set its portion of the bag in any of various relationships to the portion on the fixed support, with a mid-region of the bag flexing and bending in the nature of a hinge between the two said bag portions.

Another object is to provide one or more abutments for coaction with an inflatable bag and automatically pressure-actuated into engagement with work inserted in the press in response to pedal actuation of control means whose further actuation in the same direction effects inflation of the bag while the abutment continues unyieldingly held in its work-engaging position.

Still another object is to provide a press hav-

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ing an inflatable bag for pressing coaction with one or more abutments against which the work is pressed, and wherein the bag is adjustable to change the shape of its work-engaging surface, and the abutment is adjustable to coact with any particular adjusted shape of the work-engaging surface of the bag.

A further object is to provide a shoe sole press having an inflatable bag for pressing coaction with a work-engaging abutment, and wherein control means is operable in one direction to effect actuation of the abutment to a work-engaging position and is further operable in the same direction to effect inflation of the bag while the abutment is maintained unyieldingly in work engagement, said control means maintaining the bag inflated and the abutment in work engagement throughout a substantial reverse movement of the control means, after which a further reverse movement opens the bag to atmosphere followed by release of said abutment.

Yet another object is to provide a two-press unit wherein each press has an inflatable bag for coaction with a work-engaging abutment, and wherein a pedal actuator effects movement of the abutment of one press into work engagement and simultaneously vents the bag of the other press to atmosphere, followed by inflation of the bag of said one press simultaneously with the release of the abutment of the other press.

It is, moreover, a purpose and object of the invention generally to improve the structure, operation and effectiveness of presses and more especially shoe sole presses having an inflatable bag coacting with a work-engaging abutment.

In the accompanying drawings:

Fig. 1 is a side elevation of a press embodying features of the invention;

Fig. 2 is a front elevation thereof, showing two similar presses supported on a common base;

Fig. 3 is a detail cross-sectional view on line 3—3 of Fig. 2;

Fig. 4 is a top plan view of the upper structure of one of the presses, with the hand wheel removed;

Fig. 5 is a perspective of the abutments and their supporting bar;

Fig. 6 is a cross-sectional view approximately on line 6—6 of Fig. 5;

Fig. 7 is a top plan view of the bag-supporting members;

Fig. 8 is a top plan view of the right hand bag-supporting member, per se;

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Fig. 9 is a cross-sectional view of line 9—9 of Fig. 7;

Fig. 10 is a cross-sectional view on line 10—10 of Fig. 9;

Fig. 11 is a diagrammatic view illustrating the various control-valve positions; and

Fig. 12 is a cross-sectional view on line 12—12 of Fig. 1, on a larger scale.

Referring to the drawings, and more particularly to Figs. 1 and 2 thereof, two generally similar presses are shown in Fig. 2, mounted in side by side relation on the upper part 10 of a common base 12 which rises to a suitable height from the floor, or other support.

Each press comprises a vertically disposed yoke 14 whose lower portion 16 is secured to part 10 of the base, with an upper surface thereof providing a substantial generally horizontally disposed platform on which the inflatable and deflatable bag 18 is supported in a manner later to be described. The upper end of the yoke 14 has rigidly formed thereon the vertically disposed generally cylindrical sleeve 20 within which the smaller diameter sleeve 22 is slidably engaged, the sleeve 22 being interiorly threaded for accommodating the screw 24 which is manually adjustable in the sleeve 22 by means of the hand wheel 26 fixed on the upper end of screw 24.

The lower end of screw 24 has swivel connection at 28 to a block 30 which is slidably connected to a bar 32 pivotally mounted at 34 on the yoke 14. The bar has a longitudinal groove 33 extending along the margin of its upper edge, and block 30 is grooved at 36 to fit over bar 32, with a rib 37 on one of its groove walls for slidably engaging in the groove 33 of the bar. Hence, as the bar 32 swings about its pivot 34, block 30 can tilt relative to screw 24 and the bar and block can slide relatively, as may be requisite for different positions of the bar.

The margin along the lower edge of bar 32 also is grooved, as at 38, and an abutment unit indicated generally at 40 is suspended from the bar. As best seen in Figs. 5 and 6, the unit 40 comprises a bracket 42 whose upper relatively thick edge is grooved as at 44 for fitting over the lower edge portion of the bar 32, with two spring-pressed balls 46 frictionally engaging in groove 38 for maintaining the bracket on the bar while permitting its sliding adjustment along the bar.

A lower face of the bracket is serrated at 48 for coacting with the serrated surface of the slotted projection 50 of the abutment member 52 when the abutment member is secured by screw 54 in a selected set adjustment on the bracket. Further outward toward its free end, the bar 32 has the series of holes 56 therein for selective setting of a second abutment member 58 in any of various positions along the bar. Member 58 is deeply grooved at 60 for fitting over the under edge of the bar, with aligned holes in its opposite side walls, through which and a selected hole 56 in the bar, a pin 62 may be inserted to secure the member 58 in any selected setting along the bar.

Sleeve 22 has an enlargement 64 at its upper end to which a pair of similar links 66 are pivotally connected at 68, at opposite sides thereof, the other end of each link 66 being pivotally connected at 70, each to one of a pair of similar levers 72 which are pivotally mounted at 74 on opposite sides of yoke 14. The levers 72 tend by gravity to swing clockwise about their pivots, in Fig. 1, and the outer ends of the levers preferably are equipped with a weight 76 to augment

their unitary gravitational tendency. However, the positions of the levers 72 are determined by bell-crank levers 78 which are pivoted at 80 on opposite side of yoke 14. One arm of each bell-crank has a roller 82 on which the levers rest, respectively, the other arm of each bell-crank being connected by a link 84 to the stem 86 of a piston 88 which is operable in cylinder 90 by means later to be described.

From the foregoing description, it will be apparent that a clockwise swinging of levers 72, as viewed in Fig. 1, will elevate the sleeve 22 and screw 24 to produce an upward or clockwise swinging of bar 32 about its pivot 34, and that a counter-clockwise swinging of levers 72 will produce a downward or counter-clockwise swinging of bar 32.

The inflatable and deflatable bag 18 is mounted on the two retaining members 92, 94 which are supported respectively on the horizontally disposed lugs 96, 98 of yoke 14. Members 92, 94 are generally U-shape in plan and are oppositely arranged with the ends of their U-legs abutting each other, or substantially so. As best seen in Fig. 9, member 92 is rigidly secured to yoke 14 as by the screws 100, it having a wall 102 for engaging under the bag 18 at the forepart of the bag, and having two rib elements 104 depending from wall 102 and resting on the said lugs 96. The rib elements 104 project substantially beyond the ends of the U-legs of member 92, as at 105, and they are notched at 106 for constituting generally semi-circular bearings for the hinge portion 108 on the member 94. The ends of the rib elements 104 are adapted to rest on the said lugs 98.

Member 94 has the generally arched wall 110 for engaging under the rear portion of bag 18, and the hinge portion 108 is formed at the inner end of this wall. A screw 112 is threaded through the outer end of portion 16 of the yoke, with its end engaging the under side of wall 110. A lug 114 projects inward from each side wall of member 94 and each lug engages under the arcuate surface 116 of a rib element 104, thereby to maintain the hinge portion 108 against displacement out of the bearing notches 106. Hence, by adjusting the screw 112, the member 94 may be adjusted about the axis of hinge portion 108 to vary the relation of one portion of bag 18 with respect to the other portion. This adjustment adapts the bag 18 to effectively accommodate and act upon shoes having a wide variety of shapes and heights of heels.

The bag 18 rests loosely on the walls 102 and 110 of the members 92, 94, with its edges within and restrained by the upper marginal portions of members 92, 94.

Inflation of the bag may be effected by compressed air from any suitable source. The fluid, under pressure, is conducted to the lower portion of a base 12 through a conduit 118 which may have therein suitable manual control valves 120, 122. Two generally similar pedal-controlled valves are mounted in or on base 12, they being indicated generally at 124, 126 in Figs. 1 and 2, and in the diagrammatic showings of Fig. 11. Referring to Fig. 11, each valve 124, 126 has a rotatable valve member 128 operable within a valve casing 130 by means of the pedal 132 (Figs. 1, 2 and 12), which is fixed mid-way of its length to a pedal shaft 134 leading into the casing 130 of valve 124, with the valve member 128 of this valve fixed on its inner end. A lever 136 is fixed on the pedal shaft exteriorly of valve 124 and is

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connected by link 138 to a similar lever 140 which is fixed on the outer end of a short shaft 142 of valve 126, the inner end of this shaft 142 having the valve member 128 of valve 126 fixed thereon. As shown in Fig. 12, these inter-connected levers 136, 140 are arranged and linked together in a relation which is such that a rotation of lever 136 in either direction will result in equal but opposite rotation of lever 140.

According to the invention, the pedal valves 124, 126 not only control the inflating and deflating of bag 18 but also control the actuations of piston 88 which, in turn, effects the raising and lowering of the abutments 40, 58 relative to bag 18. Referring to Fig. 2, it will be seen that a conduit 144 leads from the pedal valve 124 to the bag 18 of the left-hand press, this conduit leading through the wall 102 of member 92 which is provided with a hole 103, as best seen in Figs. 1 and 9. A conduit 146 leads from this same pedal valve 124 to the cylinder 90 which is associated with the right-hand press in Fig. 2. Similarly, conduits 148, 150 lead from the pedal valve 126 respectively to the bag 18 of the right-hand press and to the cylinders 90 associated with the left-hand press, in Fig. 2.

Each valve member 128 of the pedal valves 124, 126 is diagrammatically represented in Fig. 11 as having two peripheral grooves 152, 154, and each valve casing 130 is portrayed as having four ports spaced at ninety degree intervals around the axis of each valve. The supply conduit 118 branches at 119, 121, with branch 119 connected to one port of valve 124 and branch 121 connected to one port of valve 126. The ports directly opposite the branches 119, 121 are vent ports, indicated at 123 and 125 respectively.

The conduits 144 and 146 are connected respectively to the other two ports of valve 124, and the conduits 148 and 150 are connected respectively to the other two ports of valve 126.

In Fig. 11, the middle pair of inter-connected valves 124, 126 illustrate a neutral position of the valves, as when the pedal 132 is in its horizontal position of Fig. 12. A slight counter-clockwise depression of the pedal from its position in Fig. 12 actuates the pedal valves to their positions represented by the pair of inter-connected valves 124, 126 shown in Fig. 11 next to the left of the middle pair. This opens the bag 18 of the right-hand press, in Fig. 2, to atmosphere, and simultaneously admits air under pressure to the cylinder 90 associated with the left-hand press, thereby to actuate the abutments 40, 58 of this latter press to their shoe-engaging positions, it being assumed that the work to be acted upon has been positioned on the bag 18 of this left-hand press.

A further counter-clockwise rotation of pedal 132 shifts the pedal valves to their positions represented by the left-most pair of valves 124, 126 in Fig. 11. This admits air under pressure to bag 18 of the left-hand press, in Fig. 2, thereby to effect pressing of the work therein. Simultaneously, the cylinder 90 associated with the right-hand press is opened to atmosphere, to permit gravity elevation of the abutments 40, 58 of this latter press thereby releasing the work therein for removal. The bag of the right-hand press continues to be open to atmosphere, and the cylinder 90 associated with the left-hand press continues under pressure.

Next, a clockwise return of pedal 132 toward its neutral position of Fig. 12 maintains the inflated condition of the bag 18 of the left-hand press, in Fig. 2, until the neutral position has been

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passed and the valves brought to their positions shown by the pair of valves next to the right of the middle pair in Fig. 11, at which time the bag of the left-hand press will be open to atmosphere. During all of this clockwise rotation of the pedal, the cylinder 90 associated with the left-hand press is maintained under pressure.

Simultaneously with the venting of the bag 18 of the left-hand press, in Fig. 2, air under pressure is admitted to the cylinder 90 associated with the right-hand press, thereby to lower the abutments 40, 58 of this press against the work which will have been inserted therein. Then, when the pedal is further depressed clockwise, the valves assume positions as indicated by the pair of valves farthest to the right in Fig. 11. Bag 18 of the right-hand press now is inflated, and the cylinder 90 associated with this press continues under pressure. The bag 18 of the left-hand press continues open to atmosphere, as does the cylinder 90 associated with the left-hand press.

Counter-clockwise return of the pedal toward its neutral position of Fig. 12, maintains the bag of the right-hand press inflated and the cylinder 25 associated with that press under pressure until the neutral position has been passed.

Preferably, the hub of pedal 132 is provided with the two notches 156, and a spring-backed detent 158 snaps into one or the other of the notches when the lever is in intermediate positions corresponding to the valve positions illustrated immediately to the right and to the left of the middle pair of valves in Fig. 11. This enables the operator to be aware of these intermediate positions, so that the pedal may be allowed to rest stationary for any desired period of time.

It will be apparent from the foregoing description, that I have provided an extremely efficient shoe press whose inflatable and deflatable bag may be quickly and effectively modified as to its surface contour to adapt the press for handling shoes whose heels may vary greatly in height and shape, and wherein the abutments against which the work is pressed, and the bag which applies the pressure, automatically respond, in timed relation, to actuations of a pedal. The bag may be adjusted relative to the abutments, and each abutment is readily independently adjustable to accommodate various shapes of work to be acted upon. Also, the abutments as a unitary structure may be quickly and variously adjusted relative to the inflatable bag.

Furthermore, the various features of the invention are disclosed in an embodiment having two presses operative in timed relation by a single operator who conveniently can remove work from one press, and re-load it, while the other press is applying pressure to the work therein.

60 I claim as my invention:

1. In a shoe sole press having fore and aft abutments and an inflatable bag arranged and adapted to receive work between them, means supporting said abutments comprising a member 65 pivotally supported at one end and having said abutments adjustably supported on the member in spaced relation outward of the pivot, a block slidably mounted on said pivoted member for movements along the member, an element supported above the pivoted member and having swivel connection to said block, said element being vertically slidable in its support for rocking said pivoted member about its pivot thereby to move said abutments toward and from said 75 bag, an actuating lever pivotally mounted adja-

cent to said slidable element and having a relatively short lever arm pivotally connected to said element, another arm of said lever having substantial extent at the opposite side of the pivot of the lever and strongly tending by gravity about said pivot in direction to elevate said slidable element, pivoted means constantly opposing said gravitational tendency of said extending arm of the lever, and pneumatic means connected to said pivoted means and operative to move said extending arm of the pivoted lever in opposition to its said gravitational tendency thereby to apply downward thrust to said slidable element, said downward thrust being applied to said pivoted member between its pivoted end and its free end thereby to move said abutments toward said bag, and means for adjusting the limit of downward travel of said slidable element thereby to adjust the lower limit of movements of said abutments.

2. In a shoe sole press having fore and aft abutments and an inflatable bag arranged and adapted to receive work between them, means supporting said abutments comprising a member pivotally supported at one end and having said abutments adjustably supported on the lever in spaced relation outward of the pivot, a block slidably mounted on said pivoted member for movements along the member, an element supported above the pivoted member and having swivel connection to said block, said element being vertically slidable in its support for rocking said pivoted member about its pivot thereby to move said abutments toward and from said bag, an actuating lever pivotally mounted adjacent to said slidable element and having a relatively short lever arm pivotally connected to said element, another arm of said lever having substantial extent at the opposite side of the pivot of the lever and strongly tending by gravity about said pivot in direction to elevate said slidable element, a bell-crank lever pivoted below said extending arm of the pivoted gravity influenced lever, one arm of the bell-crank lever engaging the said extending arm of the pivoted actuating lever, pressure-responsive means connected to the other arm of the bell-crank lever, and means for causing pressure actuation of said pressure-responsive means to depress said abutments, and for inflating said bag after the abut-

ments have reached the lower limits of their travel.

3. In a shoe sole press having fore and aft abutments and an inflatable bag arranged and adapted to receive work between them, means supporting said abutments comprising a member pivotally supported at one end and having said abutments adjustably supported on the lever in spaced relation outward of the pivot, a block slidably mounted on said pivoted member for movements along the member, an element supported above the pivoted member and having swivel connection to said block, a sleeve threadedly engaging said element, a support mounting said sleeve for vertical sliding movements, an actuating lever pivoted adjacent to the sleeve and having one arm pivotally connected to the sleeve, said actuating lever having another arm extending a substantial distance outward from its pivot and tending by gravity in a direction to elevate said sleeve, and means for moving said extending arm of the actuating lever in opposition to its said gravitational tendency, thereby to rock said pivoted member toward said bag, and means supporting said bag including a supporting member which is adjustable relative to the remainder of the bag support.

SAVERIO J. CAMPIONE.

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