

Nov. 3, 1936.

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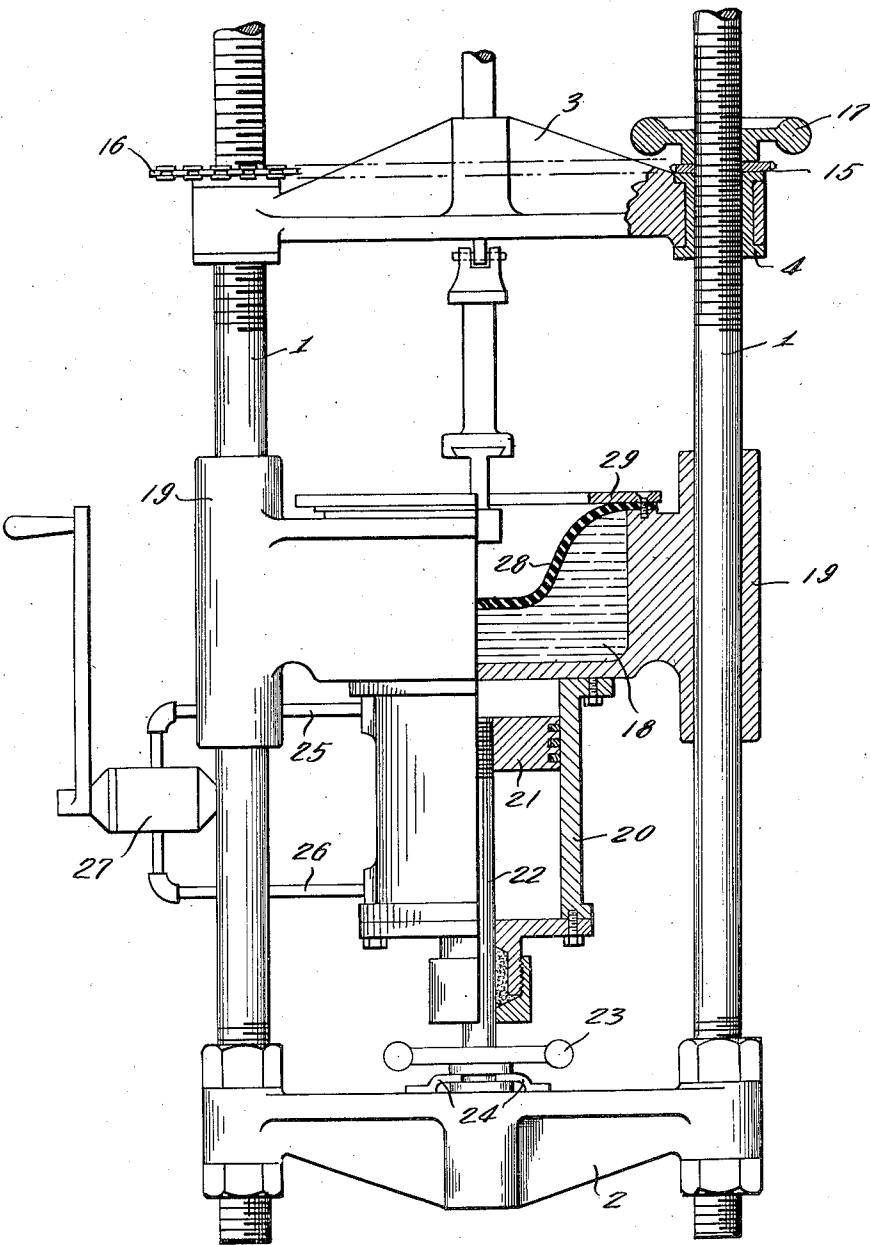
2,059,831

SHOE PRESS

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3 Sheets-Sheet 1

Fig. 1.



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Fig. 2.

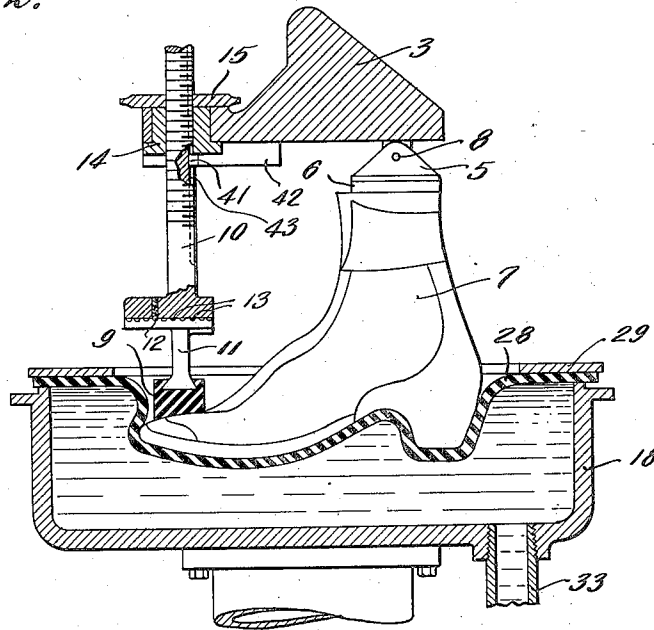
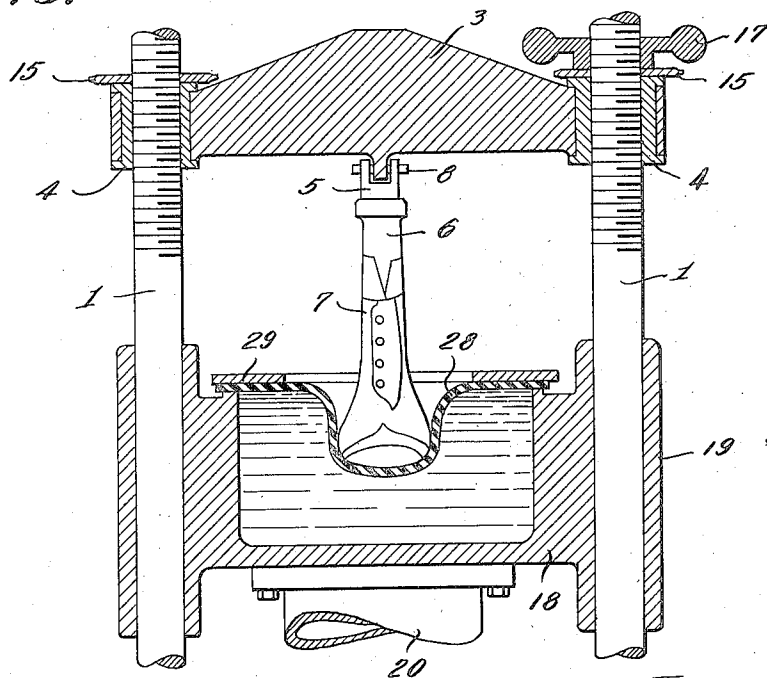


Fig. 3.



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Fig. 4.

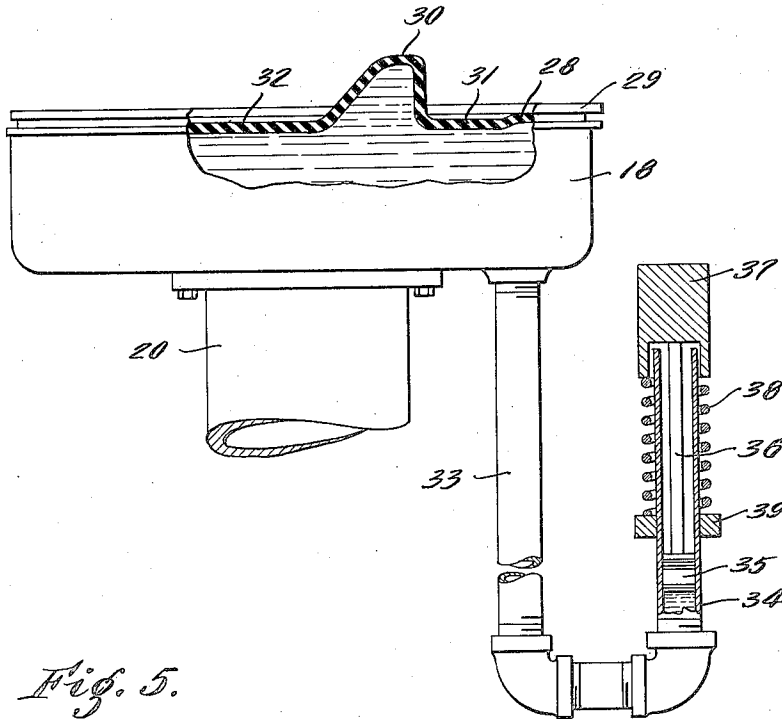
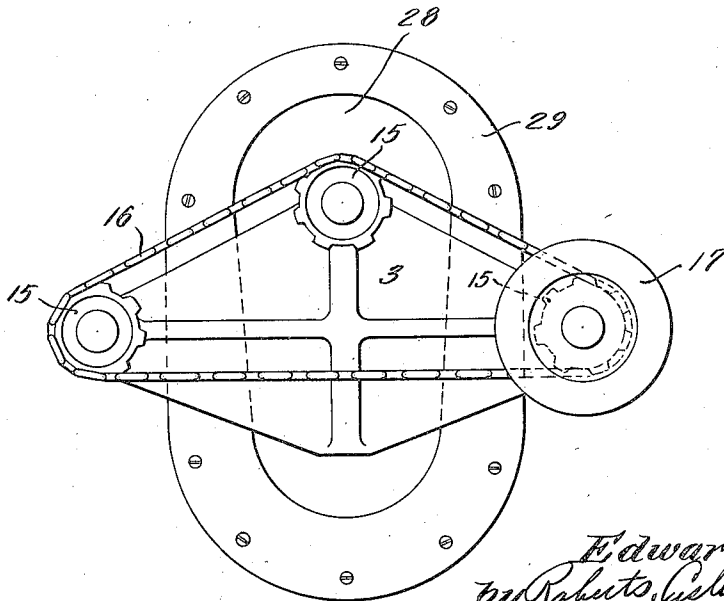


Fig. 5.



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UNITED STATES PATENT OFFICE

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SHOE PRESS

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2 Claims. (Cl. 12—33)

This invention relates to fluid-pressure apparatus for applying covers to articles, such as rubber soles to shoes, and more particularly to pressure apparatus having a diaphragm, made of rubber or the like, which, in pressing the cover against the article, is capable of conforming to the contour of the article so that all portions of the cover are pressed uniformly against the article.

Objects of the invention are automatically to control the aforesaid fluid pressure so as not to rupture the diaphragm, to facilitate the adjustment of the apparatus to articles of different sizes, such as high boots, low shoes, etc., and generally to improve the art to which this invention relates.

According to this invention the apparatus comprises an abutment head or other holding abutment for the article to be covered, together with a fluid-pressure chamber having a fluid confining wall in the form of a flexible diaphragm for pressing the cover against the article, and means for automatically limiting the pressure in the chamber to a value which is within the elastic limit of the diaphragm. The preferred pressure regulator comprises a float chamber connected to the pressure chamber and a weighted valve slidably fitting the float chamber so as to rise and fall in response to increase and decrease of pressure in the chamber. The float chamber is preferably in the form of an upwardly extending portion of a duct depending from the bottom of the pressure chamber. A spring may be associated with the weighted valve not only to cushion its downward movement when the pressure is decreased but particularly to assist in starting the valve upwardly when the pressure is increased, thereby counteracting its tendency to stick.

For use in applying rubber soles to boots, shoes and the like the aforesaid abutment head has two abutments, one engaging the toe and the other engaging the top of the last in the boot or shoe. To adapt the apparatus to low shoes or high boots the two abutments are relatively adjustable toward and from the pressure chamber. Preferably the head is mounted on guides for bodily adjustment and at least one of the abutments is adjustable relatively to the head. Inasmuch as the toe abutment should always occupy approximately the same position of adjustment, I preferably provide means for automatically maintaining this adjustment while the other abutment is being adjusted by raising or lowering the head. The preferred means for accomplishing this result comprises means for adjusting the head in one direction while conjointly

and simultaneously adjusting the toe abutment in the opposite direction relatively to the head.

For the purpose of illustration a concrete embodiment of the invention is illustrated in the accompanying drawings in which,

Fig. 1 is a front elevation with parts shown in section;

Fig. 2 is a sectional view of the upper part of the apparatus with the parts in operative position;

Fig. 3 is a similar view taken at right-angles to that of Fig. 2;

Fig. 4 is a side elevation of the pressure and float chambers with parts shown in section; and

Fig. 5 is a top plan view of the apparatus.

The particular embodiment of the invention chosen for the purpose of illustration comprises a pair of upright guides 1 having fast to their lower ends a cross-frame 2. Adjustably mounted on the upper ends of the guides is an abutment head 3 carrying rotating parts 4 threaded on the uprights. Mounted on the lower side of the head 3 is an abutment 5 for engagement with the top of a last 6 in the shoe 7, the abutment being pivoted to the head by means of a pin 8. The head 3 also carries a toe abutment comprising a rubber foot-piece 9, a threaded stem 10 and a shank 11 having a dovetailed connection with the foot-piece 9 and the stem 10 at its lower and upper ends respectively. The shank 11 is slipped into the base of the stem 10 from the right or left (Fig. 2) and is then held in adjusted position by a spring-pressed detent 12 engaging recesses 13 in the upper end of shank 11. The stem 10 is mounted on the head 3 by means of a part 14 which rotates in the head and into which the stem 10 is threaded from the bottom. Rotation of the stem is prevented by a key 41 on part 42 sliding in a keyway 43 in the stem. Fast to each of the rotating parts 4 and 14 is a sprocket wheel 15 and trained around the three sprocket wheels is a chain 16. One of the sprocket wheels 15 is provided with a handwheel 17 for rotating the three sprocket wheels in unison. By using all right-hand (or left-hand) threads on the uprights 1 and stem 10, rotation of the wheel 17 to adjust the head upwardly or downwardly on the guides 1 adjusts stem 10 in the opposite direction relatively to the head 3. Thus when the head is raised or lowered to suit the height of the boot or shoe to be soled the toe abutment remains at the same elevation.

The pressure chamber 18, which is fast to a suitable stationary support, slidably receives the uprights 1 through integral sleeves 19, and it carries on its lower side a cylinder 20 fitting

around a piston 21. The lower end of the piston stem 22 threads through a handwheel 23 which is rotatably mounted on the cross-frame 2 by means of retainers 24 which prevent axial movement of the handwheel 23 relative to the cross-frame 2. Thus by rotating the wheel 23 the piston rod is lengthened or shortened. Fluid under pressure may be introduced on either side of the piston 21 by means of ducts 25 and 26 controlled by a hand valve 27.

Mounted over the open upper side of the pressure chamber 18 is a rubber diaphragm 28 which is held tightly against the periphery of the chamber by means of a sealing ring 29. The diaphragm 28 is provided with a raised portion 30 for the shank and depressed portions 31 and 32 for the heel and toe portions of a boot or shoe.

Depending from the bottom of the pressure chamber 18 is a duct 33 which has an upwardly extending portion 34. Snugly fitting into this upwardly extending portion is a valve 35 connected through a stem 36 with a weight 37 above the open end of the duct. A spring 38 is disposed around the duct between the lower edge of the weight 37 and a collar 39 fast to the outside of the duct 34.

In operation the shoe 7 is placed on the diaphragm 28, the head 3 is lowered by the handwheel 17 until the abutment 5 engages the top of the last 6, the toe abutment engaging the toe of the shoe, and pressure is then admitted to the upper side of the piston 21 to lower the piston, uprights 1, and abutment head 3, thereby pressing the sole against the bottom of the shoe. As pressure is applied to the chamber 18 the weighted valve 35 rises to prevent excessive pressure. After

the sole has been tightly pressed against the sole of the shoe for a suitable period of time, the fluid pressure is transferred by means of valve 27 to the lower side of the piston 21, thereby causing the abutment head to rise, after which the shoe may be lifted off the diaphragm. As the pressure decreases the weighted valve 35 descends to its lowermost position shown in Fig. 4. The spring 38 tends to cushion the descent of the weighted valve but its more important function is to assist in starting the valve upward when the pressure is again applied to the pressure chamber, thereby to counteract any tendency of the valve to stick.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. In a shoe press of the type having an abutment head and opposed pressure means for pressing a sole against a shoe while the shoe is in a last, the combination with said head of last and toe abutment, and means for adjusting said head toward and from said pressure means while maintaining said toe abutment at approximately the same distance from the pressure member.

2. In a shoe press of the type having pressure means for pressing a sole against a shoe while the shoe is on a last, the combination of last and toe abutments for counteracting the pressure of said means, and means for conjointly producing relative movement between said two abutments toward and from said pressure means.

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