(No Model.) 3 Sheets—Sheet 1.

F. W. COY.

SOLE LAYING MACHINE.

No. 376,406. Patented Jan. 10, 1888.

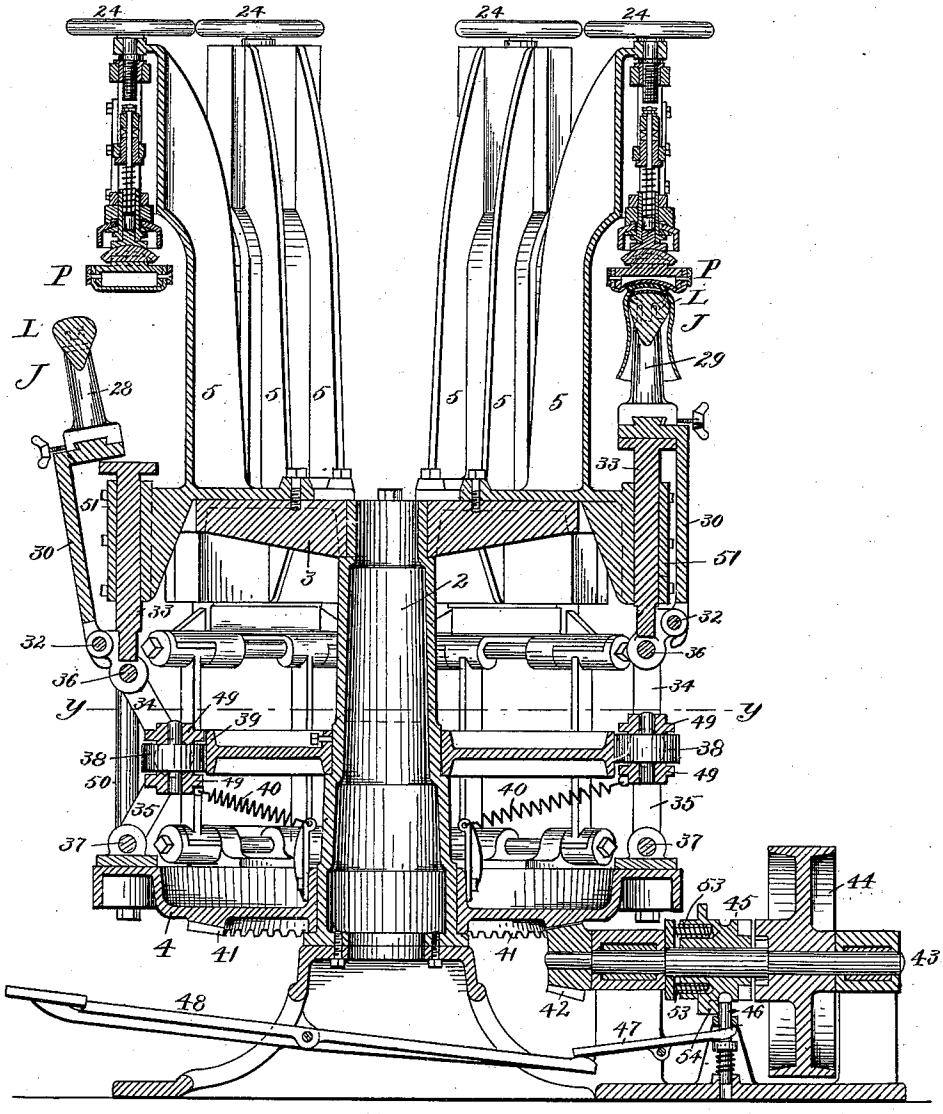


Fig. 1.

WITNESSES.

Chas. Spaulding.

Charles E. Moss.

INVENTOR.

F. W. Coy

by Wright Brown Quinby & Atty's

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 3 Sheets—Sheet 2.

F. W. COY.

SOLE LAYING MACHINE.

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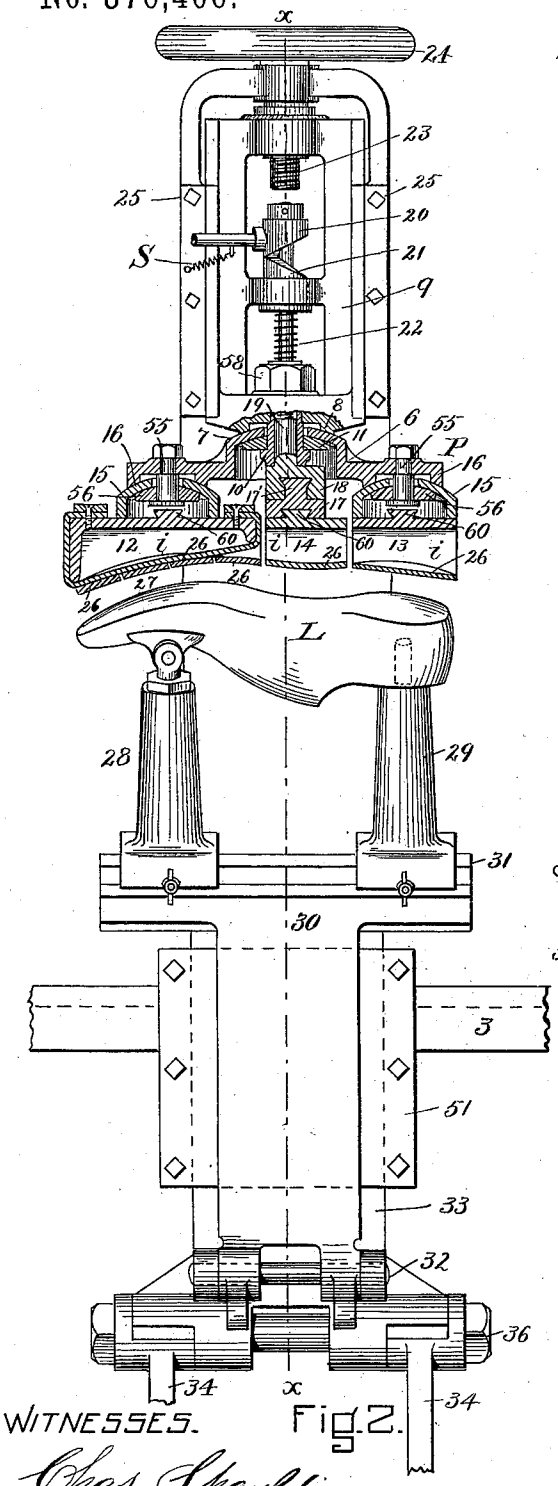


Fig. 2.

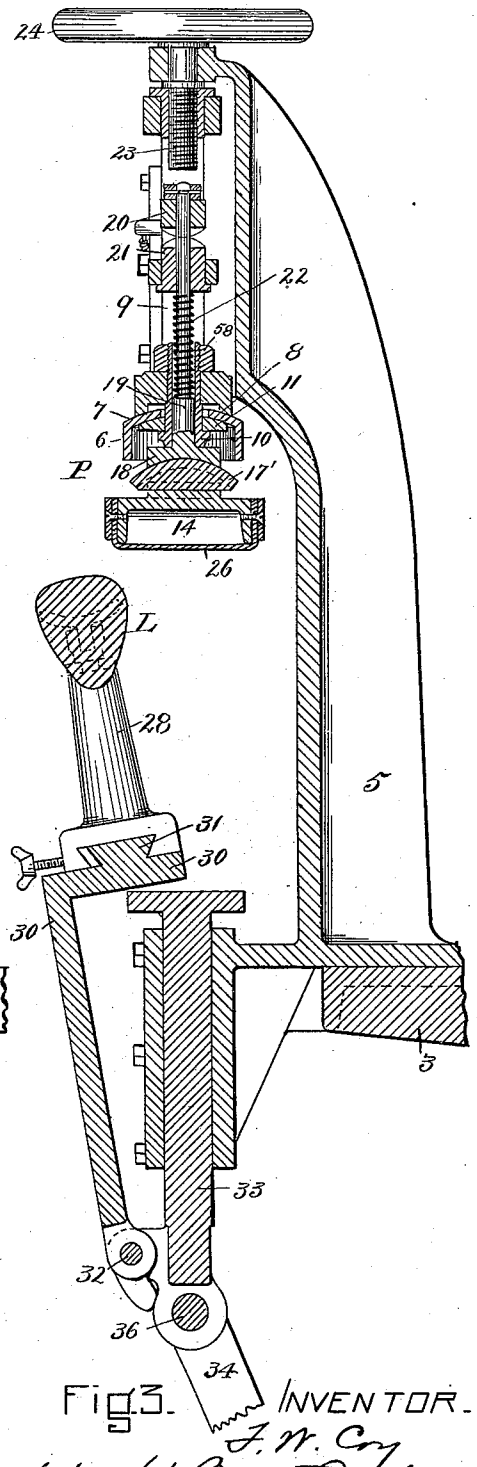


Fig. 3.

WITNESSES.

Chas. Spaulding.

Charles E. Moss.

INVENTOR.

F. W. Coy

by Wright Brown Quinby & Atty.

N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.) 3 Sheets—Sheet 3.

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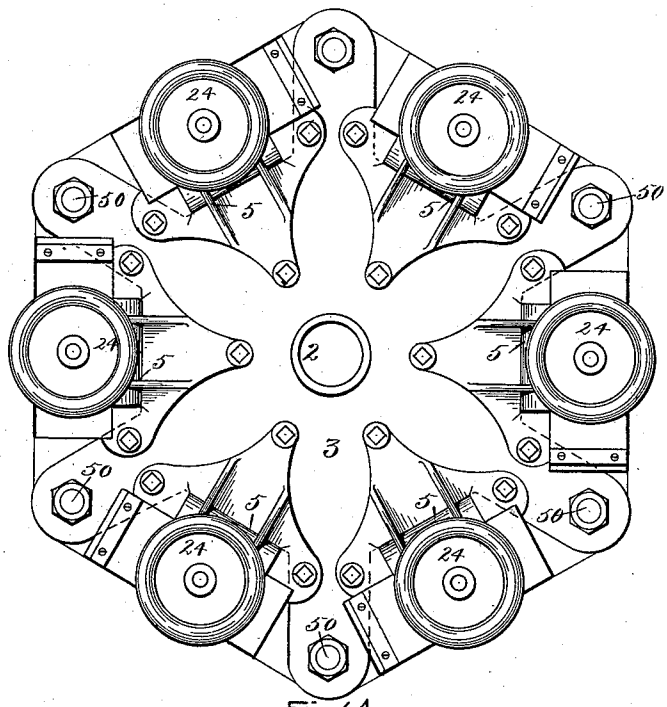


Fig. 4.

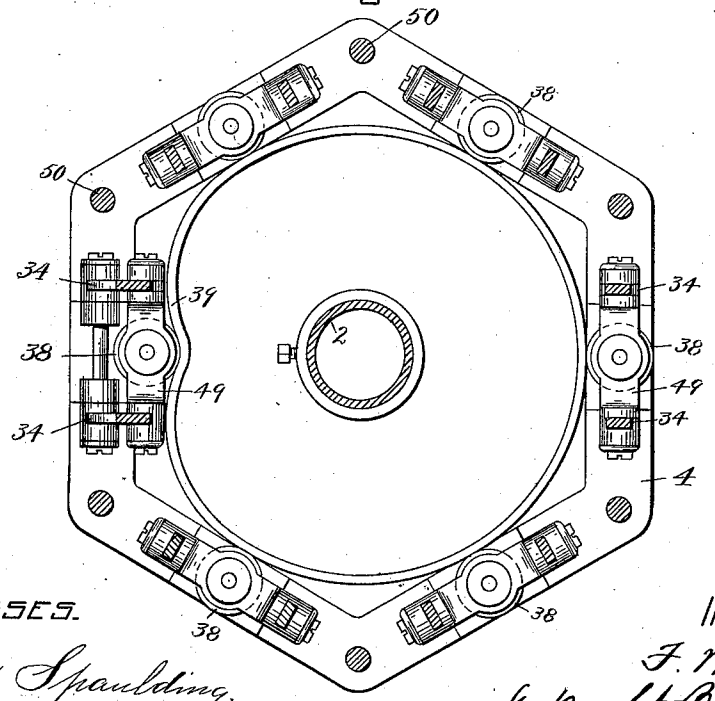


Fig. 5.

WITNESSES.

Chas. Spaulding.

Charles E. Moss.

INVENTOR.

F. W. Coy

by Wright Brown Quinby & Atty.

N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

FREDERICK W. COY, OF BOSTON, MASSACHUSETTS.

SOLE-LAYING MACHINE.

SPECIFICATION forming part of Letters Patent No. 376,406, dated January 10, 1888.

Application filed October 10, 1887. Serial No. 251,941. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. COY, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Sole Laying or Pressing Machines, of which the following is a specification.

This invention relates, particularly, to machines for pressing cement-coated outer soles against lasted uppers of boots and shoes and holding the soles against the uppers while the cement is setting or hardening; and it has for its object, first, to provide certain improvements in the sole-presser, whereby displacement of the sole by the first contact of the presser therewith is prevented and the sole is grasped and held at its shank portion before the fore part and heel portions come in contact with the presser.

The invention also has for its object to provide certain improved mechanism in an organized machine, either for sole-laying or for beating out or leveling soles, whereby a series of jacks moving in a circular path are pressed upwardly against corresponding presses during the greater part of a complete revolution and depressed during the remaining part of said revolution.

To these ends my invention consists in the several improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a vertical central section of a sole-laying machine embodying my invention. Fig. 2 represents a side elevation of a portion of the machine, showing one of the sole-pressers in section. Fig. 3 represents a vertical section on line *x x*, Fig. 2. Fig. 4 represents a top view. Fig. 5 represents a horizontal section on line *y y*, Fig. 1.

The same figures and letters of reference indicate the same parts in all the figures.

In carrying out my invention I provide a vertical circular standard, 2, supported by a suitable base, and mount on said standard two horizontal heads or frames, 3 4, which are rigidly connected by vertical tie-rods 50 and are adapted to rotate freely on the standard 2, said heads and their connecting-rods constituting a rotary carrier.

Secured rigidly to the upper head, 3, are a series of standards, 5—in this case six in number—at equal distances apart. Said standards support the sole-pressers P, the construction of which will be more fully described hereinafter, there being one presser P for each standard. Below the presser P are a corresponding series of jacks, J, each adapted to support a last, L, and present said last, with an upper thereon and a cement-coated sole, to the corresponding presser, there being a jack for each presser. Each jack is composed of an angular arm, 30, having a dovetail rib or guide, 31, on its upper portion and standards 28 and 29, secured by screws to said guide and adjustable thereon, said standards being provided, respectively, with a toe-rest and with a spindle to enter the spindle-socket of the last L. The arm 30 is pivoted at 32 to ears on a slide, 33, which is adapted to move vertically in a vertical guide or socket, 51, formed on the base of the standard 5 above it, said socket projecting downwardly through an opening in the head 3. The slide 33 is enlarged at its upper end to form a support for the upper portion of the arm 30 when the jack is in position under the presser which it accompanies, as shown at the right of Fig. 1. The pivotal connection of the arm 30 to the slide 33 enables the jack to be swung out from under the accompanying presser, as shown at the left of Fig. 1, to enable the operator to conveniently unjack and jack the shoe and place the cement-coated outer sole thereon.

The slide 33 is pivoted by a bolt, 36, to the upper ends of two links, 34 34, the lower ends of which are pivoted to two similar links, 35 35, which in turn are pivoted at 37 to the lower head, 4. The links 34 and 35 constitute toggle-joints, which support and elevate the slide 33 and the jack thereon, as presently described. The meeting ends of the links 34 35 of each pair are connected with the links of the other pair, supporting the slide 33 by a bar, 49, the ends of which form the journals or pivots that connect the links of each pair, while its center is slotted to receive a horizontal cam-roll, 38, the axle of which is journaled in the bar 49. Said roll is held by the constant pressure of a spring, 40, attached at one end to the bar 49 and at the other end to

an ear on the head 4, against a horizontal cam, 39, which is rigidly attached to the supporting-standard 2. Said cam or endless track has a recess at one side of its periphery, while the greater portion of its periphery is concentric with the standard 2, as shown in Fig. 5. When the roll 38 enters the recess of the cam, the toggle-joint links are thrown out of alignment, and the slide 33 and the jack supported thereby are depressed, as shown at the left of Fig. 1; but when the roll 38 reaches the concentric portion of the cam the toggle-joint links are thrown into alignment, or nearly so, and the slide 33 and its jack are raised and pressed against the corresponding sole-presser, as shown at the right of Fig. 1.

It will be seen from the foregoing description and by reference to the drawings that when the heads 2 3 are rotated the series of jacks and their supporting devices and the corresponding sole-pressers are moved in a circular path, and that at a given point in said path—viz., that where the recess of the cam 39 is located—each jack and its support will be lowered from the accompanying presser by the action of the spring 40, which causes the wheel 38 to enter the cam-recess, and thus throws the toggle-links out of alignment. When the jack is lowered, it may be swung out of position, as above described, to permit the removal of the shoe from the jack and the application of another shoe, and then swung back to position.

It will also be seen that each jack is raised after its depression by the movement of the cam-roll of its supporting-toggle onto the concentric portion of the cam 39, so that each jack during the greater part of its revolving movement is held up against the corresponding sole-presser, and is depressed only at the operator's station. The connected heads 3 4 and the jacks and sole-pressers carried thereby are impelled by a driving-shaft, 43, having a bevel-pinion, 42, meshing with a bevel-gear, 41, formed on or rigidly attached to the head 4. Motion is imparted to the shaft 43 by a driving-pulley, 44, thereon. Said pulley is normally loose on the shaft 43 and has a clutch on its hub adapted to engage a clutch, 45, which is engaged with the shaft so as to rotate therewith, but is free to slide thereon, and is normally engaged with the clutch on the driving-pulley by a spring or springs, 53, Fig. 1. The sliding clutch is automatically disengaged from the driving-pulley by a pin, 46, which slides vertically in fixed guides and is pressed upwardly by a spring, so that it bears on a cam-shaped collar, 54, on the clutch 45, and by contact with said cam forces the said clutch back out of engagement with the driving-pulley, as shown in Fig. 1, once during a complete rotation of said clutch. The parts are so timed that the clutch 45 is thrown out and the rotation of the shaft 43 stopped when a cam-roll, 38, has reached the center of the recess of the fixed cam 39, as shown in Fig. 5, the movement of the series of jacks and pressers being thus automatically stopped while the operator is removing and applying the shoes. When the operator is ready for the progressive movement of the series of jacks and pressers to be resumed, he depresses a foot-lever, 48, and thereby, through a lever, 47, depresses the pin 46, whereupon the springs 53 force the clutch 45 into engagement with the driving-pulley. I do not limit myself to the employment of this particular stop-motion, but may employ any other suitable automatic stop-motion whereby the progressive movement of the jacks and pressers will be automatically arrested when each jack is depressed and any suitable devices whereby said progressive movement may be resumed at the will of the operator.

The sole-presser P is composed of a series of metallic frames or sections, 12, 13, and 14, open at their under sides and provided with flexible bottoms 26, composed of straps of leather or other suitable material secured by screws to the said metallic frames or sections, as clearly shown in Figs. 2 and 3. I have shown the section 12 provided with two thicknesses of straps 26, one extending at right angles to the other, this section being longer than the others and formed to act on the fore part of the sole, as shown in Fig. 2, so that a thicker and stronger flexible bottom is desirable for it than for the shorter sections 13 and 14, which are formed, respectively, to act on the heel and shank portions of the sole. The lower edges of the sections 12, 13, and 14 are curved to approximate the longitudinal curvature of the bottom of the last, as shown in Fig. 2. The straps or flexible pressing-surfaces 26 are sufficiently yielding to insure close conformation to all parts of the bottom of the last (or the shoe thereon) presented to the presser. To the back of the fore part and heel sections 12 13 are secured bosses 15 15, the upper surfaces of which are convex and are segments of spheres, the centers of which are located as close as possible to the pressing-surfaces of said sections. Said bosses bear against correspondingly-formed concave seats 16 16, formed on a frame or holder, 6, and are connected to said holder by bolts 55 and washers 56, having convex upper surfaces, which are held loosely against the concave under surfaces of the bosses 15 by the bolts 55. Holes are formed in the bosses 15 of considerably greater diameter than the bolts 55, so that said bosses and the sections 12 13 attached thereto can tip in any desired direction, and thus conform to various longitudinal and transverse curvatures of last-bottoms.

The section 14 is provided with a convex rib, 17′, formed on a block, 17, extending crosswise of the sole-presser, said rib being fitted in a correspondingly-curved socket in a block, 18, which is movable vertically, as hereinafter described, so that the section 14 can be depressed to bear on and hold the shank portion of the outer sole before the jack supporting the same is raised to press the fore part and heel portions of said sole against the presser.

When the section 14 is not so depressed, but is in operative position, as shown in Fig. 2, it is unyieldingly supported against upward pressure by the holder 18.

The rib 17′ and socketed holder 18 permit the shank-section 14 to tip crosswise of the presser. The rib 17′, like each of the bosses 15 15, has its center near the pressing-surface of the section to which it is attached, the several centers, which are marked *i i i* in Fig. 2, being in line with each other.

By the described arrangement, whereby the sections 12, 13, and 14 of the presser can tip in arcs having their centers as close as possible to the pressing surfaces of said sections, I enable said pressing-surfaces to conform to the usual variations in the shape of last bottoms without having such a bodily movement over or upon the sole as would tend to cause either pressing-surface to displace the sole when first brought in contact with it. In other words, when either section is brought into relation with the corresponding portion of a last-bottom to which such section is not already adjusted, the movement of the section whereby it is adjusted to the shape of the last-bottom is a tipping movement upon a center which is close to or on the pressing surface of the section, and not a swinging or lateral movement tending to displace the sole on the bottom of the last, as it would be if the center of said movement were remote from the pressing-surface.

The sections 12, 13, and 14 are preferably detachably secured to the bosses 15 15 and ribbed block 17, so that said sections can be used interchangeably with others formed for lasts of radically-different shape. To this end each section has a dovetail rib, 60, and said ribs are removably fitted in the bosses 15 15 and block 17, as shown in Fig. 2.

The frame 6 is provided with a convex boss, 7, which is a segment of a sphere, and is held against a corresponding concave seat, 8, on a supporting frame or head, 9, by a tubular bolt, 10, passing through an orifice in said frame and secured to the latter by a nut, 58, and a washer, 11, supported by the head of said bolt and held thereby against the concave under side of the boss 7, said washer having a convex upper surface which fits the under side of the boss. By this connection of the presser to the frame 9 the presser as a whole is permitted to tip in any direction, and thus further adapted to conform to various shapes and styles of lasts.

The frame 9 is vertically adjustable in guides 21 21, formed on the standard 5, and is adjusted and held in different positions by a screw, 23, which works in a tapped socket in the upper portion of said frame, and is journaled in a yoke on the standard 5. Said screw has a hand-wheel, 24, whereby it may be rotated. The vertical position of the presser can therefore be varied as the operator may desire.

As already stated, the shank-section 14 of the presser is capable of being depressed below the other sections, so that it may bear upon the shank of the outer sole before the jack is raised. To this end the socketed block 18, which supports the shank-section 14, has a rod, 19, which is passed through the tubular bolt 10, and is adapted to slide vertically in said bolt, and is provided with a spring, 22, whereby it is normally depressed and caused to press the shank-section 14 against the shank of a sole while the jack on which the sole rests is depressed. The object of this arrangement is to enable the operator to secure the outer sole in its proper place on the jack before the jack commences its forward and upward movement and to obviate the necessity of the operator holding the sole upon the jack while the latter is rising and presenting the sole to the presser.

The section 14 may be held elevated, as shown in Figs. 2 and 3, until the operator has jacked the shoe and placed the outer sole thereon by a cam-shaped collar, 20, adapted to rotate on the rod 19 and bearing on a fixed cam-shaped collar, 21, through which the rod passes. When the collar 20 is turned to the position shown in Fig. 2, it rides up the incline of the fixed collar 21 and raises the rod 19 and the shank-section 14. When the operator has placed the sole in position on the jack, he turns the collar 20 so that it rides down the incline of the collar 21 and carries down the rod 19 and the section 14. I prefer to provide a spring, S, whereby the collar 20 is automatically turned to the position shown in Figs. 2 and 3 when the shank-section 14 is raised, so that the said section is automatically secured in the raised position shown until the operator is ready to depress it.

It is obvious that the improved presser herein described may be used in a machine employing but one presser and one jack. It is also evident that the sole may be conformed to the bottom of the last by a movement of the presser toward the jack instead of the reverse.

My invention is not limited to the details of construction herein described, and the same may be variously modified without departing from the spirit of the invention.

In an organized sole-laying machine having a series of jacks mounted on a rotary carrier and automatically raised and depressed, as herein described, I may use any suitably-constructed sole-pressers, my invention not being limited to the construction shown.

It is essential that the pressers be constructed to conform to variously-shaped lasts; but the conformation may be secured by a variety of constructions, it being essential that the presser have an elastic or yielding pressing-surface; hence by the term "elastic presser," as used hereinafter, I mean any presser having a pressing surface of a yielding nature adapted to conform to the shape of the bottoms of differently-formed lasts, so that the same presser can be used with many different styles of last.

The series of jacks and the means for raising and depressing the same may be used in

connection with a series of rigid sole-pressers shaped to conform to one form of last-bottom only, for the purpose of forming or beating out or leveling soles.

I claim—

1. In a sole laying or pressing machine, a rotary carrier, a series of sole-pressers, and a corresponding series of jacks carried by said rotary carrier, a series of toggle-joints supported by and moving with the carrier, and a fixed cam or endless track the perimeter of which acts on said toggle-joints and has its greater portion concentric with the axle of the carrier, whereby each toggle-joint is straightened to hold its jack against the accompanying presser during a greater part of a complete rotation of the carrier, the remaining portion of said perimeter presenting a recess, whereby each toggle-joint is permitted to yield and separate its jack from the presser at a given point in the rotation of the carriage, all combined substantially as set forth.

2. In a sole laying or pressing machine, a rotary carrier, a series of sole-pressers, and a corresponding series of shoe and sole supporting jacks carried by said rotary carrier, mechanism, substantially as described, for rotating said carrier, a series of toggle-joints supported by and moving with the carrier, a fixed cam or endless track having its perimeter arranged to act on said toggle joints, said perimeter comprising a concentric portion, whereby each toggle-joint is straightened to hold its jack against the accompanying presser during the greater part of a complete revolution, and a recess whereby each toggle-joint is permitted to yield and separate its jack from the accompanying presser at a given point in said revolution, and an automatic stop mechanism, substantially as described, which operates when each toggle-joint reaches said recess, whereby the rotation of the carrier is arrested after each separation of a jack from the accompanying presser, all combined substantially as set forth.

3. In a sole laying or pressing machine, the combination of a fixed standard, a frame or carrier fitted to rotate thereon, a series of sole-pressers, and a corresponding series of jacks supported by the carrier, a series of toggle-joints supporting the jacks and provided with cam-rolls, a fixed cam or endless track having a concentric portion and a recess, as shown, and springs whereby said cam-rolls are pressed against said cam, the latter being formed to support each jack in a raised position during the greater part of a complete rotation of the carrier and to depress it at a given point, as set forth.

4. In a sole laying or pressing machine, the combination of a sole-presser, a slide, 33, movable toward and from said presser, a jack pivotally connected to said slide, whereby the jack can be swung into and out of operative position under the presser, and means for raising and depressing said slide and jack, substantially as described.

5. The combination of a sole-presser, a slide, 33, movable toward and from the sole-presser, a jack composed of the angular lever 30, pivoted to the lower portion of said slide, and the last-supporting standards detachably secured to and adjustable on said pivoted lever, and means, substantially as described, for raising and depressing said slide and jack.

6. The combination of a fixed standard, a carrier fitted to rotate thereon, a series of pressers and a corresponding series of jacks supported by the carrier, the fixed cam or endless track having the concentric portion and the recess, arranged as shown, and the toggle joints and springs co-operating therewith, whereby the jacks are alternately raised and depressed, the bevel-gear 41 on the carrier, the shaft 43, having a pinion meshing with the gear 41, a sliding clutch and a driving-pulley having a clutch on said shaft, devices, substantially as described, whereby the sliding clutch is automatically disengaged from the driving-pulley while each jack is depressed, and devices, substantially as described, controlled by the operator, whereby said clutch and pulley may be operatively connected, as set forth.

7. In a sole-laying machine, the combination, with a jack and means for raising and depressing it, of a sole-presser, constructed substantially as described, composed of sections, one of which is capable of being depressed below the body of the presser to hold a sole on the jack while the latter is being raised, as set forth.

8. In a sole-laying machine, the combination of a rotary carrier, a series of jacks thereon, means, substantially as described, for alternately raising and depressing each jack, and a series of elastic pressers corresponding in number and position to the jacks, each presser having a section which is adapted by mechanism substantially as described to be depressed independently to hold a sole upon the depressed jack beneath it, as set forth.

9. In a sole-laying machine, the combination of a jack, means for raising and depressing it, a sole-presser located over the jack and having a section which is capable of independent movement by mechanism substantially as described, and a spring whereby said section is forcibly held down upon a sole laid upon the depressed jack, as set forth.

10. In a sole-laying machine, the combination of a jack, means, substantially as described, for raising and depressing it, a sole-presser located over the jack and having an independently-movable section, a spring whereby said section may be depressed below the body of the presser, and a holder whereby said section may be retained in its sole-pressing position, as set forth.

11. A sole-presser composed of a series of sections, each having at one side a yielding or flexible pressing-surface and at the opposite side a rigid convex bearing-surface the center of the curvature of which is at or near the

said pressing-surface, and a fixed holder having concave seats for said convex surfaces, all constructed substantially as described.

12. In a sole-presser, the combination of the sections having the convex bosses and yielding pressing-surfaces, the holder 6, having the concave seats for said bosses, and the bolts and washers connecting said sections with the holder, as set forth.

13. In a sole-presser, the combination of the sections 12 and 13, having the convex bosses 15 15 and yielding pressing-surfaces, the intermediate section, 14, having the segmental rib 17′ and the yielding pressing-surface, the holder 6, having seats or sockets for the bosses 15, and the block 18, having a socket for the rib of the section 14, as set forth.

14. The combination of the holder 6, the series of sections having yielding pressing-surfaces connected, as described, to said holder, so as to be capable of tipping independently in arcs of circles the centers of which are at or near said pressing-surfaces, and a support to which said holder is connected by means substantially as described, whereby the holder is enabled to oscillate or tip, as set forth.

15. The combination of the holder 6, the independently-tipping sections having yielding pressing-surfaces connected, as described, to said holder, the vertically-movable frame jointed, as described, to said holder so that the latter is capable of tipping universally, and an adjusting-screw and a support therefor whereby said frame may be vertically adjusted and held at any position to which it may be adjusted, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 5th day of October, A. D. 1887.

FREDERICK W. COY.

Witnesses:

EDWARD C. JUDD,

C. F. BROWN.