No. 645,934. Patented Mar. 27, 1900.

J. E. BERTRAND.

SOLE ROUGH ROUNDING AND CHANNELING MACHINE.

(Application filed Dec. 4, 1899.)

(No Model.) 5 Sheets—Sheet 1.

Fig. 1.

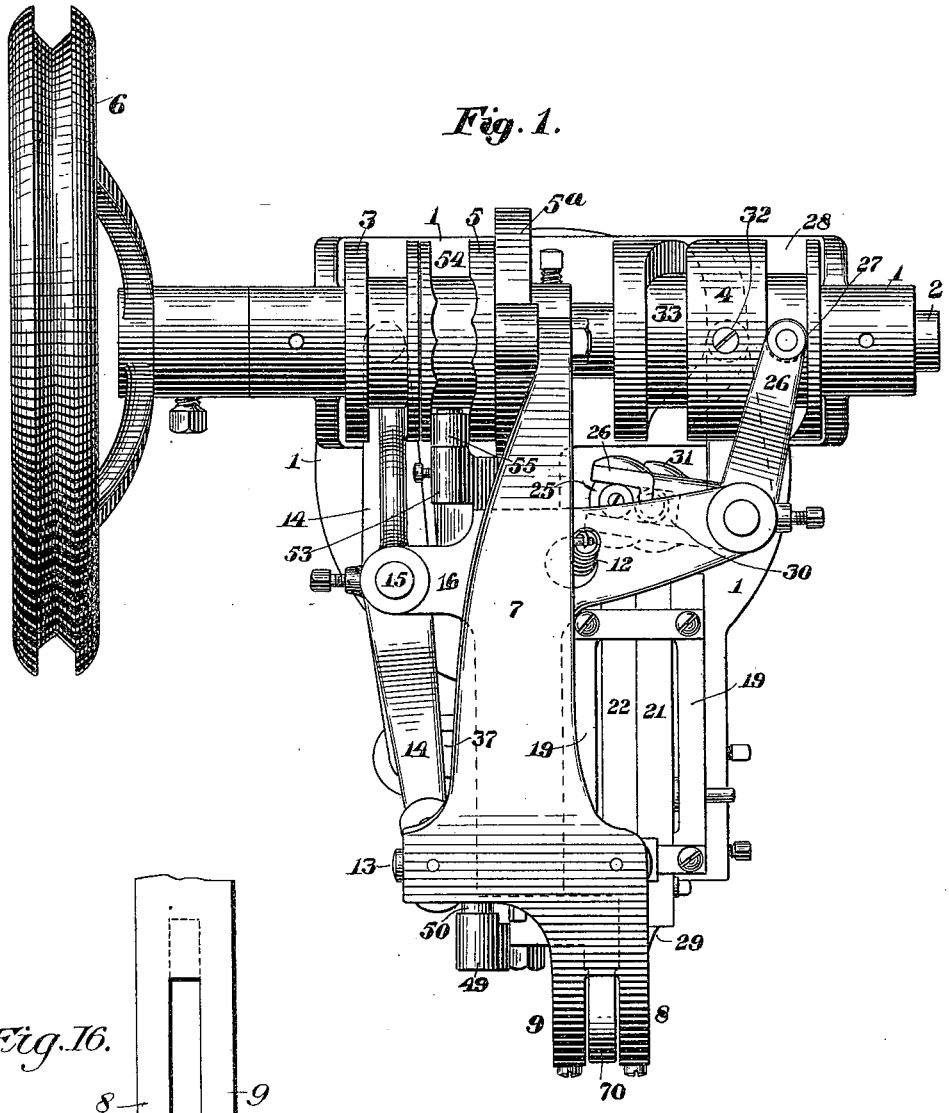


Fig. 16.




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(No Model.) 5 Sheets—Sheet 2.

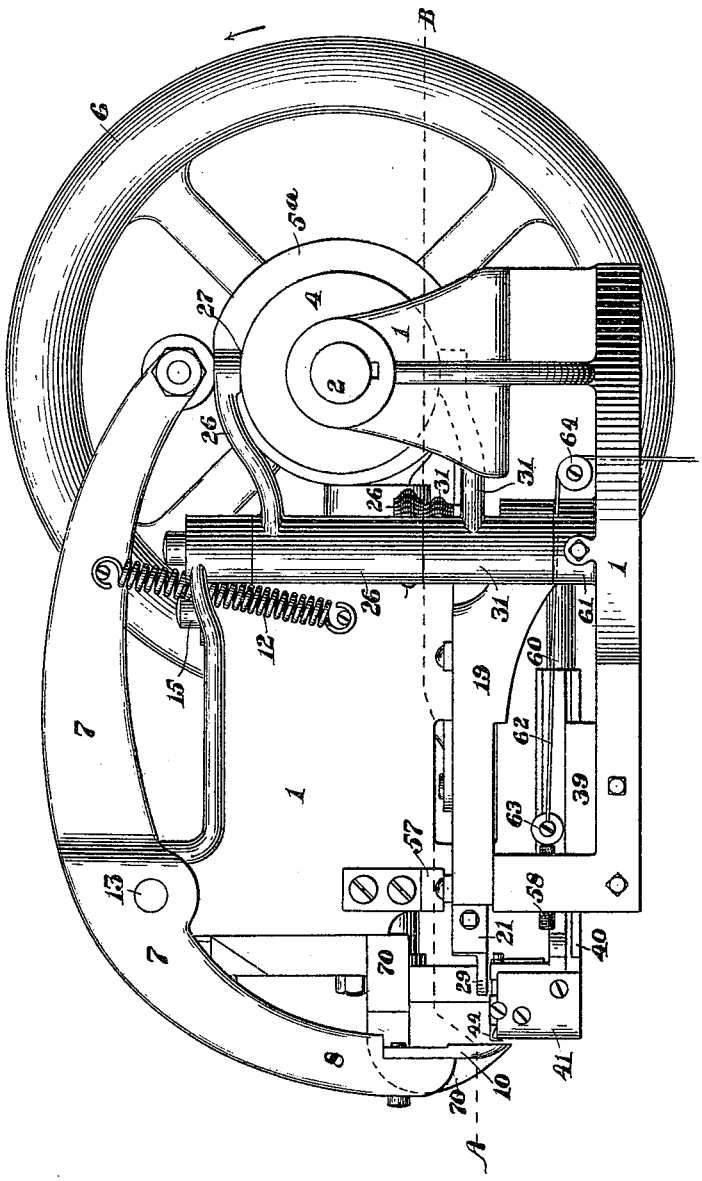


Fig. 2.

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(No Model.) 5 Sheets—Sheet 3.

Fig. 3.

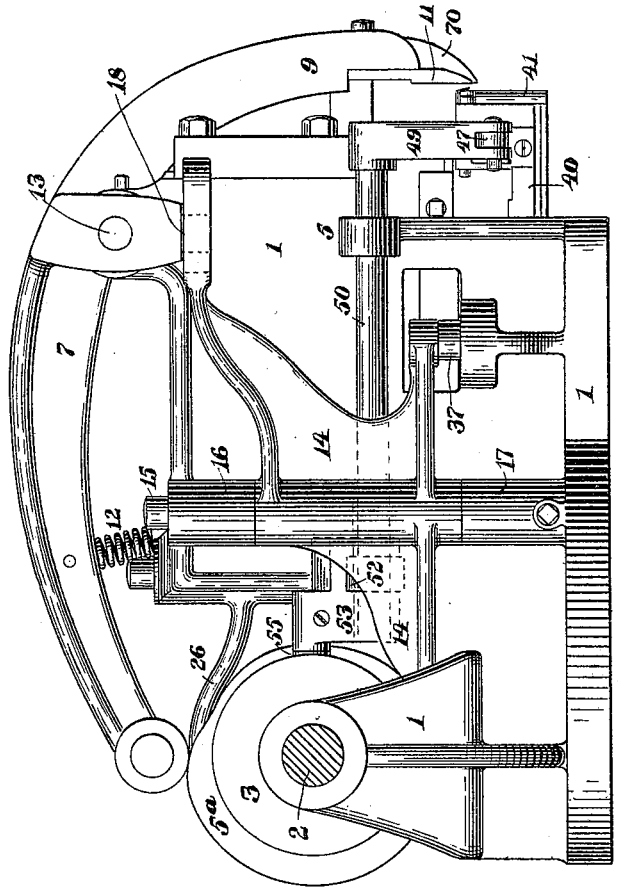


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Fig. 4

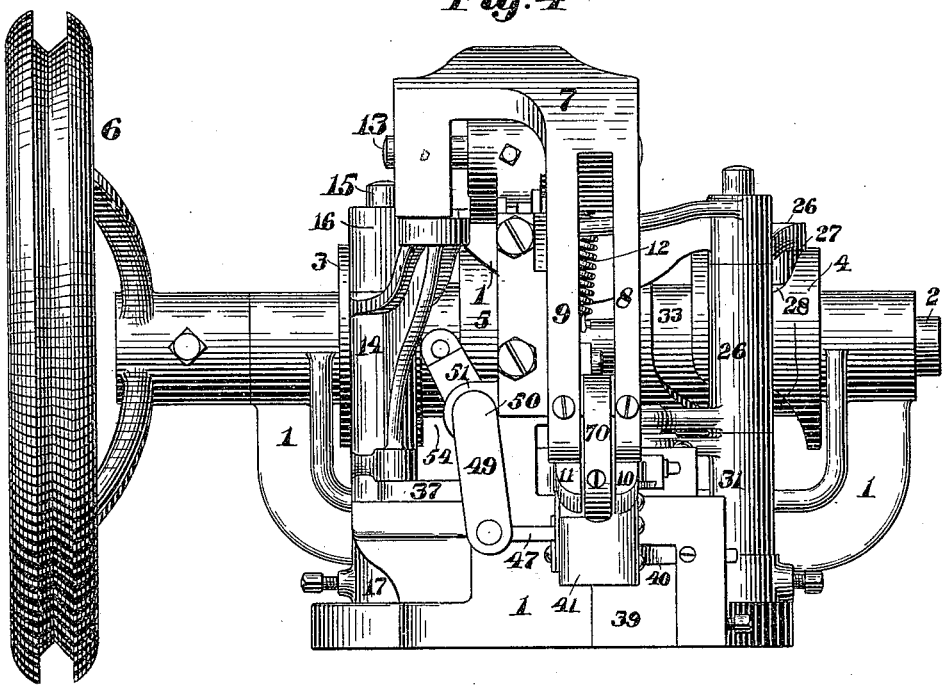


Fig. 11.

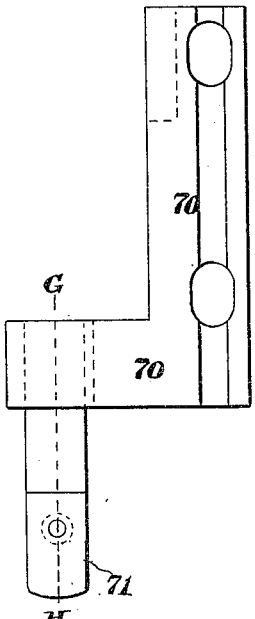


Fig. 15. Fig. 14.

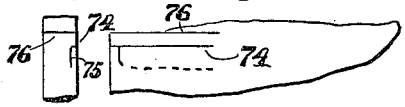


Fig. 13

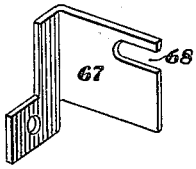


Fig. 12

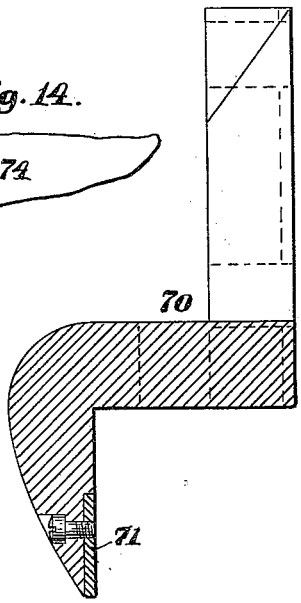


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Fig. 5.

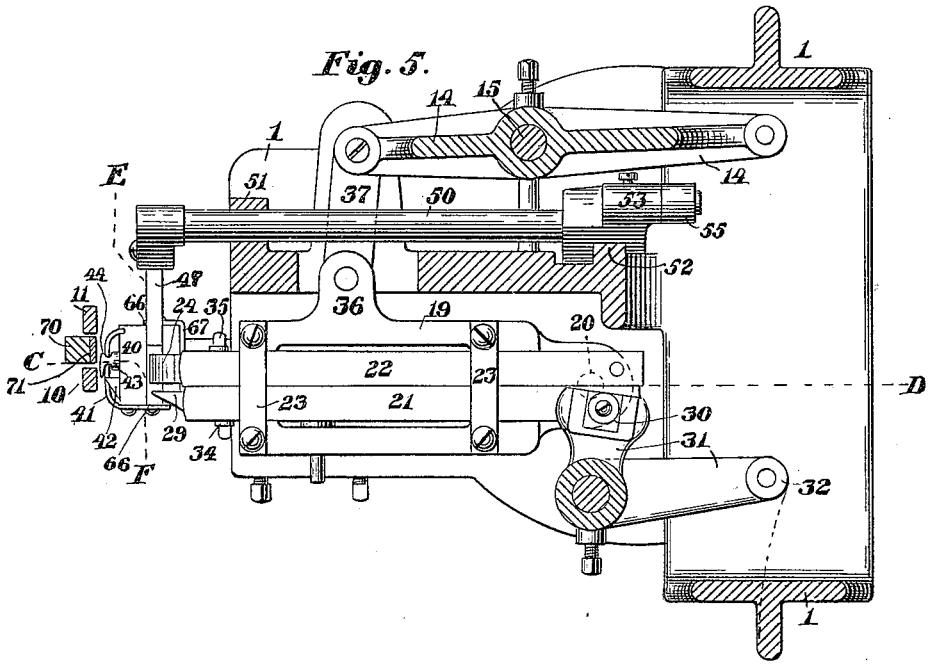



Fig. 6.

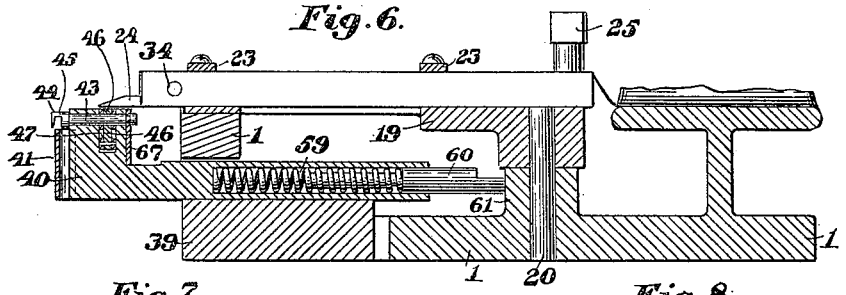



Fig. 7.

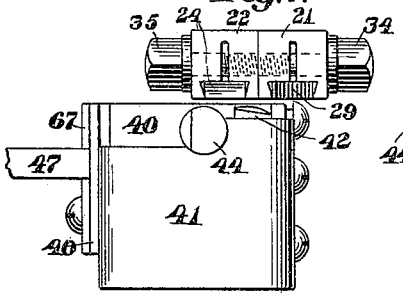



Fig. 9.

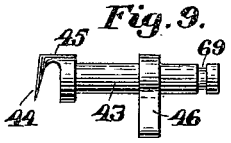



Fig. 8.

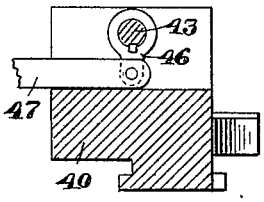
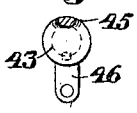



Fig. 10.

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# UNITED STATES PATENT OFFICE.

JOSEPH E. BERTRAND, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE BAY STATE SHOE MACHINERY COMPANY, OF SAME PLACE AND PORTLAND, MAINE.

## SOLE ROUGH-ROUNDING AND CHANNELING MACHINE.

SPECIFICATION forming part of Letters Patent No. 645,934, dated March 27, 1900.

Application filed December 4, 1899. Serial No. 739,217. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH ELI BERTRAND, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Sole Rough-Rounding and Channeling Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to sole rough-rounding and channeling machines and is an improvement upon the invention shown and described in the Letters Patent No. 625,737, granted to me May 30, 1899; and it consists in certain novel features of construction, arrangement, and combinations of parts, which will be readily understood by reference to the description of the accompanying drawings and to the claims hereto appended and in which my invention is clearly pointed out.

Figure 1 of the drawings is a plan of a machine embodying my invention. Fig. 2 is a right-side elevation. Fig. 3 is an elevation of the opposite side with the driving-wheel removed. Fig. 4 is a front elevation. Fig. 5 is a sectional plan, the cutting plane being on line A B on Fig. 2. Fig. 6 is a partial vertical section on line C D on Fig. 5. Fig. 7 is a front elevation of the nose of the machine, the trimming or rough-rounding cutter, the feed-point, and the cutter and feed-point carrying bars. Fig. 8 is a vertical section on line E F on Fig. 5. Fig. 9 is a side elevation of the oscillating channel-cutter. Fig. 10 is a section through the neck of said cutter looking toward the right of Fig. 9. Fig. 11 is a rear elevation of the fixed stand and soft-metal plate against which the trimming-cutter operates. Fig. 12 is a sectional elevation of the same, the cutting plane being on line G H on Fig. 11. Fig. 13 is an inside elevation of the locking-plate for securing the oscillating cutter-shaft in position. Figs. 14 and 15 are an elevation and an end view of a portion of a sole, illustrating the cuts made therein. Fig. 16 is an inside elevation of the greater part of the short arm of the sole clamping and feeding lever with the pressure feed-plates attached thereto.

In the drawings, 1 is the frame of the head of the machine, constructed and arranged to be mounted upon a column or bench. (Not shown.) The driving-shaft 2 is mounted in bearings in said frame and has mounted thereon between said bearings the cylinder-cams 3, 4, and 5 and the cam-disk $5^a$ and on the projecting end of said shaft the driving-wheel 6. A crescent-shaped lever 7 is pivoted to the front end of the upwardly-projecting plate-like portion of said frame 1, the front or shorter arm of which is divided into two fingers 8 and 9, to the inner faces of which are secured the pressure feed-plates 10 and 11, the inner surfaces of which are roughened upon their inner faces, as shown in Fig. 16, to insure a good hold upon the work to feed the same. The rear end of the lever 7 has set therein a stud, upon which is mounted a cam-truck upon which the face-cam formed upon the periphery of the cam-disk $5^a$ acts to vibrate said lever vertically, said truck being kept in contact with said cam by the tension of the spring 12.

The lever 7 is mounted upon the pivot-pin 13, so as to be movable laterally or lengthwise of said pin to assist in feeding the work.

A three-armed lever 14 is mounted upon a vertical pivot-pin 15, secured in a fixed position in the ears or bosses 16 and 17, formed on the frame 1, as shown in Figs. 3 and 4. The rearwardly-projecting arm of the lever 14 carries at its rear end a cam-truck which is acted upon by the path of the cylinder-cam 3 to vibrate said lever 14, and the upper forwardly-projecting arm of said lever is connected at its front end with the lever 7 by a swiveling block 18 to impart the necessary lateral movement to said lever 7 upon the pin 13 for feeding the work.

An arm 19 is pivoted to the frame 1 at its rear end by the vertical pin 20, rests at its forward end upon a supporting portion of the frame 1, and is provided in its upper side with a longitudinal groove, in which are mounted, so as to be movable endwise therein, the bars 21 and 22, which are held in place in said groove by the caps 23, and the bar 22 has secured to its front end the trimming-cutter 24 and to the upper side of its rear end the swiv-

eling block 25, which is engaged by the forked arm of the elbow-lever 26, mounted on a vertical pin, the other arm of which carries a cam-truck 27, which is acted upon by the cam-path 28 of the cylinder-cam 4 to vibrate said lever and impart to said bar 22 an intermittent reciprocation, as shown in Figs. 4 and 5. The bar 21 has set in its front end the feed point or spur 29, and in the upper side of its rear end a stud upon which is mounted the swiveling block 30, which is engaged by the forked arm of the elbow-lever 31, the other arm of which carries a cam-truck 32, which is acted upon by the cam-path 33 of the cylinder-cam 4 to vibrate said lever and impart to said bar 21 an intermittent reciprocation in the direction of its length. The front ends of the bars 21 and 22 are partially bifurcated and provided on their under sides with dove-tailed grooves to receive the feed-point 29 and the trimming-cutter 24, respectively, which are clamped firmly in said grooves by the clamping-screws 34 and 35, respectively, as shown in Fig. 7.

The arm 19 is provided with the laterally-projecting ear 36, to which is pivoted one end of the link 37, the other end of which is pivoted to the front end of the lower forwardly-projecting arm of the lever 14, by the vibration of which the arm 19 and bars 21 and 22 have imparted thereto a lateral vibratory motion in unison with the lateral motion of the lever 7 and feed-plate 10 for the purpose of feeding the work.

The base-plate of the frame 1 has cut through it a rectangular opening, in which is mounted so as to be vertically adjustable therein by means of set-screws the block 39, having an inverted-T-shaped groove formed in its upper side, in which is fitted so as to be movable endwise therein the nosepiece 40, upon which is secured in a fixed position the pressure guide-plate 41, against which the tread-surface of the sole bears when being operated upon, and has adjustably secured thereon by a set-screw the cutter 42 and also has mounted in a suitable bearing therein the short shaft 43, the axis of which is at right angles to the line of feed of the work, and has formed upon its front end the segmental cutter 44, concentric with said shaft, but connected thereto by the eccentric neck 45, as shown in Fig. 9, said cutter having a knife-edge extending from one side of the neck 45 around to the curved portion thereof, as shown in Figs. 9 and 10.

The shaft 43 has firmly secured thereon by a groove and key the short lever 46, to which one end of the link 47 is pivoted, the other of which is connected to the forked end of the lever 49, secured upon the front end of the shaft 50, to impart to said link a reciprocating movement, and thereby cause an oscillating movement to be imparted to said cutter 44 to cut the channel.

The shaft 50 is mounted in bearings in the ears 51 and 52, formed upon the frame 1, in such a manner that it is free to be moved endwise and oscillated about its axis therein, and has fitted upon its rear end the arm 53, the hub of which is divided and embraces the ear 52 to prevent forward-and-rearward movement of said arm when the shaft 50 is moved endwise in unison with the movements of the nosepiece 40, said arm, however, being connected to said shaft by a spline and groove, so that said shaft is compelled to move about its axis in unison with said arm, to which a series of rapid vibrations is imparted during about one-third of each revolution of the shaft 2 by the cam-path 54, formed in the periphery of the cylinder-cam 5, acting upon the truck 55, carried by said arm 53, as shown in Figs. 1 and 3.

A block or stand 57 is secured to the frame 1 above the forward cap-plate 23 to prevent any possibility of the front ends of the arm 19 and bars 21 and 22 being forced upward during the cutting or feeding of the material.

The nosepiece 40 is limited in its forward movement by the adjustable stop-screw 58, toward which it is pressed by the spring 59, inclosed in a chamber in said nosepiece and acting against the inner end of the follower 60, the rear end of which abuts against a stop 61, as shown in Fig. 6.

The nosepiece 40 is moved to the rear for the purpose of placing the work in position by means of the cord or chain 62, secured to the screw-stud 63, and after passing over the pulley 64 is connected to a treadle near the floor. (Not shown.)

The nosepiece 40 has in its upper side a slot 66 to receive the arm 46 and link 47 and has secured thereto the plate 67, which has an open slot 68 in its front edge, which engages the circumferential groove 69, formed in the inner end of the cutter-shaft 43 to prevent endwise movement of said cutter-shaft in its bearing in said nosepiece, though it may be moved endwise with said nosepiece for placing the work in position.

A bracket 70 is secured to the frame of the machine, with its lower end between the two fingers 8 and 9 of the lever 7, and has secured to its inner face a soft-metal plate 71, which enters the space between the welt and upper and serves to guide the work as it is fed through the machine and against which the cutter 24, which has a straight cutting edge, with its flat side downward, acts to trim the sole.

The plates 10 and 11, which have their inner surfaces grooved vertically, as shown in Fig. 16, also enter the space between the welt and upper, but do not bear upon the upper, but serve to clamp the sole and welt between them and the plate 41 while the cutter 24 is trimming the sole, and the plate 10, coöperating with the feed-point 26, assists in feeding the work.

The operation of my invention is as follows: The several parts of the machine being in the positions shown in Figs. 1, 2, 3, and 4, the op-

erator retracts the nosepiece 40 by placing his foot upon the treadle connected thereto by the cord or chain 62, then places the tread-surface of the sole against the pressure guide-plate 41, with the lower end of the guide-plate 71 bearing against the upper in proximity to the welt, and then releases said treadle, when the reaction of the spring 59 causes a forward movement of said nosepiece and a clamping of the sole edge between the pressure feed-plates 10 and 11 and the pressure guide-plate 41. If power be applied to the wheel 6 to revolve it in the direction indicated by the arrow on Fig. 2, the first effect produced is a forward movement of the bar 21 and feed-point 29 till said feed-point enters the sole and presses the welt into firm contact with the plate 10, caused by the action of the cam-path 33 upon the lever 31. When the forward movement of the feed-point is completed and while said feed-point remains in the sole, the forward ends of the arm 19, the bars 21 and 22, the cutter 24, and the lever 7, with the feed-plates 10 and 11, are moved toward the left by the action of the cam 3 upon the lever 14 to feed the work, which, being pressed against the cutting edge of the stationary cutter 42 as it is fed forward, a section of a shallow incision or slit 74 at right angles to the tread-surface of the sole is formed therein, as shown in Figs. 14 and 15. During the same time that the work is being fed the cam 54 is acting upon the truck 55 to oscillate the shaft 50 and cause a series of rapid reciprocations of the link 47 and a corresponding series of oscillations of the cutter 44, which cuts an incision 75 parallel, or nearly so, to the tread-surface of the sole and extending from the incision 74 toward the center of the sole a distance nearly equal to the diameter of said cutter 44, as shown in Figs. 14 and 15. When the movement of the arm 19 toward the left ceases and the feed of the work is completed, the action of the cam-path 28 upon the lever 26 causes the bar 22 and cutter 24 to be moved forward to force said cutter through the sole and welt into contact with the plate 71 on the fixed bracket 70, thereby cutting a section of the trimming incision 76. (See Figs. 14 and 15.) The continuation of the revolution of the cam-shaft 2 causes the cutter 24 and the feed-point 29 to recede to their rearmost positions, while the plates 10 and 11 move toward the front, and then the said feed-point, cutter, and feed-plates are moved toward the right to the positions occupied at the start, the work being prevented from being moved backward by being clamped between the cutting-plate 71 and the pressure guide-plate 41, these operations being repeated at each revolution of the cam-shaft 2.

I claim—

1. In a machine for channeling and rough-rounding the soles of boots and shoes while on the last, the combination of a fixed anvil or cutting-block; a pair of vibratory and laterally-movable pressure feed-plates arranged one upon each side of said anvil; a horizontally-reciprocating and a laterally-vibrating feed-point arranged to coöperate with one of said pressure feed-plates to feed the work; a horizontally-reciprocating and laterally-vibrating cutter arranged to coöperate with said anvil to trim a section of the edge of the sole after each forward lateral movement of the feed-point and said cutter.

2. In a machine for channeling and rough-rounding the soles of boots and shoes while on the last, the combination of the lever 7 provided with the two fingers 8 and 9 each provided on its inner face with a presser feed-plate; a fixed anvil or cutting-plate located between said fingers 8 and 9; a yielding nosepiece and a gage-plate carried thereby and coöperating with said anvil to clamp the work; a reciprocating and laterally-vibrating feed-point arranged to coöperate with one of said pressure feed-plates to feed the work; a reciprocating and laterally-vibrating cutter arranged to coöperate with said anvil to trim a section of the edge of the sole after each forward vibratory movement of the feed-point; means for imparting intermittent reciprocations and lateral vibrations to said feed-point and cutter; and means for imparting oscillating and lateral movements to said lever 7 as set forth.

3. In sole channeling and rough-rounding machines the combination of the nosepiece 40 provided with the slot 66; the pressure-plate 41 secured to said nosepiece; the shaft 43 provided with the cutter 44 and with the groove 69; the slotted plate 67 engaging said groove; the arm 46 secured to said shaft 43 within the slot 66 by a spline and groove and means for imparting to said arm a vibratory motion to oscillate said cutter 44.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 20th day of November, A. D. 1899.

JOSEPH E. BERTRAND.

Witnesses:
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JAMES A. WOODBURY.