J. G. ROSS.

CHANNELING MACHINE.

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1,030,614. Patented June 25, 1912.

Fig. 1.

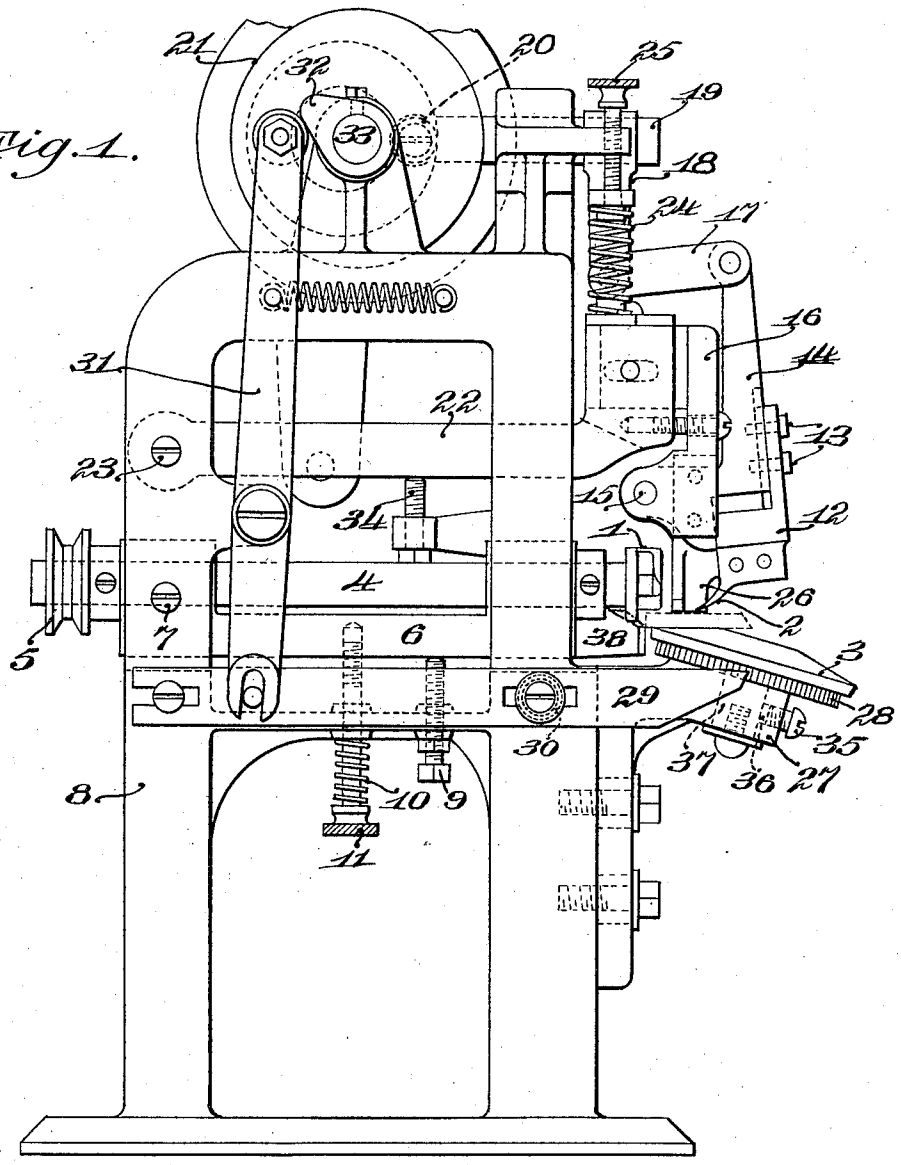

Fig. 3.

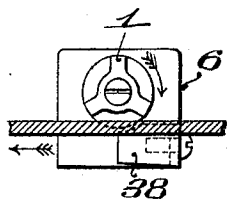

Fig. 2.

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UNITED STATES PATENT OFFICE.

JOHN G. ROSS, OF SOUTH EASTON, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

CHANNELING-MACHINE.

1,030,614. Specification of Letters Patent. Patented June 25, 1912.

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To all whom it may concern:

Be it known that I, JOHN G. ROSS, a citizen of the United States, residing at South Easton, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Channeling-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to improvements in channeling machines.

In the manufacture of a turn shoe and woman's welt shoe it is customary to provide the sole with a channel near the edge thereof to receive the seam by which the upper is secured to the sole, and to rabbet or bevel the edge of the sole to provide a space for the folded-in margin of the upper. In machines for performing work of this character such as have been heretofore proposed or used, the channel and the shoulder have been cut by means of knives of proper form which are constantly in engagement with the work and operate either by a drag cut, caused by the feeding of the work by suitable feeding means, or by a succession of chopping movements in the line of feed. In either case the cutting action of the knives is opposed in direction to the feed, so that in order to insure the regular feeding of the work it is necessary to use a feed point or a toothed feed wheel or some similar device having a positive action. The use of such feeding means is disadvantageous, owing to the fact that the position of the sole engaged thereby—usually the part between the channel and the shoulder, known as the "between-substance"—is defaced and weakened by the indentations produced, and owing further to the considerable pressure with which the work must be engaged by the feeding means, and the consequent difficulty of guiding the work properly through the machine, particularly at the pointed extremity of the sole.

The object of the present invention is to improve machines for shouldering or shouldering and channeling soles in a manner to obviate the disadvantages above pointed out, and generally to reorganize and improve machines of this character, and to these ends the invention contemplates a machine in which a rotary cutter is used to form the shoulder, preferably in combination with a channeling knife operating by a chopping movement transverse to the line of feed, so that the resistance to the feed is reduced or abolished.

The invention consists further in the devices and combinations hereinafter described and defined in the claims.

In the drawings illustrating the preferred form of the invention Figure 1 is a side elevation of the entire machine. Fig. 2 is a front view of the rotary shoulder cutter together with a portion of the sole upon which it is operating; and Fig. 3 shows a cross section of the sole produced by the machine.

The illustrated embodiment of the invention comprises as its operating instrumentalities a rotary shoulder cutter 1 and a channeling knife 2 and the work is supported and fed by a rotary work support 3. The shoulder cutter 1 is fixed to and actuated by a shaft 4 which is rotated by a pulley 5 with suitable belt connections. In order to permit vertical adjustment of the shoulder cutter to vary the depth of the cut the shaft 4 is journaled in a carrier 6 pivoted near its rear end at 7 in the frame 8 of the machine. The carrier rests upon a stop screw 9 against which it is normally drawn by a spring 10 acting through an adjusting screw 11 threaded into the carrier 6. This construction permits the shaft carrier 6 to be readily removed from operating position either by lifting the carrier against the force of the spring 11, or by screwing up the stop screw 9. The position of the screw 9 predetermines the depth of cut to be made by the rotary shoulder cutter 1.

The channeling knife 2 operates by a chopping movement transverse to the line of feed. The channeling knife is fixed to a knife carrier 12 adjustably secured by screws 13 to a lever 14 pivoted at 15 upon a head 16. In order to oscillate the lever 14 and the knife carrier and knife about the pivot 15 the upper end of the lever 14 is connected by a link 17 with an arm 18 projecting downward from a slide 19 having a bearing in the frame of the machine, and actuated by a cam roll 20 engaging a cam path in a cam 21. The knife and its sup-

porting and actuating mechanism are arranged to rise and fall to accommodate themselves to work of different thicknesses and to cause the knife to cut a channel of the same depth throughout. This is accomplished by mounting the head 16 adjustably on an arm 22 pivoted at 23 on the frame of the machine, and pressed downward by a spring 24 connected with the frame of the machine by an adjusting screw 25. A presser foot 26 is secured to the head 16 and rests upon the surface of the work, being held firmly thereagainst by the spring 24. The link 17 connecting the lever 14 with the actuating slide 19 permits vertical movement of the lever 14 without interference with the oscillating movement by which the knife is caused to cut the channel, and the positions of the pivot 15 and of the path of movement of the knife are thus always determined by the presser foot 26.

The work support 3 is in the form of a truncated cone journaled on a bracket 27 projecting from the frame. The work support serves also as a feeding device, being rotated intermittently by a ratchet 28 fixed to the work support and actuated by a slide 29 mounted on the frame of the machine and engaging the ratchet at its forward end. A spring 30 holds the end of the slide yieldingly against the ratchet and the slide is actuated by a lever 31 pivoted on the frame of the machine and connected at its lower end with the slide by a pin-and-slot connection. The upper end of the lever 31 carries a cam roll engaging a cam 32. The cams 21 and 32 are mounted on a shaft 33 which is rotated by any suitable means. In order to prevent backward movement of the work support a screw 35 is arranged to press a friction disk 36 against the stem 37 upon which the work support is journaled.

In order to prevent the channeling knife from accidentally coming in contact with the work support when no work is in the machine, a stop screw 34 is mounted in the frame of the machine in a position to limit the downward movement of the arm 22.

The machine operates as follows:—The work is placed upon the inner beveled surface of the work support and is held by the operator against an edge gage 38 mounted on the carrier 6. The channeling knife 2 engages and cuts the work intermittently, the cuts overlapping so as to form a continuous channel. The work is fed during the return strokes of the channeling knife by means of the intermittent rotation of the work support. The shoulder cutter is arranged to rotate in such a direction as to cut the work in the direction in which the work is fed: in the illustrated machine the work is fed from right to left as seen in Fig. 2, and the shoulder cutter rotates in the direction of the arrow in the same figure. This not only causes the rotary cutter to assist rather than to impede the feeding of the work, but it has the further advantage that the formation of a bur on the upper surface of the sole is avoided, since the cutting edges enter the work at the surface and cut downward to the lower surface of the shoulder, instead of entering at the surface of the shoulder and emerging at an angle through the upper surface of the sole as would be the case if the cutter rotated in the opposite direction. This mode of operation is the reverse of that usually employed with rotary cutters in machines of other kinds, but it is rendered practicable by the nature of the material operated on and the high speed of rotation of the shoulder cutter.

Since the relative positions of the work support and the shoulder cutter are fixed during the operation of the machine the thickness of the reduced marginal portion of the sole is always the same however the thickness of the material may vary, which is a desirable feature in such a machine. The surface of the work support is free from the sharp projections used in the feeding devices of previous channeling machines, and thus the work is fed without any indentation or injury of the sole.

The invention is not limited to the details of construction and operation of the illustrated embodiment thereof, but may be embodied in other forms broadly defined in the claims.

I claim—

1. A channeling machine, having, in combination, means engaging the upper and lower surfaces of a sole for holding and feeding a sole, and a rotating shoulder cutter cutting the work in the direction of feed, substantially as described.

2. A channeling machine, having, in combination, means engaging the upper and lower surfaces of a sole for holding and feeding a sole, a channeling knife, and an independently mounted rotating shoulder cutter, substantially as described.

3. A channeling machine, having, in combination, means engaging the upper and lower surfaces of a sole for holding and feeding a sole, a channeling knife, and a rotating shoulder cutter cutting in the direction of feed, substantially as described.

4. A channeling machine, having, in combination, a rotary work support for supporting a flat sole, means for rotating the work support to feed the sole, and a rotating shoulder cutter cutting in the direction of the feed, substantially as described.

5. A channeling machine, having, in combination, a rotary work support, a constantly rotating shoulder cutter, a channeling cutter vibrating transversely with respect to the line of feed, and means for rotating the work support intermittently dur-

ing the return movements of the channeling knife to feed the work, substantially as described.

6. A channeling machine, having, in combination, an unyielding work support, a rotary shoulder cutter adjustably mounted to operate at a fixed distance therefrom, and a channeling knife mounted on a yielding support so as to maintain a fixed relation to the surface of the work opposite to the work support, substantially as described.

7. A channeling machine having, in combination, a work support, a rotary shoulder cutter operating on the side of the sole opposite to the work support, a channeling cutter, separate carriers for said cutters, and means for adjusting the shoulder cutter carrier toward and from the work support independently of the channel cutter carrier, substantially as described.

8. A channeling machine having, in combination, work feeding means, a channeling cutter vibrating transversely with respect to the line of feed, and a rotating shoulder cutter cutting in the direction of feed, by virtue of which construction the resistance of the cutters to the feed is substantially abolished, substantially as described.

9. A channeling machine, having, in combination, means engaging the upper and lower surfaces of a sole for holding and feeding the sole, a yieldingly mounted channel knife, a yieldingly mounted rotating shoulder cutter, and separate carriers for said knife and cutter, substantially as described.

10. A channeling machine, having, in combination, means for holding and feeding a flat sole including a work support, a pivotally mounted shaft carrier, a rotary shaft supported thereby, a rotating cutter on said shaft constructed and operating to form a shoulder on the marginal portion of the sole, and means permitting removal of said cutter shaft from operating position, substantially as described.

11. A channeling machine, having, in combination, means for holding and feeding a flat sole including a work support, a rotary shaft, a rotating shoulder cutter on said shaft constructed and arranged to operate on the marginal portion of the sole, and a pivotally mounted carrier for said shaft, whereby the cutter may be removed from working position at will, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses.

JOHN G. ROSS.

Witnesses:
BENJAMIN PHILIPS,
ANNIE C. RICHARDSON.