Feb. 6, 1951 J. P. FREDERICKSEN 2,540,197

SOLE ROUNDING AND CHANNELING MACHINE

Filed Feb. 12, 1949

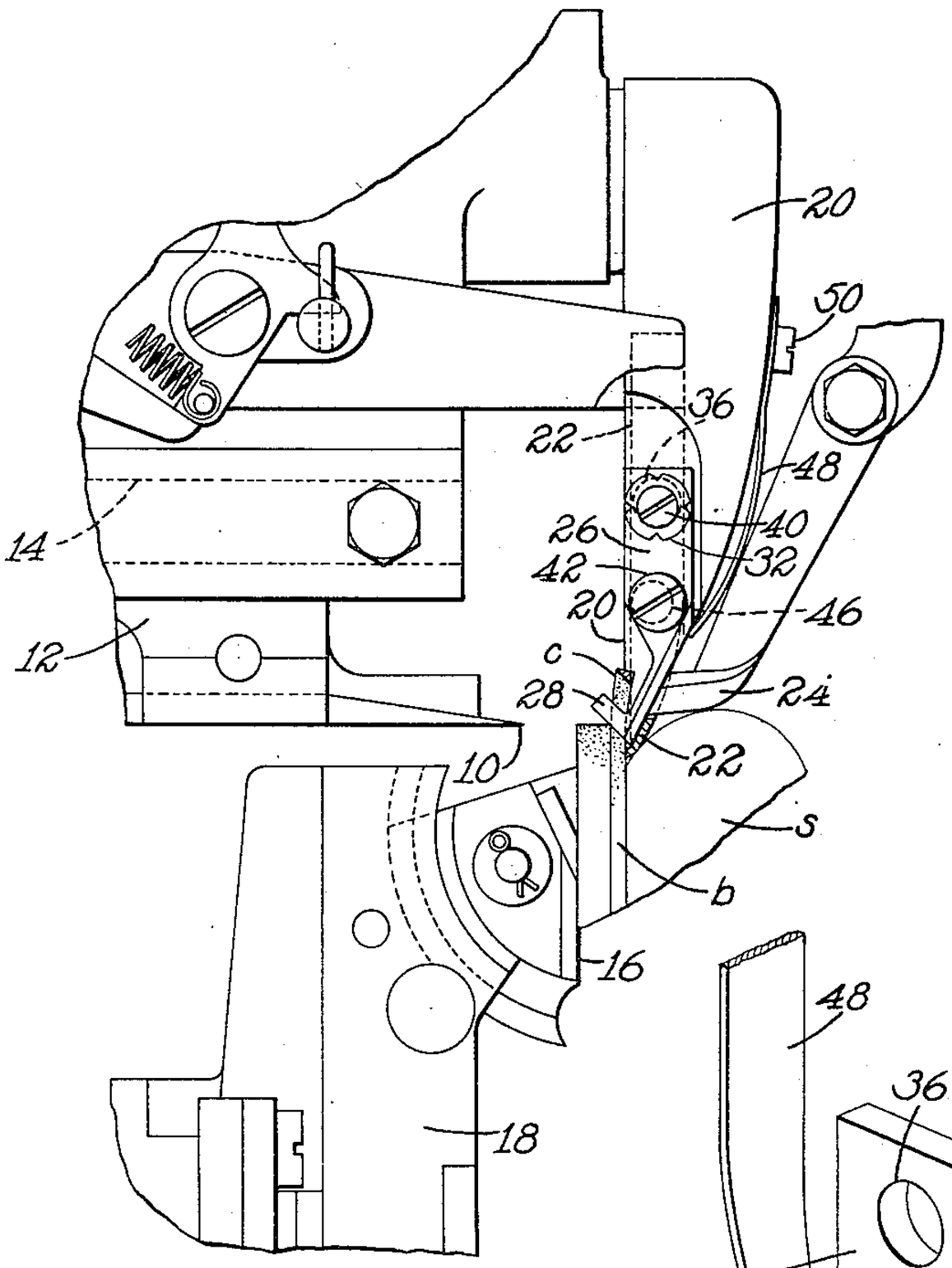


Fig. 1

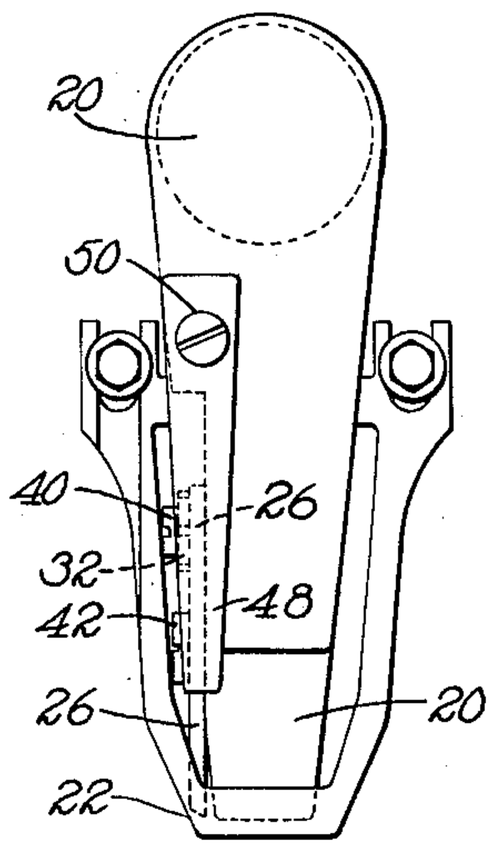


Fig. 2




Fig. 3

Inventor
James P. Fredericksen
By his Attorney

Patented Feb. 6, 1951

2,540,197

# UNITED STATES PATENT OFFICE

2,540,197

## SOLE ROUNDING AND CHANNELING MACHINE

James P. Fredericksen, Braintree, Mass., assignor to United Shoe Machinery Corporation, Flemington, N. J., a corporation of New Jersey

Application February 12, 1949, Serial No. 76,065

7 Claims. (Cl. 12—18)

1

This invention relates to sole rounding and channeling machines, and more particularly is an improvement upon a machine of the type disclosed in United States Letters Patent No. 1,030,606, granted on June 25, 1912, upon an application of F. H. Perry.

Machines of this class are employed for rounding the edge of a shoe sole, after it has been laid upon and temporarily secured to the shoe bottom, preparatory to the outsole stitching operation. Because the shoe is guided during the latter operation by the rough rounded sole edge, it is important that the edge shall have as fair a curvature as possible and be free from humps or projections which would cause the line of stitching to be positioned irregularly with respect to the sides of the upper.

In the use of a machine of the above type the sole edge is trimmed by a rapidly reciprocating chopping knife which makes a series of overlapping cutting strokes directed from the bottom of the sole toward the upper side thereof. The shoe is supported against the thrust of the knife by a feeding member, commonly called a "feed point" which is adapted to enter the welt crease and to engage the upper margin of the sole (or welt in the case of a welt shoe) opposite to the knife. When the machine is in proper adjustment the knife and feed point just meet at the end of the cutting stroke of the knife, and a complete severance of the chip from the rest of the sole along the cut of the knife is effected.

However, because of the usual bearing clearances in the mounting and driving mechanism for the knife and feed point, and the wear resulting from the use of the machine, the knife in some of its cutting strokes will stop short of engagement with the feed point. At such times a thin fringe or projection will be left extending from the ridge at the upper margin of the sole, that is, the outer edge of the welt in a welt shoe. This tendency is increased by the fact that the slightest overtravel of the knife will cause it to make a shallow trace or impression in the feed point. Thus, the knife is dulled and a very slight but objectionable clearance develops between the knife and feed point with regard to any cutting strokes that are either normal or shorter than normal.

In order that shoes rounded with the machine out of proper adjustment shall be properly prepared for the outsole stitching operation they are commonly subjected to a hand trimming operation by which any fringe or projection extending from the upper ridge of the sole edge is removed.

2

In view of the foregoing, the object of the present invention is to eliminate any such hand operation and to trim or bevel the upper ridge of the sole edge as the sole edge is being rounded and without interfering with the speed and accuracy of the rounding operation.

With this end in view, a feature of the invention consists in the combination, in a machine of the character described, with a tool for rounding the sole edge, and a feeding member for supporting the shoe sole opposite to the tool and movable alternately through a feeding stroke in one direction and a return stroke in the opposite direction, of a chamfering knife for beveling the upper ridge of the sole edge, the knife being so mounted upon the feeding member that its cutting edge faces in the direction of the return stroke of the feeding member and extends obliquely across the upper ridge of the sole edge. During each feeding movement of the work the chamfering knife remains in the leading end of the kerf made during the preceding return stroke of the feeding member, because the latter and the work move together during each feeding stroke. Consequently, each new extension of the chamfering cut begins at the end of the preceding cut, insuring a smooth and continuous bevel upon the sole edge.

A further characteristic of the Perry machine is that, during each return stroke of the feed point, it is first retracted slightly away from the knife to allow the crease guide to support the shoe against the pressure caused by the bottom rest and to eliminate back feeding of the work during the return stroke of the feed point. Later, during a short interruption in the return stroke of the feed point, at its mid-point, the feed point is quickly reciprocated inwardly to meet the chopping knife, whereby the crease guide is relieved from the thrust of the knife, and then is moved outwardly to its former position. At the end of this reciprocatory movement of the feed point its return stroke is resumed.

With this operating characteristic of the machine in view, a further object of the invention is to insure against any movement of the chamfering knife out of the leading end of the chamfering cut as a result of the reciprocation of the feed point, so that the second part of each chamfering cut will begin, without any discontinuity in the bevel, at the end of the kerf made during the first part of the chamfering cut.

To this end, and in accordance with another feature of the invention the chamfering knife is

mounted to move freely upon the feed point in response to the reciprocating movement of the feed point permitting the cutting edge of the knife to remain seated in the leading end of the kerf, the knife being yieldingly held in this position.

Invention is also to be recognized in the provision of an adjustable mounting for the knife by which its position on the feed point may be varied, as desired, in accordance with the required size of the bevel.

The above and other features of the invention will now be described with reference to an illustrative embodiment thereof shown in the accompanying drawings, and will be defined in the claims.

In the drawings,

Fig. 1 is a side elevation of a portion of the head of a rounding and channeling machine embodying the invention, and illustrating the beveling of a sole by the chamfering knife;

Fig. 2 is a front elevation of a part of the structure of Fig. 1 illustrating the mounting of the chamfering knife upon the feed point; and

Fig. 3 is a view in perspective of the chamfering knife as viewed toward and from above its cutting edge, together with the various members (in exploded relation) by which the knife is mounted upon the feed point.

In the illustrated machine, which is the same as the above-mentioned Perry machine except for the chamfering knife, 10 indicates the continuously reciprocating chopping knife, 12 the knife carrier, 14 the slideway in which the carrier moves horizontally, 16 the bottom rest, 18 the oscillating support for the bottom rest, 20 the feed point, 22 the crease guide, and 24 the forepart guide. The operating characteristics of the machine will now be briefly summarized, but only to the extent necessary for an understanding of the present invention.

The bottom rest 16 is adapted to seat upon the bottom of a shoe S, and hold the latter with the upper margin of the sole against the crease guide 22 or feed point 20, both of which extend into the welt crease of the shoe. The bottom rest 16 and feed point 20 are oscillated together from right to left (when the machine is viewed from the front) to impart a feeding movement to the shoe, and during the remainder of a cycle of their operation are returned to their original positions at the right-hand ends of their strokes. At the beginning of each return stroke of the feed point it is retracted forwardly a slight amount, away from the bottom rest, to permit the crease guide 22 to receive the pressure imparted to the shoe by the bottom rest whereby any back feeding action of the feed point upon the work during its return stroke is avoided. Each return stroke of the feed point 20 is interrupted at its mid-point for a short interval of time during which the chopping knife 10 reaches the forward end of its cutting stroke, and during this period the feed point is quickly reciprocated, first toward the knife to meet the latter at the end of its cutting stroke, and then away from the knife into its retracted position. The return stroke of the feed point is then resumed, and is completed when the feed point reaches its extreme position toward the right.

The novel structure provided by the invention consists of a chamfering knife 26, and mounting therefor, by which a bevel *b* is formed upon the sole edge immediately beyond where it is trimmed by the chopping knife 10. The chamfering knife 26 has a blade 28 provided with a cutting edge 30 which faces in the direction of the return stroke of the feed point, the knife being so mounted upon the feed point that the edge 30 extends obliquely from the feed point across the sole edge below the line of cut of the chopping knife 10. Accordingly, the chamfering knife removes a chip *c*, of triangular cross section, with which will be removed from the shoe any fringe or projection at the upper ridge of the sole edge caused by incomplete cutting of the sole by the chopping knife 10.



The chamfering knife 26 at its upper end swings upon a sleeve 32, this sleeve having a hub 34 adapted to be received in a hole 36 formed in the knife. The hub 34 is eccentric with respect to a hole 38 in the sleeve which freely receives a screw 40 which is threaded into the feed point. The length of the hub 34 is somewhat greater than the thickness of the chamfering knife 26 so that the latter is free to swing with respect to the feed point when the screw 40 is set up to hold the collar 32 fixed upon the feed point.

This swinging movement of the knife is limited by a screw 42 which is threaded into the feed point and has a shoulder 44 which is received in a somewhat larger clearance hole 46 formed in the mid-portion of the knife. A leaf spring 48 bears at its lower end against the knife 26 and urges the latter toward the sole edge. The spring at its upper end is secured to the feed point by a screw 50. Normally, the throw of the eccentric hub 34 is directed vertically upwardly, and the shoulder 44 is at the middle of the hole 46 with reference to the top and bottom thereof as shown in Fig. 1.

The action of the chamfering knife during one cycle of operation of the machine and the adjustment of the knife upon the feed point will now be described. At the beginning of the return stroke of the feed point, it is retracted to a position very slightly in front of the work engaging surface of the crease guide (as illustrated in Fig. 1 slightly exaggerated) and the chamfering knife is so positioned upon the feed point that there is a slight clearance between the shoulder 44 of the screw 42 and the knife at the rearward side of the hole 46 therein. The spring 48 urges the knife rearwardly so that its cutting edge is seated in the leading end of the kerf cut during the preceding return stroke of the feed point. With the parts referred to in this position, the first part of the return stroke of the feed point takes place causing an additional length of the bevel *b* to be formed until the mid-point of its stroke is reached. The cutting action of the knife tends to pull it toward the sole, but this movement is limited by the engagement of the shoulder 44 with the forward side of the hole 46. The feed point is now moved inwardly to meet the knife 10, and in doing so causes the knife 26, the edge 30 of which remains seated in the leading end of the kerf in the sole, to swing upon the collar 32. This movement of the knife takes place without movement of the cutting edge 30 laterally of the sole edge because of the clearance between the shoulder 44 on screw 42 and the rearward side of the hole 46 in the knife. Just before the return stroke of the knife is resumed the feed point is moved away from the knife to the position it had when its reciprocation toward the knife began. The knife again swings upon the collar 32 slightly during this movement, but without disturbing the position of the cutting edge 30

with respect to the sole. The return stroke of the feed point is now resumed, causing the bevel *b* to be further extended. At the end of its return stroke, the feed point is moved toward the bottom rest to take the pressure of the work off the crease guide preparatory to the next feeding stroke. At this time the chamfering knife is swung again upon the collar **32** to bring the knife at the forward side of the hole **46** out of engagement with the shoulder **44** on the screw **42**. The feed point is next swung from right to left with the bottom rest **16** to impart a feeding movement to the work, the knife **26** still being held in the leading end of the kerf by the spring **48**. The remaining motion of the fed point, by which it is brought again to the first position described above, is an outward movement away from the knife sufficient to allow the crease guide again to receive the pressure of the shoe. During this motion of the fed point the knife **26** swings, clockwise with respect to the fed point, but without moving the cutting edge **30** away from the sole, so that the forward side of the hole **46** substantially engages the shoulder **44**.

All the above mentioned swinging movements of the knife are very small but are desirable to prevent the bevel *b* from showing small ridges or shoulders owing to the reciprocating movement of the feed point toward and away from the knife. It is also to be understood that the swinging of the chamfering knife, while described above as with respect to the feed point about the collar **32**, may also be regarded as a rocking movement with respect to the shoe about the portion of the knife edge **30** which engages the shoe. However, this rocking of the knife has no effect upon the bevel *b* since it does not occur during any part of the return stroke of the feed point, when the beveling operation takes place.

In its normal position of adjustment upon the fed point, the collar **32** is set so that the throw of the eccentric hub **34** faces vertically upwardly. By loosening the screw **40** and turning the collar **32** in one direction or the other, the cutting edge **30** of the knife is moved laterally of the sole edge to vary the breadth of the chamfering cut according to the required size of the bevel *b*.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a sole rounding machine, a tool for rounding the edge of a shoe sole, feeding means comprising a feeding member arranged to support the upper margin of the shoe sole opposite to said tool, said member being movable alternately through a feeding stroke in one direction and a return stroke in the opposite direction, and a chamfering knife mounted upon said member for beveling the rounded sole edge, said knife having a cutting edge facing in the direction of said return stroke and extending obliquely across the upper ridge of the sole edge.

2. In a sole rounding machine, a tool for rounding the edge of a shoe sole, a feeding member constructed and arranged to support the upper margin of the sole against the thrust of said tool, said member being movable alternately through a feeding stroke in one direction and a return stroke in the opposite direction, said member also being mounted for movement toward and away from said tool, and a chamfering knife constructed and arranged to bevel the rounded sole edge during the return stroke of said member, said knife also being mounted for yielding movement on said member in response to movement of the latter toward and away from said tool.



3. In a sole rounding machine, a reciprocating tool for rounding the edge of a shoe sole, a feeding member constructed and arranged to support the shoe sole against the thrust of said knife by engagement with the upper margin of the sole, said member being movable alternately through a feeding stroke in one direction and a return stroke in the opposite direction, said member also being movable toward and away from said tool to meet said tool at the end of its cutting stroke, a chamfering knife for beveling the upper ridge of the rounded sole edge, said knife being mounted upon said member to rock about the point of its engagement with the sole edge in response to the movement of said member toward and away from said tool, and means for yieldingly holding said knife against the sole.

4. In a sole rounding machine, a tool for rounding the edge of a shoe sole, an oscillatory feeding member constructed and arranged to support the upper margin of the shoe sole opposite to said tool, a chamfering knife for beveling the upper ridge of the rounded sole edge, said knife having a cutting edge extending obliquely across the sole edge below the line of cut of said tool, said knife also being mounted upon said member for movement toward and away from the sole edge, a spring arranged to urge said knife toward the shoe, and means for limiting the movement of said knife upon said member.

5. In a sole rounding machine, a tool for rounding the edge of a shoe sole, a feeding member constructed and arranged to support the upper margin of the sole against the thrust of said tool, said member being movable alternately in opposite directions, a chamfering knife for beveling the upper ridge of the sole edge, said knife having a cutting edge extending obliquely across the sole edge below the line of cut of said tool, a support for said knife mounted for adjustment upon said member to vary the position of said knife edge with respect to the line of cut of said tool.

6. In a sole rounding machine, a tool for trimming the edge of a shoe sole, a feed member for supporting the upper margin of the sole against the thrust of said tool, said member being movable alternately through a feeding stroke in one direction and a return stroke in the opposite direction, a chamfering knife for beveling the upper ridge of the sole edge, an eccentric pivot carried by said member and upon which said knife is mounted to swing toward and from the sole edge, and a spring carried by said feed member for urging said knife toward the shoe.

7. In a sole rounding machine, a tool for rounding the edge of a shoe sole, a feeding member constructed and arranged to support the upper margin of the sole against the thrust of said tool, a chamfering knife for beveling the upper ridge of the sole edge, an eccentric pivot for said knife mounted for rotative adjustment upon said member, a spring acting upon said knife to urge it toward the sole edge, and means for limiting the movement of said knife about said pivot.

JAMES P. FREDERICKSEN.


## REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

| Number | Name | Date |
|---|---|---|
| 1,080,191 | Baxter | Dec. 2, 1913 |