

J. H. RICHARDSON.
MACHINE FOR OPERATING ON SHOES.
APPLICATION FILED DEC. 27, 1909.

1,001,078.

Patented Aug. 22, 1911.

2 SHEETS—SHEET 1.

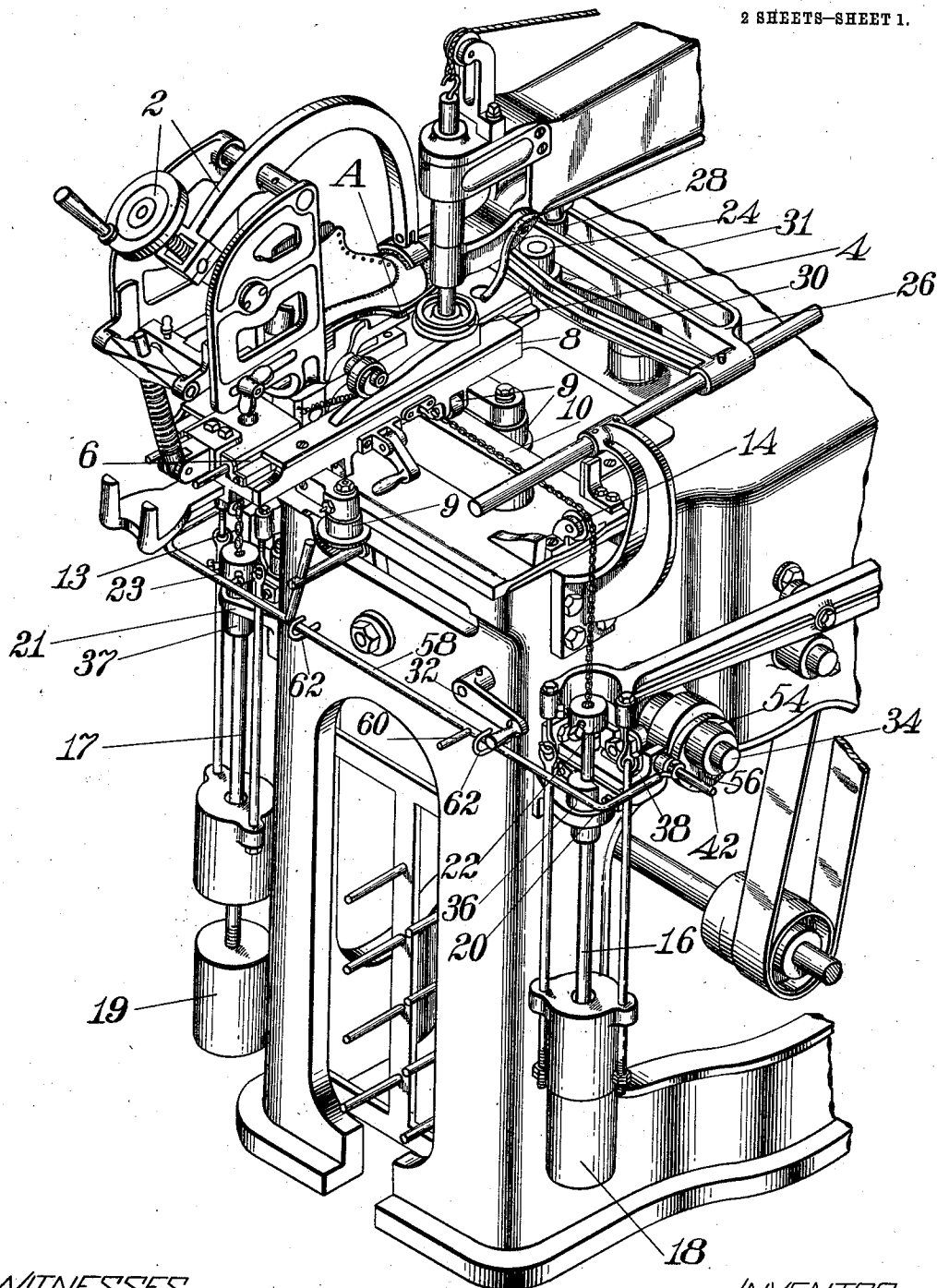


Fig. 1.

WITNESSES.

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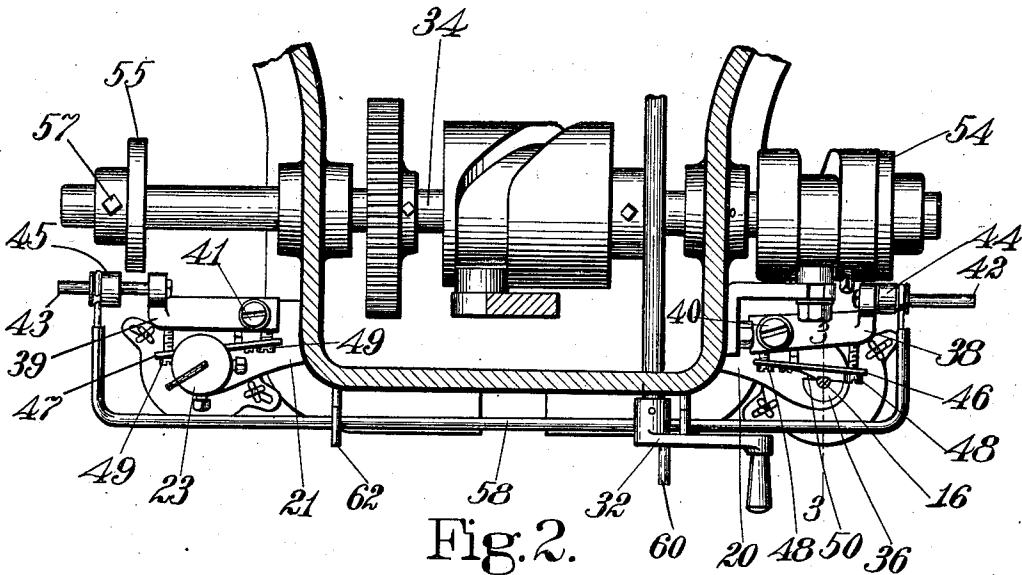


Fig. 2.

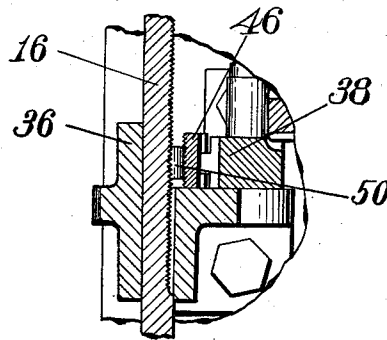


Fig. 3.

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MACHINE FOR OPERATING ON SHOES.

1,001,078.

Specification of Letters Patent. Patented Aug. 22, 1911.

Application filed December 27, 1909. Serial No. 535,106.

To all whom it may concern:

Be it known that I, JOHN H. RICHARDSON, a citizen of the United States, residing at Saugus, in the county of Essex and State of Massachusetts, have invented certain Improvements in Machines for Operating on Shoes, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to machines for use in the manufacture of boots, shoes and other footwear, hereinafter referred to as shoes, in which a tool is caused to operate along a predetermined contour of a shoe.

The invention is particularly concerned with automatic machines of that type in which such relative movement of the shoe and tool is produced that the tool is caused to operate progressively along the margin of a shoe sole forward of the heel.

More specifically the invention relates to machines of the character disclosed in the United States Patent No. 874,360, granted December 17, 1907, for automatically burnishing or setting the edges of shoe soles; and an important object of this invention is to improve the construction of the machine disclosed in said patent with a view to rendering it capable of performing additional functions desirable in manufacturing certain kinds of shoes.

The greater part of the shoes manufactured in this country, particularly men's shoes, have a more or less sharply defined corner formed on the inner edge of the sole at the juncture of the shank and forepart. Shoes of this style cannot be burnished satisfactorily on the machine above designated for the reason that the tool, as it operates around the corner, rounds off and mutilates the corner, thus spoiling the appearance of the shoe. This action is due to the fact that the shoe and tool must be pressed firmly into engagement with each other during their relative movement to cause the tool to operate along the sole edge and any pressure sufficient to effect the burnishing operation satisfactorily is great enough to cause the tool to upset the corner as it travels around the same. In order to overcome this difficulty the present invention contemplates the provision in a machine of the character

indicated, having means for pressing the tool and shoe into operative engagement with each other, of means acting automatically to relieve the pressure when the tool and shoe arrive in a predetermined relationship. Preferably the engagement of the tool and shoe is interrupted when they arrive in predetermined relationship; and such relationship may be, and preferably is, that which the tool and sole bear to each other when the tool arrives at the juncture of the shank and forepart of the sole edge. The tool is therefore not permitted to enter the shank portion and the mutilation of the corner is thus prevented. While this construction is of special value in burnishing shoes having a corner formed on the sole margin, as above described to be usual, it also has advantages in operating on shoes that do not have this characteristic. It is necessary to burnish the shank of the sole edge with a tool of different shape from that used on the forepart and it is desirable therefore to interrupt the engagement of the forepart tool with the sole edge before the tool reaches the shank portion. By the arrangement above described the machine may be adjusted to effect such interruption at the desired point.

The invention further contemplates the provision of means for adjusting the point at which the relief of pressure is effected to suit the requirements of different sizes and styles of shoes, and to accommodate readily either right or left shoes.

The foregoing and other features of the invention including certain details of construction and combinations and arrangements of parts will be clearly understood from the following description of a preferred embodiment of the invention.

Referring now to the drawings, Figure 1 is a perspective view of the machine shown in the United States Patent No. 874,360, modified in accordance with the present invention, certain portions of the machine not being shown since they are unnecessary to a complete understanding of this invention; Fig. 2 is a sectional view on a horizontal plane extending through the body of the machine; and Fig. 3 is a cross section taken on the line 3—3, Fig. 2.

For a detailed description of the construction and operation of the machine shown,

reference should be made to the specification of the above identified patent.

A very brief description of the mechanism will suffice for the purposes of the present invention.

The shoe to be burnished is clamped firmly in a jack 2 which is moved in such a manner that the shoe is presented properly to the operation of an oscillatory burnishing tool 4 supported in stationary bearings. The mechanism for moving the jack comprises a slide 6, to which the jack is rigidly secured, and a carriage 8 having guideways in which the slide is received. The carriage is arranged for movement in a direction at right angles to the motion of the slide and for this purpose is mounted on rollers 9 that run on a bed plate 10 rigid with the frame of the machine. Chains 12 and 13 are attached respectively to opposite sides of the carriage 8 and extend over suitable guiding pulleys, one of which is shown at 14 and have secured to their ends the rods 16 and 17 respectively supporting weights 18 and 19. The rods 16 and 17 extend through brackets 20 and 21 projecting from the machine frame and are provided above the brackets with adjustable collars 22 and 23 arranged to limit the downward movement of the weights by their engagement with the brackets. The collars are so adjusted that when the carriage is in its middle position they rest on their respective brackets or are equally spaced slightly above the brackets. There is then no tendency for the carriage to move in either direction. Any considerable movement of the carriage away from the middle position, however, will be yieldingly resisted by one weight or the other, depending on the direction of such movement.

The slide 6 is reciprocated on the carriage 8, for the purpose of presenting the edges of the shoe sole to the tool, by means of a roll 24 attached to the rear end of the slide 6 and operating in a slot formed in the crosshead 26, reciprocating motion being imparted to the crosshead by a roll 28 on the crank arm 30 operating in the slot 31 of the crosshead. A starting and stopping lever 32 is provided for controlling the operation of the machine.

All of the above mechanism is substantially as described and shown in the United States Patent No. 874,360.

In operating the machine the workman clamps the shoe in the jack and after adjusting the sole edge against the tool properly starts the machine into operation. Assuming that the burnishing operation is started at the juncture of the shank and forepart on the left hand or outside edge of the left shoe, shown in Fig. 1, the crosshead 26 first moves the jack forwardly, thus transferring the point of operation of the tool along the sole

edge toward the toe. As the wider portions of the sole come into contact with the tool the jack and carriage are crowded to the right against the force exerted by the weight 19. But as the tool operates along the gradually narrowing portions of the sole toward the toe, the weight acts through its connections 17 and 13 to move the carriage and jack toward the left and to hold the shoe constantly in engagement with the tool. When the tool reaches the toe, the carriage 8 is given a positive movement toward the left (by mechanism driven from the shaft 34 and fully described in the above-named patent) to transfer the point of operation of the tool around the toe. Thereafter the jack is moved backwardly to cause the tool to operate along the right hand or inside edge of the shoe from the forepart toward the heel. During this operation the jack and carriage are moved toward the left and the collar 22 and weight 18 are raised, the weight exerting a constant pull on the carriage toward the right and therefore operating to keep the sole edge pressed firmly against the tool.

In order to impart a satisfactory polish or finish to the sole edge, it is necessary to have the tool operate around the sole several times; and since the tool is not shaped for operation on the shank, it is desirable that the tool shall not be permitted to engage with this portion of the sole edge. But it is preferable to have the entire forepart burnished on the machine, since otherwise it is necessary to touch up, at a later operation, any spots not burnished. While the extent of the relative travel of the tool along the sole may be adjusted by changing the position of the roll 28 on the crank arm 30 and thus varying the length of stroke of the crosshead 26, this adjustment cannot be made to accommodate both the inside and outside edges since the former is shorter than the latter. It is usual, therefore, to so adjust the travel of the jack that the tool will burnish the entire outside edge of the sole; but when it operates along the inside edge it will travel past the corner A at the juncture of the shank and forepart and, for a short distance, on to the shank portion before the motion of the jack is reversed. When the jack begins to move forward and the point of operation is transferred along the rapidly widening portion of the sole toward the corner A, this portion of the sole edge acts against the tool as a cam to crowd the jack and carriage toward the left against the force exerted by the weight 18; and it is during this relative movement of the parts that the corner is rounded off as heretofore mentioned, and frequently the stock at this point is upset to such an extent that the shoe is permanently damaged. According to the present invention this action is prevented by

relieving the pressure of the shoe against the tool when the latter arrives at the juncture of the shank and forepart of the sole margin in its relative travel toward the heel. For this purpose the bracket 20 is provided with a boss 36, one-half of which is cut away above the bracket, as indicated in Fig. 2. A brake arm 38 is pivotally secured at one end to the upper side of the bracket 20 by a screw bolt 40 and the opposite end of the arm is turned upwardly and has a pin 42 projecting rigidly therefrom on which is loosely mounted a roll 44. A plate or brake shoe 46 is adjustably secured to the side of the brake arm adjacent the rod 16 by screws 48, and said shoe is provided with a roughened or toothed surface to frictionally engage a flat face similarly roughened or toothed formed on the rod 16. The brake shoe is normally held out of engagement with the rod by a flat spring 50 secured at one end to the brake shoe and engaging with its other end the boss 36; but the brake shoe may be forced into engagement with the rod by means of a cam 54 adjustably secured on the shaft 34 by a set screw 56. It will be seen from the drawings that the opposite side of the machine is provided with a brake arm 39, roll 45, plate 47, cam 55 and other parts corresponding in character and arrangement to those just described. The rolls 44 and 45 are connected by a shifting rod 58, supported in guides 62 projecting from the frame and provided with a handle 60, and the rolls are so spaced by the rod that one roll only is in operative relation to its corresponding cam at any given time.

Assuming the parts to be in the position in which they appear in Figs. 1 and 2 with the jack moving rearwardly, the adjustment is such that when the tool arrives at the corner A the cam 54, which rotates in timed relation to the burnishing operation, engages the roll 44, turning the brake arm 38 on its pivot and crowding the brake shoe into contact with the flat face of the rod 16, thus stopping further motion of the rod. This relieves the pressure of the shoe against the tool; and as the jack continues to move rearwardly the shoe is carried out of engagement with the tool. When the machine is reversed the jack moves forwardly until the tool and sole are again brought into engagement at the point where engagement was previously interrupted and the cam 54 then releases the brake arm and permits the rod 16 to move under the influence of the weight 18.

The point at which the pressure of the shoe against the tool is removed and the separation of the tool and shoe takes place may be varied along the sole edge by changing the angular position of the cam 54 on the shaft 34. This adjustment also permits the point of interruption of engagement to be

varied to suit the requirements of different sizes and styles of shoes.

During the operation above described, the brake on the left hand side of the machine is inoperative since the roll 45 is held out of the path of travel of the cam 55. It will be clear, however, that if, for any reason, it is desired to interrupt the engagement of the shoe with the tool on the outside edge of the shoe, such result can be effected merely by moving the rod 58 to shift the roll 45 into operative relation to the cam 55; and the point at which such interruption takes place can be varied along the sole edge by changing the angular position of the cam 55 on the shaft 34. Usually, however, it is desirable to have the pressure relieved, in the manner described, on one side of the sole only; and the primary purpose of the spacing of the rolls by the shifting rod 58 is to render the machine readily adjustable for either right or left shoes. The rod is merely moved to the left when a left shoe is being burnished and is shifted to the right when a right shoe is being burnished.

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

1. A machine for operating on shoes comprising a tool, a shoe support, mechanism for causing the point of operation of the tool to be transferred along the margin of the shoe sole from one side around the toe to the other side of the shoe, said mechanism including means for pressing the shoe and tool into operative engagement with each other, mechanism operating automatically to render said means inoperative when the tool arrives at a predetermined point on said margin and means whereby said point may be shifted to accommodate either right or left shoes.

2. A machine for operating on shoes comprising a tool, a shoe support, mechanism for causing the point of operation of the tool to be transferred along the margin of the shoe sole from one side around the toe to the other side of the shoe, means acting automatically to interrupt the contact between the tool and shoe when the tool arrives at a predetermined point on said margin, and means whereby said interruption may be caused to take place on either side of the shoe.

3. A machine for operating on shoes comprising a tool, a shoe support, mechanism for causing the point of operation of the tool to be transferred along the margin of the shoe sole from one side around the toe to the other side of the shoe, means acting automatically to interrupt the engagement of the tool with the shoe when the tool arrives at a predetermined point on said margin, means for causing such interruption to take place on either side of the shoe, and

provision whereby the points of interruption may be varied independently on opposite sides of the shoe.

4. A machine for operating on shoes comprising a tool, a shoe support, mechanism for producing such relative movement of the tool and support that the point of operation of the tool is transferred along the margin of the shoe sole from a point on one side around the toe to a point on the other side of the shoe, said mechanism being constructed to cause the tool to operate around the shoe a plurality of times, and means acting automatically to interrupt the operative engagement of the tool and shoe when they arrive in a predetermined relationship and thereafter to bring said tool and shoe automatically into operative engagement again.

5. A machine for operating on shoes comprising a tool, a shoe support, mechanism for producing such relative movement of the tool and support that the point of operation of the tool is transferred along the margin of the shoe sole from a point on one side around the toe to a point on the other side of the shoe, said mechanism operating automatically to reverse the relative movement of the shoe and tool during the relative travel of the tool past the side of the shoe, and means acting automatically to interrupt the engagement of the shoe and tool before such reversal takes place and to bring the shoe and tool again into operative engagement after said reversal.

6. A machine for operating on shoes comprising a tool, a shoe support, mechanism for producing relative movement of the tool and support to transfer the point of operation of the tool along the margin of the shoe sole from a point on one side around the toe to a point on the other side of the shoe, said mechanism operating automatically to reverse the relative movement of the shoe and tool during the relative travel of the tool past the side of the shoe, means acting automatically to interrupt the engagement of the shoe and tool before such reversal takes place and to bring the shoe and tool again into operative engagement after such reversal, at the point where engagement was previously interrupted, and provision whereby the position of the point of interruption may be varied along the sole margin.

7. A machine for operating on shoes comprising a tool, a shoe support, mechanism for producing relative movement of said tool and support to transfer the point of operation of the tool along the margin of the shoe sole from a point on one side around the toe to a point on the other side of the shoe, means acting automatically to interrupt the operative engagement of the tool and shoe when the tool arrives at a predetermined point on said margin, and pro-

vision whereby the position of said point of interruption may be varied along the shoe margin.

8. A machine in which a tool is caused to operate along the margin of a shoe sole forward of the heel comprising means for holding the shoe in operative engagement with the tool and means acting automatically when the tool arrives at the juncture of the shank and forepart to move the shoe out of engagement with the tool.

9. A machine for operating on shoes comprising a tool, a shoe support, means for producing relative movement of said tool and support to transfer the point of operation of the tool along the margin of the shoe sole, mechanism for pressing the shoe and tool into operative engagement with each other, a brake arranged in operative relationship to said mechanism and means operating in timed relation to the relative movement of the tool and shoe to apply the brake to said mechanism and thereby modify its operation.

10. A burnishing machine comprising in combination a shoe supporting jack, a burnishing tool, mechanism for causing such relative movement of the jack and tool that the tool operates along the margin of the shoe forward of the heel, means operating during such movement to press the shoe and tool into engagement with each other, a brake arranged in operative relation to said means and means operating in timed relation to the burnishing operation to apply said brake, whereby the pressure is relieved.

11. A burnishing machine comprising in combination a shoe supporting jack, a burnishing tool, mechanism for producing such relative movement of the jack and tool that the tool operates along the sole edge, means operating during such movement to press the sole and tool into engagement with each other, a brake arranged in operative relation to said means, a shaft rotating in timed relation to the burnishing operation and a cam adjustably mounted on said shaft and arranged to operate the brake.

12. A burnishing machine comprising in combination a shoe supporting jack, a burnishing tool, means for producing such relative movement of the jack and tool that the tool operates along the sole edge, mechanisms arranged respectively on opposite sides of the jack for holding the shoe in yielding engagement with the tool, a brake arranged in operative relation to each of said mechanisms, means driven in timed relation to the burnishing operation for operating each brake and means whereby either brake may be rendered inoperative.

13. A burnishing machine comprising in combination a shoe supporting jack, a burnishing tool, means for producing such relative movement of the jack and tool that the

tool operates along the sole edge, mechanisms positioned respectively on the opposite sides of the jack for holding the sole in yielding engagement with the tool, each of
5 said mechanisms comprising a weight, a rod connected thereto and a flexible connection between the rod and jack, a brake arm positioned adjacent each rod, a cam arranged to operate each arm in timed relation to the
10 burnishing operation to apply the brake, an adjustable roll interposed between each cam

and arm and a shifting rod connecting said rolls and holding them so spaced that one roll only is in operative relation to its cam at a time.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN H. RICHARDSON.

Witnesses:

JOHN H. MCCREADY,
EMILE H. TARDIVEL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."