

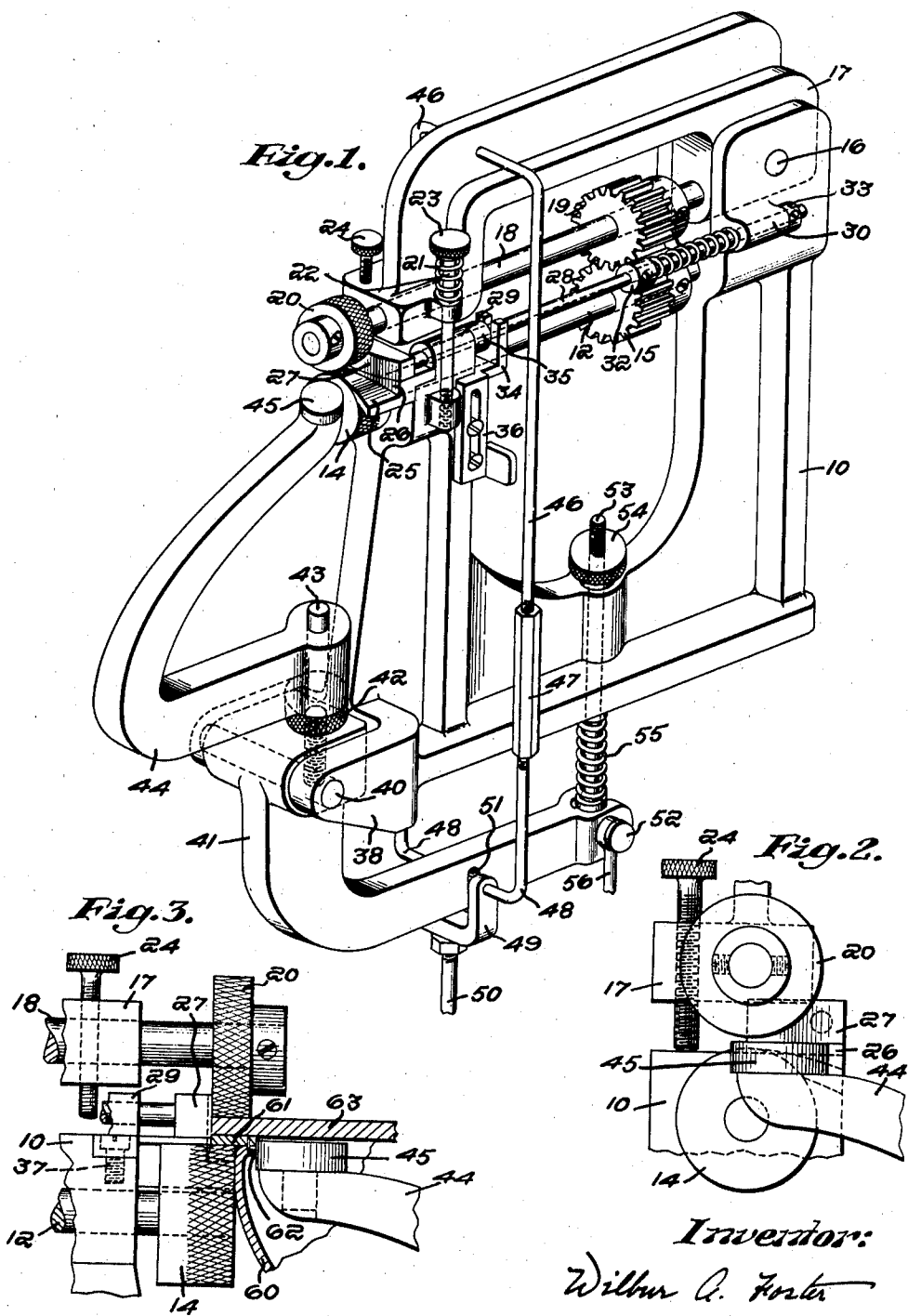
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MACHINE FOR OPERATING ON SHOES

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## UNITED STATES PATENT OFFICE

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## MACHINE FOR OPERATING ON SHOES

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The present invention relates to machines for use in the manufacture of pre-welt shoes and is herein illustrated in its application to machines for attaching soles to prewelt uppers off the last.

In preparing a prewelt upper for attachment to a sole, the parts of the upper are first cut out and then sewn together in such a way that the assembled upper is given approximately the shape of the finished shoe. A welt is then sewn to the margin of the upper with a skived lap joint. A sole is tempered and then provided with a band of cement on its upper margin. The lower surface of the welt is also covered with cement, and the parts are then ready to be cemented together in the illustrated machine.

Machines heretofore used for such work have been relatively slow and inaccurate, and the weakness of the process of making pre-welt shoes off the last has been the delay and expense incurred in attaching the welt to the sole prior to the sole stitching operation. The object of this invention is to provide a speedy and reliable machine for cement-attaching a sole to a prewelt upper off the last.

With the above object in view, this invention, in one aspect thereof, consists in the provision in such a machine of a pair of rolls constructed and arranged to press the sole and the welt together, a welt gauge arranged to engage the outer edge face of the welt, and means acting within the upper to hold the welt against said gauge. Invention is also to be recognized in the combination with a pair of synchronously driven work feeding rolls constructed and arranged to exert a continuous rolling pressure against the work of a horn constructed and arranged to enter the upper through its ankle opening and to position the upper relatively to said rolls. The illustrated horn carries a roll which acts against the inner edge face of the welt as the assembled welt and upper are fed through the machine. The operating position of the horn supported roll may be adjusted so as to hold the welted margin of the upper in the desired position without so crowding the welt as to misshape or distort it.

The machine of my invention includes a pair of pressing and feeding rolls mounted on substantially horizontal axes and held in operative position by spring means. With these is associated a horn-carried welt guide roll. This roll goes inside the upper and follows its inner surface as the assembled parts are fed through the machine and swing in the process to present the compound curvature of the work in operative po-

sition. The inner position of the horn roll is adjustably determined to hold the welt up to the proper gauge position without so crowding it as to wrinkle or distort it.

An important feature of the machine consists in a gauge or guide leading to the bite of the presser rolls and shaped to register the edge of the sole and the welt as they are fed to the working point. The gauge has independent inclined faces of sufficient width to accommodate the edge of the sole and the edge of the welt, either in registration or in predetermined spaced relation. The inside horn roll is arranged in a position offset with respect to the line joining the centers of the feed and presser rolls thus ensuring contact of the welt with the face of the gauge.

These and other objects and features of the invention will be more readily understood and appreciated from the following detailed description of a preferred embodiment thereof selected for purposes of illustration and shown in the accompanying drawing, in which:

Fig. 1 is a view in perspective of a machine constructed according to my invention,

Fig. 2 is a view in front elevation of the gauge and the rolls, and

Fig. 3 is a detail view of the operating instrumentalities of the machine, showing in section a shoe being operated upon.

As herein shown the machine comprises an upright U-shaped frame 10 in which is journaled the main driving shaft 12 of the machine. This shaft rotates about a fixed horizontal axis and at its rear end carries a crank or a driving pulley (not shown). At its forward end it carries a knurled feeding and pressing roll 14 of substantial width, and at an intermediate point it carries a driving pinion 15. Pivotally mounted upon a transverse pin 16 in the machine frame is a U-shaped bracket 17 in which is journaled a second shaft 18 disposed above and substantially parallel to the main shaft 12. This second shaft is provided with a pinion 19 meshing with the pinion 15 of the main shaft 12, and at its forward end it also carries a knurled feeding and pressing roll 20 similar to that already mentioned, but extending farther out than the roll 14. A heavy coiled spring 21 is carried on a rod 22 which slides in a lug on the pivoted bracket 17 and is threaded in the base 10 of the machine so that the bracket is at all times urged downwardly at its forward end, and therefore work interposed between the two rolls is maintained under substantial yielding pressure, such pressure being maintained continuously and without

interruption while the point of operation is transferred progressively about the entire periphery of the shoe bottom by uniform continuous movement of the shoe by said rolls. The pressure may be varied by turning the rod 22 which has a knurled adjusting head 23. While the upper roll is herein shown as yieldingly mounted either roll may be so mounted within the scope of my invention. Threaded in a lug on the bracket 17 is a stop bolt 24 which bears on the upper surface of the frame 10 and serves to adjustably determine the initial position of the upper roll 20. Thus the bolt 24 may be adjusted to obtain a desired spacing between the rolls 14 and 20.

Cooperating with the feeding and pressing rolls is a two-part gauge. Secured to the frame 10 by a screw 37 is a gauge member having a curved welt supporting lip 25 and a curved vertical gauge face 26. A second gauge member has a curved vertical face 27, the member being fixed to the end of a rod 28 which slides in a bearing 29 integral with the front of the frame 10 and in a bearing 30 forming a part of the rear of the frame. A coil spring 31 surrounds the rod 28 and bears against the bearing 30 and against a collar 32 secured to the rod 28 and capable of being fixed to the rod at any desired point to control the pressure exerted by the spring 31. Another collar 33 is secured to the rod 28 beyond the bearing 30 and maintains the rod against the action of the spring 31. It will be evident that the collar 33 may be regulated to fix the normal position of the gauge face 27 with respect to the gauge faces 25 and 26. The faces 25 and 26 accommodate a welt, and the movable face 27 guides the edge of a sole, all as will hereafter be fully described. It will be apparent that the gauge face 27 is yieldingly mounted and that pressure against it is resisted by the spring 31. In case it is desired to dispense with the action of the spring and fix the gauge 27 rigidly, I have provided a third collar 35 which is adapted to be fixed to the rod 28 adjacent the rear end of the bearing 29. A forked clamp 34 has an integral slotted shank 36 through which a pair of screws pass and are threaded in the frame 10. The clamp 34 may be fixed in the position shown in Fig. 1 wherein pressure exerted on the face 27 will be resisted by the rigid clamp, and thus immobilized. When yielding resistance is desired, the screws in the shank 36 are loosened, and the clamp 34 drops down out of engagement with the collar 35.

The lower forward portion of the frame 10 is formed as a yoke 38, providing bearings for a pivot pin 40. The pin 40 carries the enlarged head of a lever 41, in which is threaded a bolt 42 having a vertical jack post 43 extending upwardly therefrom. Swivelled on the jack post 43 is a curved horn 44 carrying a rotatably mounted roll 45 at its upper end. The horn is dimensioned so that the roll 45 is located adjacent the feeding and pressing rolls 14 and 20. The axis of the roll 45 is offset from the line joining axes of the rolls 14 and 20 on the side on which the gauge members are mounted.

The bracket 17 carries in its forward portion a rod 46 having downwardly extending legs connected by turnbuckles 47 to the ends of a similar rod 48 which is received in a yoke 49 embracing the lever 41. The lever is slotted as shown at 51 to receive the lower portion of the rod 48. The yoke 49 is connected to a treadle rod 50 operated by a treadle (not shown).

The lower end of the lever 41 is forked and

carries a pin 52 which passes through an eye in the end of a vertical bolt 53. The bolt 53 extends upwardly through the base 19 and is threaded at its upper end. A knurled adjusting nut 54 varies the position of the bolt 53 and thus controls the lever 41. A spring 55 is carried on the bolt 53 and bears against the lever 41 and the bottom of the frame 10. The spring 55 thus urges the lever 41 clockwise around the pivot pin 40 and forces the horn roll 45 toward the rolls 14 and 20. The nut 54 provides an adjustable stop for spacing the horn roll 45 from the rolls 14 and 20. A rod 56 leads from the pin 52 to a treadle (not shown).

The operation of the illustrated machine will now be described in connection with a pre-welted upper 60 having a welt 61 attached to its margin by a seam 62. As explained above, the purpose of my invention was to provide a machine for cementing the welt 61 to the margin of an outsole 63. The operator of the machine first adjusts the stop 24 to space the rolls 14 and 20 in accordance with the thickness of the sole 63 and welt. Any necessary adjustment in pressure can be made by manipulating the bolt 23. The gauge member 27 is then adjusted so that the edge of the welt and the edge of the sole will either be in alignment or in a predetermined and selected overlapping relation, according to the particular type of work being done. The nut 54 may be turned to adjust the location of the horn roll 45 with respect to the rolls 14 and 20. It should be explained that the horn roll 45 must be prevented from coming so close to the feeding and pressing rolls as to crowd or buckle the welt. Cement is applied to the welt and to the margin of the sole.

The operator then places the sole 63 and the welt 61 in juxtaposition at the toe of the shoe, inverts the shoe and places it over the horn. Pressure on the treadle (not shown) will force the rods 50 and 56 upwardly thus moving both the horn and the upper roll 20 away from the lower roll 14. The outer edges of the sole and the welt are moved by hand against the gauge members, and the treadle is released. The horn roll 45 thereupon presses against the edges of the upper 60 and the welt 61 and urges them into contact with the gauge members. The gauge face 25 supports the welt, and the faces 26 and 27 determine the relative positions of the edges of the welt and the sole.

The horn roll is offset with relation to the feeding and pressing rolls so that it can perform a double function. The horn roll acts first to force the edge of the welt against the vertical gauging surface of the gauge member and thus co-acts with the gauge member precisely to locate the edge of the welt in advance of the feeding and pressing rolls. However, the horn roll also serves as a gauge in relation to the feeding and pressing rolls, since it prevents the welt from moving laterally out of engagement with said rolls. The operator's hands perform the same functions upon the outsole. Thus we have separate instrumentalities for bringing the welt and also the sole into alignment and causing them to remain registered while the feeding and pressing rolls are operated.

The shaft 12 may be power driven or turned by a hand crank. The operator merely steers the sole against the gauge, and the rolls 14 and 20 feed and press together the welt and the sole. The upper roll 20 is offset to bear upon a marginal band of the sole almost double the width of the portion of the welt operated on by the roll 14. This makes for more accurate opera-

tion of the machine and tends to prevent the sole from touching the horn roll 45 and causing it to bind.

Since it is practically impossible to cut the upper and the outsole so accurately in advance that the welt will fit the periphery of the sole evenly all around, it is contemplated that the welt and sole will be registered at the tip of the toe and the gauge faces 25 and 27 clamped in fixed alignment. Then when the heel portion is reached, the fork 34 may be slid down and the face 27 will then be spring loaded. If the welt is somewhat short, the sole edge will push the gauge 27 inwardly so that the sole will overlap the welt. The excess can then be trimmed off in a subsequent operation.

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

1. In a machine for cement attaching a sole to a prewelt upper off the last, a pair of rolls constructed and arranged to press the sole and the welt together, a welt gage arranged to engage the outer edge face of the welt, and means acting within the upper to hold the welt against said gage.

2. In a machine for cement attaching a sole to a prewelt upper off the last, a pair of rolls movable toward each other to press the welt and sole together, and members constructed and arranged to engage the inner and outer edge faces of the welt respectively thereby to position the welt relatively to said rolls.

3. In a machine for cement attaching a sole to a prewelt upper off the last, a pair of rolls movable toward each other to press the welt and sole together, members constructed and arranged to engage the inner and outer edge faces of the welt respectively thereby to position the welt relatively to said rolls, and a gage for positioning the sole in relation to said rolls.

4. A machine for cement attaching a welted upper to a sole, comprising a pair of feeding and pressing rolls rotatably mounted on horizontal axes, means urging one roll toward the other, a horn-supported roll arranged to engage the inside edges of the welt and the upper of an inverted shoe and yieldingly and adjustably positioned with respect to said feeding and pressing rolls and rotatable about a vertical axis displaced transversely from a line joining the axes of the feeding and pressing rolls, a gauge disposed adjacent said feeding and pressing rolls cooperating with the horn roll for directing the sole and the welt in registered relation to the feeding and pressing rolls, and a welt supporting lip integral with said gauge member.

5. A machine for cement attaching a welted upper to a sole, comprising a pair of feeding and pressing rolls, a horn-supported roll disposed adjacent said feeding and pressing rolls for pressing a welt toward the bite of said rolls, a fixed welt edge gauge disposed adjacent the bite of said rolls, and an adjustable sole edge gauge disposed adjacent said welt edge gauge.

6. A machine for cement attaching a welted upper to a sole, which comprises a pair of presser rolls, a welt edge gauge disposed adjacent the bite of said presser rolls, and a yieldingly mounted sole edge gauge disposed adjacent the welt edge gauge.

7. In a machine for operating on shoes, an edge gauge system comprising a first gauge member having a gauge surface, a second gauge member slidably and yieldingly mounted adjacent said first member and having a gauge surface movable in and out of alignment with the gauge surface of said first member, and means for clamping the second gauge member in fixed alignment with the first member.

8. In a machine for operating on shoes, a pair of synchronously driven work feeding rolls constructed and arranged to exert a continuous rolling pressure against the work and a horn constructed and arranged to enter the shoe through its ankle opening and to position the shoe relatively to said rolls.

9. In a machine for operating on shoes, a pair of feed rolls rotatably mounted on horizontal axes, an edge gauge disposed in advance of the bite of said rolls, and a horn-supported roll mounted for rotation about a vertical axis which is offset from the feed rolls toward the edge gauge.

10. A machine for cement attaching a welted upper to a sole, which comprises a pair of feeding and pressing rolls, a horn-supported roll mounted for rotation adjacent said feeding and pressing rolls, and an edge gauge mounted in advance of the bite of the feeding and pressing rolls and having an integral lip curved to conform to the contour of one of said feed rolls, whereby the welt is pressed toward said feed rolls by said horn-supported roll and is supported on said lip.

11. A machine for operating on shoes, which comprises a pair of superposed rolls arranged for rotation in opposite directions upon parallel axes, means yieldingly urging one roll against the other, a gauge member disposed in advance of the bite of said rolls and having an integral portion extending between the rolls and curved to fit the surface of one of said rolls, a third roll supported by a horn and rotatable about an axis substantially perpendicular to the axes of said superposed rolls and offset therefrom toward said gauge.

12. A machine for operating on shoes, which comprises a feeding and pressing roll mounted for rotation about a fixed axis, a second roll disposed adjacent the first roll and mounted for rotation on an axis movable to and from the axis of the first roll, means urging the rolls together, a horn supported roll mounted for rotation on an axis perpendicular to the axis of said first roll and offset to one side of said first roll, a gauge in line with the horn-supported roll and arranged to direct a shoe part into engagement with the first and second rolls.

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