Sept. 4, 1934. F. L. MacKENZIE 1,972,101

GAUGE FOR FASTENING-INSERTING MACHINES

Filed Nov. 2, 1932

Fig. 1.

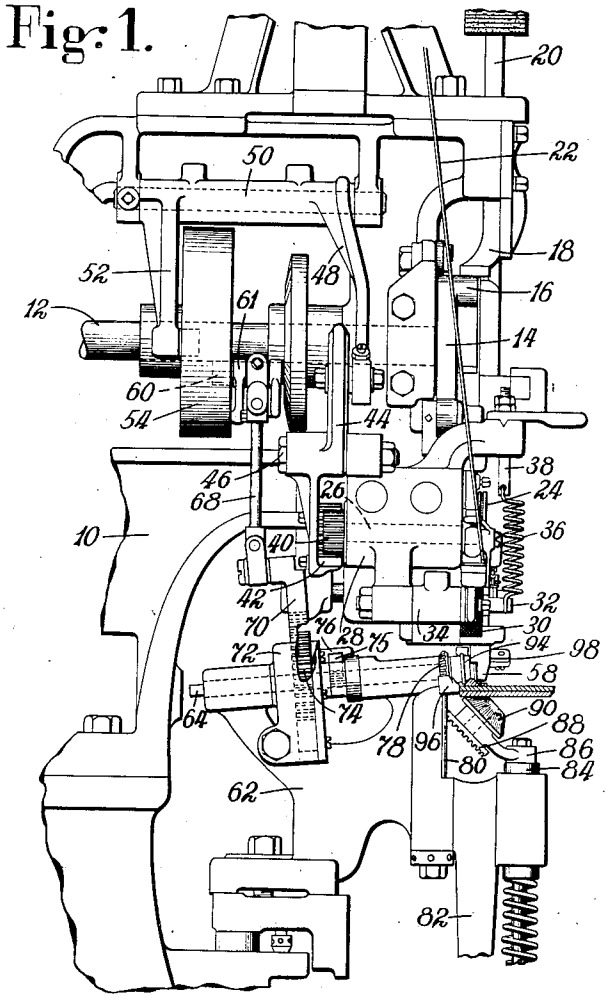



Fig. 2.

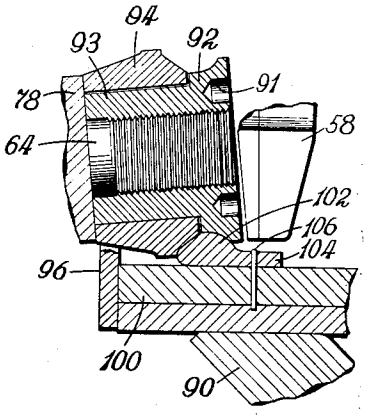
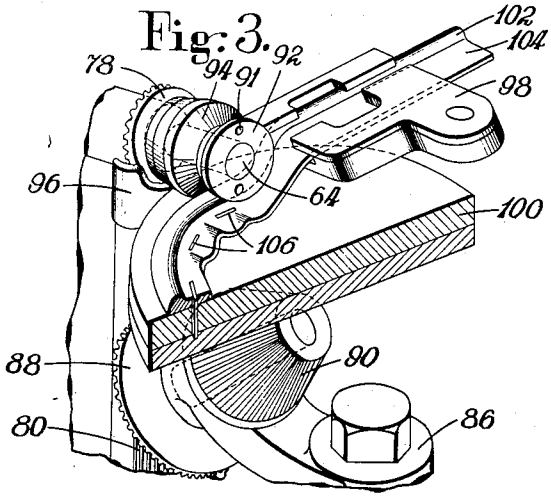



Fig. 3.




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# UNITED STATES PATENT OFFICE

1,972,101

## GAUGE FOR FASTENING-INSERTING MACHINES

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12 Claims. (Cl. 12—67)

This invention relates to welt handling mechanisms for fastening inserting machines such as those commonly used for attaching welting to parts of McKay and other nailed shoes. In one aspect the invention comprises an improved roll for accurately feeding and smoothly positioning storm welting, or beaded welting of any description, upon a sole or other shoe part to which it is to be attached in the shoemaking process. In another aspect it comprises a novel combination of instrumentalities for feeding in an improved manner both a sole and a beaded welt to the inserting devices of a fastening inserting machine.

It has been a difficult operation heretofore to attach storm welting to the margin of a McKay sole with the desired accuracy of location and smoothness in the welting, particularly about the toe and in the shank of the shoe where the welting must follow a curved path. This is partly due to the irregular cross sectional contour of the welting and to the fact that in leading welting around curves the whole area of the welting does not move in exact correspondence with the travel of feeding rolls of the type heretofore employed. For example, in rounding the toe, the outer surface of the welt bead, swinging on the longer radius, tends to travel faster than the feed roll, and in rounding the inside curve of the shank where the welting is oppositely curved the flange portion tends to travel faster than the roll. The result has been to pucker or wrinkle the welting on one edge or the other or to cause the feed roll to cut across the welting and so misplace it on the sole.

The present invention aims to solve this problem and provide mechanism whereby beaded welting in general may be fed and positioned more accurately and smoothly than heretofore and with greater assurance against the mischance of erratic behaviour on the part of the feed roll.

I have discovered that the difficulties above discussed may be obviated by engaging the welting for feeding purposes only upon the surface of the bead adjacent to the flange of the welting, that is to say, along a narrow zone including the thickest part of the welting and preferably the inner convex surface of the bead or a substantial portion thereof. It appears that if the welt is fed by feeding engagement in this zone at the same rate as the work to which it is to be attached, then the welting will be smoothly and accurately positioned and both the flange and the outer portion of the bead will take care of themselves and lie smoothly in place. As herein shown, these results are accomplished by employing a roll having two sections profiled to supplement each other in fitting the cross sectional contour of the welt bead, one of said sections being driven in its engagement with the welting and the other being freely rotatable. It is thus possible to engage the sole and the superposed welt at opposite sides in line contact, so that the work may be conveniently swung in presenting it to the machine with its edge in continuous contact with a suitable edge gauge. Since the feeding rolls thus engaging the work are traveling at the same rate, the welting is advanced and rolled into place with no tendency toward wrinkling and this action is supplemented by the free rolling of the other section of the roll at whatever rate of speed may be imparted to it by its contact with the outer surface of the bead.

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

Fig. 1 is a view of portions of the machine head in side elevation;

Fig. 2 is a fragmentary view in longitudinal section, on an enlarged scale, of the feeding rolls showing the work in position between them; and

Fig. 3 is a view in perspective on a smaller scale of the same parts of the machine together with the welt guide.

The invention is herein shown as embodied in a staple inserting machine of the construction disclosed in U. S. Letters Patent No. 1,016,930, granted February 13, 1912 on an application of W. H. Borden. For such details of mechanism as are not herein illustrated, reference may be had to that patent. The illustrated machine includes a head frame 10 in which is journaled a main shaft 12 driven by a pulley, not shown, and provided at its forward end with a driving cam 14 having a projecting segment 16. A driver bar 20 is mounted for vertical reciprocation in the head frame 10 and is provided with a lug 18 which is engaged by the cam segment 16 when the cam is rotated. The driver bar is thereby elevated to the top of its stroke and then disengaged by the cam segment, whereupon it is driven downwardly by spring mechanism, not shown, to drive the previously formed staple through the welting and in the underlying work.

The wire 22, from which the staple is formed, is supplied from a reel, not shown, and advanced between feed rolls 24 and 30 to forming mechanism, where it is shaped into a staple and delivered to the driving nozzle in line with the driver bar 20. The upper feed roll 24 has a grooved periphery to receive the wire and is mounted upon the forward end of a shaft 26 which is journaled in a bracket block 28 bolted to the side of the head frame 10. The lower roll 30 has a flat knurled periphery and is mounted for free rotation upon a stud 32 which projects outwardly from a pivoted arm 34. A tension spring 36 extends between the outer end of the stud 32 and the lower end of an adjustable

bolt 38 which projects downwardly from a bracket arm upon the block 28. The spring 36 acts to engage the wire yieldingly between the two feed rolls during their feeding movement of the wire and means, not herein shown, are provided for depressing the arm 34 so as to disengage the wire between feeding strokes.

The shaft 26 is provided at its rear end with a gear 40 which meshes with and is rotated by a segment 42 carried by the lower end of a rocking lever 44 journaled upon a stud 46 which projects rearwardly from an ear on the bracket block 28. The upper arm of the rocker lever has a sliding connection with the lower end of an arm 48 which extends downwardly from a sleeve 50 journaled to rock between bearings in the upper part of the head frame. A cam arm 52 is formed integral with the sleeve 50 and provided with a cam roll which runs in a cam track formed in the rear face of the cam disk 54 upon the shaft 12.

The wire feeding mechanism above described forms no part of the present invention and it is sufficient for present purposes to say that the oscillation of the rack 42 under the actuation of the cam 54 imparts a corresponding oscillation to the shaft 26 of the upper wire feeding roll. In the advancing movement of the feed roll, the wire being held firmly in its groove by the idle roll 30, the wire is advanced to supply a length suitable for the staple desired. Then, in reverse movement of the feed roll, while the lower roll 30 is depressed and the wire disengaged, no movement is imparted to the wire. After the staple has been shaped, it is driven downwardly through the nozzle 58 into the work beneath it.

The work rests upon a lower feed roll 90 arranged to rotate intermittently about a rearwardly inclined axis and having a beveled periphery which supports the work by substantially line contact. This feed roll is actuated by mechanism which will now be described. The cam disk 54 is provided in its forward face with a cam track in which is received a cam roll 60 which is secured to the forward end of a lever 61, the forward end only of which is shown in Fig. 1, its rear end being pivotally mounted at a point behind the shaft 12, as seen in this figure. To the forward end of the lever 61 is pivotally connected a vertical link 68 connected at its lower end to a rack bar 70 mounted to slide in a substantially vertical slideway 72 which is bolted to a forked bracket 62 adjustably secured to the column of the machine. The bracket 62 has bearings for a shaft 64 having loosely journaled thereon a gear 74 which meshes with the rack 70 and is oscillated thereby. An arm 76 is secured to the gear 74 and this carries a spring pawl 75 which cooperates with a ratchet disk fast upon the shaft 64. The result is that in the reciprocation of the rack, an intermittent rotation in clockwise direction is imparted to the shaft 64 and this movement of the shaft is utilized to drive the feed rolls of the machine.

The shaft 64 is provided near its forward end with a beveled gear 78 which, in turn, meshes with an elongated pinion 80 journaled in bearings in the forward arm of the forked bracket 62. The bracket 62 has a vertical bore through which extends a spindle 84 carrying at its upper end a head 86 in which is mounted the inclined shaft of the feed roll 90. At its lower and inner end, this shaft is provided with a beveled gear meshing with the elongated pinion 80. The spindle 84 is normally urged upwardly by a compression spring to a position determined by the thickness of the work. The connection between the elongated pinion 80 and the beveled gear 88 permits variations in the vertical position of the feed roll 90 without interrupting the driving connection thereto.

The shaft 64 carries at its forward end the welt feeding roll and for this purpose is shouldered and provided with a threaded end. The welt feeding roll comprises two concentric roll sections. The inner section 92 is provided with an elongated threaded stem 93. When this section is screwed fully upon the end of the shaft 64, the end of the stem 93 engages the shoulder in the shaft and the roll section 92 is, therefore, rigidly mounted upon the shaft and driven therewith in its feeding engagement with the welt. The outer or disk portion of the roll 92 is profiled or provided with a concave surface facing inwardly away from the end of the roll section. Diametrically disposed spanner holes 91 are provided in the end of the roll section 92 to facilitate its attachment to or removal from the shaft 64.

The other roll section 94 is slightly less in length than the length of the stem 93 of the roll section 92 and is journaled for free rotation upon the stem. It is provided with a peripheral rib and is profiled or provided with a concave peripheral surface opposite to and cooperating with the concave surface of the roll section 92.

The shape and character of the feed roll sections will be clear from an inspection of Fig. 1, where the welt strip is shown on an enlarged scale and in cross section. This illustrates one commercial form of storm welting provided with a thickened and rounded bead 102 at its outer margin and a flat thinner flange 104 at its inner margin. The welting is shown as superposed upon a double McKay sole 100 which is located in the machine and guided thereto by engagement with an adjustable edge gauge 96 mounted in the bracket 62. It will be seen that the concave circumferential zone of the roll section 92 fits the upper and inner convex surface of the welt bead 102 and, as already explained, it is by engaging this portion of the welting only that an advancing feeding movement is imparted thereto. The concave circumferential surface of the roll section 94 engages the outer curved surface of the welt bead 102 and rolls freely in contact therewith as the welting passes beneath it, exerting an ironing and smoothing effect thereon but no tendency to advance the welting. In this engagement with the bead, a slight accommodating movement is permitted by the axial play of the roll section 94 upon the shank or stem 93.

The storm welting is delivered to the surface of the sole 100 by a welt guide 98 mounted upon the head frame of the machine and having a passage corresponding to the cross sectional area of the welting. The wider portion of the welt guide passage is shaped to accommodate the bead 102 and is aligned with the groove in the welt feeding roll formed by the cooperating concave surfaces of the roll sections 92 and 94. It will be understood that the geared connection between the shaft 64 and the lower feed roll 90 is so designed as to impart the same circumferential speed to the driven roll section 92 of the welt feeding roll and the lower feed roll 90.

In operating the machine, the spindle 84 is depressed to permit the sole 100 and the end of the welt 102—104 to be inserted between the

two feed rolls. When the spindle is released so that it may be elevated by its compression spring, the work is lifted until arrested by engagement with the welt feeding roll which rotates about the normally stationary axis of the shaft 64. In presenting the work to the machine, it will be understood that the welt passes directly from the end of the welt guide 98 to the surface of the sole 100 in position beneath the welt feeding roll 92—94. The edgewise position of the sole is determined by the edge gauge 96 and the widthwise position of the welt upon the sole is determined by the welt feeding roll 92—94 which, in addition to its other functions, serves as a gauge for positioning the welt strip and thus determines the margin between the welt bead 102 and the edge of the sole 100. When now the machine is set in operation, the feed rolls are intermittently rotated to advance the work in step by step manner past the end of the nozzle 58. At each interruption of the feed the driver bar 20 is actuated and a staple 106 driven through the flange 104 of the welting and into the sole 100 beneath it. Between each fastening inserting operation, the feed rolls act in unison to advance the work, drawing the welting from the welt guide 98 and positioning it accurately and smoothly upon the surface of the sole 100 at a predetermined uniform distance from the edge of the latter.

It will be understood that the type of storm welting herein illustrated is selected as one example only of a welting which may be advantageously handled by the mechanism of my invention.

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

1. In a machine for attaching beaded welting, the combination with fastening inserting mechanism of a welt feeding and laying roll having two sections profiled to supplement each other in fitting the cross sectional contour of the welt bead, one of said sections being driven in its engagement with the welt and the other being freely rotatable.

2. In a machine for attaching beaded welting, the combination with fastening inserting mechanism of a welt feeding and laying roll having two sections profiled to correspond in their joint contour with the cross sectional contour of the welt bead, the section engaging the outer surface of the bead being freely rotatable and the other section being driven.

3. In a machine for attaching beaded welting, the combination with fastening inserting mechanism of a welt feeding and laying roll having two sections profiled to fit between them the cross sectional contour of the welt bead, one section being driven and having a shank rotatable therewith and the other being loosely mounted on said shank.

4. In a machine for attaching beaded welting, the combination with fastening inserting mechanism of a welt feeding and laying roll having concentric sections profiled to fit opposite surfaces of the welt bead, means for driving that section fitting the surface of the bead next to the welt flange, and means for supporting the other roll section for free rotation.

5. In a machine for attaching storm welting, means for supporting and feeding a sole, fastener inserting devices, a welt guide, and a welt feeding and laying roll having an inner driven member with its periphery concave in cross section to fit the inner surface of the bead of the storm welting and an outer freely rotatable member with its periphery shaped to engage the outer curved surface of the bead of the welt.

6. In a machine for attaching storm welting, a welt feeding and laying roll having a section shaped to engage the thick part of the welt bead adjacent to the welt flange and being rotated to roll the bead smoothly down upon the work to which it is to be attached, and another section arranged to roll freely on the outer surface of the bead as the welt is being so placed.

7. In a machine for attaching storm welting, cooperating feed rolls for engaging a storm welt and sole by substantially line contact and advancing them together, the welt engaging roll comprising concentric sections one of which is shaped to fit the inner surface of the welt bead and driven at the same peripheral speed as the sole engaging roll, and the other of which is free to be rotated by contact with the outer surface of the welt bead.

8. Welt handling mechanism for a fastening inserting machine, including a guide for a beaded welt and a roll adjacent thereto having a driven section shaped to fit the thickest part of the welt bead, and a concentric section free to move axially toward and from said driven section.

9. Welt handling mechanism for a fastening inserting machine, including a driven shaft shouldered and threaded at its outer end, a roll section having a hollow shank threaded upon the shaft and a disk portion with a concave bead-engaging face, and a second roll section journaled concentrically upon the stem of the first and having a circumferential welt-engaging surface.

10. In a machine for attaching storm welting to McKay soles, cooperating feed rolls for engaging the sole and superposed welting by substantially line contact at opposite sides and advancing them together, and intermittently driven shafts for the rolls driven at equal speed, the welt-engaging roll having a freely rotatable section engaging the outer surface of the bead and a section fast on its shaft shaped to engage the storm welting in a narrow intermediate zone only.

11. In a machine having fastening driving devices, a sole supporting and feeding roll, an edge gauge for controlling the path of the sole as presented to the machine, and a roll for guiding beaded welting upon the sole having concave peripheral surfaces adapted to engage opposed faces of the welt bead and so gauge the path of the welting relative to the edge of the sole.

12. In a welt attaching machine, work supporting and feeding means, in combination with a roll for guiding beaded welting to the surface of the work, said roll comprising separate concentric sections, one of which is freely rotatable and has a concave peripheral surface adapted to fit upon the convex outer surface of the welt bead and thereby gauge the welting with respect to the work.

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