Sept. 7, 1943. C. G. BROSTROM 2,328,609

ROUGHING AND TRIMMING MACHINE

Filed Dec. 24, 1941 2 Sheets-Sheet 1

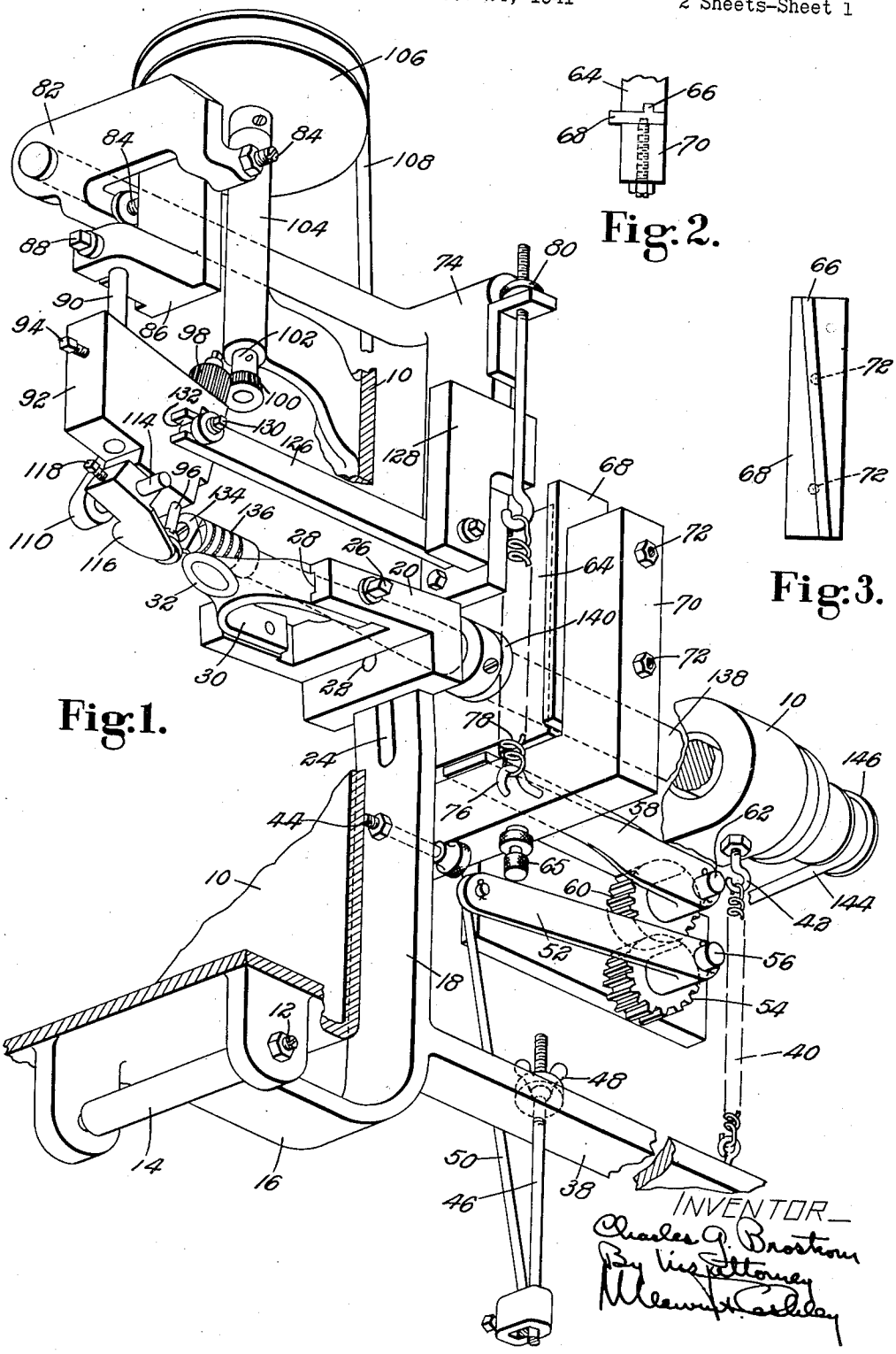


Fig. 1.

Fig. 2.

Fig. 3.

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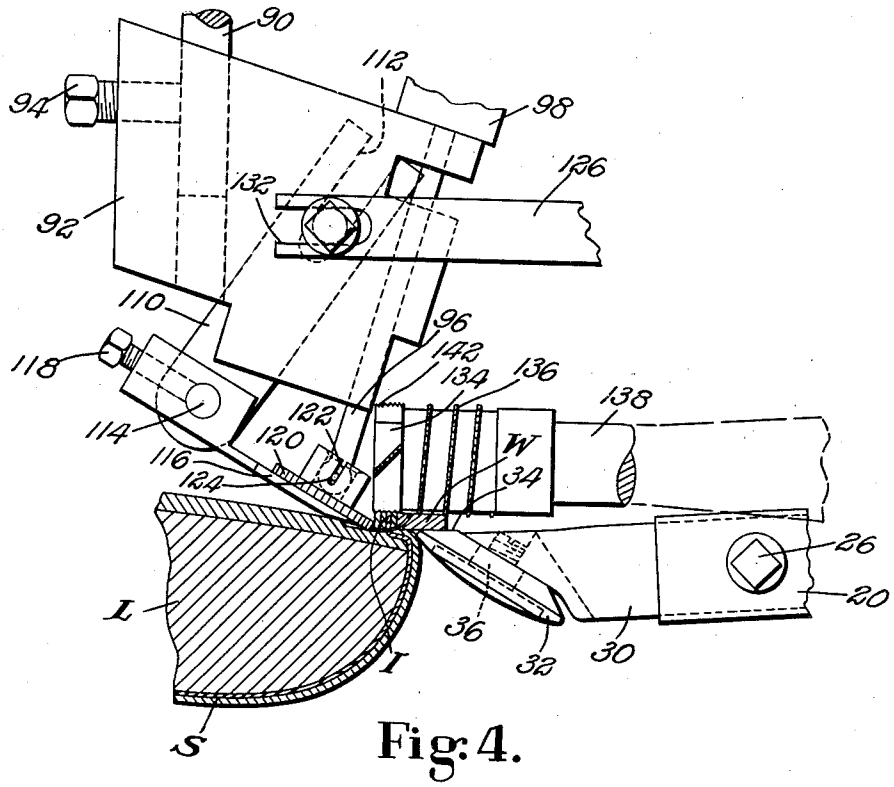


Fig: 4.

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Patented Sept. 7, 1943

2,328,609

UNITED STATES PATENT OFFICE

2,328,609

ROUGHING AND TRIMMING MACHINE

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Application December 24, 1941, Serial No. 424,329

7 Claims. (Cl. 12—51)

This invention relates to roughing and trimming machines and is herein described and illustrated as embodied in a combination machine for simultaneously roughing the welt of a lasted and welted shoe and trimming and roughing the inseam of the shoe, to prepare the shoe bottom for the reception of sole attaching cement.

In the ordinary process of making Goodyear welt shoes the inseam is trimmed, after the welt is sewed to the upper and the insole rib, by a commercial inseam trimming machine which removes the bulk of the excess upper materials, leaving the surface of the materials at the inseam sufficiently flat and level to afford a shoe bottom satisfactory for the reception of an outsole which is to be attached to the welt by stitching, as is done in the conventional Goodyear process.

When, however, the outsole is to be attached by the cement process it is necessary that the inseam be trimmed more closely and evenly and that the material, including the flesh surface of the welt, be abraded or roughed in order to prepare them in the best manner for the reception of the sole attaching cement.

It is an object of the present invention to provide a machine for performing the above-mentioned actions of trimming and roughing in a single operation, thus avoiding the necessity of operating separately upon the roughly trimmed inseam in order to prepare it for the final roughing step.

With this object in view I have developed a novel machine in which means for supporting the welt of a lasted shoe is combined with means for abrading or roughing the welt thus supported, and with other means for trimming and roughing the inseam of the shoe simultaneously with the roughing of the welt.

Preferably, power driven mechanism is provided for feeding the shoe past the operating tools, and a feature of the invention resides in a novel arrangement of a feed wheel adapted to engage the insole rib of the shoe and cooperating with the welt support to cause the shoe to be fed progressively past the trimming and roughing tools.

In the machine illustrated herein the welt support comprises a disk constructed and arranged to support the welt and to enter the welt crease of the shoe, means being provided for moving the disk yieldingly toward the feed wheel to press the insole rib against the latter.

The invention also includes an improved feed wheel mounting, including a supporting plate upon which the feed wheel is loosely sustained, a drive shaft for the feed wheel, and a loose driving connection between the shaft and the feed wheel. As shown, the feed wheel supporting plate is angularly adjustable and the connection between the drive shaft and the feed wheel is constructed to permit universal angular movement of the feed wheel relative to the shaft, in order that the driving connection shall be maintained regardless of the angle to which the supporting plate upon which the feed wheel rests is adjusted.

These and other features of the invention will be better understood and appreciated from reading the following detailed description of one embodiment thereof in connection with the accompanying drawings, in which

Fig. 1 is a perspective view of the operating mechanism of the machine;

Figs. 2 and 3 are views in plan and elevation, respectively, of a detail of the mechanism shown in Fig. 1; and

Fig. 4 is a view in side elevation of the work supporting, feeding, and roughing instrumentalities.

Referring now to the drawings, 10 indicates various portions of a stationary frame in which the movable parts are mounted and by which they are supported.

Pivotally mounted at 12 in the stationary frame 10 is a rock shaft 14 from which extends rearward a horizontal arm 16, integral with an upright swinging arm 18. A block 20 is secured to the upper end of the arm 18 by a bolt 22 which passes through a slot 24 in the arm, to provide for vertical adjustment of the block.

Adjustably held by set screws 26 in guide grooves 28 formed in the block 20 is a yoke 30 at the forward end of which is mounted a welt supporting disk 32 having a frusto-conical work engaging face 34. The disk 32 is freely rotatable around a stud 36 which is screwed into the yoke 30.

Integral with the arm 18 and extending rearward therefrom is an arm 38 the rear end of which is connected by a pull spring 40 to a stationary hook 42, the tendency of the spring being to swing the arm 18 forward about the axis of the pivot 12. The limit of this forward movement is adjustably determined by a stop screw 44 threaded through the arm 18 at a position where the point of the screw will strike, and be stopped by engagement with, the stationary frame 10. Movement of the arm 18 about the pivot 12 against the tension of the spring 40 is

effected by depression of a treadle (not shown) to which a treadle rod 46 is connected, the treadle rod being also adjustably connected by a wing nut 48 to the arm 38.

From the foregoing it will be apparent that depression of the treadle will move the welt support 32 rearward and that when the treadle is released the spring 40 will move the said support forward to a position determined by the adjustment of the stop screw 44.

Also connected to and movable with the above mentioned treadle is a second treadle rod 50 the upper end of which is connected to a lever 52 affixed to a gear 54 rotatable about a stationary stud 56. Another lever 58 is affixed to a gear 60 which is rotatable about a stationary stud 62 and meshes with the gear 54.

Raised upon the forward end of the lever 58 is a slide 64 which is movable up and down upon a rib 66 projecting from a guide plate 68 secured to a stationary portion 70 of the machine frame by screws 72. As shown in Fig. 3, the rib 66 is not quite vertical but is inclined rearward for a reason which will presently appear. The limit to which the slide can descend is adjustably determined by a stop screw 65, the point of which is engaged by either the lever 58 or the lower end of the slide.

Bolted to the slide 64 is an upwardly and forwardly extending bracket member 74 which is connected to a stationary hook 76 by a pull spring 78, the tension of which may be adjusted by turning a thumb nut 80. The function of this spring is to draw the slide 64 and the mechanism supported by it downward with the amount of force that may be desired.

Secured to the forwardly extending portion of the bracket 74 is a supporting yoke 82 having pivots 84 upon which is supported an angle member 86. Clamped in the member 86 by a screw 88 is a downwardly extending bar 90 to which a block 92 is secured by a set screw 94. A short shaft 96 is journaled for rotation in the block 92 and has affixed to its upper end a pinion 98 arranged to mesh with a pinion 100 which is secured to a vertical shaft 102 journaled for rotation in a stationary bearing 104 and having affixed to its upper end a pulley 106 driven by a belt 108 from any convenient source of power. The pinion 100 is somewhat tapered, the teeth at the line of engagement with the pinion 98 being substantially parallel to the inclined rib 66 in order that the two pinions may remain in mesh although the block 92, which carries the pinion 98, may be raised or lowered by operating the treadle. The distance through which the block 92 is raised or lowered is so small that the inclination of the rib 66 provides sufficiently for the horizontal component of movement of the slide 64 necessitated by the fact that the tool shaft 138 swings about a center located in its rear bearing.

A bracket arm 110 is adjustably secured to the side of the block 92 by a bolt passing through a slot 112 in the bracket arm and a horizontal stud 114 extends laterally from the lower end portion, serving as a mounting for a feed wheel supporting guard plate 116 which is adjustably secured upon the stud by a set screw 118.

The lower end of the shaft 96 is ball shaped and the hollow hub portion of a feed wheel 120 fits over it as shown in Fig. 4, the said hub portion being slotted at 122 to receive a pin 124 which passes transversely through the ball end portion of the shaft 96. The pin 124 and slot 122, together with the ball and socket formation of the shaft 96 and the hub of the feed wheel 120, forms a loose, universal driving connection between the shaft and the feed wheel which rests loosely upon the upper face of the guard plate 116 and is sustained thereby. By adjustment of the bracket arm 110 and of the guard plate 116 thereon the angle of the feed wheel relative to its drive shaft 96 may be readily changed as conditions may require.

A strut 126 extends from a block 128 secured to the bracket member 74 to the block 92 and is adjustably clamped thereto by a bolt 130 which passes through the slot end portion 132 of the strut. By loosening the bolt 130 it becomes possible to adjust the block 92, and the feed wheel 120 and drive shaft 96 carried thereby, about the axis of the pivots 84.

An inseam trimming and roughing tool 134 and a welt abrading or roughing tool 136 are secured upon a shaft 138 which is journaled for rotation in self-alining bearings, one of which is supported at 140 in the slide 64 and the other of which is mounted in the stationary frame 10. The welt abrading or roughing tool 136 is preferably a tool of the type disclosed and claimed in my co-pending application, Serial No. 404,284, filed July 28, 1941, and the inseam trimming tool 134 may consist of a cutting and abrading tool, preferably having a number of toothed elements as indicated at 142, which will serve to trim and roughen the trimmed surface of the inseam of a shoe.

In Fig. 4 a welted shoe S, upon a last L, is shown in position for operation upon the inseam and welt, the inseam materials being designated by I and the welt by W. In operation the operator depresses the treadle, lowering the treadle rods 46 and 50 and thereby swinging the welt supporting disk 32 rearward and elevating the tool shaft 138 and the guard 116 and feed wheel 120 associated with the tool. The welted shoe is presented to the machine by starting the welt upon the welt supporting disk 32 and releasing the treadle whereupon the guard 116 and the feed wheel 120 descend into engagement with the insole of the shoe, the feed wheel engaging the inner face of the upstanding rib of the insole. The feed disk 32 moves forward at the same time into the welt crease of the shoe causing the insole rib to be forced against the periphery of the feed wheel 120, by which the shoe is fed progressively beneath the tools 134 and 136, they having descended into engagement with the work simultaneously with the descent of the feed wheel and the guard 116 and being yieldingly pressed into engagement with the work by the action of the spring 78.

The feed wheel is driven at a moderate speed, suitable for the rate at which the work should be fed past the roughing tool, while the roughing tool is driven at a high speed by a belt 144, engaging a pulley 146 upon the rear end of the shaft 138.

By the above described apparatus the welt portion of the shoe is supported and fed accurately beneath the tool assembly which operates simultaneously to trim the inseam materials to the level of the welt surface and to roughen the surfaces of both the inseam and the welt to prepare them properly for the reception of cement.

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

1. In a roughing and trimming machine, the

combination of means for supporting the welt of a lasted shoe, means for roughing the welt thus supported, and other means, of different structure, for trimming and roughing the inseam of the shoe simultaneously with the roughing of the welt.

2. In a roughing and trimming machine, the combination of means for supporting the welt of a lasted shoe, means for abrading the surface of the welt thus supported, means for trimming the inseam of the shoe, and power driven mechanism for feeding the shoe past said means.

3. In a roughing and trimming machine, the combination of means for supporting the welt of a lasted shoe, means for abrading the surface of the welt thus supported, means for trimming the inseam of the shoe, and a power driven feed wheel arranged to engage the rib of the insole of the shoe, to feed the shoe past said means.

4. In a machine of the class described, the combination of a welt supporting disk constructed and arranged to enter the welt crease of a lasted shoe, a power driven feed wheel arranged to engage the rib of the insole and feed the shoe, means for moving said disk yieldingly toward the feed wheel to press the insole rib against the latter, and a power driven combination tool disposed in cooperative relation to the disk and feed wheel to rough the welt and trim the inseam of the shoe while it is being fed.

5. In a machine of the class described, the combination of a power driven feed wheel arranged to engage the rib of the insole of a lasted welt shoe, a disk arranged to support the welt and engage the upper of the shoe, means for yieldingly forcing the disk toward the feed wheel to press the insole rib against the latter, a power driven abrading tool for operating upon the surface of the welt, and means for yieldingly pressing said tool into engagement with the work.

6. In a machine of the class described, the combination of a work support, a feed wheel cooperatively related to the work support to feed a shoe supported thereby, a feed wheel supporting plate upon which the feed wheel is loosely sustained, a drive shaft for the feed wheel, and a loose driving connection between said shaft and the feed wheel.

7. In a machine of the class described, the combination of a work support, a feed wheel cooperatively related to the work support to feed a shoe supported thereby, an angularly adjustable feed wheel supporting plate upon which the feed wheel is loosely sustained, a drive shaft for the feed wheel, and a loose driving connection between said shaft and the feed wheel, said connection permitting universal angular movement of the feed wheel relative to the shaft.

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