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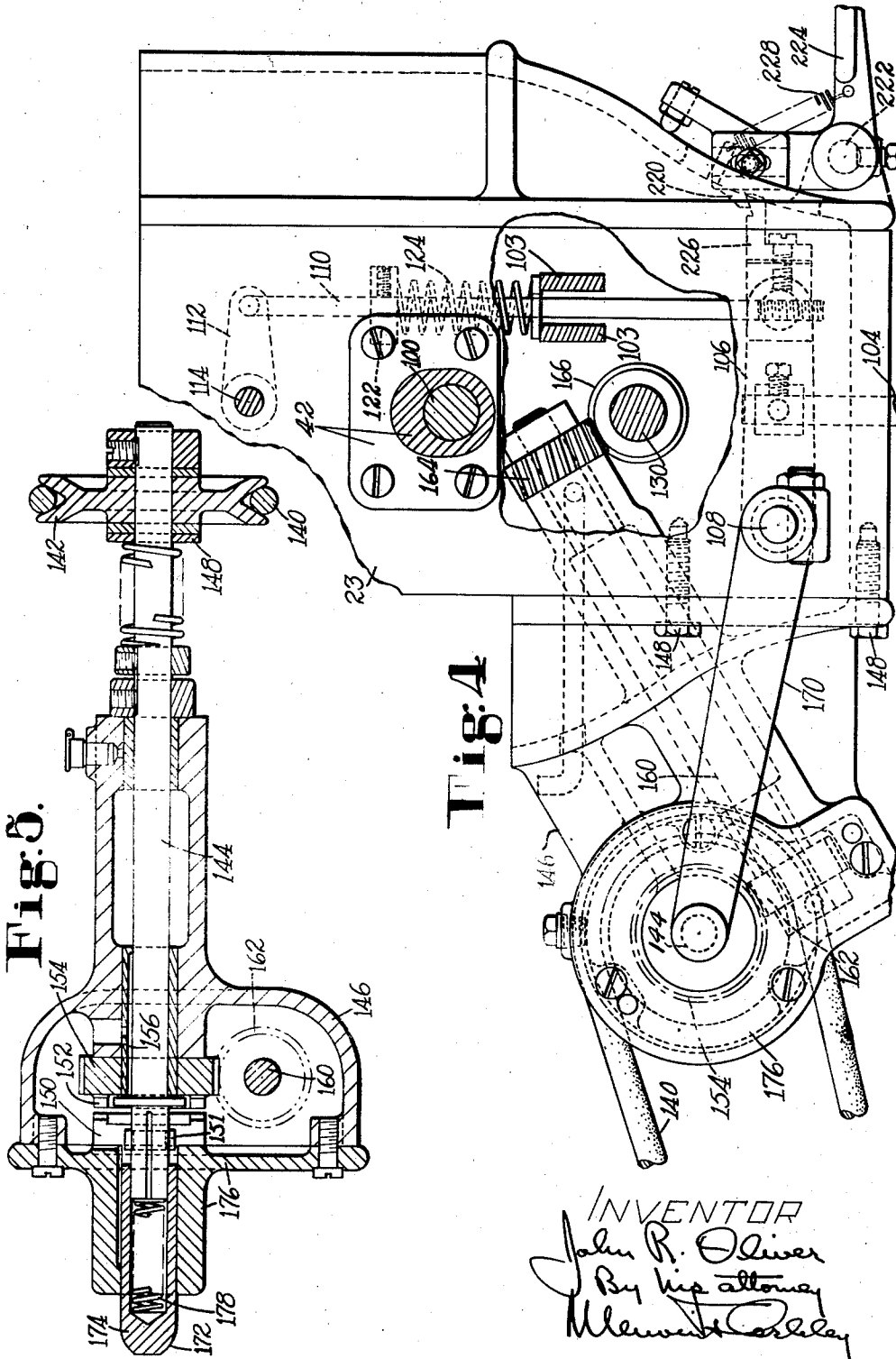
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MACHINE FOR PREPARING WELTING

Filed Aug. 21, 1940.

3 Sheets-Sheet 2



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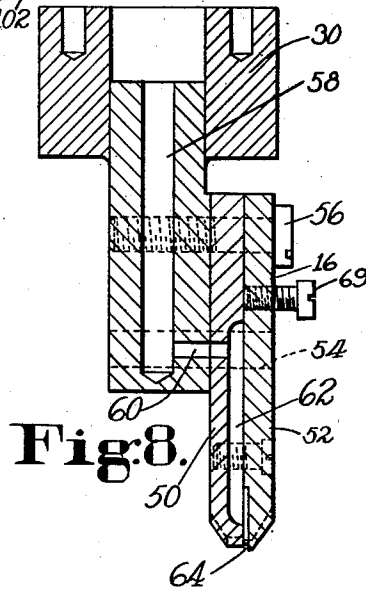
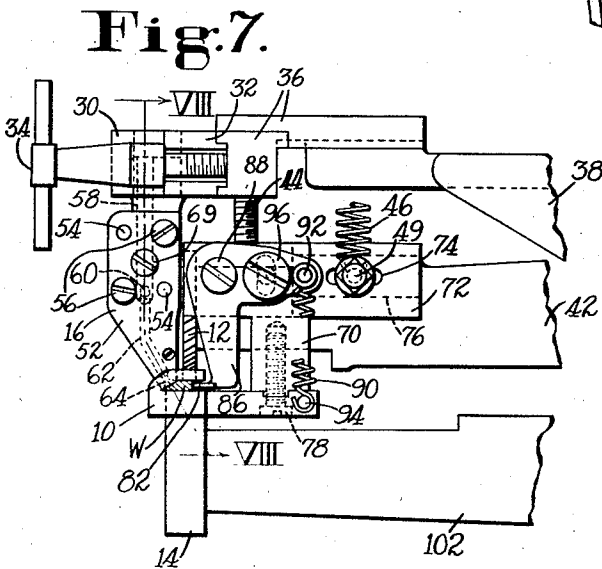
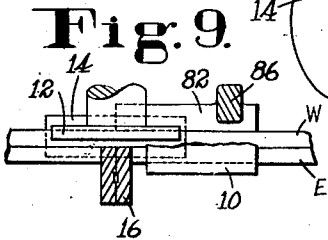
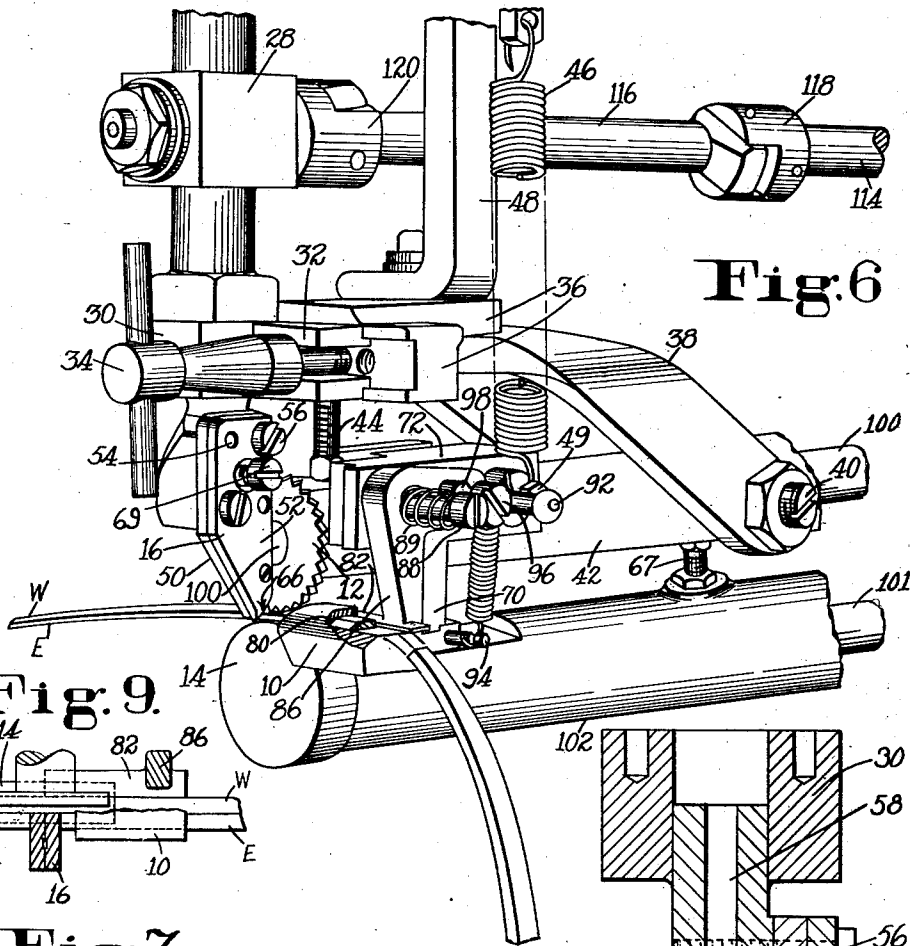
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UNITED STATES PATENT OFFICE

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MACHINE FOR PREPARING WELTING

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7 Claims. (Cl. 91—43)

This invention relates to a machine for preparing welting and is herein illustrated as embodied in a machine for applying cement to a portion of the width of the strip of welting and for simultaneously winding the strip upon a reel in such a manner that the cement may dry without contact between the cemented portion and any other portion of the strip or of the apparatus.

In the manufacture of shoes of a stitchdown type, it is sometimes desired to secure a strip of beveled-edge welting to an outwardly turned flange of the shoe by means of cement applied to the beveled portion of the strip and to an adjacent portion of the shoe. The cement is applied to the shoe a short time ahead of the assembling operation so that it will become tacky and in proper condition to receive the cemented welt. Commonly a cement made of Neoprene is employed for this purpose, and it is desirable to allow a similar cement on the welting to dry or glaze lightly so that it may be readily handled when the welting and the shoe are brought together. For this drying operation, the strip may be wound upon a reel and it is important that this shall be done in such a way that the cemented surface of the welting is held free of contact with the reel and free of contact with adjacent turns of the strip. The welting which is employed is narrow and thin and the beveled surface to which the cement is to be applied is only about $\frac{1}{8}$ " in width. This renders the work piece somewhat hard to handle and makes it necessary to restrict the application of the cement to a very narrow band.

An important object of the invention is to provide a machine for applying a band of cement to a strip of welting and for immediately winding the strip upon a drying reel.

In the illustrated arrangement the application of cement is effected by a nozzle positioned closely adjacent to the bite of a pair of feed wheels which engage the uncoated portion of the strip and drag it past the nozzle. To maintain the alignment of the strip with the operating instrumentalities, a special guide has been provided having a notched portion into which the strip is pressed by a yieldably mounted member arranged to engage the square edge of the strip.

Inasmuch as the strip must be taken up by the drying reel just as fast as it passes through the cementing portion of the apparatus, without leaving any slack and without creating any tension in the strip, provision has been made in accordance with another feature of the invention for

driving the drying reel by a connection to the feed wheels of the cementing mechanism. The feed wheels are separable and the arrangement is such that when the feed wheels are brought into engagement with the strip, as by raising the lower feed wheel, a clutch is operated to complete the driving connection to the drying reel.

The drying reel is mounted so that the strip is wound in a helical groove around the reel, and the point of approach of the strip to the reel is shifted along the periphery thereof by moving the reel laterally so that this point is always in alignment with the guide and the feed wheels of the cementing apparatus. Preferably and as shown, the drying reel has this helical groove formed by notches in a series of bars, and these notches are so designed that a square corner of the welting is received by them with the coated margin of the strip held free of contact with the reel.

These and other features of the invention will be best understood from a consideration of the following description taken in connection with the accompanying drawings, in which

Fig. 1 is an angular view of the cementing mechanism and the drying reel connected thereto;

Fig. 2 is a detail view on a larger scale showing a portion of one of the bars of the drying reel;

Fig. 3 is another detail to show the device for clamping the end of the strip to the reel;

Fig. 4 is an end elevation of the head of the cementing apparatus with parts broken away to show the driving connection to a jack-shaft which is belted to the reel;

Fig. 5 is a longitudinal section through this jack-shaft and the clutch which is embodied therein;

Fig. 6 is an angular view on a larger scale of the cementing apparatus and the guide for the strip;

Fig. 7 is a front elevation of the strip-treating portion of this mechanism;

Fig. 8 is a section on the line VIII—VIII of Fig. 7 through the passage of the nozzle by which cement is applied to the strip; and

Fig. 9 is a view looking down on the feed wheels to show the relation thereto of the strip guide and the nozzle.

It will be seen from Figs. 1 and 6 that a strip of welting W is drawn through a guide 10 by means of coacting feed wheels 12 and 14 as cement is applied to the beveled edge E (Fig. 2) from a

nozzle 16 and is then wound upon the crossbars 18 forming the periphery of a drying reel 20.

The cementing apparatus, mounted upon a pedestal 22, is of the type illustrated in Letters Patent of the United States No. 2,073,647, granted March 16, 1937, upon an application of C. A. Newhall, and comprises a casing 23. In this machine, cement is supplied from a tank 24 to the nozzle 16 by means of a pump (not shown) through a flexible hose 26, and the flow is controlled by a valve 28. This nozzle has a head 30 (Fig. 6) attached by screws to the body of the valve 28, and the head is provided with a forked portion 32 to receive a hand screw 34 by means of which the nozzle is adjustably clamped to a support 36 carried at the outer end of an arm 38 which is pivoted at 40 upon an arm 42 in which a shaft 100 carrying the upper feed wheel 12 is journaled. The position of the arm 38 is determined by an adjustable stop screw 44 which rests against the upper surface of the arm 42. The nozzle is permitted to yield upwardly to accommodate any inequalities in the thickness of the work against the tension of a spring 46 which extends between a bracket 48 on the arm 38 and a stud 49 on the arm 42.

The nozzle 16 comprises plates 50 and 52 which are positioned upon the head 30 by means of dowel pins 54. These plates are firmly held in contact with each other and with the head 30 by screws 56, and a passage 58 in the head (Figs. 7 and 8) communicates with a transverse passage 60 and this in turn communicates with a groove 62 upon the outer face of the inner plate 50, thus providing a channel for the extrusion of cement from an outlet opening 64 formed in plate 52 just beyond the inclined work-contacting surface 66 (Fig. 6) in close relation to which the beveled edge E of welting W is presented for the reception of a band of cement 68 (Fig. 2) covering this beveled edge surface E, and that alone. The lower edge of the plate 50, being higher than the surface 66 on the plate 52, controls the thickness of the band of cement 68. The strip is presented to the nozzle by the coating feed wheels 12 and 14 which, as may be seen from Fig. 7, grip the upper and lower surfaces of the welting W, and the upper feed wheel 12 is narrow so that it does not contact with the whole width of the strip but only with that portion which is not coated by the nozzle. The lower and wide surface of the strip as here positioned will usually be the grain surface and will be held in a predetermined plane by the smooth lower feed wheel 14 as well as by the guide 10. Since the upper surface of the strip of welting is then the flesh surface, any scars produced by the teeth of the feed wheel 12 will do no harm. The nozzle is substantially opposite the bite of the rolls and when it is desired to clean the same, the attaching screws 56 may be removed and the plates separated from one another by means of a screw 69 which is threaded in only the outside plate 52 and bears against the surface of the other plate.

It is not necessary for the operator to guide the strip to the nozzle, since the apparatus is provided with a notched guide block 10 which is supported upon a depending portion 70 (Fig. 6) of a plate 72 which is adjustably secured upon the arm 42 by the stud screw 49. This screw passes through a horizontal slot 74 (Fig. 7) in the plate 72, and the plate and the arm are provided with a coating groove and a rib 76 so that the movement of the plate is parallel to the axis of the arm. The guide block 10 is attached to

the depending portion 70 by means of a screw 78, and the welting-receiving groove 80 (Fig. 6) in said guide is shaped to fit the particular beveled-edge welting W which is to be treated. As the welting passes through the guide, it is held against the left side of the groove 80 by a guide strip 82 extending along the side of the welting as far as the bite of the feed rolls 12 and 14 and bearing against the square edge 84 of the welting (Fig. 2). This guide strip 82, which is thinner than the welting, is mounted at the lower end of a bell-crank lever 86 pivoted on a screw 88 in the plate 72, and the bell crank is urged to rotate in clockwise direction by a spring 90 which is attached to a pin 92 on the upper arm of the bell crank and to a stud 94 upon the guide block 10. The bell crank is yieldably held against the face of the plate 72 by a spring 89 (Fig. 6) compressed between the head of the screw 88 and the face of the lever 86. A locking screw 96 passing through a slot in the upper arm of the bell crank has a flange 98 which may be pressed against the bell crank to lock it in any desired position as, for example, when threading the strip through the guide.

The upper feed wheel 12 is carried upon the shaft 100 (Fig. 6) which is journaled in the arm 42 attached to the casing of the machine and is gear-connected to a shaft 101 which is journaled in an arm 102 and upon which the feed wheel 14 is mounted. This arm 102 is pivoted at 303 upon the casing 23 (Fig. 1) to swing up and down when a treadle (not shown) attached to a treadle rod 104 (Fig. 4) is depressed, thereby raising the lower feed wheel 14 to carry the welting into coating engagement with the lateral outlet 64 of the nozzle and at the same time to grip the strip of welting W against the under side of the upper feed wheel 12. Too close an approach of the feed wheels is prevented by a stop screw 67.

The upper end of the treadle rod 104 is attached by a pivot block to an arm 106 clamped on a cross-shaft 108 (Fig. 1) journaled in the casing 23. The arm 106 is connected by an upright rod 110 with an arm 112 (Fig. 4) which is secured to a valve-operating shaft 114 attached to the valve 28 by a connecting rod 116 (Fig. 6) in which are interposed universal joints 118 and 120. This rod 110 is also provided with a collar 122 between which and the forked inner end 103 (Fig. 1) of the lower feed wheel supporting arm 102 is a spring 124. This arrangement is substantially the same as that shown in the patent and renders it possible to raise the lower feed wheel 14 and open the valve 28 by a single motion of the treadle attached to the treadle rod 104.

The machine is also provided with a drive shaft 130 (Fig. 4) on which are power-receiving pulleys 132 (Fig. 1) connected by a belt 134 to any suitable source of power. The drive shaft is geared (not shown) to the interconnected feed wheels 12, 14 and is also arranged to drive a pump (not shown) which forces the coating material through the nozzle 16.

It is essential that the drying reel 20 shall be rotated to take up the strip of welting W as fast as it is delivered by the feed wheels 12, 14 and that the drying reel shall only be rotated when the feed wheels are being rotated. Accordingly, a driving connection to be described below is constructed and arranged to move the periphery of the drying reel 20 at approximately the same peripheral speed as, or slightly greater than, the peripheral speed of the feed wheel 12, 14, and the

drying reel 20 is rotatably mounted as will later be described, in a supporting frame 136 (Fig. 1). The reel is provided with a power-receiving pulley 138 connected by a belt 140 with a pulley 142 (Fig. 5) frictionally secured to a countershaft 144. This countershaft is journaled in a casing 146 attached by screws 148 (Fig. 4) to the casing 23 of the cementing apparatus. A friction clutch 148 provides the driving connection between the shaft 144 and the pulley 142. The other end of the shaft 144 carries one half 150 of a positive clutch, the other half 152 of which is formed upon a gear 154 mounted upon a sleeve 156 surrounding the shaft 144 and held against axial movement thereon. The clutch half 150 is slidably connected to the shaft 144 by a pin 151 flattened at its ends. In the casing 146, there is also journaled an inclined shaft 160 which has a gear 162 at its lower end meshing with the gear 154, and a gear 164 at its upper end meshing with a gear 166 on the drive shaft 130. When the clutch 150, 152 is to be closed, a lever arm 170 attached to the cross-shaft 138 is swung upwardly to engage a rounded end 172 upon a plunger sleeve 174 integral with the clutch half 150 and slidable in a cover 176 closing the end of the casing 146. This plunger sleeve 174 surrounds the end of the shaft 144, and the pressure of the lever arm 170 is effective to move the clutch member 150 endwise against the tension of a spring 178 between the sleeve and the end of the shaft to close the clutch and start the drive of the drying reel.

The drying reel 20 has end plates 180 (Fig. 1) interconnected by a series of spaced strips 18 which form the periphery of the reel and by an axial sleeve 182 which rotates about a rod 184 supported in the frame 136 and held against rotation by a set screw 186. Approximately one-half of this rod is provided with a square thread 188 for coaction with a spring-pressed pin 190 mounted on one of the end plates 180 of the reel. As the reel rotates, this pin and thread cause it to move axially along the rod 184 so that the point at which the strip of welting W is received upon the periphery of the drum is always directly opposite the feed wheels 12, 14 and forward thereof, thus being on the opposite side of the feed wheels from the strip guide 10 and in line with the wheels and the guide. The end of the strip is detachably secured to the reel by a latch 192 (Fig. 3) pivoted upon a bracket 194 attached to one of the strips 18 and provided with a claw 196 to grip the welting W to the reel. The power-receiving pulley 138 is attached to a sleeve 198 which surrounds the rod 184 and which is provided on its other end with a radially extending roll 200 coacting with a groove 202 on the inner side of a bar 204 attached to the sleeve 182 forming the hub of the reel. By this arrangement, rotation of the pulley 138 is communicated through the sleeve 198 and the roller 200 to the hub of the reel, and the latter, as it is rotated, is caused to move axially at a predetermined rate so that the strip of welting W is wound in a helical groove formed around the periphery of the reel. This groove is made up of a series of notches 206 (Fig. 2) formed along the outer edges of the strips 18 and positioned upon successive strips to form a helix. The notches 206 comprise a square portion 208 with sides substantially normal to one another and arranged to receive the square edge 84 of the welting, but it will be observed that these square portions 208 are tilted with respect to the axis

of the reel so that the cement 68 upon the beveled edge E is held away from the reel and so that the strip W, as it is wound upon the reel, naturally slips into the square portion 208 at just the location to make a desired helical formation. As further assurance against smooching of the reel or damage to the cement coating 68, the notches are provided with relieved portions or recesses 210 which underlie the beveled edges E to which the coating has been applied. Another latch (not shown) similar to the latch 192 is provided for securing the other end of the strip to the reel when the latter is filled. The reel may then be removed from its supporting frame 136 by swinging out an arm 212 pivotally attached to one end of the frame 136 and formed at its upper end to surround and support the threaded rod 184. It will be observed that the end of the rod is rounded at 214 to facilitate the swinging of the arm 212. The spring pin 190 may then be withdrawn from the thread 188 and the reel slipped endwise over the end of the rod 184 to set it aside for drying and to permit it to be replaced by another reel so that the operation of the machine may be continued. After the reel has been replaced, the arm 212 is swung back into position to support the end of the rod 184 and is held in that position by a spring-pressed latch (not shown) mounted inside the arm 212 and engaging a socket in the end portion of the rod 184.

Inasmuch as the strips of welting are long, the machine has been provided with a retaining latch 220 (Fig. 4) which is pivoted upon a pin 222 upon the outside of the casing 23 and has a finger piece 224 so that it may be released when desired. This latch 220 engages a notched block 226 attached to the treadle arm 106 and is yieldably held in engagement with said block by means of a spring 228.

In the use of the machine, after a strip of welting W has been threaded through the guide 10 and its end attached to the reel by means of the clamp 192 and assuming that power has been supplied to the pulley 132 on the drive shaft 130, the operator will depress the treadle attached to the treadle rod 104, thereby raising the lower feed wheel 14 to grip the strip between itself and the upper feed wheel 12 and present the beveled edge E to the nozzle 16. At the same time, the operation of the treadle will have caused the opening of the valve 28 and by raising the arm 170 will have started rotation of the reel 20. Then, so long as the machine is kept in operation, the narrow band of coating material, such as cement, is applied to the beveled edge E of the welting W and the welting is wound up upon the reel 20 for drying. An exact location of the beveled edge E with respect to the delivery end of the nozzle is assured by the guide 10 with its presser strip 82 and by the coating feed wheels 12, 14, the bite of which is directly beside the nozzle.

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 coating machine, coacting feed wheels engaging a portion of the width of a strip of beveled-edge welting, a notched guide to the rear of said feed wheels, considered with respect to the direction of feed, means for pressing the welting into the notch of said guide, and coating means including an extruding nozzle having an inclined surface provided with an outlet opening and positioned closely adjacent to the bite

of said feed wheels and arranged to apply a coating material to the beveled edge of said welting.

2. In a coating machine, driven feed wheels arranged to grip the top and bottom surfaces of beveled-edge welting at a point removed laterally from the beveled edge and to hold the welting in a predetermined plane, a nozzle positioned closely adjacent to the bite of said feed wheels and having a work-contacting surface provided with an outlet opening opposite to the edge surface of the welting and inclined with respect to the grain surface of the welting gripped by said wheels for delivering coating material to the beveled-edge surface, and means for supplying said nozzle.

3. In a coating machine, coating feed wheels engaging a portion of the width of a strip of welting, a notched guide to the rear of said feed wheels, considered with respect to the direction of feed, a spring-pressed strip for urging the welting into the notch of the guide, and coating means substantially beside the bite of said feed wheels, said pressing strip extending forward to a point substantially opposite to said coating means to hold the strip in contact therewith.

4. In a machine for applying coating material to a strip of welting, a coating nozzle having a lateral outlet, a displaceable strip-support adjacent thereto, a guide for both edges of the welting to the rear of said nozzle, considered with respect to the direction of feed, a reeling device forward of said feed wheels, a drive shaft to which power is supplied, a driving connection between said shaft and the reeling device, said connection including a clutch, and operator-controlled means for moving said strip-support to carry the welting into coating engagement with the lateral outlet of said nozzle and for closing said clutch to drive the reel.

5. In a machine for applying coating material

to a strip of welting, coating feed wheels at least one of which is driven and one of which is mounted for movement toward and away from the other feed wheel to grip the strip, a strip coating device adjacent to said feed wheels, a guide for the strip to the rear of said feed wheels, considered with respect to the direction of feed, a strip reeling device forward of said feed wheels, a driving connection between the driven feed wheel and the reeling device, said connection including a clutch, and operator-controlled means for bringing said feed wheels together to grip the strip and for closing said clutch to drive the reeling device.

6. In a machine for applying coating material to a strip of welting, feed wheels for moving the strip, coating means including a nozzle adjacent to said wheels, a valve for controlling the delivery of coating material to the nozzle, a strip guide and a reeling device upon opposite sides of said wheels, means for supplying power to drive at least one of said feed wheels, a driving connection between the feed wheels and the reeling device, said connection including a clutch, and a single operator-controlled means for starting the feeding operation, opening the valve, and closing the clutch to drive the reeling device.

7. In a strip-coating machine, means to apply coating material, coating feed wheels to grip the strip and move it progressively past said coating means, a guide for the strip to the rear of said feed wheels, considered with respect to the direction of feed, a receiving reel forward of said feed wheels, common means to drive said feed wheels and said reel at approximately the same peripheral speed, and means to displace said reel axially as it rotates to keep the receiving point upon the reel in a line intersecting both the guide and the bite of the feed wheels.

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