June 6, 1950 F. E. BERTRAND 2,510,208

CHANNELING AND LIP SETTING MACHINE

Filed Nov. 8, 1947 4 Sheets-Sheet 1

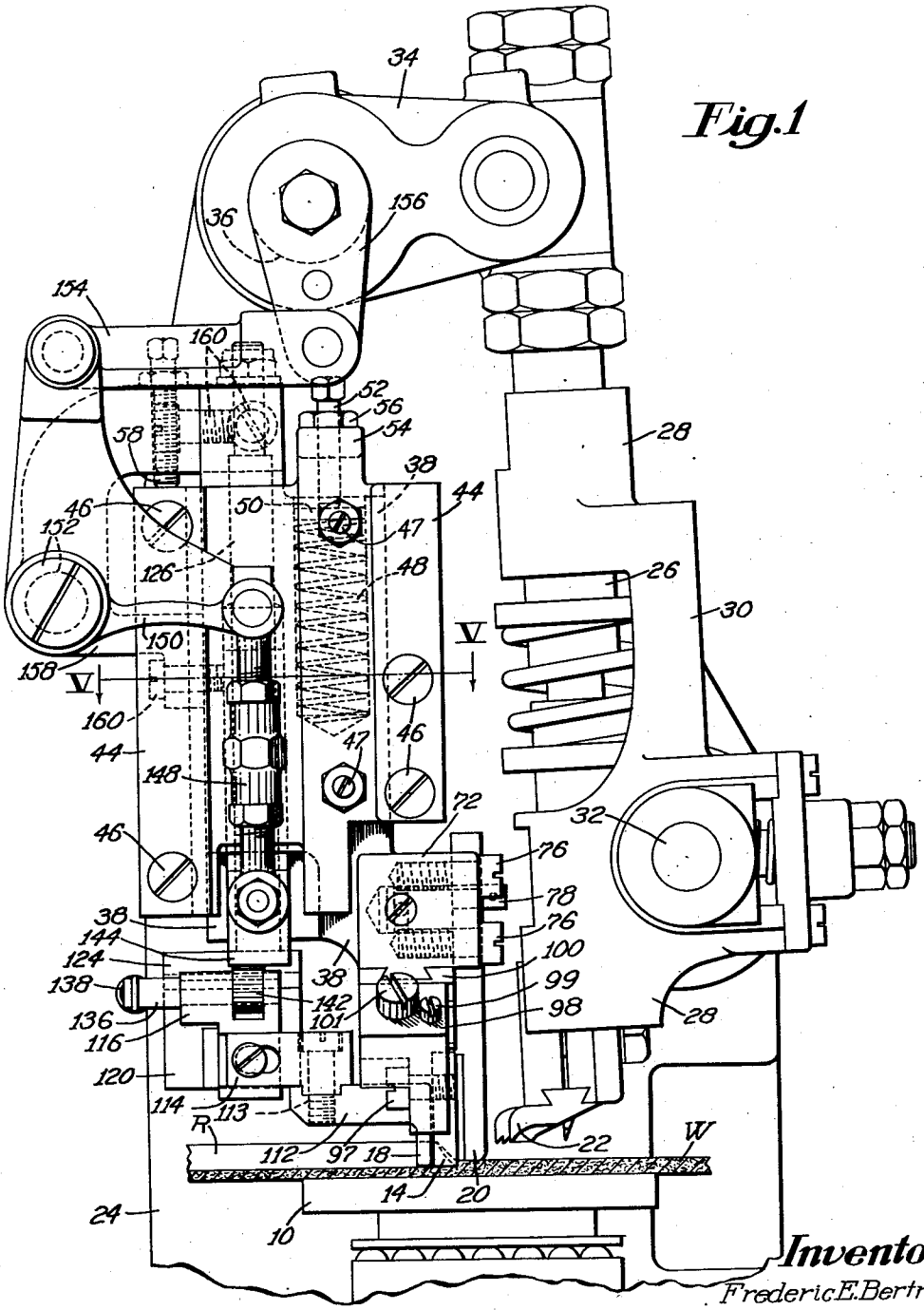


Fig. 1

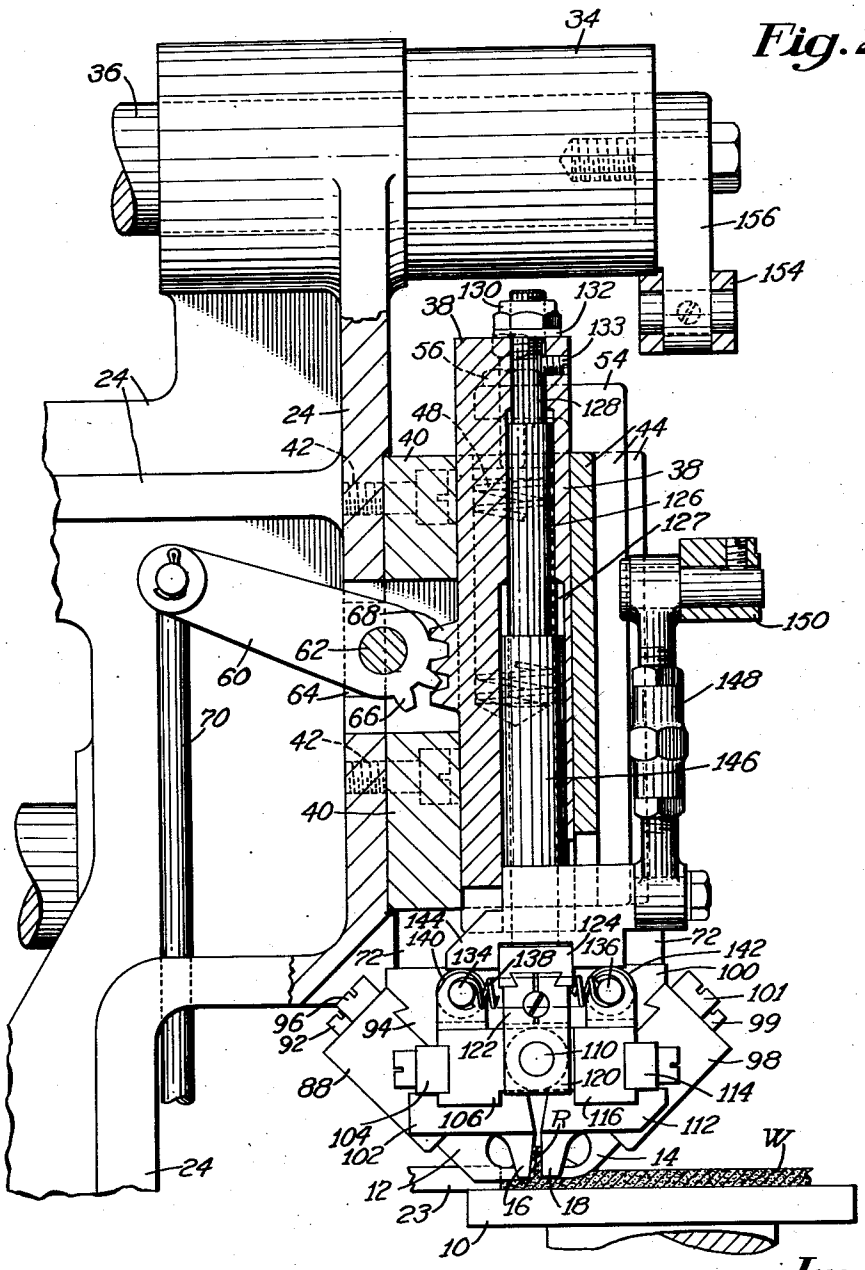
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Fig. 2



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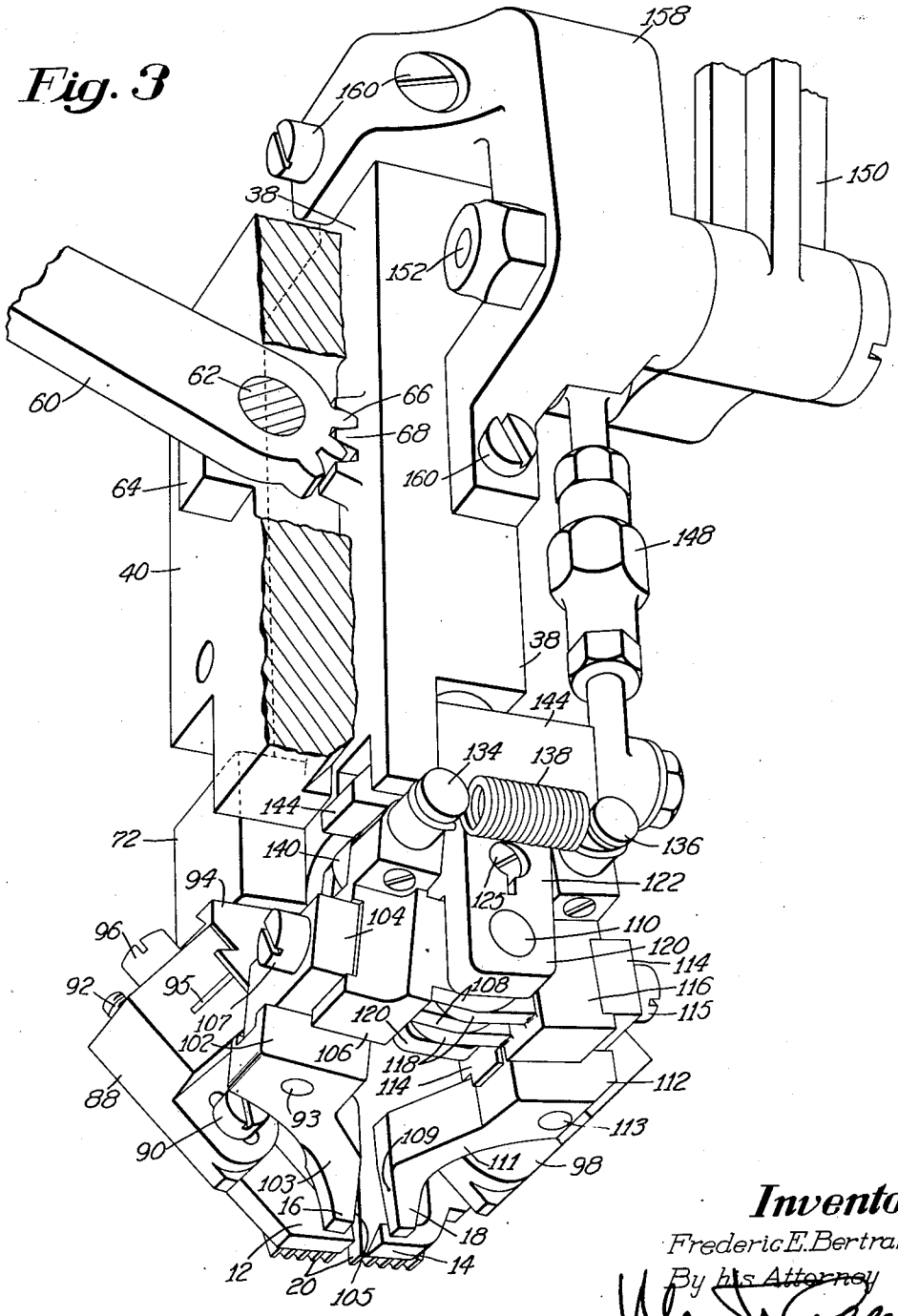
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CHANNELING AND LIP SETTING MACHINE

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Fig. 3



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CHANNELING AND LIP SETTING MACHINE

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Fig. 4

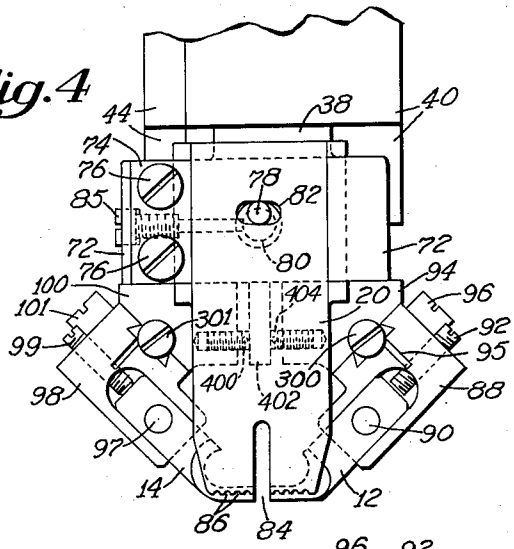
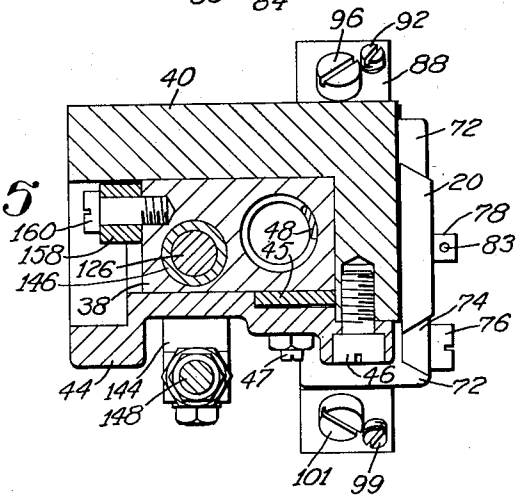


Fig. 5



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UNITED STATES PATENT OFFICE

2,510,208

CHANNELING AND LIP SETTING MACHINE

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Application November 8, 1947, Serial No. 784,866

3 Claims. (Cl. 12—27)

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This invention relates to machines for operating upon shoe soles and is herein illustrated and described as embodied in a channeling and lip setting machine of the type disclosed in United States Letters Patent No. 984,773, granted February 21, 1911, upon the application of W. C. Meyer. Such machines are provided with a pair of channeling knives which form and partially raise channel lips upon the surface of an insole and with a device for pressing these lips together back-to-back to form a sewing rib, the material from which the lips have been formed having previously been coated by cement to cause the lips to adhere together to form an upstanding rib. Inasmuch as the outline of a sole is curved, it is important in these machines to provide for such an arrangement of the work-engaging members as to avoid interference with the feeding of the sole by reason of such curvature.

It is an object of the present invention to provide an improved machine of the type under consideration so arranged as to enable the sole to feed freely, and without damage to the channel lips, notwithstanding the curvature above mentioned. In accordance with this object, a feature of the invention consists in the provision of a lip-setting device in the form of a pair of gripper jaws which are pivotally mounted upon a common fulcrum and which are swung together to set the lips and then separated to remove both jaws from the vicinity of that portion of the rib which has just been formed, thereby avoiding interference between the gripper jaws and the rib as the sole is being fed. As shown herein, the lip-setting gripper jaws are spaced, in the direction of feed of the work, as close to the channeling knives as permitted by considerations of reasonable clearance. Because of such close spacing of the gripper jaws to the knives, the turning of the sole around the more sharply curved portions will not appreciably swing the raised channel lips laterally from the common center line of the channeling knives and the gripper jaws.

These and other features of the invention will appear more fully from the following detailed description to be read in connection with the accompanying drawings and will be pointed out in the appended claims.

Referring now to the accompanying drawings:

Fig. 1 is a front elevation of the work-engaging instrumentalities of an illustrative machine embodying the invention;

Fig. 2 is a side elevation, looking in a direction opposite to that in which the work is fed, of the parts shown in Fig. 1;

Fig. 3 is an angular view of various work-engaging members and a carrier slide upon which they are mounted;

Fig. 4 is a side elevation, looking in the direction of feed, showing the presser gage and the channeling knives; and

Fig. 5 is a sectional view taken on the line V—V of Fig. 1.

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The work-engaging instrumentalities of the illustrated machine comprise a work table 10 upon which a work piece W in the form of an insole is intermittently advanced while in engagement with a pair of channeling knives 12 and 14. These channeling knives serve to cut and also partially to raise a pair of channel lips from the surface of the insole, which lips are further raised and pressed together back-to-back, by a pair of gripper jaws 16 and 18, to form a sewing rib R. In order to cause the channel lips to adhere together to form the rib R, the portion of the surface of the sole from which these lips are cut has previously been coated with cement. The height of the knives 12 and 14 in relation to the upper surface of the work piece W is determined by a presser gage 20. The feeding of the work piece is effected by a toothed feed foot 22 (Fig. 1). An edge gage 23 (Fig. 2) guides the work piece in its progress past the knives 12 and 14. The work table 10 and the edge gage of the illustrated machine are similar to corresponding portions of the machine disclosed in Letters Patent No. 984,773 above mentioned, except for the fact that in the machine herein illustrated the work table is not driven but is allowed to rotate freely as the work is fed.

The supporting structure of the illustrated machine comprises a frame 24.

The feed foot 22, which feeds the sole W step by step, is mounted upon the lower end of a telescoping spring-yielding rod 26 which reciprocates in a pair of bearings 28 carried by a bracket 30. The component of movement of the feed foot 22 in the direction of feed is provided by a crank pin 32 eccentrically mounted in the end of a driven shaft and rotatably engaging a bearing in the bracket 30. The heightwise component is derived from a crank arm 34 extending from a rock shaft 36. The feed foot 22 together with its operating mechanism is similar to the feed foot 4 disclosed in United States Letters Patent No. 1,252,348, granted January 1, 1918, upon the application of A. E. Johnson. The crank pin 32 and the rock shaft 36 of the machine herein

illustrated correspond respectively to the crank pin 50 and the rock shaft 54 disclosed in Letters Patent No. 984,773 already mentioned and referred to in the patent to Johnson.

The channeling knives 12 and 14 are mounted indirectly upon a slide 38 which is positioned over the work table 10 and guided for heightwise movement in a block 40 secured to the frame 24 by screws 42. The slide 38 is retained in its guideway by a cover plate 44 which is secured to the block 40 by screws 46. A gib 45 (Fig. 5), which may be tightened by screws 47, prevents looseness between the slide and its guideway. Housed within a bore in the slide 38 and having its lower end pressing downwardly against the slide is a coil compression spring 48, the upper end of which bears against a washer 50 which is backed by a screw 52 threaded for adjustment down through a lug 54 extending from the cover plate 44. The pressure of the spring 48 can be varied by turning the screw 52. A lock nut 56 holds the screw 52 in adjusted position. The extent to which the spring 48 can urge the slide down in the absence of a work piece on the work table 10 is determined by a stop screw 58 indirectly carried, as will later appear, by the slide 38 and having its lower end engageable with the top of the guide block 40. The operating level of the slide 38 is determined by the presser gage 20, which is carried by the slide and has its lower end resting upon the upper surface of the work piece W. The presser gage 20 thus determines the heightwise position of the knives 12 and 14 and, therefore, the depth of cut which they make with respect to the upper surface of the work piece. To facilitate insertion and removal of the work piece, the slide 38 may be raised by a lever 60 which is fulcrumed upon a pin 62 extending between a pair of ears 64 formed on the guide block 40. The lever 60 extends forwardly into a slot formed in the guide block 40 and carries upon its forward end portion three gear teeth 66 which mesh with gear teeth 68 extending rearwardly from the slide 38. Connected to the lever 60 is the upper end of a treadle rod 70 the lower end of which is connected to a treadle (not shown) by means of which the operator can raise the slide 38 when he so desires.

The presser gage 20 (see Figs. 1, 4 and 5) is mounted upon a block 72 which is integral with and extends laterally from the guided portion of the slide 38. The presser gage 20 has a sliding, dovetailed engagement with the block 72 to provide for heightwise adjustment. A gib 74, dovetailed complementally to the presser gage and secured to the block 72 by screws 76, engages one side of the presser gage. Heightwise adjustment of the presser gage is effected by means of a pin 78 which is eccentrically mounted in the end of a shaft 80 rotatably mounted in the block 72. The pin 78 extends through a horizontal slot 82 formed in the presser gage to force the presser gage to partake of the heightwise component of movement of the pin, the slot 82 serving also to accommodate the horizontal component of movement of the pin. Capstan holes 83 (Fig. 5) in the pin 78 facilitate turning of the pin and its shaft 80 to adjust the height of the presser gage 20 relatively to the slide 38. A set screw 85 holds the shaft 80 in adjusted position. Formed in the lower end portion of the presser gage 20 is a recess 84, the purpose of which is to provide room for the foremost point of the feed foot 22 as the latter is completing its feeding stroke. Formed in the under or work-contacting surface of the presser gage 20 are a plurality of grooves 86 extending in the direction of feed of the work, the purpose of these grooves being to leave as much of the surface of the work piece untouched as possible and thereby avoid scraping off the cement which has previously been applied.

The channeling knife 12 (Fig. 3) is mounted in a guideway formed in a block 88, this guideway being inclined and having components which are heightwise and transverse with respect to the direction of feed of the work. The knife is clamped in its guideway by a clamping screw 90, the precise adjustment of the knife in its guideway being determined by a screw 92 threaded through a portion of the block 88 and having its end in abutting engagement with the upper outer end of the shank of the knife 12. The block 88 has a dovetailed engagement with a block 94 whereby the block 88 can be adjusted in a direction parallel to the line of feed of the work. The block 88, which is partially split by a kerf 95, is secured in its adjusted position by a clamping screw 96 threaded into the block 88. A locating screw 300 (Fig. 4), threaded into the block 94 and having a head the inner surface of which is engageable with the block 88, determines the position to which the block 88 is to be adjusted. The block 94 has a dovetailed engagement with the block portion 72 of the slide 38 for the purpose of enabling it to be adjusted transversely with respect to the line of feed of the work. The transverse adjustment of the block 94 is determined by a locating screw 404 (Fig. 4) threaded into the block and having its end engageable with a lug 402 depending from the block portion 72. The arrangements for clamping the block 94 in its adjusted position, while not shown in the drawings, are similar to the clamping arrangements of the block 88, except that the clamping screw of the block 94 is countersunk.

The channeling knife 14 is mounted in a block 98 with provision for inclined adjustment of the knife in a direction having components which are heightwise and transverse with respect to the direction of feed of the work. The knife 14 is clamped in its adjusted position by a screw 97 (Figs. 1 and 4) similar to the screw 90, and its precise adjustment is determined by a screw 99 similar to the screw 92. The block 98 is similar to the block 88 and is carried by a block 100, being dovetailed thereto to provide for its adjustment parallel to the line of feed of the work; and it is clamped in its adjusted position on the block 100 by a screw 101. The adjusted position of the block 98 is determined by a locating screw 301 similar to the screw 300. The block 100 is similar to the block 94 and is similarly carried by the block 72 with provision for adjustment transverse to the line of feed of the work. A locating screw 400 (Fig. 4) similar to the screw 404 determines the adjusted position of the block 100. It is thus evident that the knives 12 and 14 can each be adjusted independently of the other heightwise, transversely of the direction of feed of the work, and parallel to the direction of feed of the work.

The gripper jaw 16 is integral with a block 102 and is connected thereto by a shank 103 (Fig. 3) which extends toward the knife 12. The jaw 16 extends down from the shank 103 and has a work-engaging face 105. The block 102 is in tongue-and-groove engagement with a block 104 to provide for its adjustment transversely of the feed of the work, being secured in adjusted position on the block 104 by a clamping screw 93 threaded

into the block 102 and extending through a slot in the block 104. The block 104 has a tongue-and-groove engagement with a block 106 to enable the block 104 to be adjusted parallel to the direction of feed of the work, the block 104 being secured in its adjusted position on the block 106 by a clamping screw 107. Integral with and extending from the block 106 are a pair of ears 108 which pivotally engage a pin 110.

The gripper jaw 18 is similar to the gripper jaw 16 and has a work-engaging face 109 opposed to the work-engaging face 105. The jaw 18 is integrally connected to a block 112 by a shank 111 similar to the shank 103. The block 112 has a tongue-and-groove engagement with a block 114 to enable the gripper jaw to be adjusted transversely of the line of feed of the work. A clamping screw 113 secures the block 112 in adjusted position on the block 114. The block 114 has a tongue-and-groove engagement with a block 116 to enable the block 114 to be adjusted parallel to the direction of feed of the work. A clamping screw 115 maintains the block 114 in adjusted position on the block 116. The block 116 has a pair of ears 118 which are pivotally mounted upon the pin 110.

The lower end of the presser gage 20 bears upon that portion of the insole R which is just about to be formed into channel lips by the knives 12 and 14, and the gripper jaws 16 and 18 operate upon the channel lips close to the locality at which they have been cut and partially raised by the knives. The spacing in the direction of feed of the work, between the presser gage, the knives, and the gripper jaws, is as close as permitted by considerations of reasonable clearance.

The pin 110 is secured between a pair of ears 120 (Fig. 3) which depend from a block 122. Formed on the upper portion of the block 122 is dovetail slide (Fig. 2) which engages a dovetail guideway in the lower portion of a foot 124 to enable the block 122 to be adjusted in the direction of feed of the work. This dovetail slide has a longitudinal kerf to permit it to be expanded laterally by a screw 125 (Fig. 3) having a conical point engaging a conical end of a bore in which the screw is threaded. When the screw is tightened in the block 122, the two halves of the dovetail slide are forced into clamping engagement with their guideway to hold the block in adjusted position. A stem 126 (Fig. 2) integral with the foot 124 extends upwardly therefrom into an oversized bore 127 provided in the slide 38. A bore of smaller diameter coaxial with the bore 127 is formed in the upper portion of the slide 38 to guide the stem 126. The stem 126 has an upper portion 128 of reduced diameter which is guided in a bore of still smaller diameter extending downwardly from the top of the slide 38. The portion 128 extends up above the top of the slide 38 and has threaded upon its upper end a nut 130 which supports the pin 110 and adjustably determines the height of the pin relatively to the slide 38. A washer 132 is interposed between the top of the slide 38 and the nut 130. A set screw 133 bearing against a flat surface on the reduced portion 128 of the stem 126 holds the stem in adjusted position.

The mechanism for operating the gripper jaws 16 and 18 includes a pair of pins 134 and 136 which extend, respectively, from the blocks 106 and 116 in a direction parallel to the line of feed of the work. A tension spring 138 having one end anchored to the pin 134 and its other end anchored to the pin 136 extends transversely of

the line of feed of the work and urges the jaws 16 and 18 apart as far as permitted by the engagement of the upper portions of the blocks 106 and 116 with the block 122. Mounted for free rotation upon the shank of the pin 134 is a roll 140 (Fig. 2) and similarly mounted on the shank of the pin 136 is a roll 142. Recesses are provided in the blocks 106 and 116 to accommodate the rolls 140 and 142, respectively, the periphery of each roll extending somewhat above the uppermost portion of its associated block. A foot 144 carried by a tubular stem 146 has an undersurface which is engageable with both the rolls 140 and 142. The stem 146 is integral with and extends upwardly from the foot 144 and is guided in the bore 127. The lower portion of the stem 126 fits the interior of the tubular stem 146 and is guided therein.

Pivotally attached to the foot 144 is the lower end of a connecting rod 148 (Figs. 1 and 2) having its upper end pivotally attached to a horizontal arm of a bell crank 150. This bell crank 150, which is pivotally mounted upon a fulcrum pin 152, has an upwardly extending arm pivotally attached to one end of a horizontal connecting rod 154. The opposite end of the connecting rod 154 is pivotally attached to a crank arm 156 extending from the rock shaft 36. The fulcrum pin 152 is carried by a bracket 158 which is secured by screws 160 to the slide 38.

The stop screw 58, already mentioned, for limiting the downward movement of the slide 38, is threaded down through a horizontal portion of the bracket 158.

To operate the machine the treadle is first depressed to raise the slide 38 and with it the presser gage 20, the knives 12 and 14, and the gripper jaws 16 and 18. An insole W is then placed upon the work table 10 with the edge of the insole against the edge gage 23 and the treadle is released to permit the members, above mentioned, to descend into their operating positions. The feed foot 22 operates to advance the insole intermittently, causing the knives 12 and 14 to cut into the insole and, with each advancing movement of the sole, to extend the cuts they have already made to form the channel lips. The level, with respect to the upper surface of the insole W, at which the knives 12 and 14 operate is determined by the presser gage 20. The spring 48 holds the presser gage 20 in continual contact with the work piece during the operation. The work piece, during each feeding movement, slides against the presser gage 20. While the sole is thus being advanced, the gripper jaws 16 and 18 are held separated by the spring 138. While the feed foot 22 is raised in the course of its movement of retraction, the presser gage 20 holds the sole stationary and the foot 144 descends to engage the rolls 140 and 142, thereby positively swinging the jaws 16 and 18 toward each other about their common fulcrum pin 110 to set the partially raised and adhesively coated lips, causing them to adhere together to form the sewing rib R.

Inasmuch as the jaws 16 and 18 of the illustrated machine are separated by moving them both away from the rib R, these jaws will not interfere with the feeding of the sole, particularly around sharply curved portions such as a pointed toe. Because of this freedom of interference from both gripper jaws, soles having pointed toes can be fed freely. Furthermore, the gripper jaws 16 and 18, being spaced as close to the knives 12 and 14 as permitted by clearance,

are enabled to operate upon the lips close to the locality at which the lips have been partially raised by the knives and before the lips, as the sole is turned, can be swung any appreciable distance off center with respect to the common center line of the jaws at sharply curved portions of the sole. The gripper jaws will therefore close upon the lips centrally without tending to pull the lips to the right or left of the line of feed, and will thereby avoid any danger of tearing the lips. The jaws 16 and 18, by reason of the fact that they reach all the way (allowing for slight clearance) down to the bases of the channels, are enabled to grip the lips over their entire height, thereby causing adhesion to take place over the entire areas of the opposed surfaces of the lips. The presser gage 20, having grooves 86 in its work-engaging under surface leaves a considerable portion of the coated surface of the work piece untouched and thereby avoids removing any considerable quantity of the cement.

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

1. In a machine for operating on shoe soles, means for cutting and partially raising a pair of channel lips on a sole, a pair of pivoted gripper jaws positioned as close to said cutting means as clearance permits for gripping the lips between them to set the lips, a spring interposed between the gripper jaws for yieldingly holding the gripper jaws open, and means for intermittently closing said jaws positively to set the lips.

2. In a machine for operating on shoe soles, a work support, means for feeding a sole on said work support, a slide guided for heightwise movement above said work support, means for gaging the height of said slide relatively to the upper surface of the sole on the work support, a pair of knives carried by the slide for cutting channel lips in the sole as the sole is fed, a pair of gripper jaws for gripping the lips between them to set the lips, a pivotal mounting for said gripper

jaws carried by said slide, and means for swinging said gripper jaws about said pivotal mounting to cause the jaws to close and open repeatedly for the purpose of setting the lips in closing and permitting the feeding of the sole while open.

3. In a machine for operating on shoe soles, a work support, means for feeding a sole on said work support, a slide guided for heightwise movement above said work support, a presser gage engageable with the upper surface of a sole on said work support and carried by said slide to gage the height of the slide, a pair of knives carried by the slide for cutting channel lips in the sole as the sole is fed, said presser gage being positioned to engage that portion of the sole which is just about to be operated upon by said knives, a pair of gripper jaws for gripping the lips between them to set the lips, said presser gage, said knives, and said gripper jaws being spaced as close in the direction of feed as clearance permits, a pivotal mounting for said gripper jaws carried by said slide, and means for swinging said gripper jaws about said pivotal mounting to cause the jaws to close and open repeatedly for the purpose of setting the lips in closing and permitting the feeding of the sole while open.

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