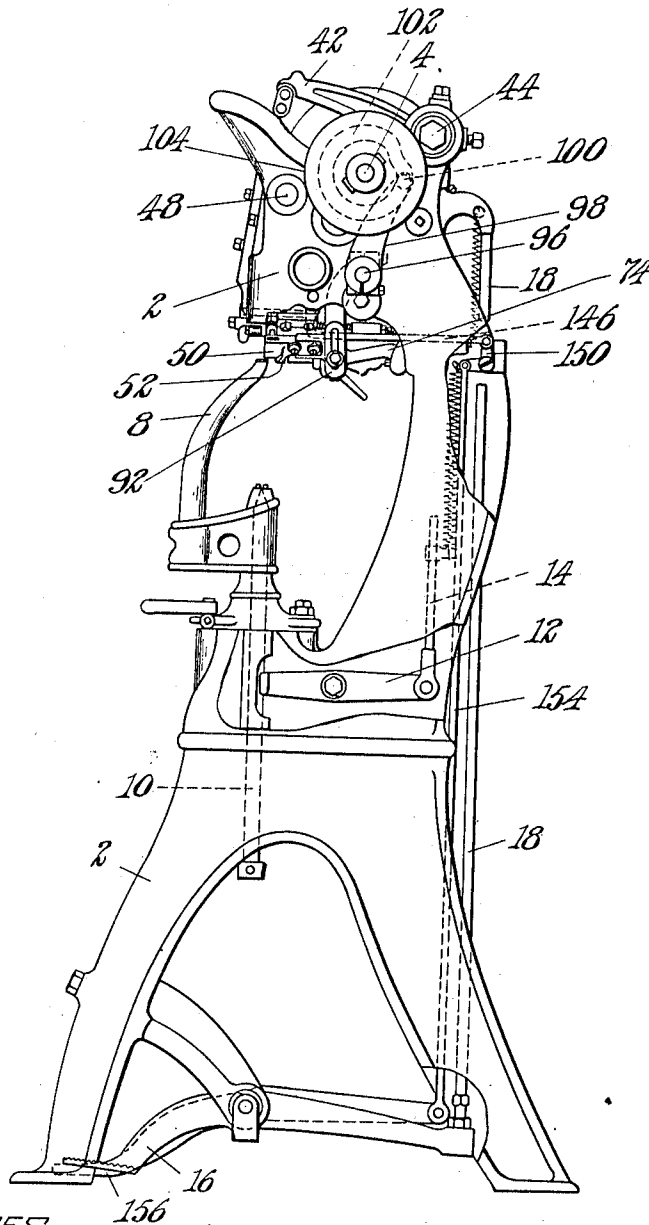


L. A. CASGRAIN.
MACHINE FOR ATTACHING WELTS.
APPLICATION FILED JULY 20, 1908.

1,053,571.

Patented Feb. 18, 1913.

2 SHEETS—SHEET 1.



WITNESSES.

Elizabeth C. Coupe
Edith C. Hollbrook

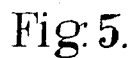
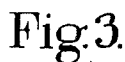
Fig. 1.

INVENTOR.

Louis A. Casgrain
By his Attorney,
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1,053,571.

2 SHEETS—SHEET 2.



WITNESSES.

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Fig. 2.

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b. *Lorrie A. Casgrain*
By *his Attorney,*
Nelson M. Howard

UNITED STATES PATENT OFFICE.

LOUIS A. CASGRAIN, OF BEVERLY, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

MACHINE FOR ATTACHING WELTS.

1,053,571.

Specification of Letters Patent.

Patented Feb. 18, 1913.

Application filed July 20, 1908. Serial No. 444,471.

To all whom it may concern:

Be it known that I, LOUIS A. CASGRAIN, a citizen of the United States, residing at Beverly, in the county of Essex and Commonwealth of Massachusetts, have invented certain Improvements in Machines for Attaching Welts, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates primarily to machines for attaching welts and is particularly adapted for use in the manufacture of a shoe of novel construction, similar to what is known as a "McKay welt" shoe, in which, after a shoe has been lasted, a welt or strip of material, usually of leather, is secured to the underside of the insole by fastenings which extend directly through welt, upper and insole substantially perpendicularly to the surface of the insole. In this type of shoe, some suitable filling material is usually placed upon the insole within the welt to form a surface substantially flush with the lower surface of the welt after which an outsole is secured to the welt by through-and-through stitching as usual.

The shoe, to the manufacture of which this present invention particularly relates, comprises a welt which is secured to the insole by metallic fastenings, for example, such as are shown in United States Patent No. 669,025, dated February 26, 1901. So far as the broader features of the invention are concerned, any suitable mechanism may be employed for securing the welt to the other parts of the shoe by stitches, nails or other fastenings, but when fastenings of the character described in the patent just mentioned are employed, it is preferred to make use of a machine for forming and inserting them of the type disclosed in applicant's co-pending application, Serial No. 306,612, filed March 17, 1906.

An important feature of the present invention is the utilization of the means by which the welt is led into attaching position as the means for feeding not only the welt but also the shoe to which it is being attached.

In this aspect, the invention comprises feeding means which, after the welt has been secured at one end of the shoe, engages only a portion of the welt which has not yet been

attached and thereby feeds the shoe. With such a construction, all stretching of the welt is avoided and no additional feeding mechanism such as has been previously employed is required. Preferably, the means which engages the welt is arranged to reciprocate or oscillate in substantially the direction in which the work is fed at the attaching point, the construction being such that upon the forward movement of the feeding means the welt is carried forward positively, while upon the movement of the feeding means in the opposite direction it does not move the welt. To this end, some means is preferably provided for holding the welt during the retracting movement of the feeding means. In the particular machine herein described, the work is sustained upon a horn or other work support which is movable to clamp and to release the work. The timing of the machine is such that when the work support is clamping the welt, the feeding means is being retracted. As herein shown, also, while the work support is in clamping position, a fastening for uniting welt, upper and insole is inserted. Thereafter, the work support is released and the work is fed forward by the means described and the cycle of operations is repeated until, in the case of the manufacture of the type of shoe first mentioned, the welt has been secured around the entire forepart and shank of the shoe and, if desired, around the heel, also.

It is sometimes desirable, for example in order to increase the flexibility of the shoe, to provide in the inner edge of the welt slits extending partially or entirely through its thickness. Preferably, the slits will stop short of both the outer edge and the upper surface of the welt so that there will be no liability that they will be visible in the finished shoe. However, as the bending of the shoe when in use occurs chiefly near the ball, it is unnecessary to slit the welt at other portions of the shoe.

Accordingly, another feature of the invention is the provision of a welt slitting mechanism which preferably may be thrown into and out of operation at the will of the operator while the machine continues in operation. In the illustrated embodiment of this feature of the invention, there is provided a welt slitting device constructed and arranged to be actuated by engagement with

a part of the mechanism which forms and inserts the fastenings. In the specific construction about to be described, the welt slitting mechanism includes a knife which is guided by the presser foot, against which the work is clamped and through which the fastenings enter the work, and the knife is arranged sufficiently close to the point at which the fastenings are inserted so that with any usual spacing of the fastenings the slits will occur between the fastenings. Hence, no fastening will be passed through a slit and thus lessen its holding power although, owing to the shape of the particular fastenings which are preferably used, they would still be effective for holding the parts together even if their shanks did pass through the slits.

In practice the welt before it is attached to the shoe is moistened or put in temper and it has been found that sometimes there is a tendency of the edge of the welt to curl toward the upper while and after the fastenings are being inserted.

Accordingly, another feature of the invention relates to means for supporting the welt near its edge. In this aspect the invention comprises mechanism for attaching a welt to another part of a shoe with one edge of the welt overlapping the part to which it is being attached in combination with means for supporting the overlapping edge of the welt, such means being held forward in welt sustaining position by a spring or other yielding device so that said means may extend close to or bear against the upper of the shoe but may be pushed backward against the resistance of its spring so as not to interfere with the proper positioning of the welt as it is being applied to the shoe. Although this welt supporting mechanism is particularly intended for a machine for attaching welts, such as is herein shown and described, wherein the work is supported upon a horn which enters within the shoe, yet such a supporting mechanism would be useful in other relations where parts of a shoe of which one overlaps another are being secured together and in its broadest aspect this feature of invention is considered to be applicable in any such relations.

Furthermore, the invention comprises, in addition to the features already referred to, various combinations and arrangements of parts as well as certain details of construction which will be hereinafter fully described and will be defined in the claims.

Referring to the accompanying drawings which illustrate a preferred embodiment of the present invention applied to a nailing machine of the type hereinbefore mentioned, Figure 1 is a view in side elevation of the entire machine with certain parts of the frame broken away to show parts otherwise hidden; Fig. 2 is a view in perspective of the

principal parts of the machine which operate upon the work, a part of a shoe being shown in position in the machine; Fig. 3 is a view from the rear, partly in section, of certain parts in the region of the operating point; Fig. 4 is a fragmentary view in side elevation of the welt slitting and the welt supporting mechanisms; Fig. 5 is a view in perspective of the welt feeding and the welt supporting mechanisms; Fig. 6 is a view in perspective of the welt and shoe guide with some of the parts separated from the others; and Fig. 7 is a view from the side opposite to that illustrated in Fig. 1 of the presser foot, the welt supporting finger and the tip of the horn with a part of a shoe shown in the position which it occupies with reference to these parts.

As illustrated, the machine comprises a frame 2 in which is supported a main driving shaft 4 carrying a series of cams for operating the various parts of the machine. Secured to the head of the machine is a presser foot 6 which has an opening 7 for the passage of fastenings and against which the work may be clamped at times by a work support shown as a vertically movable horn 8 rotatable about a sliding spindle 10. A lever 12 pivoted in the frame and engaging the spindle 10 at one end is connected at the other by a rod 14 to mechanism actuated by a cam upon the main shaft 4 for raising the horn and controlling its position. A treadle 16 is connected through a rod 18 to a suitable starting and stopping mechanism.

An awl 20 secured in an awl bar 22 is actuated by a lever 24 slotted at its forward end to receive a block 26 pivoted to the awl bar. The lever is actuated to cause the awl to penetrate the work by a cam upon the shaft 4, the awl sliding through a guide 28 rigidly secured to the swinging head hereinafter referred to. A former 30, cooperating as in the prior machine with an anvil and other parts to form a fastening, is carried upon the lower end of a sliding bar 32 provided with a pivoted block 34 which is received in the forward end of a cam actuated lever 36. The driver 38 is secured to a driver bar 40 which is connected at its upper end to a lever 42 pivoted at 44 and provided with a roller or stud co-acting with a peripheral cam upon the shaft 4, powerful springs being provided for causing the driver, when the cam permits, to descend for inserting a fastening. Awl 20, former 30, driver 38, and some connected parts are all mounted in a swinging head 46 pivoted in the frame 2 at 48 and movable forwardly and backwardly to bring the awl and driver alternately over the point at which a fastening is to be inserted.

All of the parts just described in detail may be, and preferably are, of substantially the same construction as is illustrated in the

machine of the earlier application above mentioned.

Referring now to the parts which relate more particularly to the present invention and first to the mechanism for guiding the welt and for feeding it and, through it, the work progressively to the fastening inserting mechanism, 50, as shown most clearly in Figs. 1, 5 and 6, is a bar provided with a downwardly and forwardly extending projection 52 which is adapted to bear against the upper *b* of a lasted shoe substantially opposite the edge of the insole *a*. Directly above the bar 50 and resting upon it is another bar 54 the edge 56 of which serves as a guide for the inner edge of the welt *c* to be attached to the shoe. Above this bar 54 is another 58 provided at its outer end with a down-turned flange 60 which serves as a guide for the outer edge of the welt. The shank of each of these guides is provided with slots 61 through which screws 62 pass for securing them to the shank 64 of an approximately T-shaped lever 66. These slots 61 provide for the relative adjustment of the guides so that welts of different width may be guided accurately and so that the position of the welt with reference to the shoe and particularly to the edge of the insole may be adjusted as desired. One arm of lever 66 is bifurcated and pivoted at 68 to an ear 70 projecting laterally from a bracket 72 which extends forwardly from another bracket 74 rigidly secured to the frame 2. The other arm of T-shaped lever 66 is provided with a head 78 having a vertical slot 80 in which slides a block 82 (see Fig. 2) pivoted upon stud 84 provided with a shoulder 86 so that by means of a nut 88 and washer 90 the stud may be clamped to a lever 92 provided at its lower end with a slot 94 through which the stud passes. The lever 92 is secured to a rockshaft 96 (see Fig. 1) which in turn is provided with an upwardly extending arm 98 carrying a roller or other stud 100 which engages the cam groove 102 in a disk 104 fixed upon the driving shaft. By loosening nut 88 and adjusting block 82 vertically, the oscillating movement imparted to the welt guide by the cam may be varied as desired.

As shown more particularly in Figs. 5 and 6, the bar 58 of the welt guide is provided with two pins 110 which project through a feeding member 112 provided with teeth 114 to engage and slightly penetrate the welt *c*. A bent spring 116 held against member 112 by a small rod 118 passing through holes in pins 110 maintains the teeth 114 yieldingly against the welt so that when the welt guide is moved to the left, as shown in Fig. 5, the welt, and the shoe to which the welt has been attached at a point in advance of the welt guide, will be fed forward while upon the return movement

of the welt guide, if the shoe is held against backward movement as will be explained, the teeth 114 will slide backwardly over the welt. As indicated in Figs. 2 and 7, the presser foot 6 has upon its front side a block 120 adjustably secured to the foot by screws 122 and projecting below the work engaging surface of the foot. This block serves also as a gage for the inner edge of the welt.

Referring now to mechanism which may be embodied in the machine if it is desired to produce slits upon the inner edge of the welt, especially at the ball of the shoe, to increase its flexibility, 130 (Figs. 3 and 4) represents a knife which is clamped by a screw 132 to a block 134 pivotally supported upon a stud 136 extending backwardly from a lever 138, a spring 140 which is secured at one end in a slot in the stud 136 and at its other end in a slot in the block 134 serving to maintain the lower end of knife 130 against one side of the presser foot 6. The lever 138 is clamped to a rockshaft 142 supported in a part of the frame 2 and the lever is provided with a bearing surface 144 which is normally held against a fixed stud 145 thus limiting the upward movement of the knife. At its rear end, the shaft 142 is connected to the laterally turned end of a rod 146 which at its rear end is connected by pin 148 to a bell crank lever 150 pivoted at 152 to a fixed part of the frame. A rod 154 connected to the other arm of the bell crank lever 150 extends to the base of the machine and is connected to a treadle 156. A spring 158 connected to lugs upon rods 14 and upon lever 150 tends not only to counterbalance the weight of the parts connected to the horn in the rear of the pivot of lever 12 but also tends to move the rod 146 and therefore the knife 130 to their foremost positions where stud 136 will be out of the path of former 30.

As shown clearly in Figs. 2 and 3, when treadle 156 is depressed, the rod 146 draws the shaft 142 rearward so that the rear end of stud 136 will be in position to be engaged by the former 30 as it approaches its foremost and lowest position, the parts being so proportioned and arranged that the knife 130 is forced into the welt during the last portion of the downward movement of the former. In order that the slits *e* formed by the knife shall not be visible in the finished shoe, they preferably do not extend quite through the welt or to its outer edge, although they may do so if desired. As indicated in Fig. 3, the knife 130 is arranged close to the driver passage 7 in presser foot 6 through which the fastenings are driven into the work so that for any spacing of the fastenings which is likely to be used the slit made by the knife will be between the fastening in the welt just about to be

driven and the next succeeding fastening. The rod 146, the rear end of which is held against rotation, will be put under torsional strain by the swinging of lever 138 downward through the action of former 30 and the tendency of this rod to return to its initial condition may be relied upon for raising the knife 130 to its highest position, shown in Fig. 3, and for bringing bearing surface 144 into engagement with stud 145. If desired, however; a spring, such as 160, (Fig. 4) acting upon rod 146 may be employed for returning the knife to its highest position. It is considered desirable to provide also a supporting device, such as finger 162, to sustain the edge of welt *c* near the operating point. It has been found that such a support resists any tendency of the welt to curl downwardly as it is being attached, especially around the toe. As illustrated, (Figs. 4 and 5) the finger 162 supported in bracket 72 is provided at its rear end with a block 164 recessed to receive a coiled spring 166 bearing at its rear end against a shoulder of the bracket so that the finger is pressed yieldingly forward under the welt against the upper of the shoe, preferably just in advance of the point at which the fastenings are inserted. Since it may be desirable to retract the supporting finger 162 into inoperative position a recess is provided in the middle portion of finger 162 and the forward end of block 164 is beveled at 168 and provided with a shoulder at 170 to be engaged by the toe of a hand lever 172 pivoted at 174. If it is desired to retract finger 162, lever 172 may be drawn forward causing its toe to travel down the inclined surface 168 and to come into engagement with the shoulder 170. The friction of the parts may be relied upon to hold the toe of lever 172 in engagement with the shoulder 170 or additional means such as a latch may be provided.

The functions of the various parts have been explained in connection with the detailed description but a brief general description of the operation of the machine will now be given. The welt *c* having been drawn through the welt guide, (shown in detail in Fig. 6) so that the end portion of the welt will be between horn 8 and presser foot 6, a lasted shoe is placed upon the horn and the machine started into operation by depressing treadle 16. As in the machine of the prior application mentioned, a fastening *d* having a hook-shaped head is formed from a continuous wire by former 30 and other cooperating parts and is then driven through the welt *c*, upper *b*, and insole *a* by driver 38 into a hole previously formed by the awl 20 and its inner end is clenched by the horn 8. After the first fastening has been inserted, the horn drops

away from the presser foot 6 to relieve the pressure on the work during the feeding movement. After the horn has started to descend, the lever 66 is moved by cam 102 in a direction to carry the welt guide and the feeding member 112 forward or to the left as shown in Figs. 2 and 5. The teeth 114 of member 112 cause the welt to move forward with the guide and, since the welt has been secured to the shoe by one fastening, the shoe in turn is fed forward over the horn. At the end of this forward movement, the horn is raised to clamp the work in its new position and subsequently the lever 66 is moved to carry the welt guide backward and, since the welt is firmly clamped by horn 8 and presser foot 6, the welt is drawn through the welt guide, feeding member 112 sliding over the welt. If the operator at any time desires to slit the welt he will depress treadle 156 to draw stud 136 backward into the path of former 30 in which case the knife 130 will be caused to produce a slit *e* in the welt just before each fastening is driven so long as the treadle 156 is held in depressed position. If the lever 172 is placed in the position shown in Fig. 4, the finger 162 will extend under and support the welt as shown in Figs. 3 and 7.

It will be understood, of course, that, while a complete machine has been described in full detail in order that the invention may be thoroughly understood, various modifications in construction and arrangement, in addition to those already referred to, which will occur to those acquainted with the art, may be made without departing from the substance of the invention as defined in the claims.

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 attaching a welt to a lasted shoe, a shoe supporting horn normally fixed laterally and engaging the inside of the insole of the shoe, in combination with feeding means consisting solely of a welt engaging device and actuating mechanism therefor, said device being constructed and arranged to act upon and through the welt after it has been attached at one end to the shoe and thereby to effect through the welt alone the feeding of both the welt and the shoe over the horn.

2. In a machine for attaching a welt to a lasted shoe, a single feeding device engaging only a portion of the welt which has not yet been attached to the shoe, in combination with positively actuated mechanism acting upon said device to push forward both the welt and the shoe to which the welt is being attached.

3. In a machine of the class described, mechanism for attaching a welt progres

sively to a lasted shoe, in combination with a welt guide engaging the welt in the rear of the attaching point and constructed and arranged to deliver the welt in such position relatively to the attaching mechanism that the welt will be attached near one of its edges to the shoe with the other edge overlapping the edge of the shoe, together with mechanism which constitutes the only work feeding means acting upon said guide to push forward both the welt and the shoe to which the welt is being attached.

4. In a machine of the class described, mechanism for attaching a welt progressively to a lasted shoe, in combination with a positively actuated welt guide engaging the welt in the rear of the attaching point and constructed and arranged to deliver the welt in such position relatively to the attaching mechanism that the welt will be attached near one of its edges to the shoe with the other edge overlapping the edge of the shoe, together with mechanism which constitutes the only work feeding means acting upon said guide to reciprocate it substantially in the direction of the length of the welt and when reciprocating in one direction acting to push forward the welt and the shoe to which the welt is being attached and while reciprocating in the opposite direction to be inoperative for moving either the welt or the shoe.

5. In a machine of the class described, mechanism for attaching a welt to another part of a shoe, in combination with feeding mechanism comprising welt engaging means, a swinging lever carrying said means, an actuating lever, and an adjustable positive connection between said levers for regulating the extent of feeding movement.

6. In a machine of the class described, a work support movable to clamp and to release the work, mechanism for inserting fastenings for attaching the welt to the insole of a shoe, means acting upon the welt in the rear of the attaching point to move the work intermittently over the work support while it is released.

7. In a machine of the class described, a cam shaft, a fastening former actuated from said shaft, in combination with a welt slitting device operated directly by the fastening former and constructed and arranged for movement into and out of operative engagement therewith.

8. In a machine of the class described, mechanism for inserting fastenings, means for slitting a welt located in close proximity to the point at which the fastenings are inserted, and means for feeding the welt, the said means being constructed and arranged to slit the welt upon one side of the fastening inserting point and then to feed the slit portion of the welt to the opposite side of that point during one cycle of operations.

9. In a machine of the class described, welt slitting means in combination with welt feeding means constructed and arranged to engage the welt in the rear of the slitting means and push the welt forward toward and past the slitting means.

10. In a machine of the class described, a reciprocable welt feeding means constructed and arranged to push the welt forward while reciprocating in one direction and to move over the welt while reciprocating in the opposite direction, in combination with means for slitting the welt between feeding movements located in advance of the point at which the feeding means engages the welt.

11. In a machine of the class described, means including a presser foot for supporting and positioning a welt, in combination with welt slitting mechanism comprising a knife, a supporting lever upon which the knife is pivoted, means tending constantly to maintain the knife in engagement with the presser foot, and means acting upon the lever to cause the knife to slit the welt.

12. In a machine of the class described, mechanism including a knife for slitting a welt, in combination with mechanism for inserting fastenings into the welt between successive slits, and a presser foot provided with a passage for guiding the fastening into the welt and with a guiding surface arranged to be engaged by the knife for determining the position of the slits.

13. In a machine of the class described, means for supporting and positioning a welt, in combination with welt slitting mechanism comprising a knife, a knife-carrying lever, an axially movable shaft upon which said lever is mounted, yielding means acting normally to move the knife into a position out of engagement with the welt, means acting in opposition to said yielding means to cause the knife to slit the welt and means whereby said shaft may be moved axially to put the slitting knife out of operative relation with the means by which it is caused to slit the welt.

14. In a machine of the class described, mechanism for attaching a welt progressively to a lasted shoe with one edge of the welt overlapping the edge of the shoe, in combination with a work support, a welt support having a relatively thin end and being constructed and arranged for movement horizontally toward and from the work support, a spring tending constantly to press the end of the welt support toward the work support and against the upper of the shoe, and means through which the welt support may be retracted against the resistance of the spring and locked in inoperative position.

15. In a machine of the class described, the combination with mechanism for attaching a welt to a lasted shoe of guiding means

including a guide for the shoe and a guide
for the welt constructed and arranged to
position the welt at the attaching point with
one edge of the welt overlapping the edge
5 of the shoe and means independent of said
guiding means for supporting the overlap-
ping edge of the welt constructed and ar-
ranged to bear, when in operative position,
against the under side of the welt and
10 against the upper of the shoe, said sup-

porting means being movable into and out
of operative position without affecting the
action of said guiding means.

In testimony whereof I have signed my
name to this specification in the presence of 15
two subscribing witnesses.

LOUIS A. CASGRAIN.

Witnesses:

FREDERICK L. EDMONDS,
ELIZABETH C. COUPE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."