

W. A. BOND.
MACHINE FOR INSERTING FASTENINGS.
APPLICATION FILED MAY 5, 1908.

1,014,940.

Patented Jan. 16, 1912.

2 SHEETS—SHEET 1.

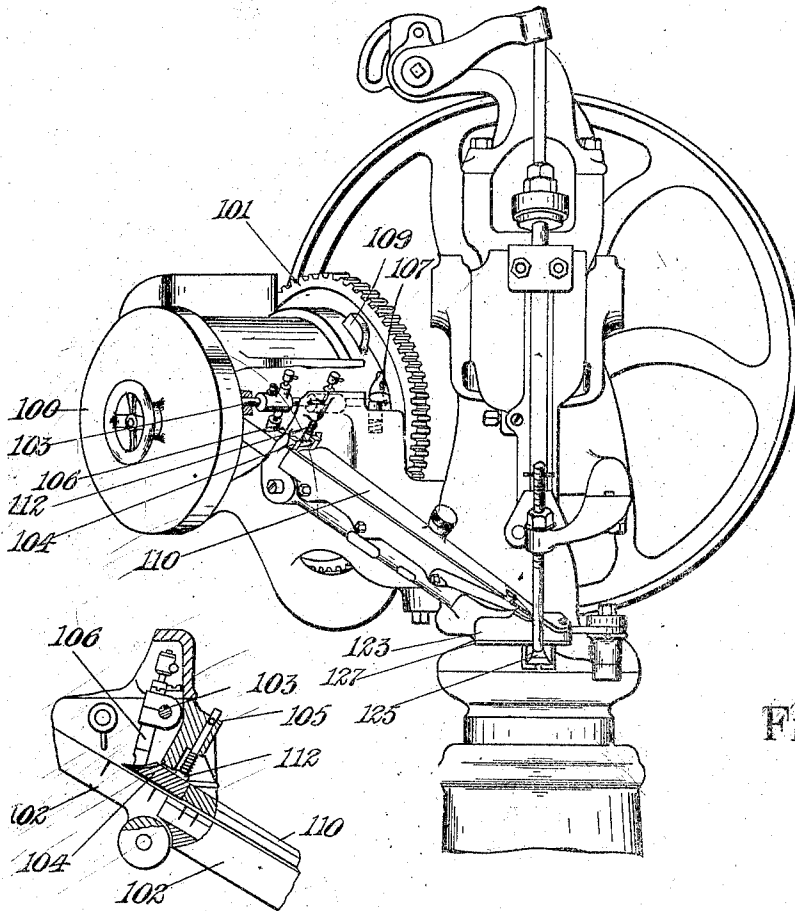


Fig. 1.

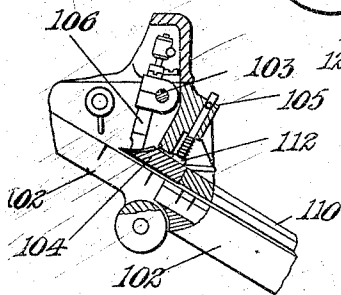


Fig. 2.

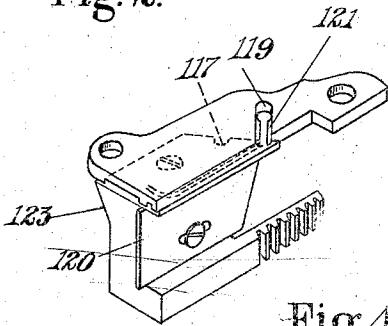


Fig. 4.

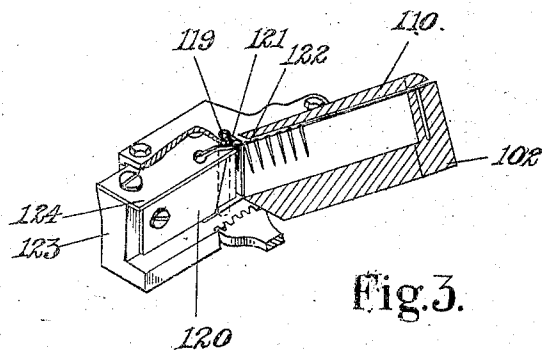


Fig. 3.

WITNESSES:

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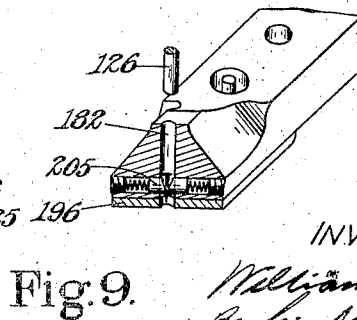
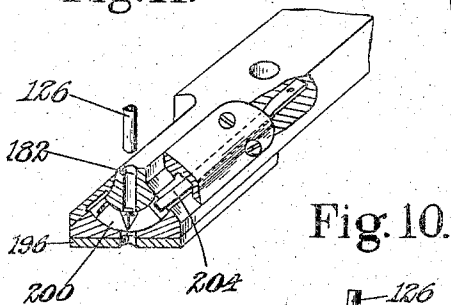
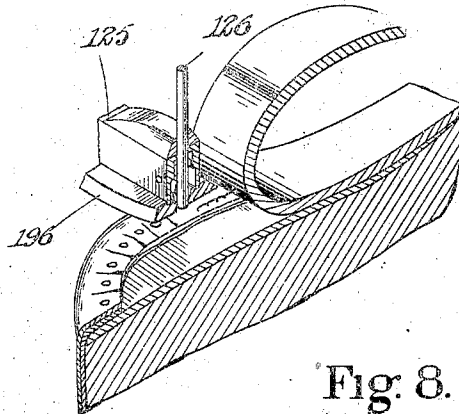
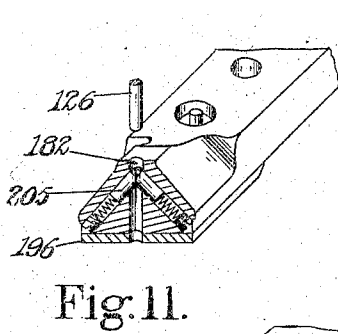
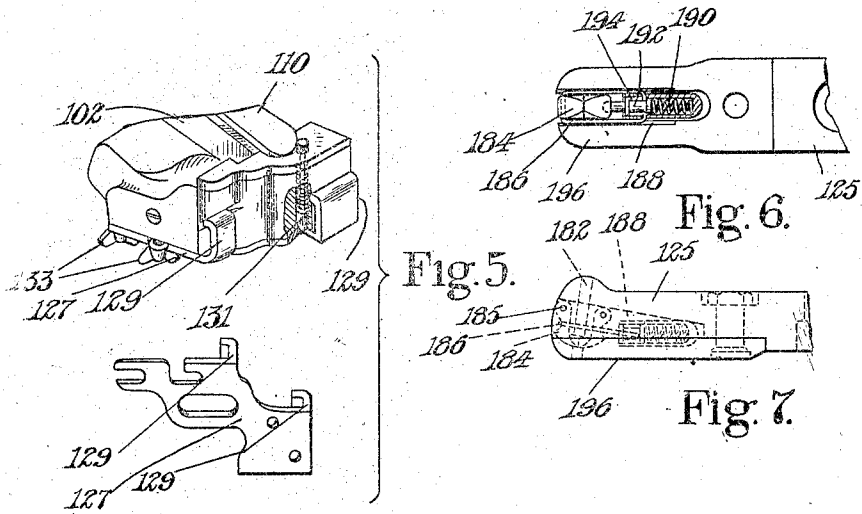
William A. Bond
By his Attorney
Robert M. Howard

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MACHINE FOR INSERTING FASTENINGS.
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2 SHEETS—SHEET 2.



WITNESSES.

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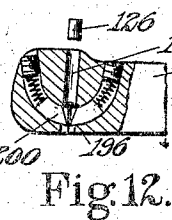


Fig. 9.

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UNITED STATES PATENT OFFICE.

WILLIAM A. BOND, OF LYNNFIELD, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

MACHINE FOR INSERTING FASTENINGS.

1,014,940.

Specification of Letters Patent.

Patented Jan. 16, 1912.

Original application filed February 25, 1907, Serial No. 359,081. Divided and this application filed May 5, 1908. Serial No. 431,010.

To all whom it may concern:

Be it known that I, WILLIAM A. BOND, a citizen of the United States, residing at Lynnfield, in the county of Essex and Commonwealth of Massachusetts, have invented certain Improvements in Machines for Inserting Fastenings, 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 to machines for inserting fastenings and the particular embodiment thereof herein selected for illustration comprises tack supplying and driving mechanism for a lasting and nailing machine. This mechanism includes a hopper, a raceway, a tack separating mechanism, and a holder to receive the separated tack and present it in position to be driven.

The invention has for its general objects to provide for a more certain and accurate supply and delivery of the fastenings than has heretofore been secured, to provide means by which the fastenings can be inserted in certain particular positions in the manufacture of shoes, to render the supplying mechanism more durable and to make provision for readily gaining access to certain portions of the mechanism that require frequent cleaning.

As herein shown the raceway is inclined downwardly from the hopper to the tack-separating mechanism to cause the tacks to travel along it by gravity. The tacks are supported by their heads in the inclined raceway and, therefore, usually stand with their stems hanging obliquely downwardly and backwardly.

A feature of this invention consists in providing means for presenting the tacks to the tack-separating mechanism with the stem of the tack to be separated and the stem of the tack next above it diverging one from the other so that the separator blade may more readily pass between the two tacks.

To this end the invention contemplates the provision of a raceway having at its delivery end a raceway section or separating table comprising tack-supporting surfaces at an angle to the tack-supporting surfaces of the adjacent section, so that the stems of the tacks on the respective sections will diverge.

As herein shown, a separating table is provided having horizontal head-supporting surfaces upon which the tacks pass from the inclined raceway and which cause the stems of the tacks to assume a vertical position by gravitation. Preferably the separating table is arranged with relation to the tack-separating mechanism so that the separator blade passes between the lowermost tack on the inclined portion of the raceway and the adjacent tack on the horizontal guide. The raceway preferably contains one or more grooves from which the tacks are delivered to the lower section or the tack-separating table, when one of the grooves is in suitable relation to the receiving groove in the table. This receiving groove in the table may be in alinement with the raceway groove or it may be inclined relatively thereto. In the former case I obtain the best results by making the separator blade with a separating face inclined at an angle of about 30° toward its direction of longitudinal movement. This arrangement gives, however, a long slender separating blade which is less durable than a shorter and blunter blade would be. I may, therefore, incline the receiving groove of the table with relation to the delivering groove of the raceway as, for example, at about 30° and this allows the face of the blade to be inclined at an angle of about 60° to the direction of its longitudinal movement and still have with reference to the receiving groove the same angular relation so that the tack is urged along that groove at the same rate as by the sharper blade. This blunter blade is easier to make and will wear longer than the more slender one.

In the use of the machine misshapen tacks and foreign substances sometimes get into the tack-separating mechanism and for this and other reasons it is quite frequently necessary for the operator to gain access to the covered parts of the mechanism. I have, in accordance with one feature of the invention, provided for holding this mechanism in assembled relation upon the raceway by novel means which will permit the separating mechanism to be quickly attached and disconnected without the use of any tools or the removal of fastening devices. As shown, this holding means comprises a supporting member between which and the raceway car-

rier the separating mechanism has a sliding fit combined with devices for automatically positioning said mechanism when it is moved approximately to correct position and devices for clamping said mechanism in place.

The tacks which are forced along the receiving groove by the separator blade ultimately fall into a tack holder which is movable from receiving position outwardly into tack-driving position over the work.

In making turn shoes having tacked heel seats the upper is fastened to the heel seat piece after the shoe is turned. In order to do this the heel end of the sole is bent upwardly, the upper wiped inwardly under it, and the tacks are driven in a line from the end of the seam connecting the sole and upper at the shank on one side of the shoe to the beginning of the seam at the shank on the other side of the shoe. In order to drive the tacks as near as possible to the end of the seam it is necessary that the tack block should be narrow to enable it to present the tack close to the upturned sole.

A feature of this invention consists in a novel construction of tack block which is particularly adapted for tacking in such positions as that closely adjacent to the ends of the seam and is also well adapted for tacking the other portions of the shoe. In the embodiment herein shown of this feature of the invention the tack block comprises a narrow carrier having a longitudinal recess in which tack fingers are mounted one in advance of the other and arranged for movement in opposite directions lengthwise of the carrier for permitting the tacks to be expelled between them. A single endwise-acting spring is employed for pressing the two tack fingers together, connections being provided for this purpose between one end of the spring and one finger and between the opposite end of the spring and the opposed finger. By this arrangement and construction of the tack fingers and their spring a narrow block can be obtained by which a tack can be driven very close to the end of the inseam. For further adapting this tack holder to position a tack close to the end of the inseam the holder is made tapering in transverse section, the greater width being at the bottom where the holder can fit under the upwardly bent heel end portion of the sole. Preferably also the tack holder is provided on its lower side with a wiper and this wiper has downwardly and outwardly inclined edges. The wiper thus presents a work-rubbing face wider than the tack holder and adapted to act upon the upper to force it into lasted position in the angle between the sole and the last bottom and close up to the end of the inseam. The wiper has a tack opening and is grooved lengthwise to receive and permit movement of the tack fingers. The raceway extends into the hopper

to receive the tacks and where it passes through the hopper means is provided for dislodging tacks that are incorrectly placed on the raceway and for agitating the line of tacks in the hopper-contained section of the raceway. This means comprises a clearer which is oscillated lengthwise of the raceway and is longitudinally extensible so that it presses yieldingly upon the upper edge of the raceway and pushes back the line of tacks as it is moved up the raceway. A block is provided which forms a close fitting cover under which only those tacks are allowed to pass which are properly placed and the block has a guiding surface over which the clearer slides as it approaches the level of the raceway to dislodge the tacks that are not correctly placed. This block is preferably so mounted that it can be readily removed to allow the raceway to be cleared. The movement of the clearer over the guide tends to tilt it and causes it to wear the adjacent face of the hopper, which is of softer metal, until the block becomes loose so that misplaced tacks sometimes pass under it and clog the raceway. The present invention contemplates the provision of a yielding locking device for the guide block so arranged as to resist the tendency of the clearer to tilt the guide block. By the use of this device wear of the block and hopper is decreased and liability of misplaced tacks clogging the raceway is reduced. The locking device also serves to hold the block from accidental removal.

These and other features of the invention, including certain combinations of parts and details of construction, will be explained more fully in the following description, and in connection with the accompanying drawings, and pointed out in the claims.

Figure 1 is a front elevation of the machine. Fig. 2 is a detail of the tack clearing means. Fig. 3 is a perspective view of the tack separating mechanism. Fig. 4 shows a modification. Fig. 5 shows the removable end block. Fig. 6 is a bottom elevation of the tack holder. Fig. 7 is a side view. Fig. 8 is a transverse section. Figs. 9, 10, 11, and 12 show modifications.

The hopper 100, which is supported on the frame of the machine, contains rotary tack lifting devices that are driven through the toothed wheel 101 from the main shaft of the machine. The raceway 102 extends into the hopper and tacks are supplied by the lifting devices in large numbers to this inclosed portion of the raceway. Those which fall upon the raceway in such position that they become suspended by their heads upon the supporting faces of the raceway slide by gravity to and along the outer portion of the raceway to the tack-separating mechanism. At the point where the raceway passes through the wall of the hopper it is

covered by a block 104, which has in its lower face a groove for the heads of the tacks and permits only those tacks which are properly arranged in alignment to pass thereunder. At the inner side of this block an oscillating tack clearer 106 is arranged on a rocking shaft 103 that has an arm 107 to be engaged by cams 109 on the wheel 101. The clearer sweeps upwardly along the raceway for pushing back misplaced tacks and then, as it retreats, it lets the tacks slide freely under the block. The clearer is mounted movably in its holder and pressed yieldingly toward the raceway. The front face of the block 104 is concave, as shown in Fig. 2, and forms a guide for the clearer as it moves toward and from the raceway. The block fits snugly between the upper side of the raceway and the lower side of the raceway hole in the hopper and is normally held from sliding out of place by the removable cover 110 which fits over the outer portion of the raceway. It frequently happens, however, in the use of the machine that it is necessary to remove this cover in order to give access to the raceway, and when this is done the block 104 is liable to be forced out of position by the clearer. To insure against this occurrence a device 112 is provided for holding the block 104 against displacement. This holding device is shown as a spring-pressed plunger mounted in a fixed portion of the hopper and having an operating handle engaging a cam face 105 which is formed to retain the holder in an elevated position when the holder is lifted and turned by the operating handle. The holder is arranged to bear yieldingly upon the upper face of the block near its outer end and thereby serves another purpose in resisting the tendency of the clearers in their intermittent movement to rock the block and cause it to wear the relatively soft cast iron of the hopper which would allow the block to become loose and unsatisfactory in use.

The main portion of the raceway is inclined, as shown, to cause tacks suspended by their heads on its upper surface to slide down by gravity. At the delivery end of the raceway is arranged tack-separating mechanism comprising, as shown in Fig. 3, a gate 120 and a reciprocatory blade 124 for separating the lowermost tack in the raceway from those above it. The portion below the separating blade is conveniently formed as a removable end block. The upper faces 121 of the end block form a supporting table upon which said lowermost tack is sustained by its head and these faces are arranged at an angle to the head-supporting surfaces 122 of the main portion of the raceway so that the stem of the tack to be separated will hang at an angle or diverge from the stem of the next tack above it and, therefore, provide a wider space for the passage of the

separating gate than would be provided by tack stems hanging parallel to each other. Preferably the faces 121 will extend horizontally, but any inclination relative to the raceway that would cause the stems to diverge as described would be advantageous. After the separator gate passes between the tacks the separated tack is forced by the slotted plate 124 into a position where it may fall through the vertical delivery passage 119 into the reciprocating tack holder 125 from which it is inserted into the stock by a driver 126 actuated by a usual spring not shown. It will be observed that the tack groove in the end block is in line with the raceway groove in Fig. 3 and the separator blade 124 has a sharp slender finger formed by the inclined slot in its inner edge. The best results are obtained when the inclination of this slot is about 60° to the tack groove in the end block, or about 30° to the direction of the reciprocating movement of the blade. The separating finger is subjected to constant wear and I have shown in Fig. 4 a modified arrangement in which the tack groove 121 in the end block below the separator blade is formed at an angle of about 30° to the groove in the raceway and the transferring edge of the blade, having the notch 117 to permit the passage of the head of the tack, is formed at an angle of about 60° to the direction of its movement. This still gives an angle of about the same size (60 degrees) between the groove and the slot in the blade so that the advance of the tack along the groove is the same as before, but the separating finger is blunter and therefore more substantial and durable. The separating table and the end block 123 of the raceway form, with the end face of the raceway section 102, a guideway for the separator blade which is actuated endwise by suitable connections with the tack holder 125.

The end block and its associated parts are, as shown in Fig. 5, removably held in place by a supporting plate 127 provided with holding members 129 having tongue and groove connections with the end block and a locating recess to receive the spring-pressed locating pin 131 having a beveled lower end. The supporting plate 127 is itself clamped to the raceway carrier by thumb bolts 133 which extend through open ended slots in the plate and permit the plate itself to be removed when they are loosened. It is not necessary, however, to remove the plate in order to remove the end block. When the clamping thumb nuts are loosened they have sufficient play in their slots to permit the removal of the block without entirely removing the plate. When the block is replaced it is simply slid endwise to the left (Fig. 5) behind the holding members 129 until the pin 131 snaps into the hole in

the plate whereupon the block and its supporting plate are pressed inward and the thumb nuts tightened to clamp the block in position against the raceway support.

5 The tack holder 125, which is actuated by suitable mechanism forwardly from receiving position directly under the separating mechanism into position over the work into which the tack is to be driven, is shown
10 more in detail in Figs. 6, 7, and 8. The holder has a tack and driver passage 182 in which a tack may be supported by the fingers 184, pivoted at 185 in the fore part of a longitudinal groove 188. The fingers
15 are arranged one in advance of the other, as shown, to allow the tack holder to be made narrow. This is particularly desirable in machines used for lasting the heel seats of turn shoes, for in this work, in
20 which the tack holder is advanced over the shoe bottom into position for the tack therein to be driven for securing the upper in its overworked position, it is necessary that the tack holder advance under the upturned
25 heel end of the sole and drive tacks as close as possible to the angle between the sole and the end of the inseam. The fingers 184 are yieldingly held pressed together to support the tack, but allow the driver to force the
30 tack therebetween, by means which includes a loop 186 seated in a groove in the front finger and extending rearwardly with its side arms embracing the sides of the fingers. The rear ends of the side arms are intumed
35 to form hooks that extend through the walls of a spring case and terminate between two collars on a plunger 192. The plunger is engaged by a spring 190 seated in the case and the front end of the plunger rests in a
40 recess in the back side of the rear finger 184. With this arrangement the one spring 190 acting in one direction through the loop 186 and in the reverse direction through the plunger 192 holds the two fingers yieldingly
45 toward each other with equal forces. The ends of the loop stand in the space 194 between the case and the reduced portion 192 of the plunger and by limiting the forward movement of the plunger center the two tack
50 fingers with relation to the driver passage 182. Not only is the tack holder made narrow by arranging the tack fingers and their associated parts as described, but the side faces of the holder are inclined upwardly
55 and inwardly toward each other, as shown in Fig. 8, to conform them to the position of the upwardly bent face of the sole and allow a tack to be driven as close as possible to the end of the inseam. Preferably
60 and as shown, the tack holder carries on its lower side a wiper 196 which is the device that forces the upper into position to be secured, or assists in doing so. The edges of this wiper are inclined like the sides of the
65 holder so that the wiper has a broad lower

working face that can extend laterally beyond the tack holder and reach under the turned up sole where it acts upon the upper quite close to the end of the inseam.

In the modification shown in Figs. 10 and 12 the tack supporting fingers 200 are
70 formed as segment-shaped blocks arranged to slide in correspondingly shaped guide-ways. In Fig. 12 the tack fingers are ar-
75 ranged one in advance of the other lengthwise of the tack holder and are held in tack-supporting position by suitable coiled springs. In the construction shown in Fig.
80 10 the tack fingers are arranged transversely of the block and are held in position by leaf springs 204. In both Figs. 10 and 12 the tack fingers are arranged to slide outwardly and upwardly with relation to the driver
85 passage to permit the tack to be driven. In Fig. 11 the tack fingers are shown as spring-pressed plungers 205 arranged to slide downwardly and outwardly in guideways
90 extending obliquely with relation to the driver passage 182. In Fig. 9 the fingers or plungers 205 slide horizontally outwardly as the driver forces the tack downwardly.

In the use of the machine the tack lifting devices deposit tacks upon the portion of the raceway that is within the hopper. Those
95 tacks that enter the raceway groove properly slide under the block 104 and those that gather at the entrance are dislodged by the clearer 106, the shaft of which receives an
100 intermittent rocking motion from the wheel 101. The clearer sweeps forth and back over the block, which is securely held in place by the plunger 112, even when the
105 raceway cover is removed and if it becomes necessary to gain access to the portion of the raceway groove that is covered by the block 104 the handle of the plunger is
110 forced over the cam face 105 to free the block. As the endmost tack in the groove slides upon the separating table its shank is caused, by the inclination of the faces 121
115 relative to the faces 122, to swing by gravity forwardly away from the shank of the next tack so that the stems of the tacks are automatically separated to provide an entrance
120 for the gate 120. The separator blade in its next advance, in time relation to the backward movement of the tack holder toward receiving position, pushes the separated tack
125 toward and to the outer end of the groove in the separating table and discharges it through the passage 119 into the tack holder. Should a misshapen tack or other
130 obstruction clog the separating mechanism the end block with the gate and blade can be removed by pushing it toward the right in Fig. 5 relatively to the holding members 129
135 with sufficient force to overcome the spring acting upon the locating plunger, first loosening the winged clamping bolts 133. Reverse movements restore the parts to op-

erative position, the plunger 131 automatically locating them correctly. The tack holder in its advance movement carries the tack which it has received into inserting position under the driver and over the work which may be held against a suitable edge rest. When the tack holder is provided with the wiper the latter works or presses the stock over the last into position to be secured by the tack. When working next to the upturned heel end of the sole of a turn shoe the tack holder and wiper by reason of their particular shape are adapted to overwork the upper and to insert a tack very close to the end of the in seam, thus leaving so little space between the seam and the first tack that the upper will not pull away or be crowded outwardly by the pressure in the heel attaching operation or otherwise.

Certain features of this invention are shown and described but not claimed in my prior application Serial No. 359,081, from which they have been divided for presentation herein.

Having explained the nature of my invention and described a mechanism embodying the same, I claim as new and desire to secure by Letters Patent of the United States:—

1. In a machine of the class described, tack-supplying and driving mechanism comprising a raceway, means for supplying the raceway with tacks, an oscillating clearer for removing misplaced tacks from the raceway, a guide over which the clearer slides, yielding means 112 for holding the guide from movement by the clearer and a cam 105 to hold the said yielding means in inoperative position.

2. In a machine of the class described, the combination with the hopper, the tack-lifting devices, the wheel 101, the cams 109, the rock shaft 103 having the arm 107, the clearer 106, the clearer guide 104, and the holder 112 having a spring to force it into operative position and a cam to lock it in inoperative position.

3. In a machine of the class described, a raceway section having a tack guiding slot, a second raceway section having the tack guiding slot 121 extending at an angle to the slot in the first section, and the tack separating plate having a face inclined at substantially the same angle to each of the slots for forcing the tack through the slot 121.

4. In a machine of the class described, the combination with a raceway of a removable end block, a support upon which the end block is rested and guided for movement bodily transversely of said raceway into and out of operative position, and means for automatically stopping and holding the end block when it reaches correct adjusted relation to the raceway.

5. In a machine of the class described, the combination with a raceway and its carrier of a removable end block, a support upon which the end block is mounted and is movable bodily to position the block in operative relation to the raceway, locating means to facilitate positioning the block in operative relation to the raceway grooves, and additional means for clamping the block so located.

6. In a machine of the class described, the combination with the raceway, of the removable end block, the support 127 provided with the fingers 129 having tongue and groove engagement with the end block, and the spring-pressed locating plunger 131.

7. In a machine of the class described, the combination with the raceway, of the removable end block, the supporting plate 127 having means for determining the position of the end block thereon and provided with open-ended slots, and the thumb bolts 133 extending through said slots into the raceway to clamp the plate in place, said parts being constructed and arranged to permit the removal of the plate and block when the clamping bolts are loosened.

8. In a machine of the class described, the combination with tack-supplying means and a driver, of a tack holder movable transversely of the path of the driver from tack-receiving position to tack-inserting position and tapering from the lower portion to the upper, and tack fingers arranged one in advance of the other and mounted for relative movement lengthwise of the holder.

9. In a machine of the class described, the combination with tack-supplying means and a driver, of a tack holder comprising a tapering block decreasing in width toward the top and channeled lengthwise, tack fingers supported in said channel one in advance of the other, and finger controlling means located in the wider lower portion of the block.

10. In a machine of the class described, the combination with tack-supplying means and a driver, of a tack holder comprising a tapering block having a wide base decreasing in width toward the top and channeled lengthwise, and tack fingers supported in said channel one in advance of the other, said block being provided with a tack and driver passage in alignment with the tack fingers.

11. In a machine of the class described, the combination with a driver, of a tack block comprising two tack fingers, a spring, a casing for the spring, a plunger mounted in the casing and actuated by the spring to press against one finger, and a connection between the spring casing and the other tack finger.

12. In a machine of the class described, the combination with tack-supplying means

and a driver, of a tack holder comprising a tapering block decreasing in width toward the top, and tack fingers arranged one in advance of the other in said block and arranged, to be displaced lengthwise of the block and also vertically to permit the driver to insert the tack.

13. In a machine of the class described, the combination with a driver, of a tack block comprising two tack fingers, a spring, a casing for the spring, a plunger mounted in the casing and actuated by the spring to press against one finger, and a loop inclosing the two fingers and connecting the second finger to the casing.

14. In a heel seat lasting machine a reciprocating tack holder movable over the shoe bottom and formed to insert tacks under the upturned heel seat end of the sole adjacent to the end of the inseam, said holder having a broad lower face and tapering toward a narrow upper face.

15. In a heel seat lasting machine a reciprocating tack holder movable over the shoe bottom and formed to insert tacks under the upturned heel seat end of the sole adjacent to the end of the inseam, said holder having a broad under surface and having its opposite sides inclined toward a narrow upper surface.

16. In a machine of the class described, the combination with a raceway, a tack-delivering vertical passage and a tack-transferring horizontal passage extending from said raceway to said vertical passage, of tack-separating means having a separating and transferring edge inclined laterally relatively to the raceway, said horizontal passage being also so inclined laterally to said raceway that it contributes to the tack-separating function of said separating means.

17. In a machine of the class described, the combination with a tack raceway and a tack-receiving passage, of means for effecting a separation of the tack from said race-

way and the delivery thereof to said receiving passage comprising a separator operating transversely to said raceway and having a tack-separating and transferring edge inclined to its direction of movement at an angle greater than 45° and means for increasing the separating efficiency of said separator and at the same time increasing its tack-transferring efficiency comprising a horizontal tack-transferring passage extending from said raceway to said receiving passage and inclined to said raceway.

18. In a machine of the class described, a raceway, a tack-separating mechanism having the tack-delivering passage 119 and comprising a tack-transferring passage having the supporting walls 121, and the separator having a straight inclined separating and transferring edge with the notch 117 intermediate its ends.

19. In a machine of the class described, a raceway, a tack separating mechanism provided with a tack delivering passage, a tack transferring passage and a separator having a separating and transferring edge arranged at an angle to said transferring passage of substantially 60° , said transferring passage and said edge being equally inclined to the raceway.

20. In a machine of the class described, the combination with a raceway of a member having a tack transferring passage and a relatively movable member having a tack separating and transferring edge, said passage and said edge being laterally inclined to a vertical plane passing through the raceway and disposed on opposite sides of said plane.

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

WILLIAM A. BOND.

Witnesses:

ARTHUR L. RUSSELL,
ELIZABETH C. COUPE.