

Feb. 11, 1936.

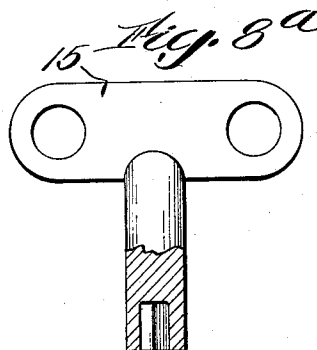
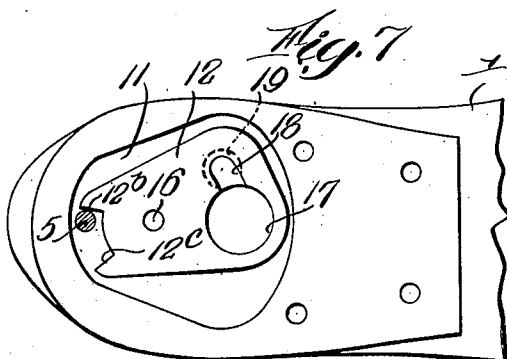
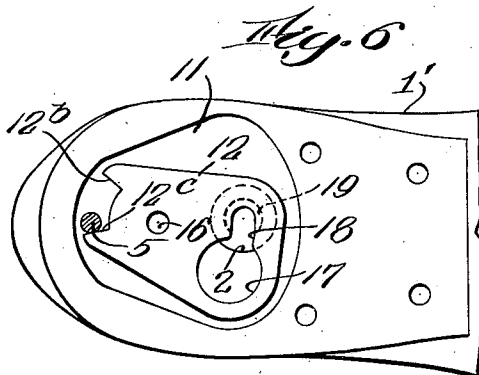
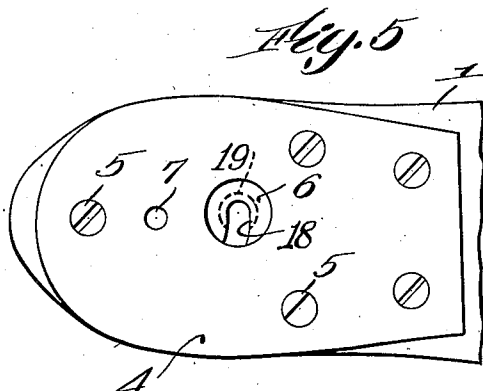
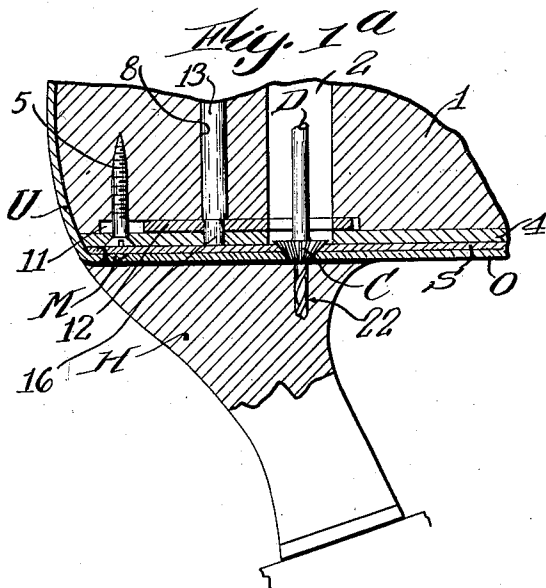
M. CUOZZO

2,030,139

METHOD OF AND APPARATUS FOR ATTACHING SHOE HEELS

Filed Jan. 10, 1934

3 Sheets-Sheet 2



Inventor
Michael Crozzog
By Robert Kishman & Bookbinder
his Atty's.

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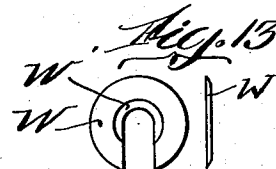
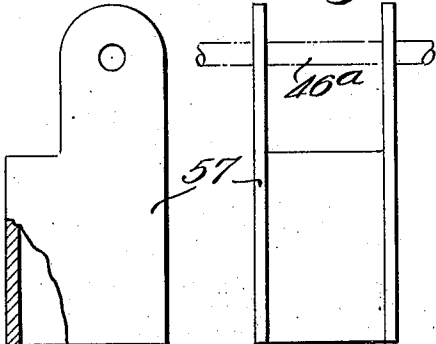
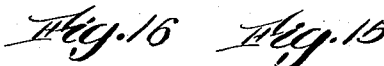
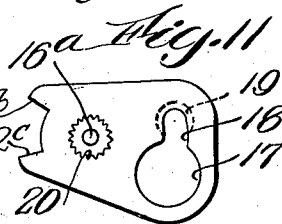
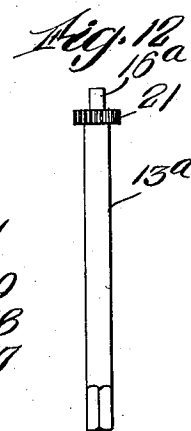
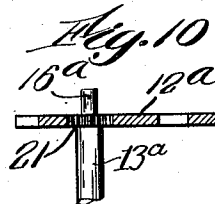
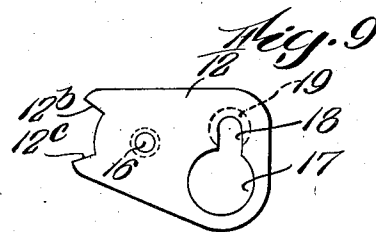
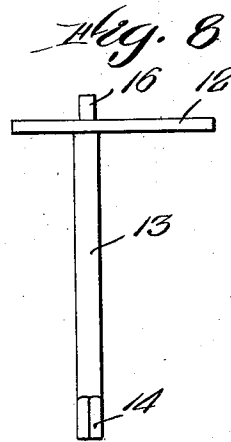
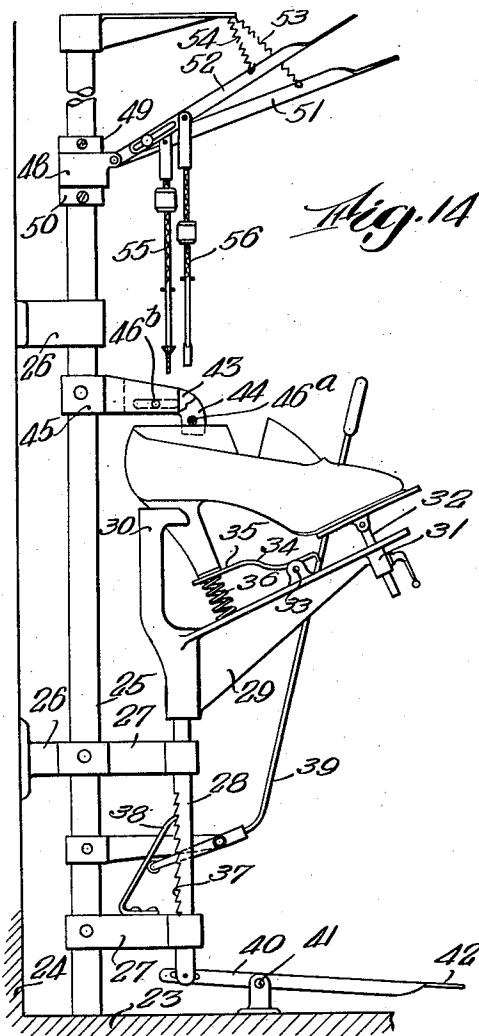
M. CUOZZO

2,030,139

METHOD OF AND APPARATUS FOR ATTACHING SHOE HEELS

Filed Jan. 10, 1934

3 Sheets-Sheet 3



Inventor
Michele Cuozzo
By Robert Cushman & Associates
705 100th St.

UNITED STATES PATENT OFFICE

2,030,139

METHOD OF AND APPARATUS FOR
ATTACHING SHOE HEELS

Michele Guozzo, Lynn, Mass., assignor to United
Shoe Machinery Corporation, Paterson, N. J.,
a corporation of New Jersey

Application January 10, 1934, Serial No. 706,000

23 Claims. (Cl. 12—147)

This invention relates to the attachment of heels to shoes, it having special utility in connection with the securing of wood heels by fastening means applied within the shoes, and, when an adhesive is employed, assisting in effecting a more perfect adhesive union.

In work of this character, it is a well-known practice to apply a temporary fastener to a lasted shoe and its heel to draw these elements together, and then, at a later time, as after an adhesive interposed between the heel-seat of the shoe and the heel-cup has hardened, to remove this temporary securing means and substitute a permanent fastener.

An object of my invention is to simplify and render more efficient the above-indicated procedure. To this end and in an improved method of heel-attaching, I utilize the same fastener, as a wood screw, to perform both temporary and permanent securing operations. First, it may be caused to urge the heel, shoe and its contained last toward one another, as by its entrance into the heel and the reaction of a head which it bears against a part of the last. Then, after the desired interval, which, for example, may be sufficient for the heel-securing adhesive to set, and during which various making operations may be performed upon the work, the last is released from the fastener, which is thereupon employed as a part of the shoe-structure. Preferably, to receive the fastener initially, a hole is drilled through the shoe-bottom into the heel, and to protect the heel-seat-material against being cut by the fastener during the final attaching operation, a washer may be inserted between the fastener-head and the inner surface of the heel-seat after the last has been released from the fastener.

The invention has as another object the provision of means by which my improved method may be performed. This comprises, more essentially, a last through the heel-seat portion of which opens a passage to receive the fastener which is to be used, there being mounted at the heel-seat end of the passage a member which is movable upon the body of the last into and out of position to be engaged by the fastener. Thus, for the step of temporary attachment of a heel, the member may be caused to assume a relation in which a portion of the fastener, as its head, may contact with the member; while for the permanent use of the fastener, the member may be moved from its retaining position so the last may be removed from the shoe, and the fastener set firmly in the work. Herein, the member is shown as movable in a space between the last-body and

a heel-plate secured thereto, it containing an opening, one portion of which will permit the fastener-head to pass, while another will retain said head, and thus furnish an abutment to which the reactive force of the fastener is applied.

Herein, I have disclosed certain steps in the process and one embodiment of apparatus desirable for use in carrying the process into effect, but wish it to be understood that other and equivalent apparatus may be employed for the purpose, and that other and equivalent process steps may be substituted for those specifically illustrated and described herein. Another species of the apparatus is made the subject of an application for Letters Patent, filed in my name in the United States Patent Office on July 16, 1935, the Serial No. being 31,647.

In the accompanying drawings:

Fig. 1 is a fragmentary longitudinal section showing the rear portion of a last with parts of a shoe mounted thereon, the last being provided with devices useful in carrying out the present process, the parts being arranged in the position which they occupy when a heel has first been attached to the shoe;

Fig. 1a is a view similar to Fig. 1, illustrating the drilling of the hole in the work for the accommodation of the fastener;

Figs. 2 and 3 show respectively in fragmentary longitudinal sections through the shoe and heel after the last has been removed, the position of the partially set fastening and said fastening in its final position;

Fig. 4 is a top plan view of the rear part of a completed shoe, made in accordance with the present invention, showing the slip sole broken away to uncover the head of the heel fastening;

Fig. 5 is a fragmentary bottom plan view of a last for carrying out the present invention;

Fig. 6 is a fragmentary bottom view of the last of Fig. 5 but with the metal heel plate removed, and the screw-engaging plate of my invention in the position which it occupies during the initial driving of the fastener, this corresponding to Fig. 1;

Fig. 7 is a view similar to Fig. 6 but with the plate positioned to permit withdrawal of the last from the shoe;

Fig. 8 is a side elevation of the plate and its actuating stem;

Fig. 8a is a side elevation, partly in section, of a key for actuating the plate;

Fig. 9 is a plan view corresponding to Fig. 8;

Fig. 10 is a view similar to Fig. 8 but showing a modified construction;

Fig. 11 is a plan view corresponding to Fig. 10;

Fig. 12 is an elevation of the actuating stem of Figs. 10 and 11;

Fig. 13 includes both a plan view and an edge elevation of a contact washer which may be employed in connection with the heel-attaching fastening here illustrated;

Fig. 14 is a side elevation of a machine useful in performing my improved method; and

Figs. 15 and 16 are a front and a side elevation, respectively, of a clamping element, useful at times, for holding a shoe during certain steps of my process.

Referring to the drawings, the numeral 1 designates a shoe last which may be of the usual type except for such modified details of construction as are hereinafter described as pertaining to the present invention. In this last is a spindle hole 2, preferably provided with a metallic liner 3, and the rear part of the last is furnished with a nail clenching plate 4 which may be secured by screws 5. This plate is provided with a central opening 6 commonly used to permit the rear assembling tack to be driven into the wood of the last. In accordance with this invention the opening 6 is in axial alignment with the spindle hole 2. The plate 4 is also furnished with a bearing opening 7 here shown as located between the rear fastener 5 and the hole 6. At the rear of the last is a bore 8 extending vertically through the top 9 of the cone, this bore being provided with an enlargement 10 adjacent to the surface 3.

Between the plate 4 and the body of the last is a shallow cavity 11 (Figs. 6 and 7) for the reception of a movable abutment plate 12. This plate, as illustrated in Figs. 8 and 9, is fixedly united to a stem or shaft 13 which is journaled in the opening 8 in the last. The stem projects into the enlargement 10 of the opening 8, where it is arranged for engagement by a key 15 (Fig. 8a). The stem 13 is preferably extended at 16 beyond the plate 12 and this extension 16 is journaled to turn in the opening 7 of the plate 4. The plate 12 has a slot or opening preferably of key-hole shape, having a substantially circular head portion 17 at one end and a narrow tail portion 18 extending laterally therefrom. This tail portion is curved on an arc concentric with the stem 13, and its extreme end may be countersunk or beveled, as shown at 19, at that side of the plate which is nearest to the top of the last.

As illustrated in Figs. 10, 11 and 12, the plate 12^a may be made independently of the stem 13^a and in this event I prefer to provide the plate with an opening 20 of preferably toothed contour and provide the stem with an enlargement 21 of similar contour and adapted to fit within the opening. The stem 13^a has a projection 16^a beyond the enlargement 21, adapted to turn in the opening 7 of the plate 4. This arrangement provides a reliable connection between the stem 13^a and the plate 12^a. In a preferred construction, the edge of the plate, whatever its connection to the stem, preferably has a pair of stop shoulders 12^b and 12^c which may cooperate with the rear screw 5 to limit the rotation of said plate in either direction.

My improved method may be carried out in connection with the described last substantially as follows: In Fig. 1a I have illustrated an insole S and an upper U assembled in lasted relation, with the margin M of the upper turned over onto the under surface of the insole and united thereto

by lasting tacks. The upper U, as here referred to, may be understood to include an outer element, a lining, doubler, and counter, if such parts be employed, and it will be understood that if the present invention be applied to shoes of other types, for example, turn shoes, wherein but a single sole is employed, the present method will be modified, as will be obvious to those skilled in the art, in such particulars as may be necessary to conform it to the particular type of shoe being made. As illustrated herein, the shoe may be considered as of McKay type, having an outer sole O secured to the lasted insole and upper, and the rear part of this outer sole may be beveled at its edges to provide a heel-seat for the concave upper surface of a wood heel H.

Having prepared the shoe by usual methods, as above outlined, and assuming that the shoe is otherwise ready for application of the heel, I next prefer to apply a coating of glue or other adhesive G (Fig. 1) to the heel-seat surface of the sole or to the cup of the heel, or to both, and having placed said heel in contact with the heel-seat of the sole, I clamp it firmly in place, preferably by mechanism such as hereinafter described. At this time the last I is within the shoe, and the next step in the process consists in introducing a drill D (Fig. 1a) through the spindle hole 2 of the last and causing said drill to form a bore 22 extending through the shoe bottom and into the heel H. The drill D may be provided with a counter-sink portion C adapted to form a beveled enlargement 22^a of the bore 22 where the latter passes through the heel-seat.

In using this combined drill and countersink the abutment plate 12 is arranged as shown in Figs. 1a and 7, the head 17 of the slot registering with the spindle opening 2 so the entire boring tool may pass through into engagement with the work. This adjustment of the plate may be accomplished by the application of such a tool as a key 15 to the end 14 of the stem 13. The boring having been completed, the plate is shifted to bring the tail 18 of the slot over the spindle opening, and such a fastening device or fastener, as a wood screw F (Fig. 2) having a slotted head E, is placed in the bore 22, for example with the assistance of a magnetic screw driver M. This screw is now turned until its head is set firmly against the abutment walls at opposite sides of the slot 18, the beveled surface of the seating upon the inclined wall 19 at the end of the slot. The screw F should be of such length and diameter as to provide a secure anchorage for the heel. Since a hole is first drilled in the heel for the reception of this screw, there is little danger of splitting the heel in inserting the screw, although the latter may be of substantial diameter and of considerable length. Since the head of the screw bears against the abutment plate 12 and since the latter is held against displacement within the last in the space 11, it is possible to so drive the screw as to exert a very powerful clamping action and to draw the heel firmly against the heel-seat with sufficient pressure to enable the glue, while setting, to develop its maximum holding power.

The screw driver is withdrawn from the spindle-hole 2 after the screw has been set in the position of Fig. 1, and the shoe may be now finished, including such further operations on the heel as may be necessary. When the shoe is substantially complete, the operator turns the stem 13, by means of the key 15, to swing the plate 12 back to the position shown in Fig. 7. If neces-

sary, the screw F may be backed off slightly so as to free the abutment plate to allow this movement. It is now possible to withdraw the last from the shoe, since the head E of the screw is free to pass through the head 17 of the keyhole slot in the plate. The screw F may now be turned into final position, and while it is not wholly necessary, by reason of the firm attachment of the heel to the shoe by the interposed glue, I prefer, in performing this final setting up of the screw F, to hold the heel firmly clamped against the heel-seat of the shoe. To distribute the strain imposed upon the sole by the head of the screw while the shoe is being worn, I may at this time insert a washer W (Fig. 13) which is slipped under the screw head E just before the latter is finally set. Preferably this washer has a countersink W' so that the screw head may be brought down flush with the upper surface of the sole member. The slip sole K (Fig. 4) is now inserted in the shoe in usual fashion, its rear end covering the head of the screw and the washer.

To assist in carrying out the above operations I may, if desired, provide a machine such as illustrated in Fig. 14. This machine comprises a base 23 having a substantially vertical standard 24 and a post 25 secured to the standard by brackets 26. On the post 25 are brackets 27 having aligned bearings for a vertically slidable jack spindle 28 on the upper end of which is mounted a shoe-supporting jack 29. This jack preferably has an upright portion 30 provided with a suitable pad for engagement with the rear surface of the shoe heel and with a bearing 31 for a vertically adjustable toe support 32. The jack also comprises a heel supporting member 34 pivoted at 33 to swing about a horizontal axis and having a rear portion 35 preferably furnished with a pad on which the heel of the shoe may rest. The part 35 rests upon a very stiff spring 36 adapted to allow slight yield of the shoe sufficient to avoid breakage of the heel during the operations to be performed. The jack spindle is furnished with a series of ratchet teeth 37 engaged by a pawl 38 to retain the spindle in vertically adjusted position, the pawl being disengageable from the teeth 37 by a lever 39. At its lower end the spindle 28 is pivotally connected to a tread-lever 40 fulcrumed at 41 between brackets carried by the base 23 and having a foot-pad 42 by which the operator may rock the lever and thus raise the jack.

Above the normal level of the jack 29, the post 25 carries a yoke 45 comprising spaced arms 43 and 44 adapted to engage the upper part of the last at the heel portion thereof. Preferably the end portions of the arms 43 and 44 are adjustable and may be retained in position by means of a bolt 46^b. A bar 46^a carried by the adjustable end portions of the arms is arranged to bear down upon the top 9 of the last cone. The yoke is constructed to withstand upward pressure, exerted by the operator through the treadle 42 and spindle 28. Above the yoke 45 is a sleeve 48 rotatable on the post 25 between a pair of fixed collars 49 and 50. The member 48 has fulcrumed upon it a pair of vertically movable levers 51 and 52 normally held up in inoperative positions by springs 53 and 54. The lever 52 supports a drill mechanism 55, which may be of the helical type or motor driven. This mechanism actuates the drill D. The lever 51 carries a screw driver mechanism 56 which may be helical or motor driven and includes the screw driver M. Since the member 48 may turn on the post 25, it is

readily possible to bring either the drill D or the screw driver M into vertical alignment with the spindle hole 2 of the last upon the jack 29, so that the drill and the screw driver may alternatively be placed in operative position. The levers 51 and 52 may comprise relatively adjustable parts to conform to shoes of different sizes. The mode of use of the machine is so obvious in view of the above description of the method, that it is not necessary to go into further detail.

As previously pointed out, it is desirable, when setting the screw F into its final position after withdrawal of the last, to clamp the heel firmly against the shoe bottom, and the mechanism shown in Fig. 14 may be used for this purpose as well as in the drilling of the heel and the initial setting of the screw. To facilitate the clamping of the heel during the final setting of the screw I may, if desired, provide an auxiliary clamping element 57 (Figs. 2, 3 and 15) which may, for example, be secured to the yoke 45 by means of the bar 46^a above described. This clamping member 57 is preferably of substantially U-shape in horizontal section and is adapted to fit within the rear part of the shoe with its lower edge resting against the upper surface of the insole, leaving a free space for the passage of the screw driver M. Thus in performing the final operation of setting the screw, the shoe from which the last has been removed is placed on the jack in the position shown in Fig. 14, and the jack is elevated until the insole is pressed against the lower edge of the member 57, as shown in Fig. 2. The heel is thus firmly held against the shoe and screw driver M may now be operated to set the screw to its final position without disturbing the adhesive joint. While it is possible to apply the clamping member 57 to the apparatus of Fig. 14 prior to each final setting of a retaining screw F, I may find it preferable, when making any substantial number of shoes, to provide two separate machines, one being furnished with the clamping member 57 but without the drill and screw driver, while the other has such operating mechanisms without the clamping device.

As an alternative mode of procedure, I may, instead of the movable abutment plate 12, provide the last with a fixed abutment. For example, the hole 6 in plate 4, may be of such diameter that its edges constitute an abutment for the head E of the screw F. In using such an arrangement, it would be necessary to back the screw all of the way out to permit removal of the last from the shoe, and the subsequent reinsertion of the screw in the hole already made in the heel (now firmly united to the shoe bottom by adhesive). The reinserted screw would then be set to final position, following the procedure already outlined and illustrated in Figs. 2 and 3, it being possible under the modified method to employ a washer of complete annular form. While this last described method results in a completed shoe having the same characteristics as that resulting from the first described procedure, it is somewhat slower, so I prefer the latter.

While I have illustrated one desirable form of apparatus I wish it to be understood that the invention is not limited to this particular embodiment but that other and equivalent means may be employed in carrying my invention into effect.

I claim:

1. That method of attaching heels to shoes which comprises as steps applying a heel to the heel-seat surface of a shoe mounted on a last, inserting a fastener element from the interior of

the shoe through the shoe bottom and into the heel, causing the fastener to react against a part of the last, thereby to draw the heel toward the last and to press the heel firmly into engagement with the heel-seat surface of the shoe bottom, thus maintaining such engagement of the heel and heel-seat while performing subsequent operations on the shoe, and employing said fastener as a means for permanently uniting the heel to the shoe bottom.

2. That method of attaching heels to shoes which comprises as steps applying a heel to the heel-seat surface of a shoe mounted on a last, having first interposed an adhesive between the opposed faces of the heel and the heel-seat, inserting a fastener element from the interior of the shoe through the shoe bottom and into the heel, causing the fastener to react against a part of the last, thereby to draw the heel toward the last and to press the heel firmly into engagement with the heel-seat surface of the shoe bottom, thus maintaining such engagement of the heel and heel-seat until the adhesive has set, and employing said fastener as a means for permanently uniting the heel to the shoe bottom.

3. That method of attaching heels to shoes which comprises as steps applying a heel to the heel-seat surface of a shoe mounted on a last, having first interposed an adhesive between the opposed faces of the heel and heel-seat, inserting a fastener element from the interior of the shoe through the shoe bottom and into the heel, causing the fastener to react against a part of the last, thereby to draw the heel toward the last and to press the heel firmly into engagement with the heel-seat surface of the shoe bottom, thus maintaining such engagement of the heel and heel-seat until the adhesive has set, removing the last, and thereafter causing the same fastener to react directly against the shoe bottom, so as mechanically to unite the heel to the shoe.

4. That method of attaching heels to shoes which comprises as steps applying a heel to the heel-seat surface of a shoe mounted on a last, having first interposed an adhesive between the opposed faces of the heel and heel-seat, inserting a headed fastener from the interior of the shoe through the shoe bottom and into the heel, causing the head of the fastener to react against a part of the last, thereby to draw the heel toward the last and to press the heel firmly into engagement with the heel-seat surface of the shoe bottom, maintaining such engagement of the heel and heel-seat until the adhesive has set, thereafter disengaging the head of the fastener from the last and withdrawing the last from the shoe, and employing said fastener for permanently uniting the heel to the shoe bottom.

5. That method of attaching heels to shoes which comprises as steps applying a heel to the heel-seat surface of a shoe mounted on a last, having first interposed an adhesive between the opposed faces of the heel and heel-seat, inserting a headed fastener from the interior of the shoe through the shoe bottom and into the heel, causing the head of the fastener to react against a part of the last, thereby to draw the heel toward the last and to press the heel firmly into engagement with the heel-seat surface of the shoe bottom, maintaining such engagement of the heel and heel-seat until the adhesive has set, and thereafter disengaging the head of the fastener from the last and causing the head of the same fastener to react against the inner surface of the shoe bottom.

6. That method of attaching heels to shoes which comprises as steps applying a heel to the heel-seat surface of a shoe mounted on a last, having first interposed an adhesive between the opposed faces of the heel and heel-seat, drilling a hole through the shoe bottom and into the heel, inserting a headed screw through the hole in the shoe bottom and into the heel, advancing the screw until its head engages a part of the last, thereby causing the screw to react against the last and to draw the heel toward the last and into firm engagement with the heel-seat surface of the shoe bottom, thus maintaining such engagement of the heel and heel-seat until the adhesive has set, thereafter disengaging the screw head from said last-part and further advancing the screw to cause its head to react against the shoe bottom.

7. That method of attaching heels to shoes which comprises as steps applying a heel to the heel-seat surface of a shoe mounted on a last, having first interposed an adhesive between the opposed faces of the heel and heel-seat, drilling a hole through the shoe bottom and into the heel, inserting a headed screw through the hole in the shoe bottom and into the heel, advancing the screw until its head engages a part of the last, thereby causing the screw to react against the last and to draw the heel toward the last and into firm engagement with the heel-seat surface of the shoe bottom, thus maintaining such engagement of the heel and heel-seat until the adhesive has set, thereafter disengaging the screw head from said last-part, introducing a washer element between the screw head and the inner surface of the shoe bottom, and further advancing the screw until its head engages the washer and is brought substantially flush with the inner surface of the shoe bottom.

8. The method of attaching heels to shoes mounted upon lasts which consists in applying a fastener to urge a heel, shoe and last toward one another, maintaining this condition for a time interval, releasing the last from the fastener, removing said last from the shoe, and employing the applied heel-engaging fastener as a part of the shoe-structure.

9. The method of attaching heels to shoes mounted upon lasts which consists in inserting a fastener through the last and the heel-seat of a shoe into a heel, setting the fastener into heel-clamping engagement with the last, releasing the last from the fastener and removing said last from the shoe, and setting the fastener into heel-clamping cooperation with the shoe.

10. The method of attaching heels to shoes mounted upon lasts which consists in inserting a fastener through the last and the heel-seat of a shoe into a heel, setting the fastener into heel-clamping engagement with the last, releasing the last from the fastener and removing said last from the shoe, inserting a contact device between the fastener and the heel-seat portion of the shoe, and setting the fastener into heel-clamping engagement with the contact device.

11. A last having a body provided with a fastener-receiving passage opening through the heel-seat portion, and a member mounted at the heel-seat end of the passage and being movable upon the body of the last into and out of position to be engaged by a fastener in the passage.

12. A last having a body provided with a fastener-receiving passage opening through the heel-seat portion, a plate secured to the heel-seat portion and through which the passage extends, there

being a space between the plate and the body of the last, and a fastener-engaging member movable in the space.

13. A last having a body provided with a passage opening through the heel-seat portion and arranged to receive a headed fastener, and a member mounted to move at the heel-seat end of the passage and being provided with an opening, one portion of which may permit the fastener-head to pass while another portion will retain said head.

14. Apparatus for use in attaching a heel to a shoe by means of a headed fastener, said apparatus comprising a last having a heel-plate and spindle-hole, the last having a cavity beneath the heel-plate, the spindle-hole extending into said cavity and the plate having an aperture axially aligned with the spindle-hole and of a size to permit passage of the shank and head of the fastener, a movable abutment device arranged within said cavity, said abutment device having a part which may be arranged so as partially to obstruct the aperture in the plate, thereby to prevent passage of the fastener head, and operating means exposed at the top of the last for moving said abutment part out of aperture obstructing position.

15. Apparatus for use in attaching a heel to a shoe by means of a headed fastener, said apparatus comprising a last having a heel-plate and spindle-hole, the last having a cavity beneath the heel-plate, the spindle-hole extending into said cavity and the plate having an aperture axially aligned with the spindle-hole and of a size to permit passage of the shank and head of the fastener, a movable abutment device within said cavity, said device comprising spaced abutments arranged to permit passage of the shank of the fastener element between them but to prevent passage of the head of the fastener, and operating means accessible from the top of the last for moving said abutments out of the path of the head of the fastener.

16. Apparatus for use in attaching a heel to a shoe by means of a headed fastener, said apparatus comprising a last having a heel-plate and spindle-hole, the last having a cavity beneath the heel-plate, the spindle-hole extending into said cavity and the plate having an aperture axially aligned with the spindle-hole and of a size to permit passage of the shank and head of the fastener, a movable abutment device arranged within said cavity, said abutment device having an elongate opening therethrough which at one part is wide enough to permit passage of the fastener shank but too narrow to permit passage of the fastener head, said opening at another part being wide enough to permit passage of the fastener head, and means operative to move the abutment device so as alternatively to cause its wider or narrower parts to register with the aperture in the heel-plate.

17. Apparatus for use in attaching a heel to a shoe by means of a headed fastener, said apparatus comprising a last having a heel-plate and spindle-hole, the last having a cavity beneath the heel-plate, the spindle-hole extending into said cavity and the plate having an aperture axially aligned with the spindle-hole and of a size to permit passage of the shank and head of the fastener, a movable abutment device arranged within said cavity, said device having a keyhole slot therein, the head of the slot being of a diameter substantially as great as that of the aperture in the heel plate while its tail portion is too narrow to

permit passage of the fastener head therethrough but wide enough to permit passage of the fastener shank, and means for moving the abutment device so as alternatively to bring either the head or the tail portion of the keyhole slot into registry with the hole in the plate.

18. Apparatus for use in attaching a heel to a shoe by means of a headed fastener, said apparatus comprising a last having a heel-plate and spindle-hole, the last having a cavity beneath the heel-plate, the spindle-hole extending into said cavity and the plate having an aperture axially aligned with the spindle-hole and of a size to permit passage of the shank and head of the fastener, a movable abutment device in said cavity, said device being arranged to swing about an axis eccentric to the axis of the aperture in the heel-plate, said abutment device having a keyhole slot, the head portion of which is curved concentrically with the axis about which the device swings, the head portion of the slot being large enough to permit passage of the head of the fastener, and the tail portion being large enough to permit passage of the shank of the fastener but too narrow to permit passage of the head of the fastener, and means for swinging said device about said axis.

19. Apparatus for use in attaching a heel to a shoe by means of a headed fastener, said apparatus comprising a last having a heel-plate and spindle-hole, the last having a cavity beneath the heel-plate, the spindle-hole extending into said cavity and the plate having an aperture axially aligned with the spindle-hole and of a size to permit passage of the shank and head of the fastener, a movable abutment device in said cavity, said device having a stem portion arranged to turn in a bearing opening in the last, the stem portion having one end exposed at the top of the last and shaped for application of an implement whereby it may be turned, thereby to swing the abutment device about the axis defined by said bearing opening, said abutment device having spaced abutments operative in one position of the abutment device to obstruct the opening through the heel-plate, thereby to prevent passage of the fastener head through said opening, said spaced abutments, when the abutment device occupies another position, being so located as not to obstruct the opening.

20. Apparatus for use in attaching a heel to a shoe by means of a headed fastener, said apparatus comprising a last having a heel-plate and spindle-hole, the last having a cavity beneath the heel-plate, the spindle-hole extending into said cavity and the plate having an aperture axially aligned with the spindle-hole and of a size to permit passage of the shank and head of the fastener, a movable abutment device in said cavity, said device having an actuating stem arranged to turn in a bearing in the last, said stem having an extension turning in a bearing in the heel-plate, the stem extending substantially to the top of the last and being exposed to permit so actuating it as to swing the abutment device within the cavity, the abutment device comprising parts adapted in one position to be engaged by the fastener head and in another position to be disengaged from the fastener head.

21. Apparatus for use in attaching a heel to a shoe by means of a headed fastener, said apparatus comprising a last having a body portion provided with an elongate passage adjacent to its heel end, said passage extending from the top to the bottom of the body portion, the last also

having an abutment member underlying the bottom of the heel end of the body portion, said abutment having a non-circular opening, a part of the margin of said non-circular opening being of such contour and dimensions as to obstruct passage of the fastener head through the opening and to receive the pressure of the head whereby the fastener may be caused to draw a shoe heel into firm contact with the sole of a shoe mounted on the last.

22. Apparatus for use in attaching a heel to a shoe by means of a headed fastener, said apparatus comprising a last having a body portion provided adjacent to its heel end with a passage leading from the top to the bottom of the body portion, the last also having an abutment member underlying the heel end of the body portion and furnished with a non-circular opening, the margin of one portion of said opening being of such contour and dimensions as to obstruct passage of the fastener head through the opening and to receive the pressure of said head, and

means for so relatively moving the abutment and the fastener as to permit the fastener head to disengage said margin of the opening and to pass freely through the opening in the abutment member.

23. Apparatus for use in attaching a heel to a shoe by means of a headed fastener, said apparatus comprising a last including a body portion provided adjacent to its heel with a passage extending from its top to its bottom surface, the last also having an abutment plate underlying its heel portion, said abutment plate being furnished with an opening having a marginal portion of such contour and dimensions as to obstruct the passage of the fastener head through the opening, said marginal portion of the opening being operative to receive the pressure of the fastener head when the fastener is advanced into a heel, whereby the latter may be firmly drawn toward the bottom of a shoe mounted on the last.

MICHELE CUOZZO.