

Dec. 22, 1936.

W. H. NUTT
METHOD OF ATTACHING HEELS TO SHOES AND
APPARATUS FOR PERFORMING SUCH METHOD
Filed Sept. 21, 1935

2,064,939

2 Sheets-Sheet 1

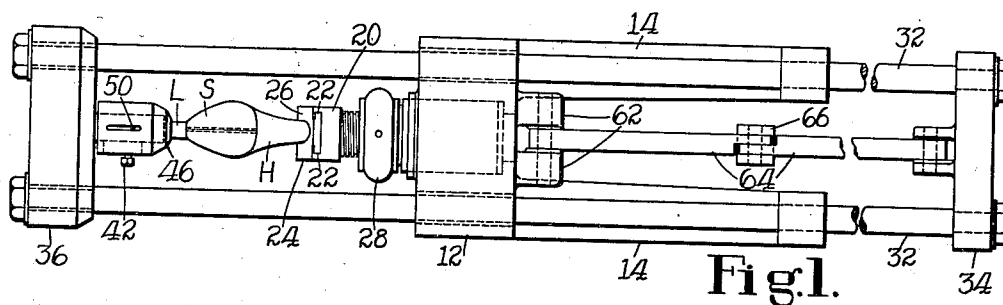


Fig. 1.

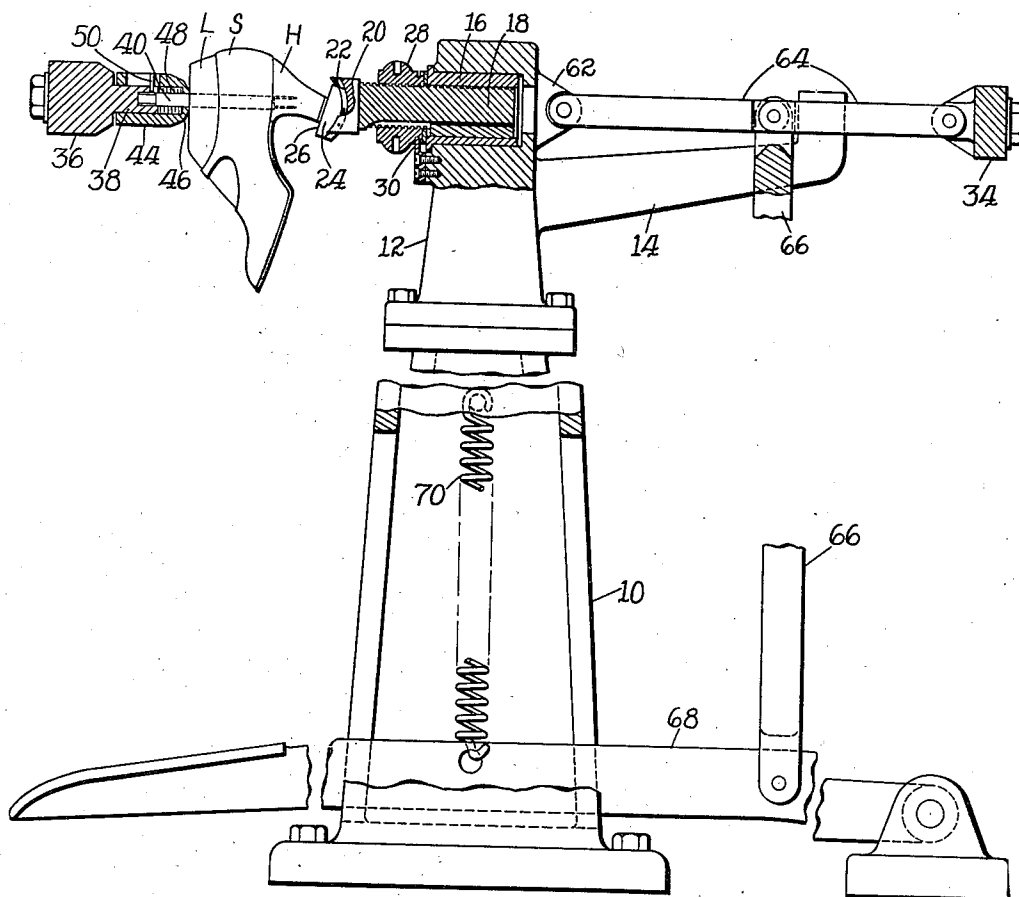


Fig. 2.

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2 Sheets-Sheet 2

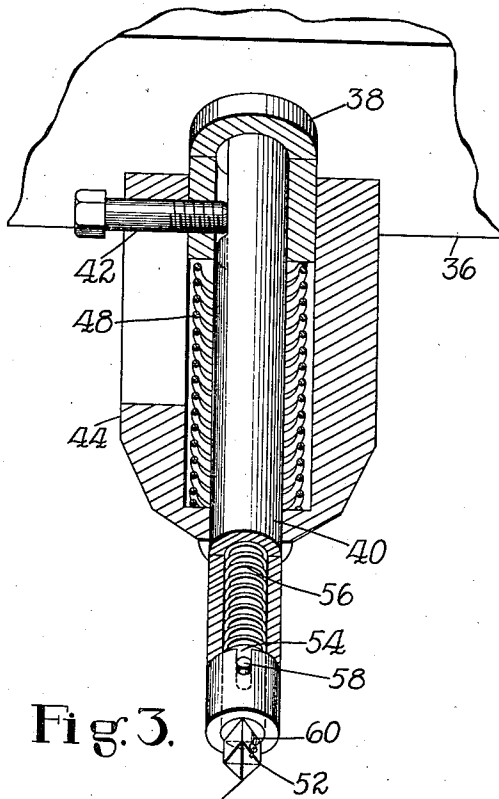


Fig. 3.

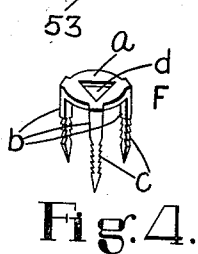


Fig. 4.

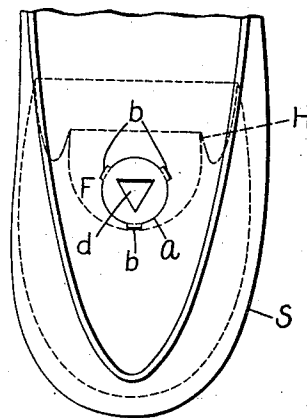


Fig. 5.

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UNITED STATES PATENT OFFICE

2,064,939

METHOD OF ATTACHING HEELS TO SHOES
AND APPARATUS FOR PERFORMING SUCH
METHODWilliam H. Nutt, Beverly, Mass., assignor to
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Application September 21, 1935, Serial No. 41,612

23 Claims. (Cl. 12—42)

My invention relates to the attachment of heels to shoes, it especially concerning the utilization of a driven fastening.

In securing heels to shoes, and particularly those of wood in connection with women's work, it is a common practice to coat with an adhesive the heel-seat of the shoe and the cup of the heel, and, after bringing the coated surfaces together, to insert through the heel-seat into the heel a temporary fastening in the form of a screw to hold the parts together until the adhesive has set; or a permanent screw is sometimes employed. In either case, it is customary to thereafter nail the heel and heel-seat in the usual manner. This increases the security of attachment if an adhesive alone has been used. If a permanent screw has been applied, it guards against the weakness which might be produced by careless operators through stripping the thread made in the heel by the screw. An object of my invention is to provide for the rapid insertion of an effective heel-attaching fastening in such a way that it will be disposed to the best advantage with relation to the work, a single fastening device being sufficient to supplement the adhesive.

In the attainment of this object, a feature of the invention may be found in a method of attaching heels to shoes, in which, when a multi-pronged fastening is used, the relation of the prongs to the heel operated upon is determined by the position of an opening in the fastening, the thus-positioned fastening thereupon being driven into the work to effect the attachment. I prefer to use fastenings having three prongs, in which case the opening is best triangular and is in the yoke joining the prongs, one side of the opening being arranged substantially parallel to the breast of the heel. In this location of the fastening, the prongs may be kept with certainty so spaced from the upwardly and forwardly curved breast of the heel that there will be no danger of their emergence therethrough when the fastening is driven, and no two prongs are aligned from front to rear of the heel, or in the direction of the grain, so the tendency to split the heel is minimized. A fastening of this character may be inserted by a single quick stroke of a driver. Its hold upon the heel cannot be destroyed by overdriving, as in the case of a screw, and it furnishes a securing means of much efficacy for adding to the holding power of an adhesive. In the insertion of the fastening, regardless of the exact character of its work-entering portions, its position about an axis

heightwise of the heel may be determined by its engagement with a driving tool, as by the entrance of said tool into the opening in the fastening.

Another feature of the invention involves an apparatus by which, among other utilizations, my improved method may be performed. There is combined with a driver-head and its driver an opposing abutment, the driver being so formed as to hold a fastening in a definite angular relation about its axis. By this arrangement, a fastening, as one having three prongs, may be held in a predetermined relation to the heel which it is to attach. The driver-head and opposed abutment are movable relatively to insert the fastening. Upon the head with the driver is an engaging member, the two being so relatively movable upon the head that the member may engage the work, as a last within the shoe being heeled, to hold said work under pressure against the abutment while the driver is acting upon the fastening. Preferably, the fastening is located by a portion of the driver which is yieldable, so it does not interfere with the inserting operation. The positioning portion of the driver is shown as provided with means to hold the engaged fastening against displacement longitudinally. I prefer to arrange the heel-abutment and the fastening-driver for their relative movement in a horizontal plane. The application of the work to the apparatus is thereby facilitated, and the operator can better inspect it for its introduction to the apparatus and during the inserting operation. In the illustrated embodiment of the apparatus, a standard furnishes a supporting frame, with a heel-tread-abutment projecting from one side and a head mounted to reciprocate horizontally upon the standard toward and from the abutment. The head has its driver extending toward the abutment, and a yieldable work-engaging sleeve surrounds the driver.

In the accompanying drawings,

Fig. 1 is a broken top plan view of one embodiment of the apparatus of this invention;

Fig. 2, a broken side elevation thereof;

Fig. 3, a sectional perspective of the driver and its directly associated elements;

Fig. 4 shows in perspective a fastening used for the performance of my improved method, and

Fig. 5 is a top plan view of a shoe with its heel attached by such fastening.

The frame of the apparatus may be provided by a standard 10, to which is attached an upper

section 12 having projecting rearwardly substantially horizontal brackets 14, 14. Into the front of the frame-section 12 near the top a horizontal bushing 16 is fitted, and within this bushing is splined, for longitudinal movement only, the shank 18 of an abutment member 20. In its outer face, the abutment member has arcuate undercut ways 22 extending vertically, and having a movement of angular self-adjustment in the ways is the abutment proper, designated as 24, with its outer face 26 arranged for contact with the tread-surface of a heel H being operated upon. The shank 18 is threaded, and engaging the thread is a nut 28 retained by a projection 30 from the frame to rotate without movement of translation. By turning the nut, the heel-abutment may be moved horizontally to position in this direction work held against it.

Arranged to reciprocate in horizontal bores at opposite sides of the frame-section 12 and in the brackets 14 are rods 32, 32 yoked together at the rear of the apparatus at 34 and joined at their opposite extremities by a pressure- and driver-head 36. These elements together furnish a slide. At the center of the inner side of the head is a horizontal cylindrical projection 38, having an axial bore to receive a fastening-driver 40 removably secured by a set-screw 42. The diameter of the driver is such that it may enter the spindle-hole of a last L having upon it a shoe S to be heeled, while its length permits it to pass through the last from the top of the cone to the heel-seat-surface. Surrounding and guided by the projection 38 and the driver 40 is a sleeve 44 provided with a somewhat reduced end 46 for engagement with the top of the last-cone, the spindle-hole of which has received the driver. The sleeve is arranged to yield longitudinally of the driver, being urged normally forward toward the abutment-surface 26 by a spring 48 surrounding the driver and lying in an annular recess in the sleeve. The extent of forward movement of the sleeve may be limited by a slot-and-pin connection 50 between it and the projection 38.

To hold a fastening in driving position, the driver 40 carries at its inner extremity a projection or leader 52 of non-circular cross-section, so it may enter a complementary opening in a fastening and maintain it at a definite angular relation about the axis of the driver. A form of fastening which I consider as effective for the purposes of my invention appears in Fig. 4.

This fastening F is in the form of a multi-pronged staple. It has a generally circular yoke a, equally spaced about which and extending substantially at right angles thereto are three prongs or legs b. These prongs are preferably toothed at c, the inclination of the teeth being such as to resist withdrawal of the fastening from the work. An opening d in the yoke for the reception of the projection 52 may conveniently correspond to the arrangement of the prongs, that is, it is triangular, the apices of an equilateral triangle being respectively opposite the prongs. With an opening of this character, the driver-projection 52 may be triangular in cross-section and of such dimensions that the fastening may be readily placed upon it, this being facilitated by a pyramidal or otherwise pointed end 53. To avoid interference by the projection with the insertion of the fastening, said projection is yieldably mounted upon the driver, it having a shank 54 arranged to reciprocate in an axial bore in the driver and forced

outwardly, by a spring 56 surrounding it, to an extent permitted by a slot-and-pin connection 58 with the driver. To retain the fastening upon the driver-projection until it has been inserted, said projection has secured to one side, outside the driver-end, a leaf-spring 60. The outer face of this spring lies just far enough from the projection-wall to engage and hold the fastening frictionally and yet to offer no material resistance to the withdrawal of the driver after the insertion of the fastening.

The driver-head 36 of the inserting mechanism, with the driver 40 and the sleeve 44, is shown as reciprocated toward and from the heel-tread-abutment 24 for the fastening-driving operation by treadle mechanism actuated by the operator, though, obviously, power may instead be applied mechanically. The yoke 34 is joined to lugs 62 upon the frame-section 12 by links 64, 64, together furnishing a toggle-lever. The center of the toggle is united by a connecting rod 66 to a treadle 68 fulcrumed upon the floor at the foot of the standard 10. With the treadle held normally up by a tension-spring 70 joining it to the frame, the toggle is broken. This acts through the yoke 34 and side-rods 32 to separate the head 36 from the abutment member 24, so the work may be put in place for the operation upon it. Upon depression of the treadle, the toggle is straightened and the head 36 is forced toward the abutment to clamp the work and then drive a fastening therein.

In using the above-described apparatus to perform the method of my invention, the treadle 68 being raised by its spring and the head 36 withdrawn from the heel-abutment 24, the operator first places a fastening F upon the driver-projection 52, which is received by the fastening-opening d. It is desired that two of the fastening-prongs shall, when inserted, lie substantially parallel to the breast of the heel. Consequently, one of the triangular walls of the projection is parallel to the general breast-line of a heel positioned in the apparatus for the fastening-inserting operation. When thus disposed, the fastening may be driven near the center of a heel having a heavy pitch, and yet its prongs so removed from the curved breast that they will not penetrate it. When a three-pronged fastening is to be inserted, this, at the same time, places no two prongs in line from front to rear of the heel or in the direction of the grain of the wood, so there will be little splitting effect. The operator takes a shoe S upon its last L together with a heel H, the heel-seat of the shoe and the cup of the heel being, if desired, coated with glue or other adhesive. With the heel applied to the heel-seat of the shoe, he places the work between the driver 40 and the abutment 24 and draws it toward him, the driver being received in the last-hole, and the end of the last-cone resting against the engaging end 46 of the sleeve 44. The work is now supported in the proper vertical position for the operation upon it, being held by the driver against lateral displacement, and has only to be turned to the correct angle about said driver. This the operator can do readily, since he is able to look directly down upon the rear portion of the shoe and upon the heel. The treadle 68 is depressed sufficiently to apply to the work what may be considered to be preliminary pressure, the contact of the sleeve with the last-cone forcing the heel-seat of the shoe against the heel and the tread of said heel against the abutment-

surface 26, the member 24 adjusting itself to the proper angle. After a final positioning of the work, if this be necessary, the operator fully depresses the treadle, straightening the toggle 64, 64. The sleeve 44 continues to hold the work under pressure as the spring 48 yields, and the driver 40 forces the prongs b of the fastening which it carries through the heel-seat of the shoe and into the heel, sinking the yoke a in the insole. The multiple prongs of the fastening, with their teeth c, offer very effective resistance to pulling-off of the heel, and because of their considerable separation from one another radially of the heel-seat upon the circular yoke a, they exert a substantial effect to draw the periphery of the heel-cup close to the heel-seat at the crease. An additional nailing operation is thus generally rendered unnecessary. The attachment of the heel being completed, and upon release of the treadle by the operator, the spring 70 raises said treadle and straightens the toggle 64, 64, separating the head 36 from the abutment 24 and allowing the finished work to be removed from the apparatus.

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

1. The method of attaching heels to shoes by multi-pronged fastenings in which are openings, which consists in determining the relation of the prongs of a fastening to a heel to be attached by the position of the fastening-opening, and driving the thus-positioned fastening into the work.

2. The method of attaching heels to shoes by fastenings having three prongs projecting from a yoke in which is a triangular opening, the apices of which correspond in position to the prongs, which consists in arranging a fastening with one side of the opening substantially parallel to the breast of a heel to be attached, and driving the thus-positioned fastening into the work.

3. The method of attaching heels to shoes, which consists in supporting in a definite position for the insertion of a fastening a shoe and a heel applied thereto, locating a fastening in a predetermined angular relation about an axis heightwise of the heel by its engagement with a driving tool, and driving the fastening while maintaining this angular relation.

4. The method of attaching heels to shoes, which consists in supporting in a definite position for the insertion of a fastening a shoe and a heel applied thereto, locating in a predetermined angular relation about an axis heightwise of the heel a fastening having a plurality of prongs and an opening, such location being effected by the entrance of a driving tool into the opening, and driving the fastening while maintaining this angular relation.

5. The method of attaching heels to shoes, which consists in supporting in a definite position for the insertion of a fastening a shoe and a heel applied thereto, locating in a predetermined angular relation about an axis heightwise of the heel by its engagement with a driving tool a fastening having three prongs, with two of the prongs lying along a line substantially parallel to the heel-breast, and driving the fastening with the prongs thus related into the heel.

6. In a heel-attaching apparatus, a driver-head, an opposite heel-abutment, a driver mounted upon the head, said driver being formed to hold a fastening in a definite angular relation

about its axis, and means for imparting relative movement to the head and abutment to insert the fastening.

7. In a heel-attaching apparatus, a driver-head, an opposite heel-abutment, a driver mounted upon the head, said driver having yieldable means to hold a fastening in a definite angular relation about its axis, and means for imparting relative movement to the head and abutment to insert the fastening.

8. In a heel-attaching apparatus, a driver-head, an opposite heel-abutment, a driver and a work-engaging member mounted upon the head, the engaging member and driver being relatively movable to cause the projection of the driver from the engaging member, said driver having a portion non-circular in transverse section to enter a corresponding opening in a fastening, and means for imparting relative movement to the head and abutment to insert the fastening.

9. In a heel-attaching apparatus, a driver-head, an opposite heel-abutment, a driver and a work-engaging member mounted upon the head, the engaging member and driver being relatively movable to cause the projection of the driver from the engaging member, said driver being formed to hold a fastening in a definite angular relation about its axis, and means for imparting relative movement to the head and abutment to insert the fastening.

10. In an apparatus for attaching heels to lasted shoes, a heel-abutment, a fastening-driver arranged to enter an opening in a last, a last-engaging member surrounding the driver and yieldable longitudinally thereof, and means for imparting relative movement to the driver and abutment to insert the fastening.

11. In an apparatus for attaching heels to lasted shoes, a heel-abutment, a fastening-driver arranged to enter an opening in a last, a fastening-positioning member yieldable upon the driver, and means for imparting relative movement to the driver and abutment to insert the fastening.

12. In an apparatus for attaching heels to lasted shoes, a heel-abutment, a fastening-driver arranged to enter an opening in a last, a last-engaging member surrounding the driver and yieldable longitudinally thereof, a fastening-positioning member yieldable upon the driver, and means for imparting relative movement to the driver and abutment to insert the fastening.

13. In a machine for attaching a heel to a shoe, a frame, a heel-abutment and a fastening-driver mounted upon the frame for relative movement in a substantially horizontal direction, the work being supported upon the frame with the rear of the shoe and heel in full view of the operator from above, and means for producing relative movement of the driver and abutment.

14. In a machine for attaching a heel to a shoe, a frame, a heel-abutment and a fastening-driver mounted upon the frame for relative movement in a substantially horizontal direction, the work being supported upon the frame with the rear of the shoe and heel in full view of the operator from above, means for producing relative movement of the driver and abutment, and means movable longitudinally of the driver for pressing the work toward the abutment.

15. In a heel-attaching machine, a frame, a heel-abutment and a fastening-driver mounted upon the frame for relative movement in a substantially horizontal direction, and means for producing relative movement of the driver and

abutment, the driver being arranged to engage the work prior to the driving operation and retain it against lateral displacement.

16. In an apparatus for inserting a multi-pronged heel-attaching fastening provided with a positioning-opening, a driver having a portion constructed and arranged to enter the fastening-opening and to hold the prongs of the fastening in a predetermined angular relation about the axis of the driver.

17. In an apparatus for inserting a multi-pronged heel-attaching fastening provided with a positioning-opening, a driver having a portion yieldable thereon, said portion being constructed and arranged to enter the fastening-opening and to hold the prongs of the fastening in a predetermined angular relation about the axis of the driver.

18. In an apparatus for inserting a heel-attaching fastening provided with an opening, a driver having a portion arranged to enter the fastening-opening, said driver-portion being provided with means to hold the fastening against displacement longitudinally of the driver.

19. In an apparatus for inserting a heel-attaching fastening provided with an opening, a driver having a portion arranged to enter the fastening-opening, a yieldable leader upon the driver arranged to enter the fastening-opening, and a fastening-engaging spring projecting from the leader.

20. In a heel-attaching apparatus, a standard,

a tread-abutment projecting from one side of the standard, a head mounted to reciprocate horizontally on the standard toward and from the abutment, a driver extending from the head toward the abutment, and a sleeve yieldable about the driver and from which said driver normally projects.

21. In a heel-attaching apparatus, a standard, a tread-abutment projecting from one side of the standard, a head mounted to reciprocate horizontally in the standard toward and from the abutment, a driver extending from the head toward the abutment, a yieldable leader carrier by the end of the driver toward the abutment, and a sleeve yieldable about the driver and from which said driver normally projects.

22. In a heel-attaching apparatus, a frame, a tread-abutment carried by the frame, a slide mounted to reciprocate in the frame, a head movable by the slide opposite the abutment, a toggle joined at one end to the frame and at the other to the slide, and an operator-actuated member connected to the center of the toggle.

23. In a heel-attaching apparatus, a standard, a tread-abutment projecting from the front of the standard, a bracket projecting rearwardly from the standard, a slide movable through the bracket, a head carried by the slide opposite the abutment, a fastening-driver projecting from the head, a lever connecting the slide and standard, and a treadle joined to the lever.

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