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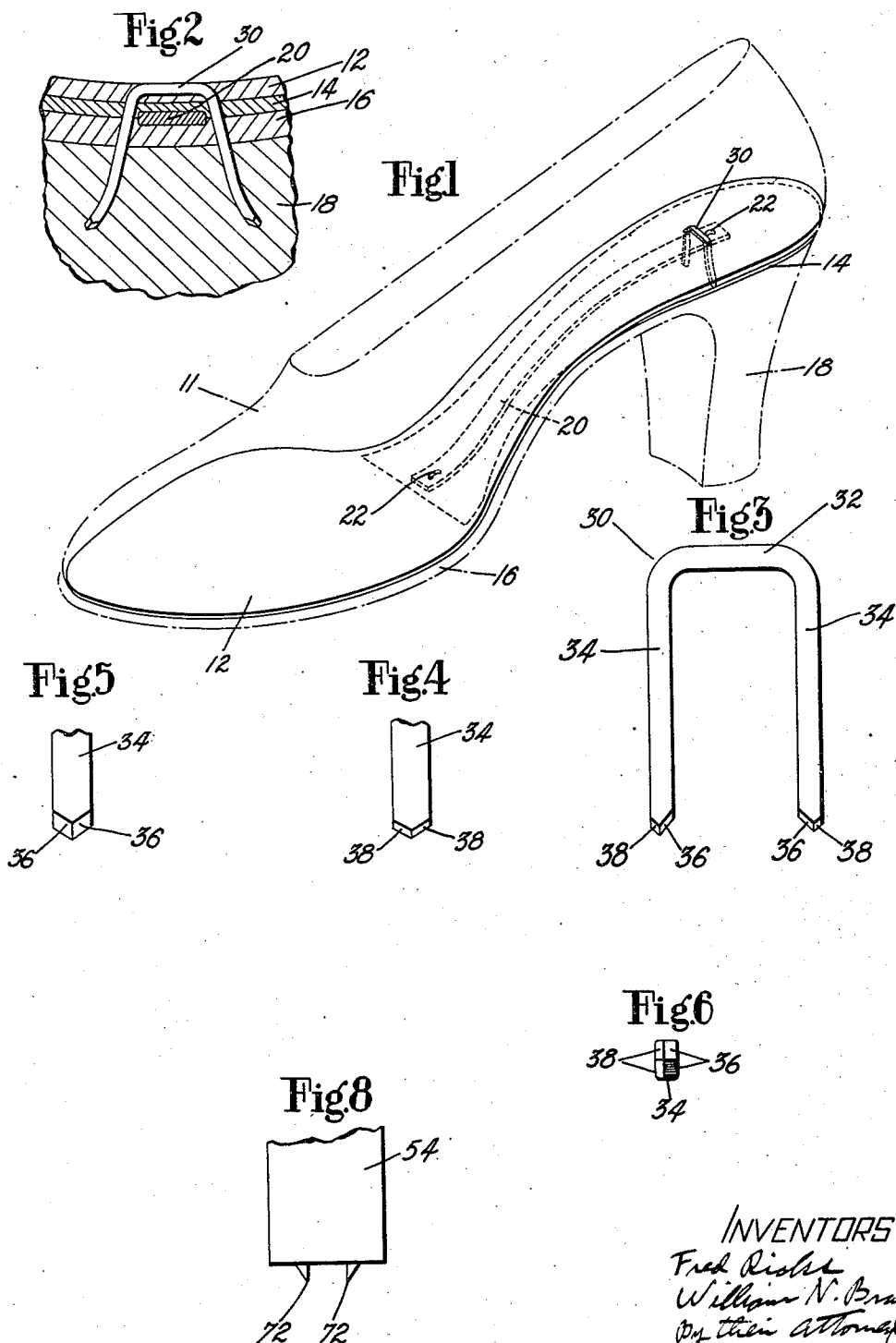
F. RICKS ET AL

2,261,734

SHOEMAKING

Filed Nov. 3, 1939

2 Sheets-Sheet 1



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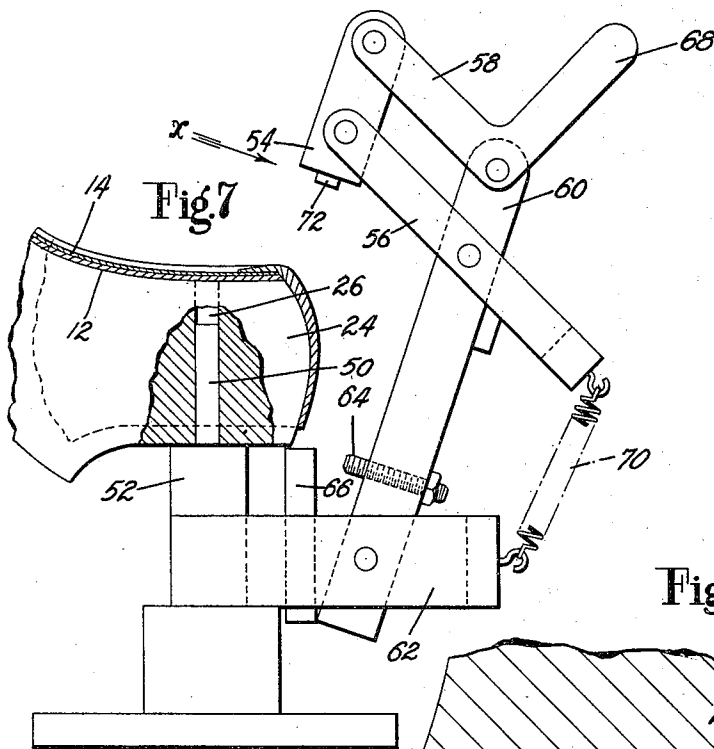
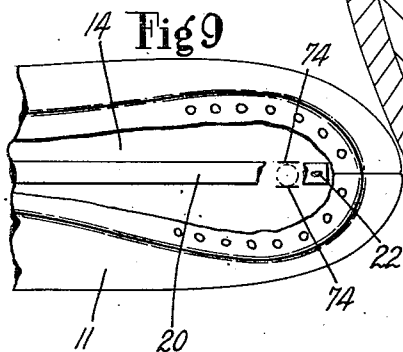
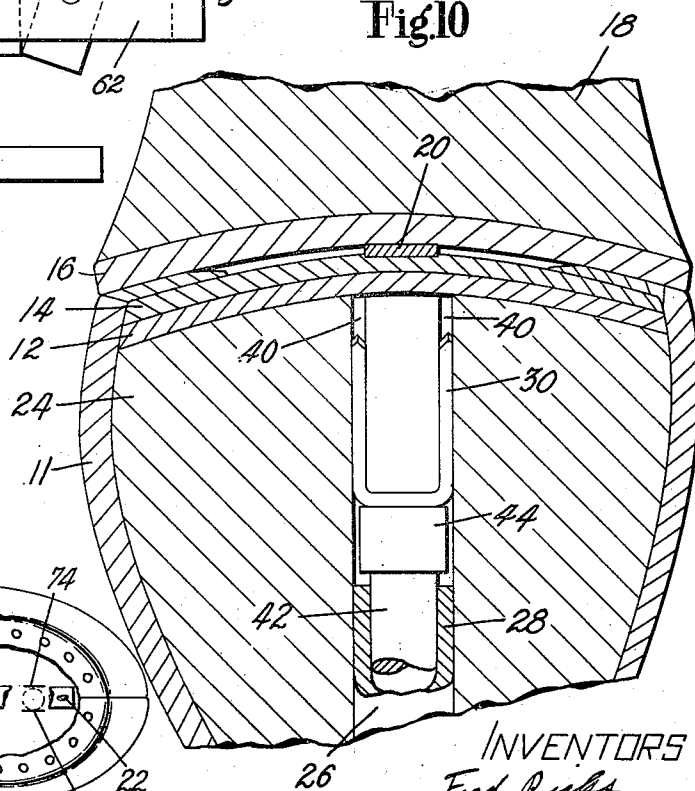


Fig 10



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UNITED STATES PATENT OFFICE

2,261,734

SHOEMAKING

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7 Claims. (Cl. 12—142)

This invention relates to improvements in methods of shoemaking and to improvements in shoes and devices for use therein.

It is a common practice in shoe manufacture to employ a metallic shank stiffener in the bottom of a shoe to strengthen the shank portion of the shoe bottom and assist in maintaining the arched shape of the latter, such a shank stiffener usually being formed of a strip of steel arched to conform to the longitudinal curvature of the shoe bottom and ordinarily being attached to the shoe bottom by tacks, prongs or the like. In order to increase the rigidity with which the rear or heelward end portion of a shank stiffener is held in place in the shoe and thus to insure against displacement of that portion of the stiffener during the wearing of the shoe, various expedients have been employed, but in most cases entirely satisfactory results have not been obtained.

One object of the present invention is to provide in an improved manner for the securing in place of the rear portion of a shank stiffener in a shoe.

With this object in view, the invention in one aspect provides an improved method of shoemaking in the practice of which a staple is driven from the inside of a shoe through the heel-seat portion of the shoe bottom, the staple straddling and closely embracing the rear portion of a shank stiffener in the shoe so as firmly to anchor that portion of the stiffener, as well as to function in securing the heel to the shoe. As herein illustrated, a staple is employed, the separation between the legs of which is not sufficiently great (compared with the width of the shank stiffener) for reliance to be placed on the legs passing one at each side of the shank stiffener without being stopped thereby, the staple having the work-entering end portions of its legs so shaped that as the legs are driven they do not run in straight parallel paths but run in paths inclined outwardly away from each other thereby insuring that they are spread sufficiently to pass one at each side of the shank stiffener without being stopped by the same. Such a method is conveniently (and as hereinafter described by way of example) practised by driving the staple, while the shoe is still on its last, from a staple driving spindle received in a bore which extends heightwise through the last. The legs of the staple will serve to prevent any substantial subsequent displacement of the heelward end portion of the shank stiffener widthwise of the shoe, and the crossbar of the staple will press firmly

down upon the work and will cause the heelward end portion of the shank stiffener to be held firmly in place and to be locked against any subsequent vertical displacement to a markedly greater degree than could be effected by the use of tacks, prongs or like fastening device.

Invention is also to be recognized as residing in a shoe embodying the improved features of construction hereinafter described and claimed.

The invention will be described with reference to the accompanying drawings, in which

Fig. 1 is a perspective view of a shoe having a shank stiffener and having a staple driven from the inside of the shoe into the heel in such a manner as to straddle the rear portion of the shank stiffener, the insole of the shoe, together with the portion of the staple and the portions of the shank stiffener securing tacks which are located at the upper side of the insole, being shown in full lines, while the remainder of the shoe is indicated by dot-and-dash lines;

Fig. 2 is a fragmentary cross-sectional view taken in the plane of the staple;

Fig. 3 is a side elevational view on an enlarged scale of the staple showing it as it appears before it has been driven;

Fig. 4 is a detailed view of the lower end of a portion of the outer side of one of the legs of the staple;

Fig. 5 is a detailed view of a portion of the inner side of the staple leg shown in Fig. 4;

Fig. 6 is a view looking at the free end of the staple leg shown in Figs. 4 and 5;

Fig. 7 is a view in side elevation of a locating device for use in determining the position in which the shank stiffener should be positioned upon the bottom of a shoe, a shoe mounted on its last being shown in position to be operated upon;

Fig. 8 is a detailed view of the marking tool of the locating device shown in Fig. 7, showing the tool as it would appear when looked at in the direction of the arrow X in Fig. 7;

Fig. 9 is a bottom plan view of the rear portion of a shoe showing a shank stiffener assembled therewith, a portion of the shank stiffener having been broken away to indicate the marks made by the locating tool shown in Fig. 8; and

Fig. 10 is a cross-sectional view of a shoe mounted upon the last, the section extending through the bore in the last and the view showing a staple located in the bore in position to be driven into the shoe by means of a staple driving spindle received within the bore.

The invention will be described with reference

to its application to the making of a shoe comprising an upper 11, an insole 12, a heel and shank reinforcing piece 14, an outsole 16, a heel 18, and a metallic shank stiffener 20. The reinforcing piece, which may be made of fiberboard or similar material, is substantially coextensive with the heel and shank portions of the insole 12. The shank stiffener 20 is located between the reinforcing piece 14 and the outsole 16 and is fastened to the shoe bottom, after the shoe has been lasted but before the outsole and the heel have been applied, by means such as tacks 22, the bent-over or clenched upper ends of which are shown in Fig. 1. The shank stiffener 20 is in the form of a strip of steel arched to conform to the longitudinal curvature of the shank portion of the shoe bottom and long enough to extend heelwardly beyond the heel breast line well on to the heel-seat portion of the shoe bottom. The correct position of the shank stiffener 20 on the shoe bottom may be determined by the use of a device hereinafter described with reference to Figs. 7 and 8 of the drawings. The shoe is mounted upon a last 24 having a hole or bore 26 extending heightwise thereof, from its crown to its heel-seat surface, the bore being adapted to receive a staple driving spindle. When the shoe is ready to have its heel attached, the shoe is placed, bottom upward, in a heel attaching machine provided, in addition to heel clamping means (not shown), with a spindle 28 which is adapted to enter the bore in the last and to drive a staple, such as the staple 30, through the bottom of the shoe and into the heel.

The staple 30 is preferably made from steel wire of a generally rectangular cross-section (though with the corners slightly rounded) about eight hundredths of an inch by about five hundredths of an inch, the broader dimension of the wire lying at right angles to the plane of the staple. The crossbar 32 of the staple 30 is at right angles to its legs 34 which are parallel. The width of the staple between the outside surface of its legs is about three-eighths of an inch and the length of the staple is about two-thirds of an inch. As herein shown, the work-entering end portion of each leg has a point portion thereon which is of pyramidal shape having four faces, two faces 36 at the inside surface of the leg and two faces 38 at the outside surface of the leg, which intersect each other in four lines meeting at an apex constituting the point of the leg. This point lies considerably closer to the outside surface of the staple leg than to the inside surface, the two faces 36 at the inside surface of the leg constituting a beveled formation which extends beyond the central line of the leg and which extends further away from the point than does the beveled formation constituted by the two faces 38 at the outer side of the leg. In consequence the preponderance of bevel located at the inner side of each leg causes, as hereinafter described, the legs to spread apart as the staple 30 is driven into the work.

The spindle 28 is hollow, as shown in Fig. 10. The diameter of the spindle 28 is equal or substantially so to the distance between the outside surfaces of the legs of the staple 30, the upper end portion of the spindle having diametrically opposed slots 40 therein for receiving and positioning the staple. Received in the lower portion of the slots 40 there is also the upper portion of a driving member 42. The driving member is T-shaped and its upper portion is in the form of a plate 44 which extends into the slots 40 and the upper edge surface of which engages the

crossbar of the staple to drive the staple. Below the plate 44 the driving member has a downwardly extending stem which passes downwardly through the lower portion of the spindle 28 and is operated by actuating means which is not shown but which may be similar to that disclosed in United States Letters Patent No. 1,679,346, granted August 7, 1928, upon application of W. R. Barclay.

After the shoe and last are placed on the spindle 28 the heel to be attached to the shoe is positioned on the heel-seat portion of the shoe bottom and the machine operated to cause the clamping means of the machine to hold the heel in place while the staple 30 is driven, the shoe being so positioned on the spindle that the plane of the staple is at right angles to the longitudinal axis of the shoe. As the staple 30 is driven from the inside of the shoe (the bore 26 in the last serving to confine the staple during driving within the slots 40) the aforesaid beveled formations of the point portions of the legs of the staple cause the legs to spread apart in outwardly directed paths. For example, in the case of a staple with the dimensions mentioned hereinbefore the separation of the points of the legs after driving may be about five-eighths of an inch or more. The staple 30 will be driven firmly into the work so that its crossbar is not left projecting above the insole but is impressed into the surface thereof, as shown in Fig. 2. The shank stiffener 20 extends heelwardly beyond the locality at which the staple 30 is driven and is of a width substantially equal to or slightly in excess of the initial separation between the inside surfaces of the legs of the staple so that were the staple to be driven with its legs remaining in their initial parallel relation it would be probable (having regard to the impracticability of insuring complete precision in the relative position of the parts) that one or both of the legs of the staple would strike and be stopped by the shank stiffener. On the other hand when the legs of the staple are arranged to spread apart as aforesaid their point portions will, during driving, have already separated sufficiently by the time that they reach the level of the shank stiffener 20 to insure that they will pass one at each side of the shank stiffener without being stopped thereby. Moreover, the aforesaid preponderance of bevel at the inner side of the legs of the staple has the effect, even should one of the legs strike a margin of the shank stiffener, of tending to cause the leg merely to be deflected past the shank stiffener without being stopped thereby. Considering, by way of example, that the combined thickness of the insole 12 and reinforcing piece 14 is about one-eighth inch, the points of the staple 30 will not, on driving of the staple, reach the level of the shank stiffener 20 until they have traveled one-eighth inch into the work by which time their separation will have increased sufficiently to make their striking the shank stiffener unlikely. As the crossbar of the staple 30 is impressed into the insole surface at the end of the driving operation, the inner surface of the crossbar may be driven to within perhaps about one-sixteenth inch from the shank stiffener 20 and (since the spread between the legs of the driven staple diminishes with approach to the crossbar) the parts of the legs of the driven staple which lie at the level of the shank stiffener may be in or almost in contact with the shank stiffener thereby locking the same against widthwise displacement. Moreover, as the crossbar of the staple 30 is forced into the insole material, it causes the adjacent portions of

the insole 12, reinforcing piece 14 and outsole 16 to be pressed tightly together to hold the heelward end portion of the shank stiffener 20 securely between them and lock the same permanently against vertical displacement. A shoe construction of considerable rigidity at the desired heel-seat locality is thus provided. Moreover, because of its diverging legs, the staple functions much more effectively in securing the heel to the shoe than if the staple legs were parallel. After the heel 18 has been attached by the staple 30, further manufacturing operations will be performed in known manner, including, if desired, the insertion, when the shoe has been taken off its last, from the inside of the shoe into the heel of a plurality of heel attaching nails around the peripheral portion of the heel seat to secure the heel yet more firmly than does the staple alone.

It will be appreciated from the above description that the correct relative positioning of the shank stiffener 20 and staple 30 is dependent upon the shank stiffener being located on the shoe bottom in proper relationship with respect to the bore 26 through which the staple is driven. In order to assist correct location of the shank stiffener on the shoe bottom there may be employed a device such as that shown in Figs. 7 and 8 of the drawings. This device comprises a fixed spindle 50 extending vertically upwardly from a support 52. Above the spindle 50 is a marking tool 54 supported by two parallel links 56, 58 pivoted at one side to the marking tool and at the other side to a bar 60 which is pivoted at its lower end portion to the support 52. The bar may be swung into an upright position, determined by the engagement of an adjustable screw 64 with a stop 66, in which position the marking tool 54 is directly over the work. The links 56, 58 support the marking tool 54 for movement up or down and the upper link 58 has a handle 68 attached thereto, upon actuation of which the marking tool may be moved downward, it normally being retained in a raised position by a suitable spring 70. At its lower surface the marking tool 54 has two parallel indenting edges 72, 72 (Fig. 8) which are separated from each other by a distance equal to the width of the shank stiffener to be used. The axis of the fixed spindle 50, if projected upwardly, would intersect the marking tool midway between the indenting edges when the tool is in operating position. In the use of this device the lasted shoe is placed on the device with the spindle 50 received within the bore 26 in the last. The marking tool 54 is then lowered to cause the indenting edges 72, 72 to make two parallel marks 74, 74 (Fig. 9) on the shoe bottom. After removing the shoe and last from the device the operator will lay the shank stiffener 20 on the shoe bottom and so position its heelward end portion that it lies between the two marks 74, 74. The shank stiffener 20 will then be secured, as by the tacks 22, in this position and will be so located that the axis of the bore 26 in the last will intersect the shank stiffener at a point midway of its width as is desirable to insure correct disposition with respect to the shank stiffener, of the staple 30 subsequently driven from the bore in the last. It is desirable also to employ lasts in which particular care has been taken in the location of the bores in which are received the spindle from which the staples are driven. Frequently similar bores in lasts have not, in the past, been located very accurately in the lasts. In employing a staple, such as the staple 30, it should be driven from a central position widthwise of the shoe bottom. It, accordingly, is important that the bore

in the last should emerge from the heel seat of the last in a transversely central location thereon and the bores are preferably drilled in lasts by a drilling machine having associated therewith means for jiggling the last in a predetermined position with respect to the drill to insure such positioning of the bore with respect to the heel-seat surface of the last bottom.

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

1. That improvement in methods of making shoes which consists in securing the bottom margin of an upper in overlaid position upon an insole on a last having a bore extending heightwise through its heel portion in a transversely central location therein, securing a shank stiffener of less width than the diameter of said bore to said insole with the heelward end portion of said stiffener located rearwardly of said bore and transversely centered with respect to the bore in the last, positioning a staple in said bore with its legs located outwardly of the lateral edges of the stiffener, attaching an outsole and positioning a heel upon a shoe, and driving said staple through said bore and through said insole and said outsole and into the heel so that the legs of the staple will straddle the shank stiffener thereby affording firm anchorage for the shank stiffener and securing the heel to the shoe.

2. That improvement in methods of making shoes which consists in securing a shank stiffener in a transversely central position upon the bottom of a shoe having no outsole, attaching an outsole, positioning a heel upon the shoe, locating a staple inside the shoe in position to straddle the shank stiffener when the staple is driven, the staple having its legs spaced apart by a distance substantially equal to the width of the shank stiffener and having the free ends of its legs formed to cause the legs to spread apart when the staple is driven, and driving the staple through said insole and said outsole and into said heel thereby spreading the legs of the staple to avoid striking the shank stiffener.

3. That improvement in methods of shoemaking which consists in transversely centering the rear portion of a shank stiffener upon the bottom of a shoe on a last having a bore extending heightwise through its heel portion in a transversely central location, fixedly securing both end portions of the stiffener to the insole, thereafter attaching an outsole and positioning a heel upon the shoe, and driving a staple through said bore and through the bottom of the shoe and into the heel so that the staple will straddle the shank stiffener and secure the heel to the shoe.

4. That improvement in methods of shoemaking which consists in lasting an upper over an insole on a last having a bore extending heightwise through its heel portion in a transversely central position therein, making parallel marks on the lower side of the heel-seat portion of said insole extending lengthwise of the insole and substantially in line with opposite portions of the bore in the last, laying a shank stiffener upon the insole with the rear portion of the stiffener overlying the heel seat of the insole and positioning the rear portion of the shank stiffener between said marks on the insole, attaching an outsole and positioning a heel upon the shoe, providing a staple having legs separated by a distance substantially equal to the width of the

shank stiffener and having the free ends of its legs formed to cause the legs to spread apart when the staple is driven, positioning the staple within said bore with the crossbar of the staple disposed crosswise of the insole, and driving the staple through said insole and said outsole and into said heel thereby spreading the legs of the staple to insure against striking the shank stiffener.

5. That improvement in methods of making shoes which consists in lasting an upper over an insole on a last having a bore extending heightwise through its heel portion in a transversely central location, providing a staple of a width corresponding substantially to the diameter of said bore, said staple having parallel legs the free ends of which are formed to cause the legs to spread apart when the staple is driven, laying upon the insole a shank stiffener of a width corresponding substantially to the distance between the legs of said staple, transversely centering the rear portion of said stiffener relatively to the insole and securing the stiffener in place, attaching an outsole to the shoe, positioning a heel upon the shoe, and driving said staple through said bore and through said insole and said outsole and into said heel thereby spread-

ing the legs of the staple to avoid striking the shank stiffener and causing the staple to secure the heel to the shoe and afford firm anchorage for the shank stiffener.

6. A shoe comprising an insole, an outsole, a shank stiffener located between the insole and the outsole, a heel, and a staple driven from the inside of the shoe into the heel, the staple straddling the shank stiffener and the legs of the staple being inclined outwardly relatively to each other and extending through the insole and the outsole in close proximity to the lateral edges of the stiffener.

7. A shoe comprising an insole, an outsole, a shank stiffener located between the insole and the outsole, a heel, and a staple having diverging legs extending through the insole and the outsole in close proximity to the lateral edges of the shank stiffener and extending also a substantial distance into the heel and having its crossbar embedded within the material of the insole with the upper surface of the crossbar substantially flush with the upper surface of the insole.

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