

Aug. 23, 1938.

C. D. TURNER

2,127,634

MANUFACTURE OF SHOE BOTTOM UNITS

Filed Oct. 27, 1936

2 Sheets-Sheet 1

Fig.1.

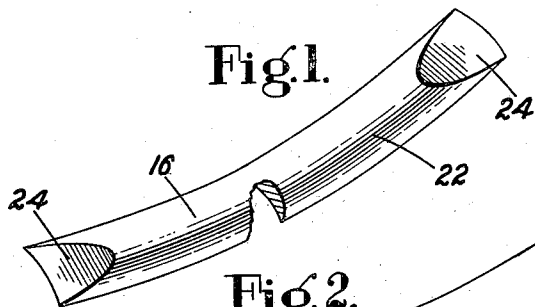


Fig.2.

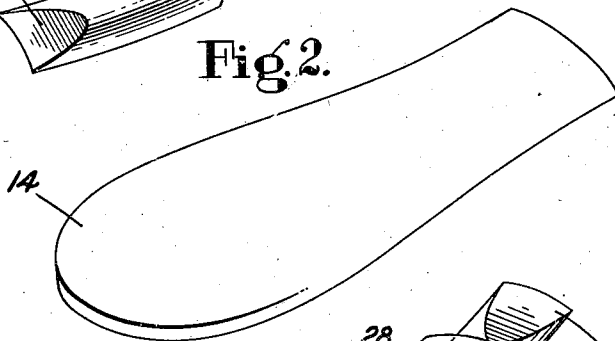


Fig.3.

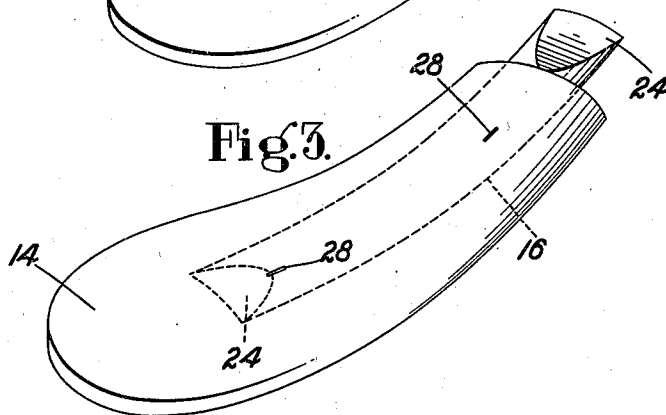
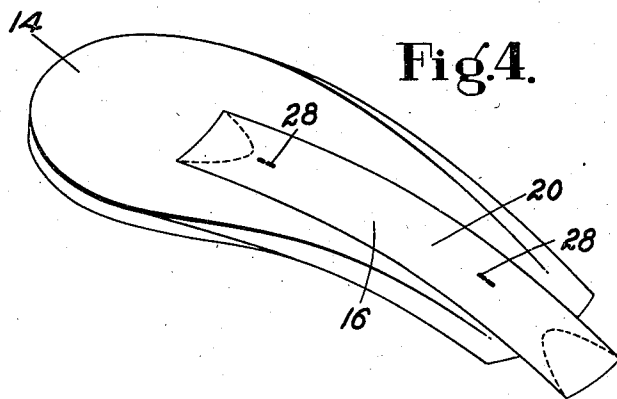


Fig.4.



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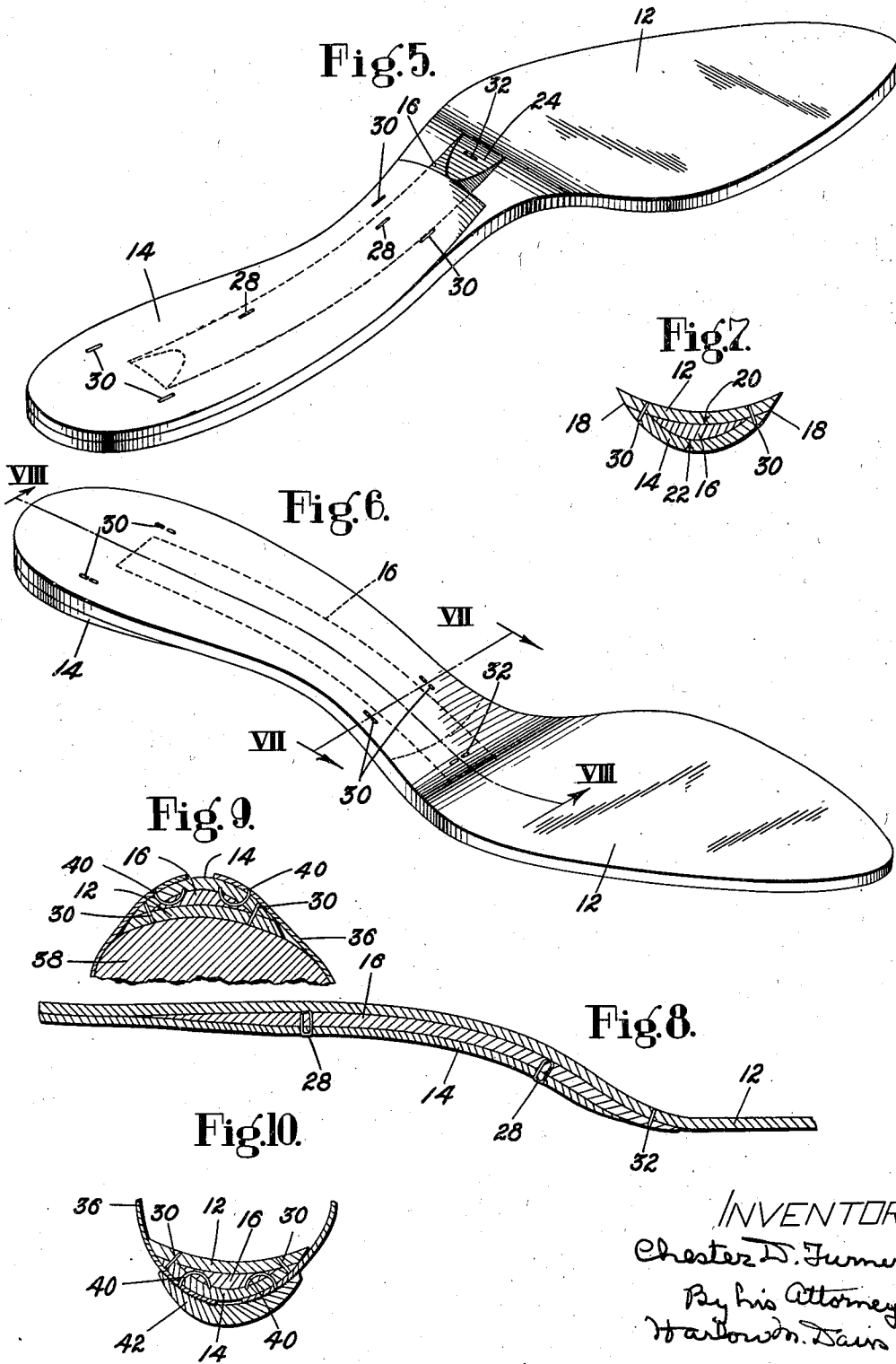
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

2,127,634

MANUFACTURE OF SHOE BOTTOM UNITS

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14 Claims. (Cl. 12—146)

This invention relates to improvements in shoe bottom units and methods of making the same and to improvements in shoes.

One object of the invention is to provide a reinforced shoe bottom or insole unit of novel construction which will be inexpensive to manufacture and the use of which in a shoe will facilitate the performance of the lasting operation and tend to produce better lasted shoes.

With this object in view the invention, in one aspect, resides in a reinforced shoe bottom or insole unit, as an article of manufacture, comprising an insole, a heel and shank reinforcing piece, a shank stiffener interposed between the insole and the reinforcing piece, both the reinforcing piece and the shank stiffener being composed of material that is readily penetrable by means of lasting fastenings, fastening devices securing the reinforcing piece to the shank stiffener, and other fastening devices securing the reinforcing piece and the shank stiffener individually to the insole. In making my reinforced insole unit, as herein exemplified, the unit is shaped to correspond substantially to the bottom contour of a last without the use of expensive molding forms, the desired curvatures in the shank portion of the unit being obtained by shaping the insole and the reinforcing piece to the curvatures of the shank stiffener which is interposed between them in the process of assembling and securing the several parts together. As herein exemplified, a resilient wooden shank stiffener is employed having the usual longitudinal curvature and having a desired amount of transverse concavity at that side which is to engage the insole and a desired amount of transverse convexity in that side which is to engage the reinforcing piece. In proceeding with the manufacture of the unit, the reinforcing piece and the shank stiffener are assembled in the desired relative positions and secured together by fastening devices such as wire staples which are driven through the reinforcing piece and through the shank stiffener, thereby providing a reinforcing piece and shank stiffener assembly or shank stiffener unit in which the longitudinal curvature of the shank stiffener is imparted to the reinforcing piece. Thereafter, as herein illustrated, adhesive is applied to the heel and shank portion of an insole and to that side of the reinforcing piece and shank stiffener assembly which is to engage the insole, the parts are assembled in the desired relative positions and staples are driven through the lateral marginal portions of the reinforcing piece and the insole

at opposite sides of the shank stiffener, thereby imparting to the shank portion of the insole a longitudinal curvature corresponding to that of the reinforcing piece and shank stiffener assembly and, in addition, imparting desired transverse curvatures to the shank portions of the insole and the reinforcing piece.

In making a shoe embodying my improved insole unit, the unit is assembled with an upper on a last, the upper is worked over the last and its margins secured in overlapped position upon the shank portion of the insole unit by means of lasting fastenings, for example, wire staples. Because of the character of the shank stiffener which is capable of being readily penetrated by the lasting fastenings, the latter may be inserted without reference to the location of the shank stiffener, inasmuch as they will penetrate the shank stiffener as readily as the other parts of the insole unit. Consequently, as herein illustrated, the upper may be secured by means of the lasting fastenings to the shank stiffener as well as to the heel and shank reinforcing piece.

Considered in other aspects, therefore, the invention provides also improvements in methods of making reinforced insole units and to improvements in shoes embodying such units substantially as hereinafter described and claimed.

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

Fig. 1 is a perspective view partially broken away of the shank stiffener employed in my improved shoe bottom unit;

Fig. 2 is a perspective view of the heel and shank reinforcing piece;

Figs. 3 and 4 are perspective views showing the lower and upper sides, respectively, of the heel and shank reinforcing piece as it appears after the shank stiffener has been secured to it;

Figs. 5 and 6 are perspective views showing the lower and upper sides, respectively, of the completed shoe bottom unit;

Figs. 7 and 8 are sectional views taken along the lines VII—VII and VIII—VIII of Fig. 6.

Fig. 9 is a cross-sectional view of the shank portion of a shoe in process of construction having my improved insole unit incorporated therein; and

Fig. 10 is a cross-sectional view of the shank portion of the shoe as it appears when completed.

The improved shoe bottom or insole unit shown in the drawings comprises a full length insole 12, a reinforcing piece 14 for the heel and shank portions of the insole, and a shank stiffener 16 55

which is adapted to be interposed between the insole and the heel and shank reinforcing piece. The insole 12 may be made of leather or any suitable leather substitute and it is cut to the required shape and size in any suitable manner, for example, by a rounding or by a die-cutting operation. The reinforcing piece may be made of stiff leather or fiberboard and may be died out or rounded to correspond substantially in lateral and rear edge contour to that of the insole. As indicated at 18 in Fig. 7, the lateral edges of the reinforcing piece as well as those of the heel and shank portions of the insole are beveled to facilitate smooth lasting of the shoe upper over the edges of the insole unit in the heel and shank portions of the shoe. The shank stiffener 16 is made of material which possesses the desired degree of resiliency and which is capable of being readily penetrated by lasting fastenings, it having been found in practice that wooden shank stiffeners of the usual construction are entirely satisfactory. The wooden shank stiffener 16 herein shown is formed with a transversely concave upper side 20 where it is to engage the insole and with a transversely convex lower side 22 where it is to engage the reinforcing piece. The shank stiffener also has the usual longitudinal curvature and as usual the opposite end portions of the shank stiffener are beveled as indicated at 24.

For use in shoes of different sizes it is of course necessary to cut the insoles in sizes to correspond with the sizes of the shoes. It is unnecessary, however, to provide a complete run of sizes of the heel and shank reinforcing pieces on account of the relatively small change in shape of the heel and shank portions of the insole resulting from a change in size of the insole. Accordingly, it is practicable to employ a single size of reinforcing piece for a run of several sizes of insoles, it being customary to provide only three or four sizes of reinforcing pieces for use with a lot of insoles comprising a full run of sizes. Thus, by selecting a reinforcing piece of a size appropriate for use with an insole of a given size the reinforcing piece will correspond as closely as is necessary to the shape of the heel and shank portions of the insole. Moreover, it is unnecessary for the same reason to provide a complete run of sizes of shank stiffeners.

In manufacturing the insole unit a heel and shank reinforcing piece and a shank stiffener of a size appropriate for use with a given insole are first assembled and secured together and later are applied as a unit to an insole. The reinforcing piece and the shank stiffener are assembled manually, the widthwise relation of the parts being determined by the eye of the operator and their lengthwise relation by means of suitable measuring or gaging devices, it being preferable, as herein illustrated, to have the shank stiffener project forwardly beyond the forward edge of the reinforcing piece an amount sufficient to insure that when the parts are assembled with the insole the forward edge of the shank stiffener will be located substantially at or slightly behind the break line of the insole. After the reinforcing piece and the shank stiffener have been thus assembled with the transversely convex side of the shank stiffener in engagement with the reinforcing piece the parts are secured together by means of fastenings, such as wire staples 28, which may be inserted in the locations indicated in Fig. 3, the staples being driven through the reinforcing piece and through the wooden shank

stiffener and having the ends clenched against the transversely concave side of the shank stiffener. The staples may conveniently be driven by a fastener inserting machine such, for example, as that disclosed in United States Letters Patent No. 1,011,592, granted December 12, 1911, upon application of W. J. Drey. The attaching of the reinforcing piece 14 to the shank stiffener 24 in this manner causes the reinforcing piece to have imparted thereto a longitudinal curvature corresponding to that of the shank stiffener and provides a reinforcing piece and shank stiffener assembly, as shown in Figs. 3 and 4, which is adapted for attachment as a unit to an insole.

Preparatory to attaching the reinforcing piece and shank stiffener assembly to an insole a suitable adhesive, such as rubber latex, is applied to the surfaces of the assembly and of the insole which are to engage each other, i. e., to the lower side of the heel and shank portion of the insole and to the upper side of the reinforcing piece and shank stiffener assembly. After the adhesive has been allowed to set until it is sufficiently tacky for use, the reinforcing piece and shank stiffener assembly is positioned upon the insole with the side and rear edges of the reinforcing piece aligned by means of the operator's fingers with those of the heel and shank portions of the insole and the parts manually pressed together to cause them to adhere, the pressure also serving to conform the insole to the longitudinal curvature of the shank stiffener and to curve the insole more or less transversely to conform to the transverse curvature of the upper surface 20 of the shank stiffener. The parts are then firmly and permanently secured together by means of fastenings such as wire staples 30 (Figs. 5 and 6) which may be driven by means of a fastener inserting machine, such as that already referred to, through the lateral marginal portions of the reinforcing piece and the insole, the said machine functioning to drive the staples through the insole and also to clench the points of the staples over against the upper or foot side of the insole. In the operation of a machine of the general type referred to, not only will the staples be driven in a manner firmly to secure together the marginal portions of the reinforcing piece and the insole but the machine operates also to clamp the work in the localities where the staples are driven with a substantial amount of pressure and this clamping pressure is effective to insure that a satisfactory bond will be established between the adhesive coated parts and it will also insure that the reinforcing piece will be conformed to the convex transverse curvature of the lower side of the shank stiffener so that a substantial amount of transverse convexity will be imparted to the lower side of the reinforcing piece.

Two staples may be driven through each lateral margin of the reinforcing piece, as shown in Fig. 5, or a row of several staples may be driven as may be found desirable. At the same operation of the fastener inserting machine it may also be desirable to drive one or more additional staples as, for example, to drive a staple 32 through the projecting forward end portion of the shank stiffener so as more securely to attach the same to the insole. In some instances it may be found desirable to insert the staples from the insole side of the unit and to clench the points of the staples over against the lower surface of the reinforcing piece.

It will be seen that in the practice of the above-described method a reinforced shoe bottom or insole unit is produced which has substantially

all the characteristics of a unit which has been premolded to the shape of a last bottom although no molding forms have been employed and consequently a substantial saving in time and expense has been effected.

In making a shoe embodying my improved insole unit, the unit is assembled with a shoe upper 36 (Fig. 9) on a last 38, the upper is worked over the last and the overlaid margins of the upper are secured to the unit, for example, by means of lasting fastenings such as the curved staples 40. Inasmuch as the shank stiffener 16 may be readily penetrated by the lasting fastenings, it is unnecessary to be careful to drive the fastenings in such locations as to avoid the shank stiffener, as would have to be done if a metallic shank stiffener were employed, but the fastening may be driven without reference to the location of the shank stiffener and, as shown in Figs. 9 and 10, they may be driven so as to enter and become firmly anchored within the substance of the shank stiffener. This permits the staples or other lasting fastenings to be inserted much closer to the median line of the unit than would be possible if a metallic stiffener were used. This is of particular advantage in the manufacture of narrow shank or so-called "fiddle shank" shoes where if metallic shank stiffeners were employed it would be difficult if not impossible properly to secure the overlaid margins of the upper to the insole in the shank portion of the shoe.

After the upper has been secured in lasted position to the insole unit, and trimmed if necessary, an outsole 42 may be attached in any customary way as, for example, by means of cement, as indicated in Fig. 10, or by through-and-through stitches.

In the insole unit herein shown a wooden shank stiffener has been employed which has a transversely convex surface at its lower side, the radius of curvature of which is substantially shorter than that of the transversely concave surface at the upper side of the stiffener. Thus, the transverse curvature imparted to the shank portion of the reinforcing piece 14 is substantially greater than that imparted to the shank portion of the insole, a condition which is often desirable.

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

1. As an article of manufacture, a reinforced insole unit comprising an insole having a longitudinally curved shank portion and a flat forepart, a stiff heel and shank reinforcing piece capable of being readily penetrable by lasting fastenings and having its forward extremity located a substantial distance rearwardly of the junction between the shank portion and the forepart of the insole, a resilient wooden shank stiffener interposed between said insole and said reinforcing piece, said stiffener being narrower than either of said parts and extending forwardly to said junction, and means for securing said parts together including a fastening device extending only through said insole and said reinforcing piece at the forward end portion of the latter.

2. A reinforced insole unit comprising an insole, a heel and shank reinforcing piece, a shank stiffener interposed between said reinforcing piece and said insole, both the shank stiffener and the reinforcing piece being readily penetrable by lasting fastenings, fastening devices securing the reinforcing piece to the shank stiffener and fas-

tening devices securing the reinforcing piece to the insole, and a separate fastening device or devices securing the shank stiffener directly to the insole, said devices penetrating the parts secured together thereby.

3. A reinforced insole unit comprising an insole, a heel and shank reinforcing piece, and a shank stiffener interposed between said parts, both the reinforcing piece and the shank stiffener being readily penetrable by lasting fastenings, fastening devices securing the reinforcing piece to the shank stiffener, and other fastening devices securing the reinforcing piece and the shank stiffener individually to the insole.

4. A reinforced insole unit comprising an insole, a reinforcing piece for the shank portion of the insole, a wooden shank stiffener located between the reinforcing piece and the insole and secured to the reinforcing piece by means of staples which are clenched against the inner side of said stiffener, and the shank stiffener and the reinforcing piece being secured by means of adhesive to the insole.

5. A reinforced insole unit comprising an insole, a reinforcing piece for the shank portion of the insole, a wooden shank stiffener located between the reinforcing piece and the insole and secured to the reinforcing piece by means of staples, and the shank stiffener and the reinforcing piece being secured to the insole by means of adhesive and by means of staples located at opposite sides of said stiffener.

6. A reinforced insole unit comprising an insole member having a longitudinally arched shank portion, a reinforcing piece for the shank portion of the insole member secured only to the marginal portions of the latter, and a wood shank interposed between the reinforcing piece and the insole member and bonded by means of adhesive to the insole member.

7. An insole unit comprising an insole, a reinforcing piece for the shank portion of the insole, and a wooden shank stiffener, the shank stiffener being interposed between the reinforcing piece and the insole and being secured by means of adhesive to the insole, and the reinforcing piece being secured by staples to the shank stiffener and to the insole.

8. An insole unit comprising an insole, a reinforcing piece for the shank portion of the insole, and a wooden shank stiffener, the shank stiffener being interposed between the reinforcing piece and the insole and being cemented and stapled to the insole, and the reinforcing piece being secured by staples to the shank stiffener and by cement and staples to the insole.

9. That improvement in methods of making reinforced insole units which consists in securing together a heel and shank reinforcing piece and a shank stiffener by means of fastening devices penetrating each of said parts thereby providing a shank stiffener unit, and thereafter securing said unit to an insole by means of fastening devices penetrating said heel and shank reinforcing piece and the insole and other fastening devices penetrating the shank stiffener and the insole.

10. That improvement in methods of making reinforced insole units which consists in securing together a heel and shank reinforcing piece and a shank stiffener by means of fastening devices penetrating each of said parts thereby providing a shank stiffener unit, and thereafter securing said unit to an insole by means of adhesive and penetrative fastening devices.

11. That improvement in methods of making reinforced insole units which consists in securing together a heel and shank reinforcing piece and a shank stiffener having a transversely convex lower side by means of fastening devices penetrating each of said parts thereby providing a shank stiffener unit, and thereafter securing said unit to an insole by means of adhesive and later driving fastening devices through said reinforcing piece and into said insole at opposite sides of said shank stiffener thereby causing the reinforcing piece to partake of the convex contour of the shank stiffener.

12. A shoe comprising an insole, a heel and shank reinforcing piece secured to the lower or lasting side of the insole, a shank stiffener interposed between said insole and said reinforcing piece, an upper having overlasted marginal portions secured by lasting fastenings to said reinforcing piece and to said shank stiffener, and an outsole secured to said marginal portions of the upper.

13. As an article of manufacture, a reinforced insole unit comprising an insole, a heel and shank reinforcing piece located at the lower side of the insole, a shank stiffener having transversely curved upper and lower surfaces located between

the central portions of the insole and the reinforcing piece, said stiffener having its lower face transversely curved to a substantially greater extent than its upper face, and means securing together the marginal portions of said insole and said reinforcing piece, said insole and said reinforcing piece partaking of the transverse curvatures of the surfaces of the shank stiffener engaged respectively thereby.

14. As an article of manufacture, a reinforced insole unit comprising an insole, a relatively stiff heel and shank reinforcing piece conforming in outline to the shank and heel portions of the insole, a shank stiffener having a transversely concave surface engaging said insole and a transversely convex surface engaging said reinforcing piece, the radius of curvature of said convex surface being substantially shorter than the radius of curvature of said concave surface, and means securing together the marginal portions of the insole and the reinforcing piece surrounding said stiffener and imparting to said reinforcing piece and said insole transverse curvatures corresponding approximately to the curvatures of the surfaces of the shank stiffener engaged respectively thereby.

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