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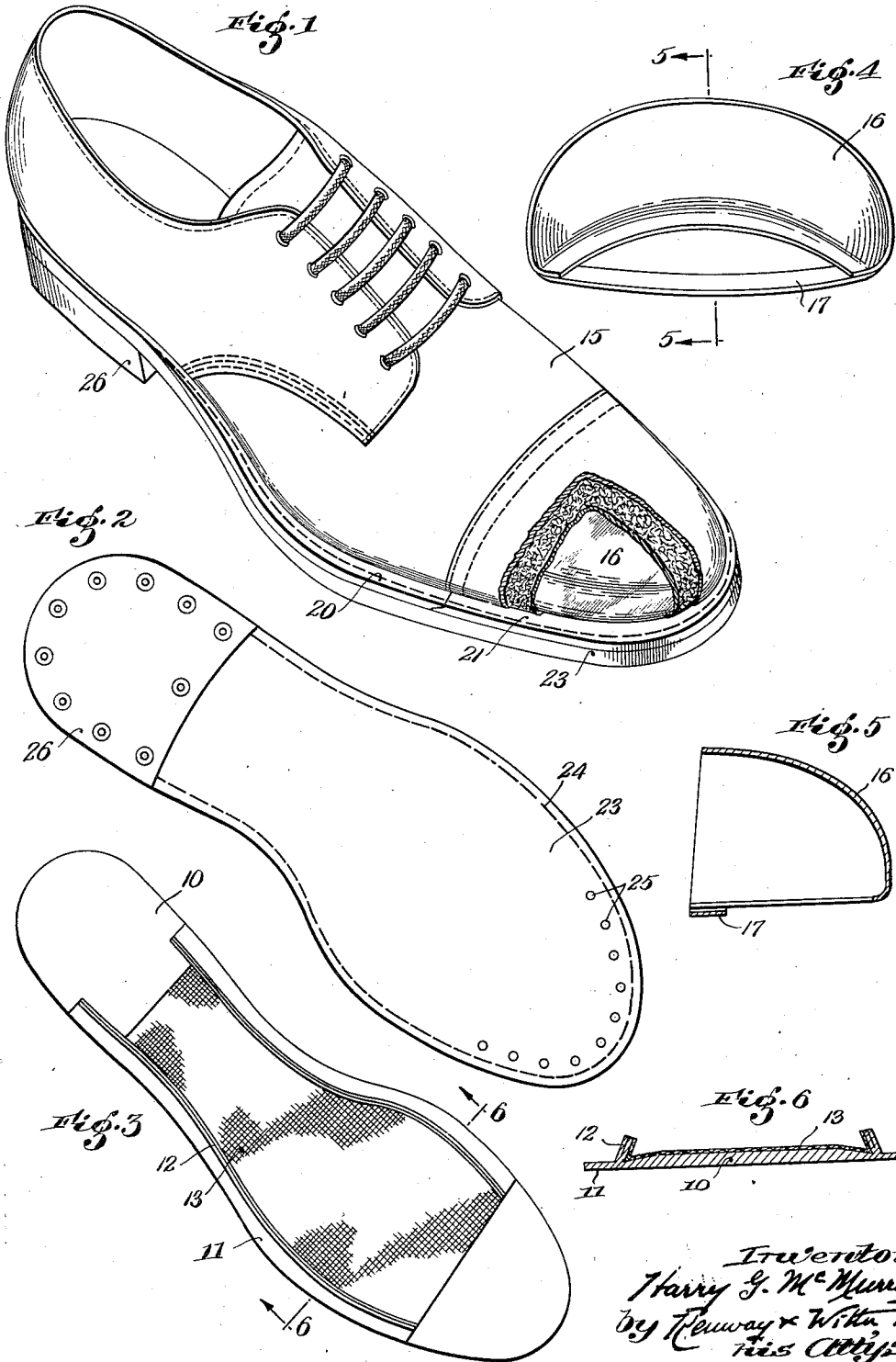
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2,438,016

SAFETY SHOE AND PROCESS OF MAKING THE SAME

Filed Jan. 27, 1947

2 Sheets-Sheet 1



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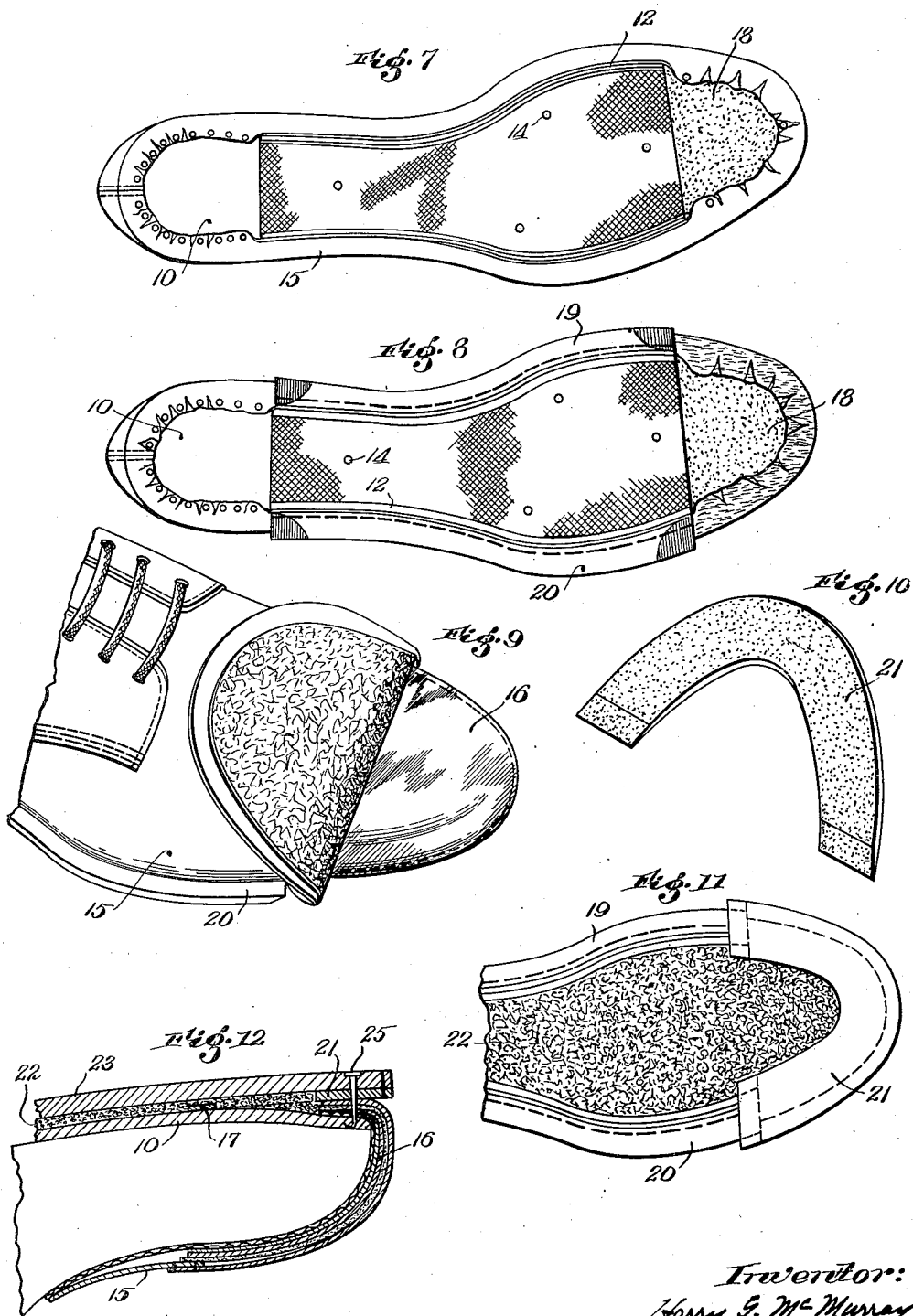
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UNITED STATES PATENT OFFICE

2,438,016

SAFETY SHOE AND PROCESS OF MAKING THE SAME

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a corporation of Massachusetts

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5 Claims. (Cl. 36-17)

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This invention comprises improvements in safety shoes which include a sheet steel box for protection of the toes of the wearer. In one aspect it comprises a novel process of manufacturing shoes by a series of steps which facilitate the shoemaking operations in general and lead to the production of a flexible welt shoe while eliminating the danger of breaking needles which has heretofore been a serious detriment. In another aspect the invention comprises the improved welt shoe herein shown as produced by the process of my invention.

The improved safety shoe of my invention is characterized by the employment of a toe plug which may be inserted as a flat piece of leather about the toe of the shoe and take the place of the welt in this location. In combination with the toe plug I employ two short pieces of welt which terminate approximately at the tip line of the shoe and make connection with the toe plug so as to provide a continuous extension with the plug to which the outsole may be subsequently sewn. This results in a particularly strong and rugged construction for a safety work shoe. It preserves the flexibility of a welt shoe, it eliminates breaking needles in sewing around the toe, and it also eliminates failure of the shoe due to rotting of the in-seam by rust which forms on the steel box when the shoes are worn for any length of time in damp places.

These and other features of the invention will be best understood and appreciated from the following description of a preferred form of shoe in which the invention is embodied, together with a description of the process of its manufacture as illustrated in the accompanying drawings, in which:

Fig. 1 is a view in perspective of the complete shoe with a portion of the tip broken away,

Fig. 2 is a plan view of the shoe bottom,

Fig. 3 is a plan view of an insole which may be used in the construction of the shoe,

Fig. 4 is a view in perspective of a steel box which may be used in the construction of the shoe,

Fig. 5 is a view of the box in section on the line 5-5 of Fig. 4,

Fig. 6 is a view of the insole in section on the line 6-6 of Fig. 3,

Fig. 7 is a plan view of the shoe bottom at the conclusion of the toe lasting operation,

Fig. 8 is a similar view showing the welt strips attached and the overlapped margin of the upper as roughened and cemented,

Fig. 9 is a fragmentary view in perspective show-

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ing the steel box as assembled on the last in the upper,

Fig. 10 is a view in perspective of the toe plug,

Fig. 11 is a plan view showing the toe plug in place in the shoe bottom, and

Fig. 12 is a view in longitudinal section through the toe portion of the finished shoe.

The insole 10 employed in the construction of the illustrated shoe as shown in Fig. 3 is channeled and shouldered in the usual manner to provide a marginal feather 11 and an upstanding sewing rib 12, the latter being reinforced with a ply of canvas 13 which is cemented in face-to-face contact to the body of the insole. In this instance the ribs and reinforcing ply terminate approximately at the tip line of the insole.

In manufacturing the shoe, the insole 10 is temporarily secured to the last bottom by tacks 14, as suggested in Fig. 7, and the upper 15 is pulled over, side lasted and heel lasted in the usual manner. In these operations the overwiped margin of the upper is conformed to the rib 12 of the insole throughout the shank and forepart of the shoe and is tacked to the outer surface of the insole about the heel seat of the shoe.

At or about this stage of the shoemaking process, the steel box is assembled with the upper upon the toe of the last. The steel box, as shown in Figs. 4 and 5, comprises a convex body portion 16 having the shape of the toe portion of the last and being provided with an returned marginal flange and a flat tie bar 17 which extends transversely between the rear corners of the flange of the steel box. The operation of inserting the steel box is suggested in Fig. 9 where the toe portion of the upper is shown as turned back permitting the box 16 to be placed over the lining and upon the toe portion of the last. This may be accomplished easily by merely removing the pulling over tacks at the tip of the shoe. As soon as the box 16 has been properly placed, the tip is turned back to its original position and the toe lasted. In this step the toe portion of the insole is first coated with cement 18 and the over-lasted margin completely tacked in position until the cement has set. This is the condition of the shoe bottom illustrated in Fig. 7.

The next step in the manufacturing process consists in stitching two short welt strips 19 and 20 to the ribs 12 of the insole. This is effected by the regular welt sewing operation which includes the margin of the upper. Thus the two strips, the margin of the upper, and the insole rib are all united from the heel breast line to sub-

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stantially the tip line, this being accomplished in a welt sewing operation which is much more easily carried out than the usual welt sewing operation in that it does not oblige the operator to carry it about the curvature of the toe portion of the shoe. Having attached the two welt strips 19 and 20 in the manner explained, both ends of each welt strip are beveled to a feather edge terminating in a common transverse line at each end of the shoe. This operation may be conveniently effected by the commercial welt butting machine now available to all manufacturers of welt shoes.

When the cement has set which holds the overlapped margin of the upper about the toe of the shoe, the lasting tacks may be removed, the upper trimmed if necessary and roughened to receive a coating of cement upon its exposed face upon which the toe plug is to be cemented.

The toe plug 21, as best shown in Fig. 10, may comprise a horseshoe shaped piece of leather approximately 4 irons in thickness, beveled at its rear ends to fit the beveled ends of the welt strips 19 and 20, and of such contour as to supplement the welt strips and form an extension uniform with them about the toe portion of the shoe.

In Fig. 11 the toe plug 21 is shown as cemented in place in the toe portion of the upper with its rear beveled ends making a spliced beveled joint with the forward ends of the welt strips 19 and 20. In Fig. 11 the toe plug 21 is shown as extending slightly beyond the contour of the welt strips. This is not in the least objectionable since the final contour of the shoe is determined in the rough rounding and trimming operations effected after the outsole is laid. The precise shape of the toe plug is of secondary importance so long as it is of sufficient area to supplement and complete the usual welt contour of the shoe in combination with the welt strips.

The shoe bottom may now be filled with any plastic composition 22 usually employed in the manufacture of welt shoes. Subsequently the outsole 23 is laid in the usual manner and rough rounded together with the welt strips and the toe plug to impart to the sole its desired final contour. The outsole may then be stitched in the regular manner, the outseam 24, as shown in Fig. 2, passing continuously about the margin of the outsole and including both welt strips and the toe plug 21. Finally, the toe portion of the shoe is reinforced by a series of loose nails 25 driven in an arc extending about the toe portion of the outsole between the ends of the welt strip and extending through the outsole 23, the toe plug 21, the overlapped margin of the upper, and the insole 10. The shoe may then be completed by attaching, trimming and finishing the heel 26.

In making a safety shoe by the steps above outlined, it will be seen that the welt sewing operation is terminated at substantially the tip line of the shoe and before there is any danger of striking the steel toe box with the needle of the welt sewing machine. That portion of the shoe bottom adjacent to the steel box is fastened not only by the outseam which may possibly in

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wear be impaired by rust from the box, but also by the loose nails 25 which constitute metallic fastenings that will outlast the shoe under the most severe conditions of wear.

Having thus disclosed my invention, what I claim as new and desire to secure by Letters Patent is:

1. The process of making safety shoes, which includes the steps of inserting a steel toe box in the toe end of an upper while on the last, said upper having beveled welt strips terminating approximately at the tip line on both sides of the shoe, lapping the welt strips with a toe plug that projects beyond the contour of the toe box, stitching an outsole to the welt strips and toe plug, and finally nailing the outsole about its toe portion.

2. The process of making safety shoes, which includes the steps of inserting a steel toe box in the toe end of an upper while on a last carrying a ribbed insole, side lasting the upper, sewing a separate welt strip to each side of the upper and insole rib, beveling the two welt strips to a feather edge lying approximately in the tip line, attaching a flat toe plug to the shoe bottom in overlapping relation to the beveled ends of the welt strips, the said plug extending beyond the contour of the toe box, then stitching an outsole to the welt strips and toe plug, and finally nailing the toe end of the outsole to the insole by loose nails driven in an arc between the ends of the welt strips.

3. A safety shoe comprising an insole provided with ribs terminating at the tip line, a welt strip sewn to each rib and beveled at its forward end in the location of the tip line, a steel toe box included in the upper of the shoe, a horseshoe shaped toe plug supplementing the welt contour of the shoe and making a beveled connection with the welt strips, an outsole sewn to the welt strips and toe plug, and nails attaching the outsole and toe plug forward of the welt seam.

4. A safety shoe comprising a welt insole, an upper including a steel toe box, welt strips terminating at approximately the tip line of the shoe, a flat toe plug extending between the welt strips and completing the general welt contour of the shoe, an outsole sewn to the welt strips and toe plug, and metallic fastenings securing the toe portion of the outsole in the shoe bottom.

5. A safety shoe comprising an insole provided with ribs terminating at the tip line, a welt strip sewn to each rib and beveled at its forward end in approximately the location of the tip line, a steel toe box enclosed in the upper of the shoe and having an intumed marginal flange, a horseshoe shaped toe plug supplementing the welt contour of the shoe and substantially coextensive with the marginal flange of the steel toe box, the ends of said toe plug being formed to provide beveled connections with the forward ends of the two welt strips, and an outsole sewn to the welt strips and the toe plug by a continuous line of stitching.

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