Dec. 28, 1948. W. G. GREENAN 2,457,463

PROCESS OF MAKING SAFETY SHOES

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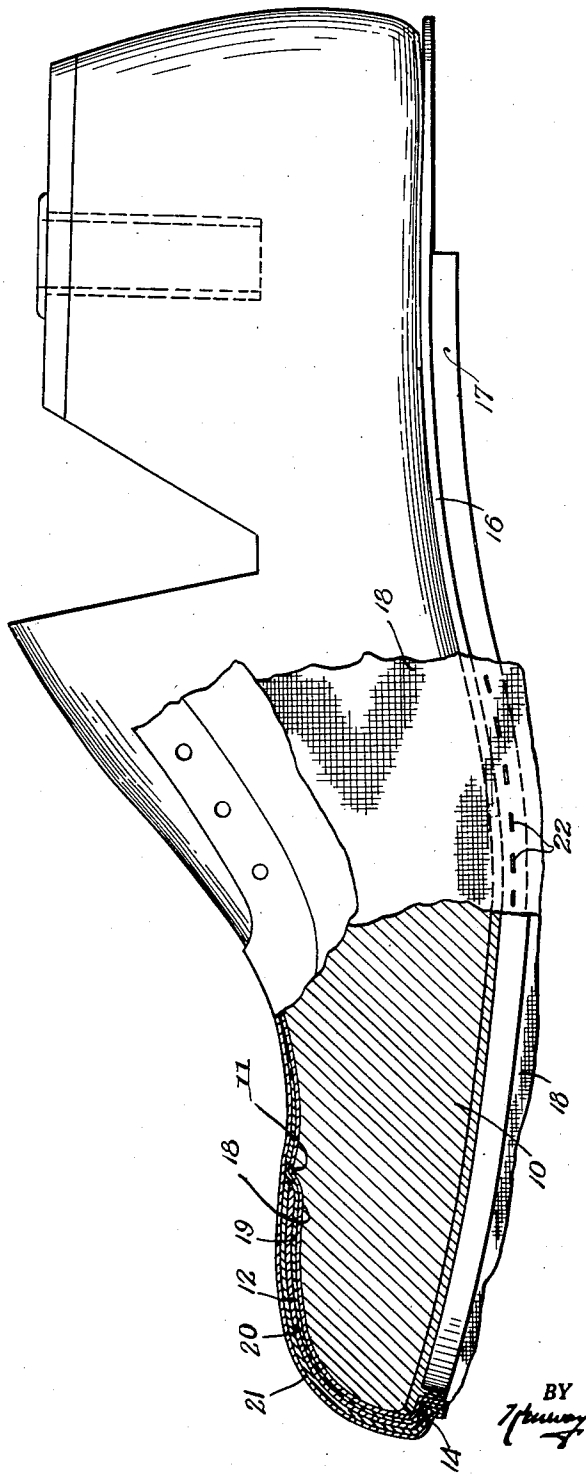


Fig. 1

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Fig. 2

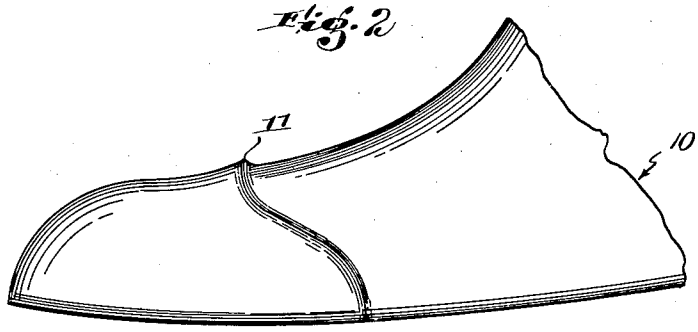


Fig. 3

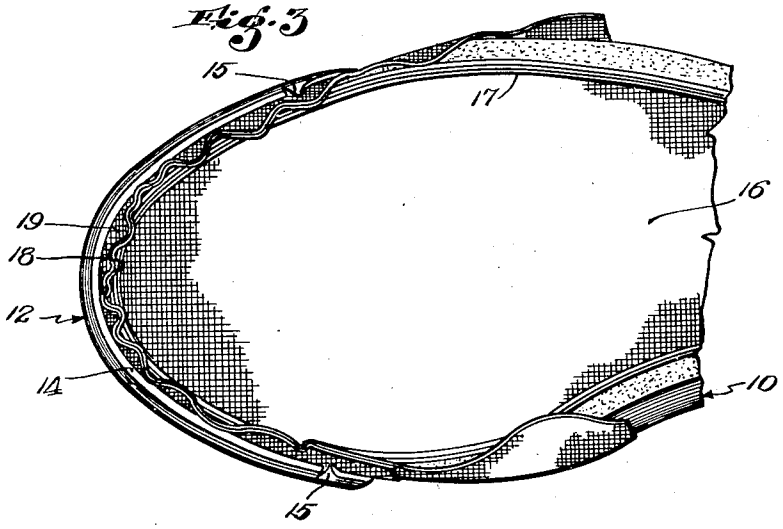
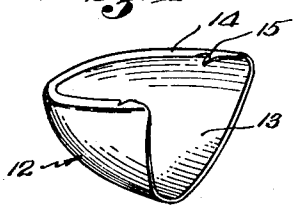


Fig. 4



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PROCESS OF MAKING SAFETY SHOES

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4 Claims. (Cl. 12—146)

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This invention comprises a new and improved method of making safety shoes, that is to say, shoes having a metal box toe protecting the toes of the wearer against danger of crushing from heavy metal objects falling thereon.

Safety shoes as heretofore constructed have presented the awkward appearance of heavy work shoes and have usually included a somewhat artistic tip employed to conceal the additional thickness in the upper caused by the metal box. By the process of my invention it is possible for the first time to make safety shoes in plain toe or wing tip style and in general to improve the style, fit and appearance of safety shoes.

The process of my invention is characterized by the steps of placing a metal toe box upon the toe of a last having a transverse ridge extending approximately across its tip line with its rear arched edge disposed in front of the ridge on the last and then lasting the leather tip on the upper smoothly over the metal box. The ridge provided in the last is formed by the addition of wood to the last so that the ridge projects somewhat but to a small degree above the normal contour of the last but by an amount sufficient to compensate for the thickness of the metal box and if desired the additional thickness of an inner lining which in some cases includes a plastic box. When the leather tip of the upper is lasted it presents a smooth stream-line exterior surface even in a plain toe Oxford made with a full vamp. The vamp flows over the edge of the box without making any perceptible impression on the vamp.

Going more into detail my novel process may include the steps of placing a lining and also a plastic toe box upon the toe end of the last, then placing a metal toe box over the plastic box with its rear edge disposed wholly in front of the ridge on the last padding the outer surface of the metal toe box and finally lasting the leather tip of the upper smoothly over the assembled parts. The inner lining and plastic box insulate the metal of the metal box from the toes of the wearer, they supply material which guards the toes of the wearer from the metal of the toe box in case of erosion and they form a bite pad extending beyond the rear end of the metal box and thus increase the comfort of the shoe in wear, whereas it has been necessary heretofore to employ a vamp cut-off and to abut this carefully against the rear edge of the steel box. This is no longer necessary as already explained and

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a plain toe vamp may be employed with entire satisfaction.

Another feature of the invention consists in providing the metal toe box with barbs located in each side thereof which serve to retain the box in proper position on the toe end of the last when once properly presented thereto. Heretofore there has been a tendency in the metal box to bounce forwardly or to cock or otherwise become misplaced due to the resilient nature of the pleated lining which is interposed between it and the toe of the last.

My invention includes within its scope the novel last herein shown as employed in carrying out the process of my invention. This is shown as provided with a transverse ridge which may extend across the toe of the last in proximity to its tip line or may extend in a sinuous curve corresponding generally to the outline of a wing tip. Preferably the ridge is convex in form, being formed by convex surfaces meeting in a common vertex and projecting beyond or above the normal contour of the last.

These and other features and characteristics of the invention will be best understood and appreciated from the following description of a preferred manner of carrying out the novel process as illustrated in the accompanying drawings in which—

Fig. 1 is a view in elevation of a last shown partially in longitudinal section with the parts of the upper assembled thereon,

Fig. 2 is a view in elevation of the forepart of the last,

Fig. 3 is a fragmentary plan view showing the bottom of the lasted shoe, and

Fig. 4 is a view in perspective of a metal toe box.

The last 10 used in carrying out the process of my invention is in itself of novel construction. It is complete in contour but provided with additional wood in the shape of a transverse ridge 11 extending from the bottom edge of the last on one side, across the forepart of the last in the vicinity of the tip line and to the bottom edge at the other side of the last. It may extend straight across the last or it may follow the undulating curve of the wing tip as shown in Fig. 2 in which the center of the ridge is considerably in advance of its rear ends. The ridge itself is formed by two concave surfaces converging to a common apex. In practice the ridge 11 may project about $\frac{1}{16}$" beyond the normal contour of the last.

The metal toe box employed in carrying out

the process of my invention may be of any commercial construction. Such a metal box is illustrated in Fig. 4. It comprises a convex dome-shaped box portion 12 having an arched rear edge 13 and an inturned marginal flange 14. The rear edge 13 is herein shown as being substantially straight but its shape may be varied in accordance with the type of shoe in which the box is to be used. In some instances it will have a wing tip shape similar to that shown in Fig. 2.

The metal toe box herein shown, however, has the novel feature already mentioned; that is to say, its inturned flange is provided at each side adjacent to the rear corners of the box with a barb 15. This may be made by cutting the flange 14 and bending the material thereof downwardly to form forwardly directed barbs. The purpose of these barbs, as will be apparent, is to prevent outward displacement of the box when it has been once positioned in the toe of the shoe.

In carrying out the process of my invention the lined upper is assembled upon the last and pulled over in the usual manner. An insole 16 has previously been tacked to the last bottom and if the shoe is to be of the Goodyear type, the insole will include a sewing rib 17 as shown in Figs. 1 and 3. The outer integuments of the upper are then turned back and the lining 18 is lasted smoothly over the toe of the last and the ridge 11. A plastic box 19 is then positioned smoothly upon the lining with its rear edge terminating in advance of the ridge 11. The lining and plastic box are superposed in continuous face-to-face engagement and their marginal portions are overlasted in pleats upon the toe end of the insole 16. The lining 18 is herein shown as secured to the rib of the insole by lasting staples 22. The plastic box may be of the solvent softening type or of the heat softening type, but in either case the box and the lining become bonded together and form a substantial protective ply lying next to the foot of the wearer in the toe of the shoe.

Now the metal box is pressed firmly upon the toe of the last enclosing the protective ply just described. The pleats of this ply are somewhat compacted by the metal box and the latter is held in place by the bite of the barbs 15 into the underlying material. The rear edge of the metal box 12 is located close to and in front of the ridge 11. The ridge 11 and the rear arched edge of the metal box conform to each other in curvature and the height of the ridge above the normal contour of the last is substantially equal to the combined thickness of the metal box 12 and the interior ply formed by the lining 18 and the plastic box 19.

It is generally advantageous to cover the metal box with a felt pad 20 which, as shown in Fig. 1, also terminates in the vicinity of the ridge 11. This pad may be employed or not as preferred by the manufacturer.

Finally the outer leather integument 21 of the upper, which has been turned back in the meantime, is now restored to position and lasted in the usual manner over the padded metal box. In forming the toe portion of the shoe in the manner above explained the outer ply of the upper will be found to extend smoothly and with a very pleasing streamline effect over the metal box 12 and the parts assembled with it. As

already intimated a plain toe shoe made with a full vamp in this manner presents a smooth appearance with no indication of the concealed metal box. Similarly, if the upper includes a tip, the vamp cut-off may be located wherever it happens to come and no visible ridge is formed in the tip by the concealed metal box. This permits the employment of wing tips of any selected design.

The fact that the metal box is provided with the barbs 15 is of decided advantage in that it prevents the box from being accidentally twisted during the shoemaking process and so retains it in proper position to escape being struck by the needle in the welt sewing operation. Heretofore much annoyance has been caused by needle breakage due to slight angular displacement of the metal box.

While the last has been described as provided with a projecting rib formed from the wood of the last, it may in some cases be found convenient to form the ridge of metal, leather, or plastic composition and apply it to the contour of the last. Such construction would be within the scope of the present invention.

Having thus disclosed my invention and described in detail illustrative embodiments thereof, I claim as new and desire to secure by Letters Patent:

1. The process of making safety shoes which includes the steps of placing a lining and a plastic toe box upon the toe end of a last having a transverse ridge approximately at its tip line and extending to the bottom edge of the last on both sides, placing a metal toe box over the plastic box with its rear arched edge disposed wholly in front of the ridge on the last, padding the outer surface of the metal toe box, and then lasting the leather tip of the upper smoothly over the assembled parts.

2. The process of making safety shoes which includes the steps of placing a lining upon the toe of a last having a transverse ridge approximately across its tip line and extending to the bottom edge of the last on both sides, placing a metal toe box over the lining with its rear arched edge disposed in front of the ridge on the last, and then lasting the leather vamp of the upper smoothly over the metal box.

3. The process of making safety shoes which includes the steps of placing a lining upon the toe of a last having a continuous ridge projecting from its normal contour and extending approximately across the tip line of the last and then rearwardly in a compound curve to the bottom edge of the last on both sides, placing a metal toe box over the lining with its rear arched edge conformed approximately to the contour of said ridge and lying wholly in front of the ridge, padding the outer surface of the metal toe box, and then lasting the leather vamp smoothly over the assembled parts.

4. The process defined in claim 3, further characterized by the step of anchoring the toe box against displacement from the ridge by driving a forwardly directed barb on the box laterally into the underlying lining.

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No references cited.