Aug. 31, 1948. K. ENGEL 2,448,301

METHOD OF MAKING A SHOE WITH UPWARDLY DEFLECTED SOLE

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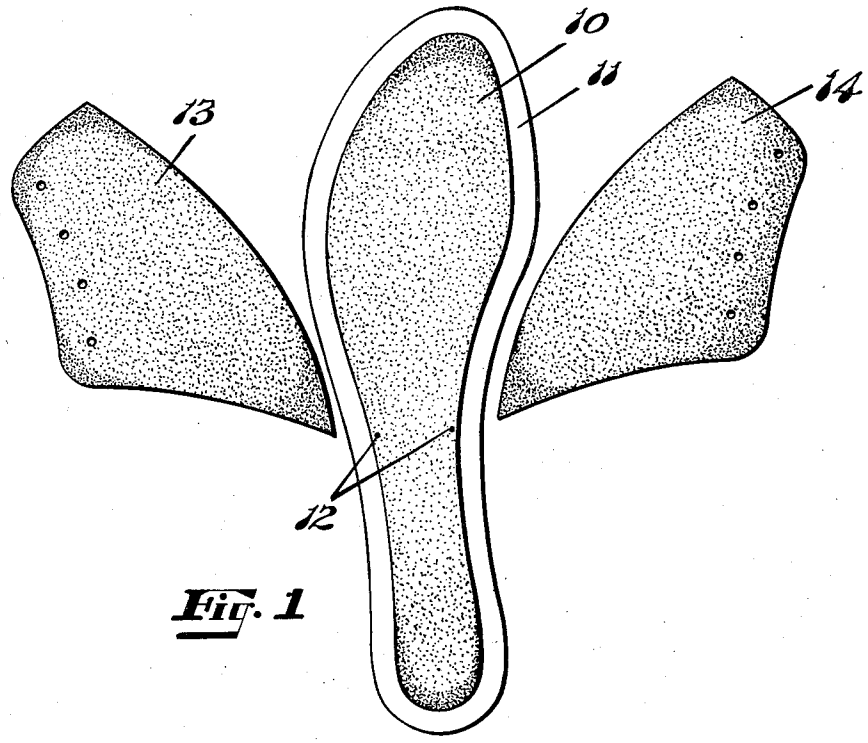


Fig. 1

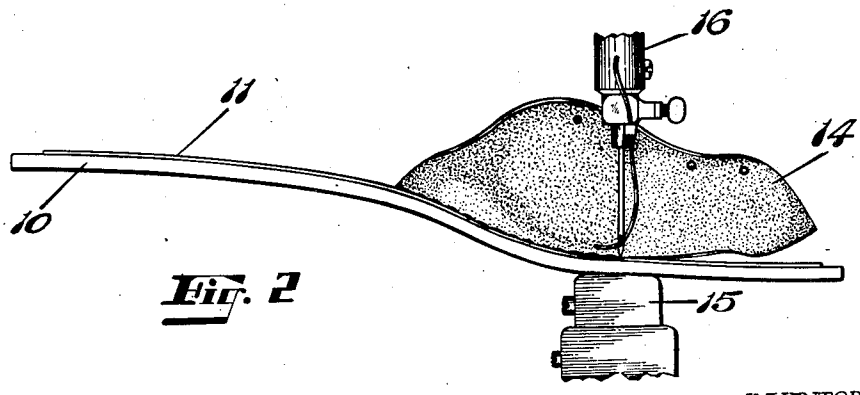


Fig. 2

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Fig. 3

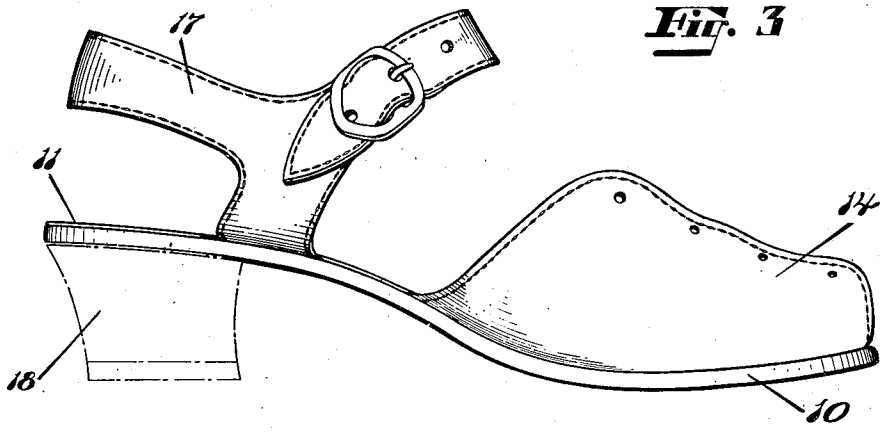
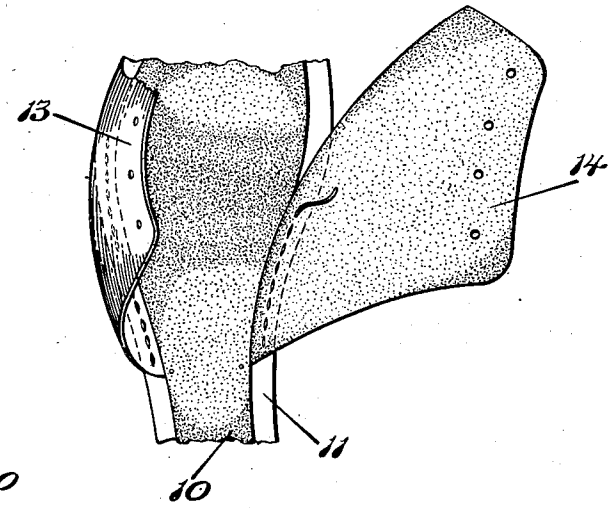


Fig. 4



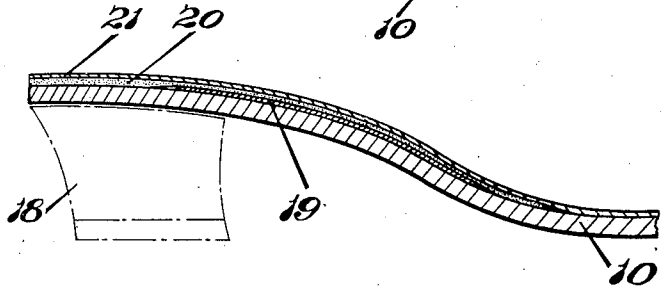


Fig. 5

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Patented Aug. 31, 1948

2,448,301

UNITED STATES PATENT OFFICE

2,448,301

METHOD OF MAKING SHOES WITH UPWARDLY DEFLECTED SOLES

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Application October 12, 1945, Serial No. 622,015

2 Claims. (Cl. 12—142)

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This invention consists in a new and improved process of making single sole shoes or sandals.

While turn shoes have always been highly approved on account of their flexibility, light weight and comfort in wear, they have almost disappeared from the market on account of the difficulty of manufacture and the lack of skilled operators required to produce them.

By the process of my invention I am able to produce at low cost and without the exercise of any special skill single sole shoes having many of the desirable characteristics of turn shoes, and having the very great advantages of requiring the presence of a last for a short period only in the shoemaking process. Moreover, the said process requires only a minimum of easily-operated machinery and equipment for practice on a commercial scale.

I have discovered that by providing a shoulder of convex contour or outline in a sole and an edge of convex edge curvature in separate upper forepart blanks, and then forcibly conforming the edges of the upper blanks to the shoulder of the sole and fastening the sole and upper together in that relation a permanent longitudinal curvature of the desired shape is imparted to the shank of the sole. In other words, by throwing a fullness of material into the united sole and upper I secure a curvature of shank heretofore only acquired by a molding operation. The curvature thus secured may be adjusted and regulated to the height of heel for which the shoe is designed by varying the convexity of the edge curvature of the upper blanks. Within reasonable limits, the greater the convexity of the conformed curves the greater the longitudinal curvature imparts to the shank of the sole.

The shoulder required in the sole may be formed in any desired manner and preferably approximates in depth the thickness of the upper material. Accordingly, when the upper is secured to the sole it forms with the elevated or unchanneled portion of the sole a smooth flush surface under the foot of the wearer, comparable with that found in a turn shoe and like a turn shoe formed in a shoe bottom which comprises a single flexible sole. It is believed that heretofore longitudinal curvature has never been imparted to a shoe bottom by the procedure above described.

The upper blanks and the shouldered sole, which are all initially flat, may be conformed to each other progressively and fastened by the aid of a flat-bed sewing machine, or they may be united in the desired relation by cement, but a

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straight-needle, flat-bed sewing machine is easily operated and in using it no great amount of skill is required in bringing the convex edges of the sole and upper into linear conformity and uniting the materials in a step by step manner.

These and other features and characteristics of the invention will be best understood and appreciated from the following description of a preferred manner of practicing it, selected for purposes of illustration and shown in the accompanying drawings, in which—

Fig. 1 is a plan view of the component parts of the shoe,

Fig. 2 is a view in side elevation illustrating the step of conforming and fastening one section of the upper to the sole,

Fig. 3 is a view in side elevation of the complete shoe, the heel being shown conventionally in dot and dash lines,

Fig. 4 is a fragmentary plan view corresponding to Fig. 2, and

Fig. 5 is a view in longitudinal section through the rear portion of the sole of the completed shoe, the heel being again shown conventionally in dot and dash lines.

As indicated in Fig. 1, the sole 10, which may be 4 to 7 irons in thickness, is prepared by being provided with a marginal channel 11 which forms a continuous shoulder extending about the entire periphery of the sole and spaced within its margin approximately ⅜ of an inch. While in Fig. 1 the channel is shown as being of uniform width, it will be understood that it may be narrowed if desired in the rear portion of the sole or it may terminate in advance of the heel seat. Preferably a pair of reference marks or fitting points 12 are placed upon the sole adjacent to the shoulder as a stock-fitting step to indicate the proper location on the sole for the parts of the upper.

Separate upper blanks 13 and 14 for the forepart of the shoe are died or cut out from upper material and, as shown in Fig. 1, these may be provided with lacing holes. Each upper blank, which is a vamp portion, has its inner or lower edge formed as a continuous convex curve. The curvature of the shoulder in the sole is convex along the outer side of the forepart and is a compound curve having a concave and a convex portion more pronounced along the inner side of the sole.

Having prepared the sole and the upper blanks as suggested in Fig. 1, the next step of the process consists in forcibly conforming the convex edge of the upper blank 13 to the convex shoulder

of the sole, beginning at the reference point 12 and proceeding in a step-by-step manner, fastening the upper and sole together as the conforming operation proceeds. After the blank 13 has been conformed and attached in this manner, the blank 14 is similarly conformed and attached. These steps may be carried out by or with the assistance of a straight needle machine as suggested in Fig. 2, the bed 15 and the needle bar 16 being shown in this figure. It is, of course, impossible to bring the oppositely convex edge of the upper and shoulder of the sole into conformity in a flat condition and I have discovered that the deformation of the material taking place in this conforming operation manifests itself in a longitudinal curvature of the sole somewhat as suggested in Fig. 2; that is to say, the shank portion of the sole is curved upwardly, and by properly shaping the upper blanks this curvature may be made that which is desired for the shank curvature of the finished shoe. In the conforming operation it will be understood that the first stitch is, in effect, a tacking stitch securing the rear tip of the upper blank 13 to the bottom of the flat channel of the sole with the point of the upper blank opposite to the reference mark 12. After initially attaching the upper blank, the operator may readily proceed to force the two curved edges together and to secure the upper and sole right side out in conformed condition by following along with the stitching operation. While stitching is the best means now known to me for securing the parts together, it would be within the scope of the invention to substitute staples, cement, or other fastening medium. It will be noted that since the upper blanks are separate and not closed at the tip of the shoe, the conforming and attaching steps may be carried out independently and without interference.

The formation of the longitudinal shank curvature of the sole is carried out as above explained, but this does not take care of the proper curvature of the heel seat of the shoe. That is effected by providing a curved shank stiffener 19 having a downwardly concave shape and which, when secured to the sole, has the effect of deflecting its rear portion downwardly into the plane of the heel 18. The shank stiffener 19 may be associated with a tuck or cover piece 20 and this in turn is preferably covered by a sock lining 21. The shank stiffener 19 with its cover piece 20 may be cemented or otherwise secured to the rear end of the sole 10 in the manner well known in the industry, and then the complete surface of the shoe bottom beneath the foot of the wearer may be covered with a sock lining 21 of flexible material.

In forcing together the two convex edges it will be apparent that a fullness is thrown into the combined area of the sole and upper in the

sense that the united parts cover substantially less projected area than the same parts in flat condition.

The rear portion of the shoe as herein shown is of the open type comprising a back strap 17 merging into a buckled instep strap, although the counter portion of the shoe may be formed in any desired style. The heel 18 is secured by heel nails driven through the heel seat of the sole 10 into the body of the heel. The shoe is completed by lacing together or otherwise fastening the free edges of the upper sections 13 and 14, thus providing an open-toe tip in the forepart of the shoe.

Having thus disclosed my invention and described in detail illustrative steps by which the novel process may be carried out, I claim as new and desire to secure by Letters Patent:

1. The shoemaking process which includes the steps of providing a sole having a shoulder within the marginal edge thereof of convex contour about the forepart and of concave contour rearwardly thereof, providing separate vamp portions having convex curvature about their entire lower edges, conforming the convexly curved lower edges of said vamp portions to convex and concave portions of said shoulder, and fastening them right side out in this relation to said sole, thereby deflecting upwardly a portion of the sole to which the vamp portions are attached.

2. The shoemaking process which includes the steps of providing a sole having a shoulder within the marginal edges thereof of convex contour about the forepart and of concave contour rearwardly thereof, providing separate vamp portions having convex curvatures about their entire lower edges, and conforming the convexly curved lower edges of said vamp portions to convex and concave portions of said shoulder while progressively fastening them to the sole right side out in this relation starting from positions within the opposite concave edge portions of the shoulder, thereby deflecting upwardly a portion of the sole to which the vamp portions are attached.

KARL ENGEL.

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