May 10, 1960 W. H. HEATON 2,935,753

PROCESS OF FORMING AND STIFFENING SHOE QUARTERS

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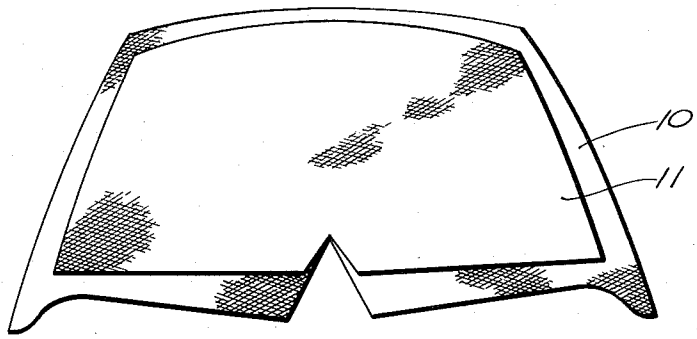


FIG. 1

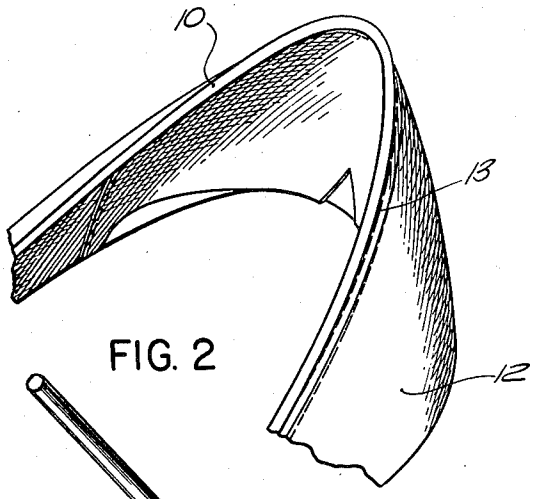


FIG. 2

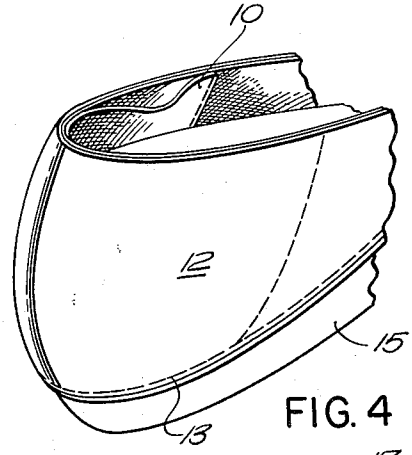


FIG. 4

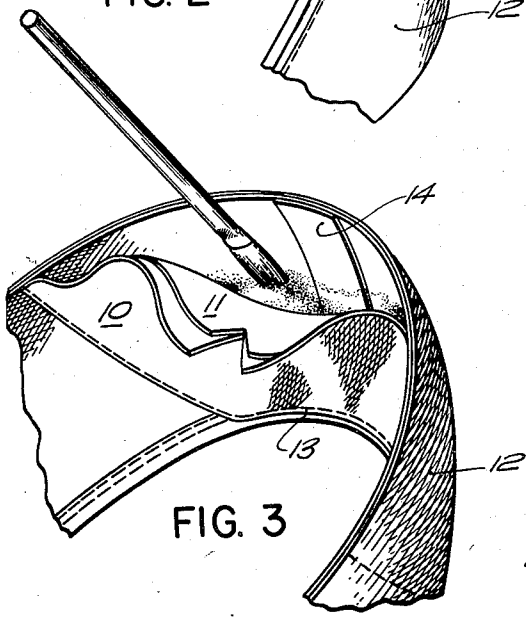


FIG. 3

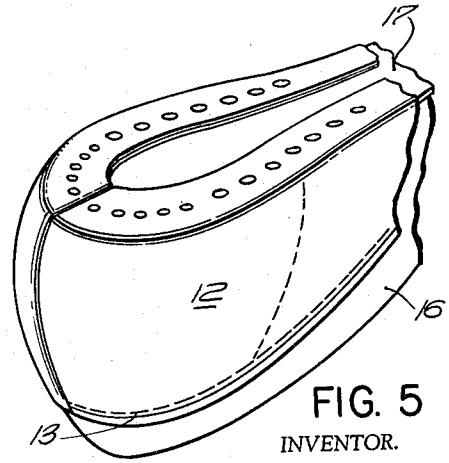


FIG. 5

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PROCESS OF FORMING AND STIFFENING SHOE QUARTERS

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1 Claim. (Cl. 12—146)

The present invention comprises a new and improved process of forming and stiffening the quarters of shoes in a single operation.

Heretofore the desired shape and stiffness has been imparted to the quarters or counter portion of the upper by inserting a molded counter of stiff fibreboard into a counter pocket formed in the lining of the upper, usually in the conventional assembling operation. This procedure has been accepted as fairly satisfactory by the industry but only in case the counter stiffener inserted is of the correct size and shape and is accurately and skillfully inserted without twisting or other displacement from a true symmetrical position. There are, of course, many departures from the ideal procedure the correction of which involves serious cost to the manufacturer. Even if the greatest care is exercised by the operator, a premolded counter is often so stiff that it prevents the upper from accurately conforming to the fine lines of the last particularly about the shoulder formed by the insole with the last bottom.

The present invention solves the difficulties above mentioned, makes an important reduction in shoemaking costs, and results in a product of improved quality.

The process herein disclosed is characterized by the employment of a stiffening element that may be incorporated in flexible condition into the upper, shaped by conventional quarter molding or heat seat lasting, and then stiffened with the upper in situ in molded contour.

Going more into detail, my novel process includes the steps of adhesively attaching a flexible catalyst-impregnated blank within the margin of a counter pocket formed by stitching the quarter lining blank by one edge to the upper outside the contour of the impregnated blank, contacting the blank with a liquid polymerizable resin or aminoplast, and then molding the counter portion of the upper and holding it under conditions of heat and pressure while a condensing reaction of the resin stiffens the shoe parts. Preferably the counter pocket is attached to the upper by the usual top stitching operation and then the quarter lining with its attached impregnated blank is temporarily separated from the upper to permit the application of the liquid resin.

Attempts have been made heretofore to employ aminoplasts for stiffening shoe parts but these prior processes have been unsatisfactory in that they require the operator to manipulate a blank wetted with liquid or semi-liquid resin. This cannot be done in a cleanly manner nor without danger from the toxicity of the resin. In accordance with the process of the present invention the operator has only to handle a dry catalyst-impregnated blank and to apply the liquid resin by means of a brush to an area of the upper that is substantially beyond reach of his fingers.

These and other features and characteristics of the process will be best understood and appreciated from the following disclosure of a preferred manner of carrying it out as shown in the accompanying drawings in which:

Fig. 1 is a plan view of the counter pocket and its attached catalyst-impregnated blank,

Fig. 2 is a fragmentary view showing the counter pocket in place in the upper,

Fig. 3 is a fragmentary view in perspective suggesting the step of applying the aminoplast,

Fig. 4 is a fragmentary view in perspective suggesting a molding or forming step, and

Fig. 5 is a fragmentary view in perspective suggesting a heel seat lasting step.

The quarter lining blank as shown in Fig. 1 is of conventional shape and may be formed from any suitable lining material such as light upper leather, artificial leather, or fabric. Upon the quarter lining **10** is superposed a textile blank **11** which is cut so that it lies entirely within the contour of the counter pocket. The blank **11** is impregnated or cut from stock which has been impregnated with a catalyst such as ammonium chloride for expediting the condensation reaction of an aminoplast such as an incompletely condensed urea aldehyde resin. Typical of such resins are thiourea-aldehyde, melamine-aldehyde or phenol-aldehyde. While ammonium chloride is a satisfactory catalyst, ammonium phosphate, phosphoric acid, hydrochloric acid or their equivalents may be employed as the catalytic component required in the practice of the process.

Having superposed the catalyst-impregnated blank **11** upon the quarter lining **10** as suggested in Fig. 1, the counter pocket is assembled in the rear portion of the upper **12** in the usual manner by the line of top stitching **13** and stitching along the two side edges of the quarter lining located always outwardly beyond the contour of the catalyst-carrying blank **11** so that the stitching passes only through the exposed margin of the counter pocket **10**.

The lower edge of the superposed parts **10** and **11** is therefore entirely free at this stage so that these parts may be temporarily separated from the upper as suggested in Fig. 3. In this figure the upper is shown in inverted position with the backstay **14** exposed. The liquid resin or aminoplast is now brought into contact with the catalyst-impregnated blank **11** by being applied either to the blank or to the inner surface of the upper. In either case the liquid resin must be applied by a brush to areas beyond the reach of the operator's fingers and so entirely out of contact therewith. The counter pocket is then restored to its proper position while the blank **11** remains in flexible and conformable condition thus forming the desired smooth lining for the counter portion of the upper.

A quarter molding step may then be carried out as suggested in Fig. 4 in which the male mold is indicated by reference character **15**. The upper with its counter pocket **10** and the catalyst-impregnated blank **11** still in flexible condition is conformed to the shape of the mold **15** by cooperating concave molds and held under conditions of heat and pressure while condensation reaction takes place in the now catalysed aminoplast.

The upper may be molded as shown in Fig. 4 with its side walls extending upwardly above the mold **15**, or it may be molded upon the last **16** as suggested in Fig. 5 in the conventional heel seat lasting operation. In the latter case the marginal edges of the upper are over-lasted upon the heel seat portion of the insole **17** and secured in position by the usual heel seat nails thus carrying the shoemaking process to the side lasting stage.

It will be appreciated that the preparatory steps of the process are all stitching room operations, viz. the cutting of the lining material for the counter pocket, the cutting of the catalyst-carrying blank, the cementing of the blank, using latex cement for example, to the coun-

ter pocket and the stitching of the counter pocket in the upper.

The advantage of dealing with assembled upper parts which, in accordance with this invention, are flexible during the shaping or molding steps, cannot be too much emphasized. This is particularly noticeable in conforming the upper to the shoulder of the insole. The flexible upper parts are readily conformable to this contour whereas if the upper contains a premolded counter stiffener, it will bridge and tend to bulge away from the shoulder.

Another advantage of the present invention is that it completely obviates the necessity of any preparatory treatment of the catalyst-impregnated blank at the time the parts of the upper are being assembled. The blank may be handled and inserted in the counter pocket like a piece of dry flexible cloth, whereas a counter stiffener of leather or fibreboard must be properly mulled or tempered in order that the conventional counter molding operation may be carried out.

Having thus disclosed my invention and described in detail a preferred manner of carrying it out, I claim and desire to secure by Letters Patent:

The process of forming and stiffening the quarters of shoes, comprising the steps of adhesively securing a flexible catalyst-impregnated blank to a quarter lining blank

in superposed relation with the margin of the lining blank exposed outside the contour of the impregnated blank, securing the superposed blanks within an upper by top stitching the lining blank, temporarily separating the blanks from the upper at their unstitched edges thus exposing an area of the upper beyond the reach of the operator's fingers, applying an aminoplast to the face of the upper thus exposed, smoothing the superposed blanks against the inner surface of the upper, and molding the parts of the upper thus assembled under heat and pressure, thereby causing simultaneous condensation reaction of the aminoplast and stiffening of the quarters in molded contour.

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