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METHOD OF MANUFACTURING A MOLDED SOLE AND HEEL COMBINATION

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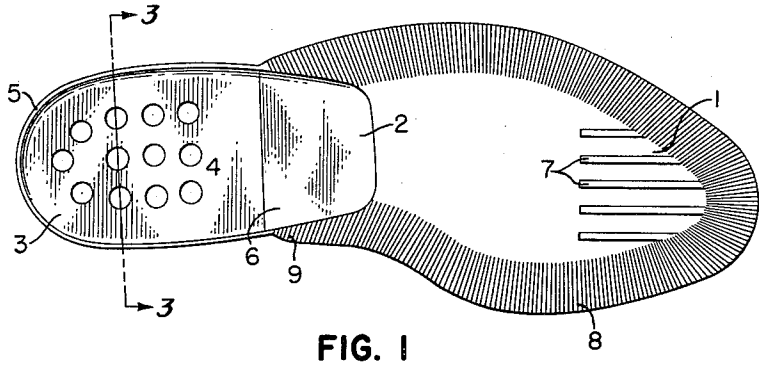


FIG. 1

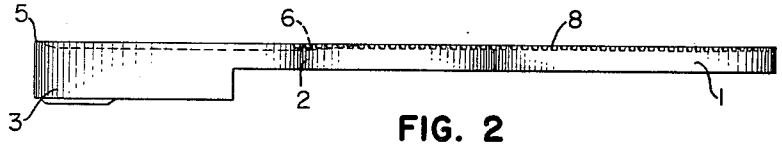


FIG. 2

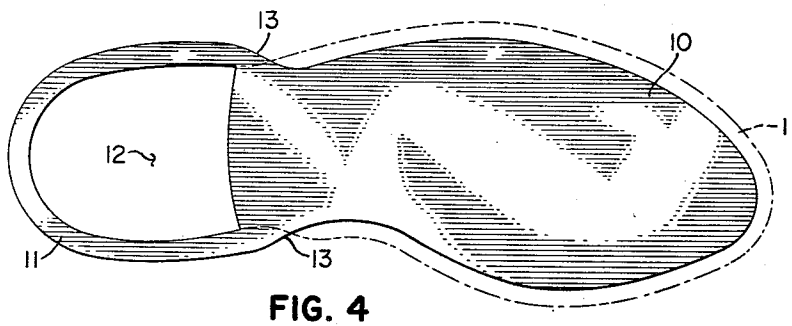


FIG. 4

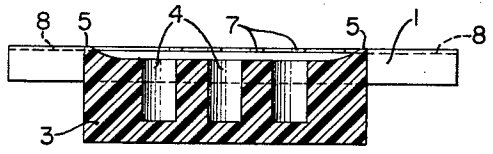


FIG. 3

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METHOD OF MANUFACTURING A MOLDED SOLE AND HEEL COMBINATION

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Original application Apr. 5, 1962, Ser. No. 185,321, now Patent No. 3,175,309, dated Mar. 30, 1965. Divided and this application July 16, 1963, Ser. No. 301,226

1 Claim. (Cl. 12—142)

This is a division of application Serial No. 185,321, filed April 5, 1962, now Patent No. 3,175,309, issued Mar. 30, 1965.

This invention relates to the method of making a unitary molded sole and heel units adapted to be fitted to a variety of shoe uppers on a variety of last shapes and to a method of preshaping such units.

In the art of manufacturing shoes having adhesively attached unitary molded sole and heel units, it has been the past practice to individually mold such units for each length, width and last shape. This necessarily involved extremely large mold investment and required a molded unit shaped precisely for each and every shoe size and last shape. Because of the latter, the shoe manufacturer was limited in easily changing from an established style to another by his reliance on the limited sole supply and the necessity for obtaining another style of mold in order to produce a proper sole unit. The present invention obviates such problems by providing a molded unitary sole and heel which requires a vastly reduced number of molds, but which can be completely preshaped to the desired style prior to attachment to the shoe. In addition to being adaptable to a wide variety of shoe sizes and styles, the unit, according to the present invention, is so constructed as to assure automatic alignment of the heel and sole with the upper.

It is one object of the present invention to provide a molded heel and sole unit adaptable to a variety of shoe sizes and styles.

It is a still further object of the present invention to provide a heel and sole unit which assures proper alignment when attached to a shoe upper.

It is an additional object of the present invention to provide means whereby a heel and sole unit can be rapidly and accurately shaped to fit a variety of shoe sizes and styles.

These and additional objects and advantages will be further apparent from the following description and drawings in which:

FIG. 1 is a plan view of a molded sole and heel unit made in accordance with the present invention,

FIG. 2 is a side elevation of the unit shown in FIG. 1,

FIG. 3 is a section along line 3—3 of FIG. 1, and

FIG. 4 is a plan view of a locking, positioning template used in shaping the sole portion of the unit.

Referring to the figures, FIG. 1 illustrates a molded unit having a forepart **1**, a shank area **2** and a heel portion **3**. As may be seen in the figure, the heel portion **3** is provided with a number of recesses **4**, principally to reduce weight. The heel area, as may be more clearly seen in FIG. 3, may also be provided with a raised edge or bead **5** around the sides and the back to assure a tight fit to the upper. As is also apparent in FIG. 3, the upper surface of the heel is cupped or dished, transversely, which cupping is extended into the shank area, as at **6**, to insure a good fit to the shoe bottom and assure alignment of the entire unit with the shoe upper. The extension of the dishing into the shank area also accommodates the strength member usually incorporated in the

shank portion of the shoe and thereby provides a smooth, pleasing appearance to the sole. The forepart of the sole may be provided with a number of longitudinal ribs **7** which act to prevent curl in the toe area. If desirable from a style standpoint, the edge of the sole may be provided with a wheeled pattern, as at **8**, said pattern extending for a substantial distance toward the interior of the sole so that sufficient wheeling remains after the sole is shaped to the final configuration of the particular style being produced. The oversized sole edge is tapered into the shank area, as illustrated at **9**, to permit shaping smoothly in at the shank or instep area of the shoe and to reduce drag on the shaping tool as it is guided away from the sides of the heel. One of the great advantages of utilizing a unitary sole and heel unit such as illustrated is that it is possible, for example, to use one size of molded unit for five lengths, six widths, and as many as sixteen styles of last shapes. It should be apparent, therefore, that the expense of molds is materially reduced and the shoe manufacturer obtains much greater styling flexibility.

In a unit, made according to the present invention, the heel size is the same or final configuration for all shoes within the range, permitting a shaping of the sole as necessary for styling purposes without altering the heel. It is therefore desirable to provide a means which will automatically position a sole and heel unit during the shaping operation and at the same time protect the molded heel from damage such as scarring during the shaping. One such means is illustrated in FIG. 4 and comprises a template **10**, which may be made of wood, metal, or a relatively hard plastic material. The template, in the sole or forepart, may have a variety of shapes, depending on the size and style of the shoe sole for which it is the pattern. The heel portion **11** of the template is relatively large and has a cut out portion **12** into which the heel portion of the unit fits, permitting the shaping operation to be performed while the unit is in a flat, horizontal position and also while it is locked in the template against horizontal rotation. Such cut out portion could, of course, alternately be a depression of suitable shape and depth, but is preferably open. The template further provides a relatively inflexible surface against which the flexible sole is held during shaping so that vertical movement is avoided and a smooth cut effected. In addition, the heel portion is provided with outwardly projecting cam or guide surfaces, as at **13**, which act to guide the tool of the shaping machine outwardly as it approaches the heel portion and rides it out around the heel so that no damage occurs to the heel as the unit is shaped in one continuous operation.

The particular shaping machine utilized may be one of a number which are commercially available and a detailed description here is unnecessary. The sole and heel units may be molded from a number of plastics and elastomers. A particularly useful material is an elastomer-resin blend typically formulated as follows:

Ingredients:	Parts (wt.)
SBR rubber (butadiene/styrene; 75/25)	100.00
Resin (styrene/butadiene; 80/20)	50.00
Zinc oxide	5.00
Stearic acid	1.00
Calcium silicate	75.00
Process oil	5.00
Paraffin wax	1.50
Accelerator (Altax)	2.00
Methyl tuads	0.25
Sulfur	3.00

While certain representative embodiments and details have been shown for the purpose of illustrating the invention, it will be apparent to those skilled in this art

that various changes and modifications may be made therein without departing from the spirit or scope of the invention.

We claim:

The method of manufacturing a shoe having an upper and an integral heel and sole bottom unit which comprises the steps of:

(1) molding an integral shoe bottom unit wherein the heel, including the breast portion on the forward edge thereof is molded to a final configuration and simultaneously molding with said heel, a sole to a size greater than the final configuration, said sole united to said heel at the breast, the edges of said sole being molded so that they angle outwardly and forwardly adjacent the heel breast so that the sole has a width in the shank portion that is greater than the width of said heel, said increased molded sole width continuing around the periphery of the sole, said sole having a molded wheeled edge on the upper surface, said molded wheeling extending a substantial distance into the interior of said surface of said sole;

(2) removing a substantial amount of molded material from the periphery of said sole to attain the final configuration, said wheeling continuing around the sole in an uninterrupted pattern after the removal of said material;

(3) roughening at least a portion of the upper surface of said unit so that optimum adhesion can be effected between said unit and the shoe upper; and

(4) adhering said unit in which the heel has been molded to final configuration and the sole has been tailored to the final configuration to the shoe upper thus forming a complete shoe.

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