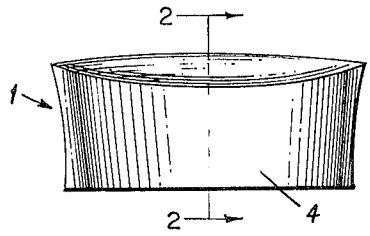
March 1, 1966 G. A. E. COUTURE 3,237,320

PREFINISHED HEEL WITH FIBROUS CORE

Filed April 14, 1964

FIG. 1



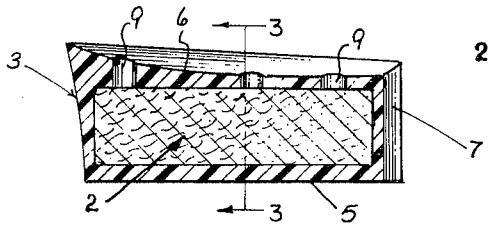


FIG. 2

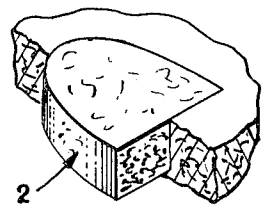


FIG. 5

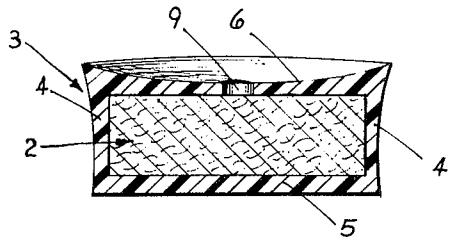


FIG. 3

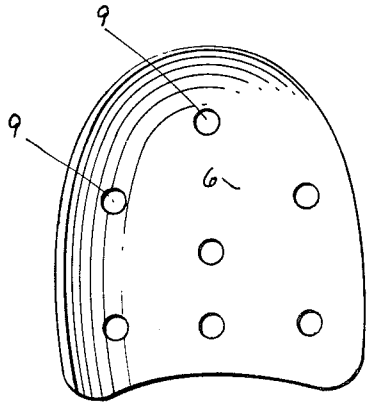


FIG. 4

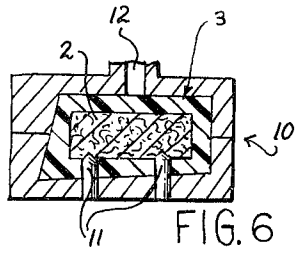


FIG. 6

INVENTOR:
George A. E. Couture
BY,
Ezekiel Wolff, Wolff & Greenfield
ATTORNEYS

United States Patent Office 3,237,320 Patented Mar. 1, 1966

3,237,320

PREFINISHED HEEL WITH FIBROUS CORE

George A. E. Couture, Quebec, Quebec, Canada, assignor to St. Lawrence Manufacturing Company, Inc., Giffard, Quebec, Canada, a corporation of Quebec

Filed Apr. 14, 1964, Ser. No. 359,702
6 Claims. (Cl. 36—35)

The present invention relates to a prefinished heel for footwear.

The general purpose of this invention is to provide an improved prefinished molded heel which may be used in a wide variety of footwear but which is particularly useful in a skate boot construction.

In the manufacture of heels for footwear there have been attempts to fabricate improved heels by molding heels of various materials. However, several difficulties have been encountered in the fabrication of molded prefinished heels of plastic material particularly for use on skate boots. First, when the heels are large in size, as is usually the case in heels for skate boots, the amount of plastic heretofore used is substantial. Since plastic material is a relatively expensive material for use in footwear, the cost of such heels is substantial. Second, the volume of plastic required to mold a solid heel in the sizes used on skate boots makes it extremely difficult to mold such a heel without distortion. Third, nails or screws normally do not hold well in plastic material, and consequently there has been difficulty not only in providing molded plastic heels which can be readily and firmly attached to skate boots, but also molded plastic heels to which ice skate blades, or roller skate wheels can be firmly attached.

Attempts to minimize the expenses involved by using fillers for the heel construction have not been successful. In some cases cup shaped shells of plastic have been molded and the recess filled with a filler. Such constructions are not satisfactory because there are additional assembly steps required in such assemblies that include steps in trimming and shaping the filler so that it properly fits the recess. Further, such constructions do not provide a satisfactory means for securing the heel to footwear by nailing from the inside of the boot. Nor do such constructions provide a completely waterproof heel or a structurally integral heel that may be treated as an integral component during fabrication of the skate assembly. Attempts have also been made to incorporate a filler entirely within an outer coating or shell of plastic shaped in the form of a heel, but these constructions have not been adaptable for inexpensive and uniform injection molding operations, nor do they appear to be as structurally sound as is normally desired.

An object of this invention is to provide a prefinished heel consisting of a filler and an outer shell of plastic material with the heel construction injection molded in a one step operation. A further object of this invention is to provide a prefinished heel construction which is relatively inexpensive, waterproof, structurally integral, solid and is capable of being injection molded in large quantities with a minimum quantity of rejections.

The present invention is also designed to provide a waterproof prefinished heel which is particularly useful in ice and roller skate boot constructions and which may be molded with any desired design.

A further object of this invention is to provide a molded plastic heel formed about a filler material with the construction designed to minimize the incidence of distortion during the production of such molded heels.

A further object of this invention is to provide an improved method of fabricating a molded heel.

In this invention there is provided a prefinished heel

particularly adapted for use in connection with the fabrication of skate boots and having a filler of compacted fibers with a density of between 24 and 34 pounds per cubic foot, and a moisture content of less than 5%, and with this filler encased by an outer shell of plastic material injection molded about the filler under pressure and at an elevated temperature.

These and other objects and advantages of the present invention will be more clearly understood when considered in conjunction with the accompanying drawings in which:

FIG. 1 is a plan elevation of a heel embodying the invention;

FIG. 2 is a cross-section of the heel shown in FIG. 1 taken along the line 2—2 of FIG. 1;

FIG. 3 is a cross section taken along the line 3—3 of FIG. 2;

FIG. 4 is a top plan view of the heel shown in FIG. 1;

FIG. 5 is a perspective view of the die cut filler used in the heel embodying the invention with a portion of the surrounding material from which it is cut, and

FIG. 6 is a schematic cross-sectional view of the molding apparatus used in fabrication of the heels embodying the invention.

In the present invention a prefinished heel 1 is formed with a filler 2. The filler material is preferably an inexpensive fibrous material and is not a solid material. It should have preferably a density of between 24 and 34 pounds per cubic foot and a moisture content of less than 5% by weight of the total weight of the fiber material. Thus the filler may consist of a limited group of materials which preferably comprises compacted cellulosic fibers such as wood fiberboard and/or compacted leather fibers such as leatherboard. The filler is preferably formed by die cutting from a solid sheet of the fibrous material such as wood fiberboard or leatherboard, or from a laminated sheet composed of several layers of the fibrous material. The density referred to above is required in order to assure a core which is not likely to collapse or otherwise cause distortion in the molding operation described hereafter. The moisture content should be within the range set forth in order to minimize the likelihood of expansion or swelling of the heel after the molding operation which occurs with the presence of a high moisture content that is turned to steam during the elevated temperature used in the molding process. It is for such a reason that fillers such as wood or plywood are not useful in the present invention.

The filler 2 should roughly have the shape of the heel which is being molded and should have dimensions slightly less than the dimensions of the heel to be molded in each direction. Preferably the filler 2 should have dimensions at least 1/16" less than the dimensions of the heel.

An outer shell 3 encapsulates the filler. This shell is formed with continuous side walls 4, a bottom 5 and top 6. The bottom 5 preferably has a flat, substantially uniplanar outer surface. The side walls 4 preferably are flared upwardly and outwardly from the bottom 5 except at the forward end 7 which normally forms the breast portion of the heel. The top 6 is preferably formed with a concave outer surface. The shell 3 is completely closed and integral on all sides and the bottom. Preferably, the only openings in the shell are the openings 9 which extend downwardly through the top 6 of the shell and expose the fiber material of the filler 2.

The material of which the plastic outer shell is formed may be selected from a variety of suitable molding compositions such as polyethylene, polypropylene, cellulose acetate, vinyl chloride and polystyrene copolymers, known as high impact styrene in the trade.

In the manufacture of the present invention a filler 2 composed of leatherboard, for example, is cut from a

larger flat sheet as illustrated in FIG. 5. This die cut filler is, in a preferred example, 5/8" thick and with a density and moisture content as set forth above. This filler **2** is cut with sides roughly conforming to the shape of the heel to be formed but with dimensions approximately at least 1/16" less in each direction. The filler **2** is positioned within the cavity of injection molding die **10**. The filler is supported upon locating pins **11** which may be provided with sharpened ends adapted to rigidly secure the filler on the locating pins **11**. The two sides of the die are closed and low density polyethylene with a melt index of 20, for example, is injected into the die through the opening **12** under a pressure of approximately 10,000 pounds per square inch. The temperature of the die and the molding composition is maintained between 350° F. and 400° F. The pressure and temperature conditions will of course vary depending upon the nature of the materials used. The pressure of the molding material will further compress the fiber material slightly. The pressure of the molding material and the further compression of the slightly resilient filler **2** assures an integral bond between the molding material and the filler. Upon removal of the molded heel from the die, moisture, vapor or gases trapped within the shell may escape through the holes **9** formed by the supporting pins **11**.

What is claimed is:

1. A prefinished heel for footwear comprising,

a filler of compacted fibrous material having a density of between 24 and 34 pounds per cubic foot and a moisture content of less than 5%,

an outer shell formed of a heat softened plastic material molded about said filler under heat and pressure, said shell having integral and continuous side walls, bottom and a top, with the bottom having a flat substantially uniplanar outer surface and said top having a concave outer surface.

2. A prefinished heel for footwear as set forth in claim **1** wherein said top defines openings exposing portions of said filler.

3. A prefinished heel as set forth in claim **1** wherein said compacted fibrous material consists essentially of compacted cellulosic fibers.

4. A prefinished heel as set forth in claim **1** wherein said compacted fibrous material consists essentially of compacted leather fibers.

5. A prefinished heel as set forth in claim **1** wherein said plastic material is polyethylene.

6. A prefinished heel as set forth in claim **1** wherein said plastic material is polypropylene.

References Cited by the Examiner

UNITED STATES PATENTS

1,721,599	7/1929	Kroeger	36—35
1,751,557	3/1930	Roberts	36—35
1,806,641	5/1931	Gorman	36—35
1,932,293	10/1933	Stevenson	36—35
2,375,153	5/1945	Uhlig	36—35
2,378,511	6/1945	Strupp	36—35
2,895,174	7/1959	Hocett	264—257
3,087,201	4/1963	Williams et al.	264—257

FRANK J. COHEN, *Primary Examiner.*