United States Patent [19]

Morin

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[45] **June 19, 1973**

[54] **MOLDED GOLF SHOE HEEL AND INSTEP STRUCTURE AND METHOD OF MAKING SAME**

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[52] **U.S. Cl.** ..... **36/2.5 AH,** 12/142 P

[51] **Int. Cl.** **A43b**

[58] **Field of Search** ..... 36/2.5 R, 2.5 AH, 36/59 R, 67 R, 67 D; 12/142 R, 142 RS, 142 P, 146 BR

[56] **References Cited**

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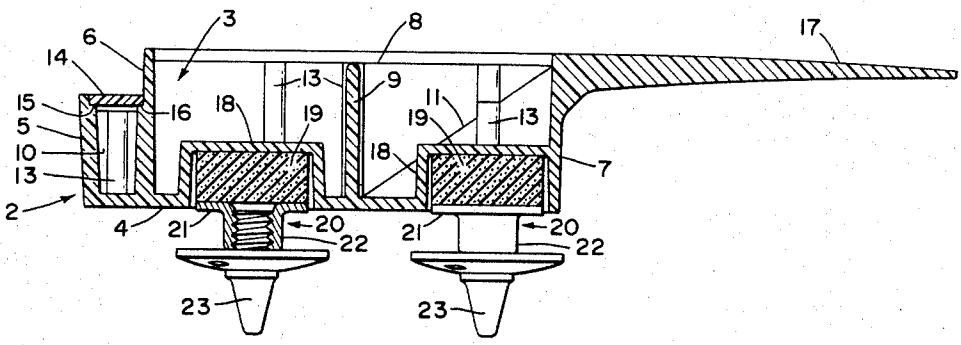
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[57] **ABSTRACT**

A golf shoe heel filler having a plurality of spike retainers securred to the outer face of a plurality of resilient pads mounted on the bottom of the heel filter. The body is substantially hollow and made of hard, heat-resistant plastic. Each of the pads is compressed and held in place by a heel injection molded to the filler.

10 Claims, 6 Drawing Figures

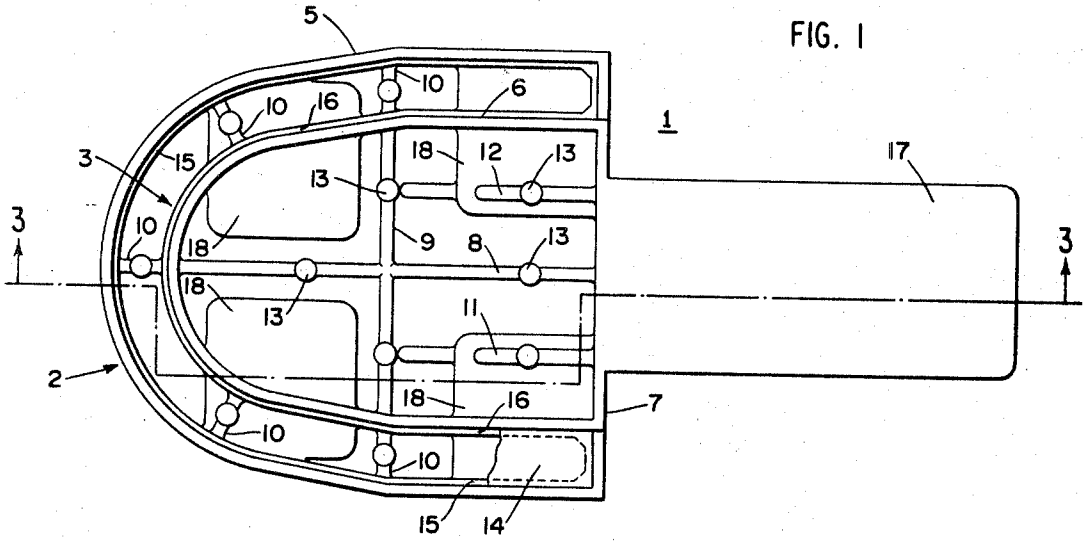


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SHEET 1 OF 2

FIG. 1



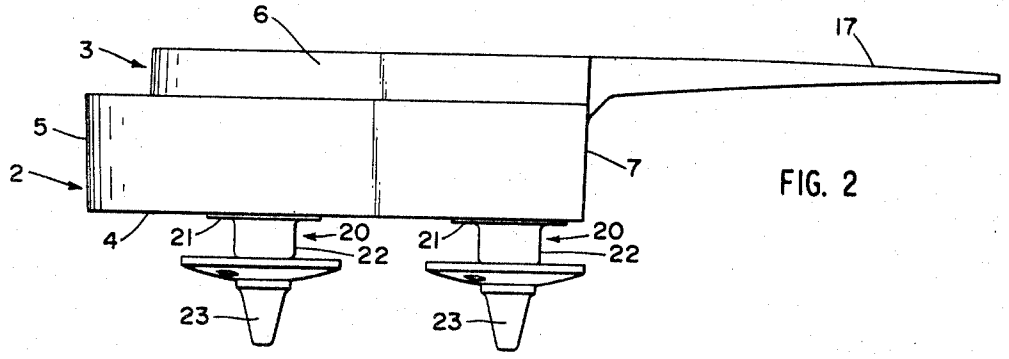


FIG. 2

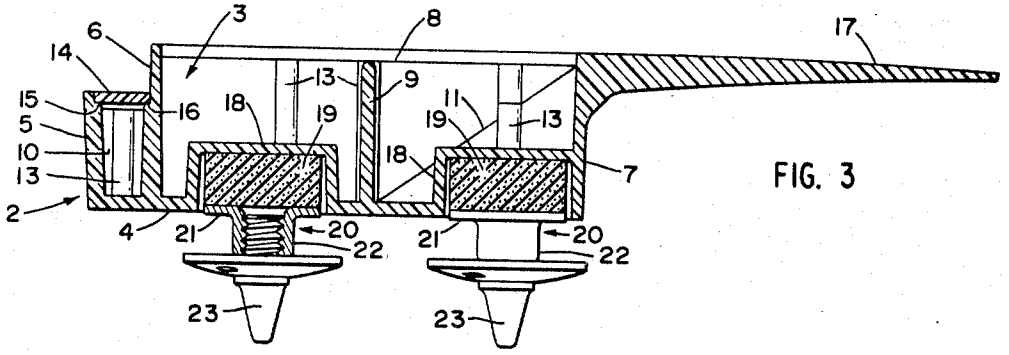


FIG. 3

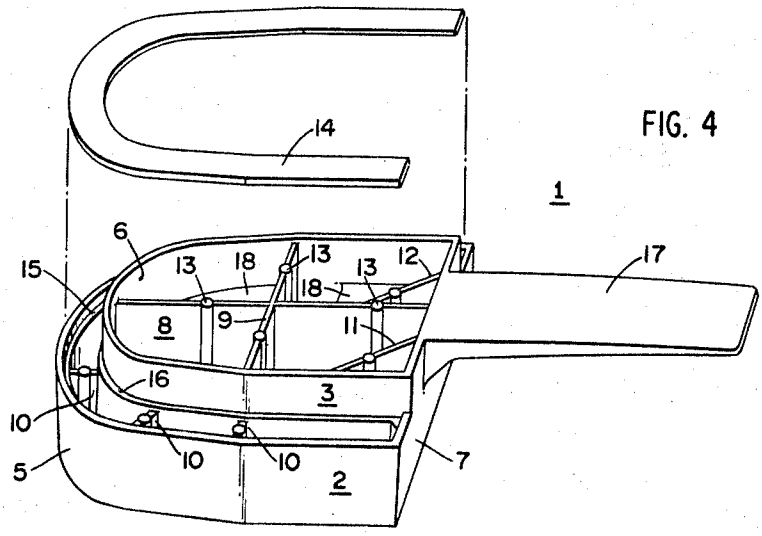


FIG. 4

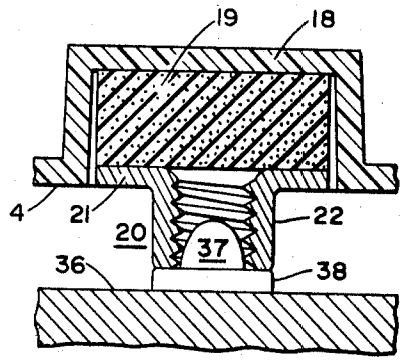
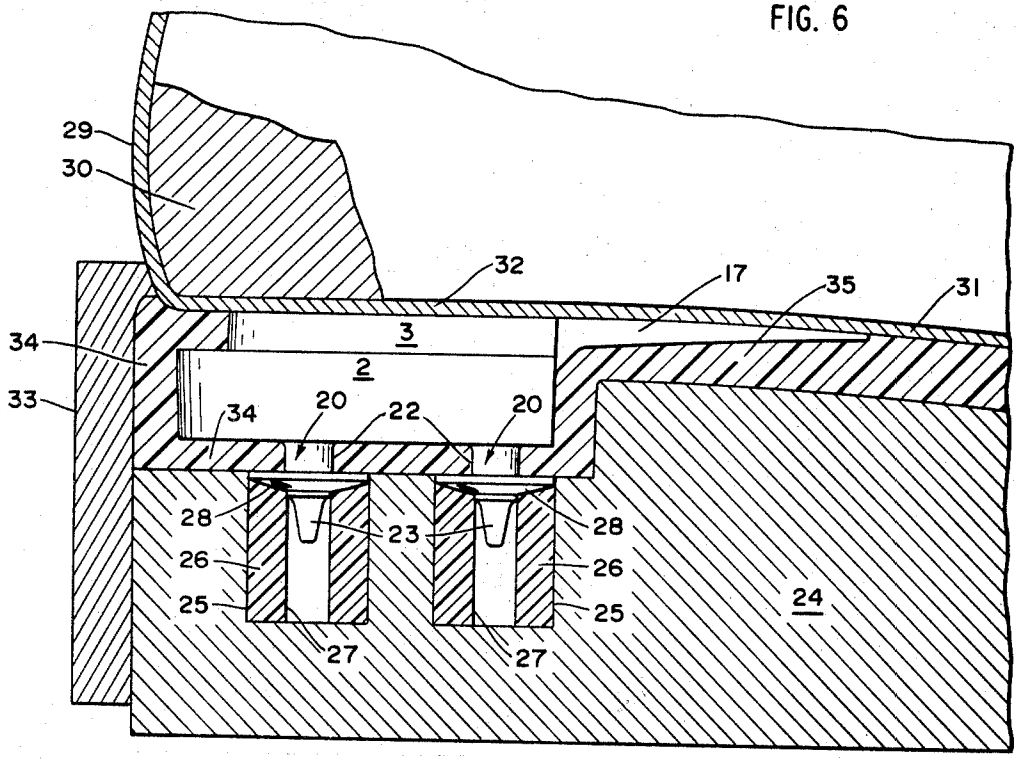


FIG. 6

FIG. 5



MOLDED GOLF SHOE HEEL AND INSTEP STRUCTURE AND METHOD OF MAKING SAME

BACKGROUND OF THE INVENTION

1.Field of the Invention

Injection molding of a golf shoe heel with removable spikes.

2. Description of the Prior Art

The following is the usual method of manufacturing golf shoes with removable spikes in the heel area. A shoe upper is prepared with a bottom wall cemented in place and ground to an adequately smooth condition. To this bottom is attached an instep reinforcement consisting of a steel shank secured by a spot of hot-melt cement at its front end with a small portion of its back end extending over the heel area of the shoe. The shoe upper is then slipped onto a metal foot form. A thin metal plate carrying threaded spike receptacles is placed in the heel cavity of an injection mold. In order to press this metal plate against the bottom of the heel cavity during the molding step, a crushable filler block of multi-laminated paper is interposed between the heel portion of the shoe bottom and the thin metal plate. The back portion of the steel shank overlies a portion of the filler block. With the shoe upper in place on the bottom mold structure, pressure is exerted through the metal foot form and a moldable plastomer (e.g. P.V.C.) is injected into the bottom mold heel cavity, as well as the usual sole cavities to complete the shoe bottom.

The above arrangement presents serious problems. The hot-melt cement, being heated to a temperature of about 320°F to 300°F is extremely difficult to handle, to apply in the proper amount and to avoid misalignment of the metal shank. Also in order to afford a sufficient bonding area between the shoe bottom surrounding the filler an excessive thickness of P.V.C. around the filler must be used resulting in cooling problems, including excessively long cooling times and shrinking of the P.V.C. to produce a "sinking" or concave effect in the finished product. Also the filler material tends to introduce impurities which adversely affect the quality of the finished product.

SUMMARY OF THE INVENTION

The principal aspect of this invention resides in a hollow heel filler body made of a plastic such as polytyrene. The body is provided with lower recessed receptacles carrying resilient pads to each of which is cemented a spike retainer member. An instep shank is integrally formed with said heel filler body which is also stepped back at its upper end to provide for an increased area between a shoe upper and the heel filler body into which polyvinal chloride (P.V.C.) may flow to increase the bonding force of the P.V.C. between the shoe upper and the resultant molded heel. When the heel filler is placed in a shoe bottom mold, and the shoe upper is pressed upon the top of the heel filler, the resilient pads permit the spike retainers, either with or without spikes already attached, to move into accurate alignment in the bottom mold. Thereupon P.V.C. is injected into the mold cavity to form a molded heel and instep in which the spike retainers and the instep shank are firmly and accurately sealed.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top view of the novel heel filler body;

FIG. 2 is a side view of the heel filler body of FIG. 1 showing spike receptacles carrying spikes mounted on the bottom of said body;

FIG. 3 is a cross-section of the heel filler body taken along line 3—3 of FIG. 1 and also showing a closure member closing the top of the lower portion of such body;

FIG. 4 is a perspective, exploded view of the heel filler body and such closure member;

FIG. 5 is a partial vertical section of a portion of a shoe bottom mold, with a shoe upper mounted thereon and with the heel filler assembly of FIGS. 1–5 shown in elevation in place within the mold; and

FIG. 6 is a fragmentary section through a heel mold and a heel filler body showing a modification of the arrangement of FIG. 5.

DETAILED DESCRIPTION OF THE INVENTION

In the several Figs. of the drawings, a body **1** comprising a combined heel filler and instep shank is molded from a plastic such as polystyrene which is relatively hard, has high impact strength and possesses good heat stability or heat resistance. General-purpose polystyrene is a relatively low-cost material which is ideally suited for this purpose. The heel filler portion consists of a lower hollow section **2** and stepped-back upper hollow section **3.** Sections **2** and **3** are formed on a lower wall **4,** with a peripheral wall **5** surrounding the lower wall and terminating at about two thirds of the distance to the top of the body **1,** and defining the lower section **2.** An inner wall **6,** spaced from and parallel to wall **5,** extends from the bottom wall **4** to the top of the body **1.** The walls **5** and **6** are combined at the front of the structure into a step-shaped wall **7** as shown most clearly in FIG. **4.** In order to provide for minimum weight with maximum strength, walls **4, 5, 6** and **7** are all relatively thin and are provided with material bracing webs. A pair of crossed vertical bracing webs **8** and **9** extend across the space encompassed by wall **6** and extend from the bottom wall **4** to a point just below the top of wall **6.** A series of bracing webs **10** extend between the walls **5** and **6** and terminate a short distance from the top of wall **5.** The front wall **7** is braced by a pair of triangular bracing webs **11** and **12.** Each of the webs **8-12** is stiffened by one or more vertical stiffening ribs **13.**

For reasons to be explained below, the top of the cavity comprised between the walls **5** and **6** must be closed. This is accomplished by a U-shaped closure member **14,** of the same material as the body **1,** which fits into the corresponding U-shaped opening between the walls **5** and **6** and rests on shoulders **15** and **16** formed adjacent the top of walls **5** and **6** respectively.

An instep shank **17** is molded integrally with the heel filler section of body **1** and projects forward from the wall **7** with its upper surface flush with the top of wall **6.** In order to provide the proper strength and resiliency, shank **17** is thicker at its rear end and tapers to a smaller thickness at its front end.

The lower wall **4** is formed with a plurality of recessed pockets **18,** preferably four in number. Into each of these pockets is cemented a resilient pad **19** made of some suitable material such as sponge rubber. The lower face of each pad **19** is slightly recessed from the lower face of wall **2.** A spike retainer **20** is cemented to the lower face of each pad **19.** Preferably each spike retainer is of the type provided with a flat

base 21 from which extends an internally threaded sleeve 22 into which the threaded stud of a golf spike 23 may be threaded. Thus the heel filler body 1 carries a plurality of golf spikes 23 preferably four in number. It will be noted that the resilient support afforded each spike assembly 20–23 permits a considerable degree of motion to each such spike assembly under pressure which may be exerted between said assemblies and the body 1 prior to the final injection molding of the plastomer heel. Since each pad 19 is substantially surrounded by its pocket 18 and spike retainer base 21, it will be protected from the hot injected plastomer and therefore need not be as heat resistant as the material of body 1.

After the heel filler assembly as illustrated and described in FIGS. 1–4 has been completed, it is placed in a shoe bottom mold of the type as described and claimed in my copending application Ser. No. 267,573 filed June 29, 1972. As illustrated in FIG. 5 herein, the mold includes a metal heel mold section 24 provided with bores 25 in the vicinity of where each spike 23 is to be inserted. Into each bore is inserted a plug 26 of a material such as polytetra fluorene. Each plug 26 has a central bore 27 of a diameter to receive a spike 23. Each spike 23 is provided with an enlarged flange 28 having a slightly convex shape and the upper surface of each plug 26 is preferably dished to conform to the shape of flange 28.

After the heel filler assembly has been placed in the mold 24, a preformed shoe upper 29, mounted on a shoe last 30, and provided with a bottom wall 31 having a heel portion 32, is pressed on top of the upper hollow section 3 of the shoe filler. Due to the pressure exerted from the shoe upper through the heel filler body to the resilient pads 19 and reaction pressure of the heel cavity mold exerted through the flanges 28 and the spike retainer members 20, the resilient pads 19 are compressed and flexed so as to permit the spikes 23 to move into accurate alignment with the bores 27 and to cause the flanges 28 tightly to engage the upper surfaces of the associated plugs 26. At the same time the upper surface of the instep shank 17 is caused tightly to engage the lower surface of the bottom wall 31 of the shoe upper 29. Thereupon a side mold 33 is moved into place and a moldable elastomer such as a highly plasticized polyvinal chloride (P.V.C.) is injected into the mold cavity to form a molded heel 34 and an instep 35. It is understood that at the same time the usual sole will also be molded.

As is well known in this type of molding process, P.V.C. which is injected at about 350°F is highly plastic and flows readily into the cavities provided within the confines of the mold members 34 and 33, and then rapidly sets into its final form as its temperature drops. Therefore, the P.V.C. will flow around each spike retainer sleeve 22 and into contact with each spike retainer base to form the lower portion of the final heel. When the P.V.C. sets, it firmly retains each spike retainer accurately in the position to which it had been moved by the pressure of the shoe upper 29 as described above. Also the P.V.C. will flow around the sides of the lower section 2, of the heel filler body. As the P.V.C. flows over the top of the section 2, it is prevented from flowing into the hollow heel filler body 1 due to the fact that at this point the heel filler is closed by the U-shaped member 14. The P.V.C. also flows to fill the horizontal cavity formed between the heel portion 32 of the upper, the side walls of upper section 3, member 14 and the inner walls of side mold member 33. This provides a greatly increased area of the heel portion 32 of the upper 29 to which the P.V.C. can seal and produce a very firm bond between the molded heel 34 and the upper 29. This is accomplished without appreciably increasing the thickness of the P.V.C. in any portion of the heel 34. As a result, the P.V.C. in every portion of the heel 34 tends to cool at the same rate which avoids various defects of strength and appearance which non-uniform cooling would tend to produce.

As previously indicated, the injected P.V.C. also flows beneath the instep shank 17 to seal to said shank and form the instep 35 tightly bonded to the shoe bottom 31.

Instead of molding the spike retainers 20 into the heel with the spikes already inserted into said retainers, the spikes can be omitted and inserted into their retainers after the molding of the shoe has been completed. For this purpose, the modification of FIG. 6 may be used. In this case, a modified portion 36 of the mold is provided with a stud 37 on the lower rim 38 of which the threaded sleeve 22 of the spike retainer member 20 may seat. After the injection molding has been completed, this arrangement leaves the central bore of sleeve 22 open to receive a spike. Other modifications within the scope of the appended claims, may also be made. For example, the spike retainer and spike may be made as an integral body resulting in a golf shoe with the spikes permanently molded in place.

What is claimed is:

1. A golf shoe heel filler comprising
   a. a body of a hard heat resistant material
   b. a plurality of resilient pads secured to the bottom of said body; and
   c. a golf shoe spike retainer secured to the outer face of each of said pads.

2. A golf shoe heel filler according to claim 1 in which said body is substantially hollow and is comprised of thin walls of a hard, heat-resistant plastic.

3. A golf shoe heel filler according to claim 2 in which integral with said body, and comprised of said plastic, is an elongated instep reinforcement strip extending from one side of body with its upper surface in substantially the same plane as the upper face of said body.

4. A golf shoe heel filler according to claim 2 in which each of said pads is contained within a separate recessed chamber formed in the lower wall of said body.

5. A golf shoe heel filler according to claim 1 in which said body comprises:
   a. a lower heel-shaped section having substantially vertical walls terminating in a substantially horizontal step at the top of said lower section;
   b. said step extending around a substantial portion of said lower section; and
   c. an upper heel-shaped section having substantially vertical walls extending fron the inner edge of said step to the top of said body.

6. A golf shoe heel filler according to claim 5 in which said lower and upper sections are hollow members composed of thin outer walls and said step is also comprised of a thin wall member.

7. A golf shoe comprising:

a. a shoe upper having a bottom wall comprising a heel portion;

b. a heel filler comprising a body of a hard heat-resistant material, a plurality of resilient pads secured to the bottom of said body, and a golf shoe spike retainer secured to the outer face of each of said pads;

c. the top of said heel filler being in contact with said heel portion and being secured in place thereon by a body of a moldable plastomer surrounding and embedding said heel filler and in firm adhesive contact with said heel portion.

8. A golf shoe according to claim **7** in which:

a. the bottom wall of said upper also comprises an instep portion;

b. said heel filler also comprises an elongated instep reinforcement strip integral with said heel filler and extending from the upper surface of said heel filler in substantially the same as said surface and in contact with said instep portion; and

d. said instep reinforcement strip also being embedded in said plastomer body.

9. A golf shoe according to claim **7** in which:

a. said heel filler comprises a lower heel-shaped section having substantially vertical walls terminating in a substantially horizontal step at the top of said lower section;

b. said heel filler also comprising an upper heel-shaped section having substantially vertical walls extending from the inner edge of said step to the top of said heel-filler body; and

c. said plastomer fills the space between the top of said step and the bottom wall of said upper;

d. whereby the adhesive force between said plastomer body is substantially increased.

10. The method of making a golf shoe which comprises the steps of:

a. securing a plurality of resilient pads to the bottom of a heel filler body;

b. securing a spike retainer to each of said pads;

c. inserting said heel filler into a heel mold;

d. pressing a preformed shoe upper against the upper portion of said heel filler thereby compressing each of said pads by the pressure thus exerted through said heel filler to said pads and the reactive pressure of said heel mold exerted through said spike retainer to said pads; and

e. injection molding a heel of an elastomer around said heel filler and said spike retainers, whereby said spike retainers are fixed in the positions relative to heel to which they had been constrained to move by said pressure.

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