Feb. 2, 1971 L. E. BERNIER ET AL 3,559,311

GOLF SHOES

Filed June 12, 1969

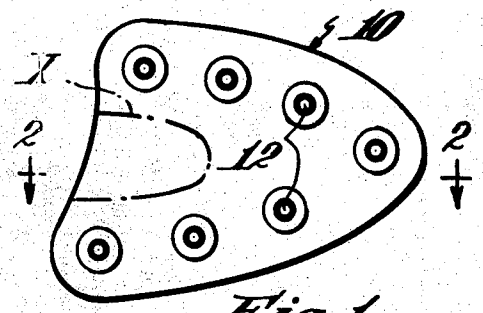


Fig. 1

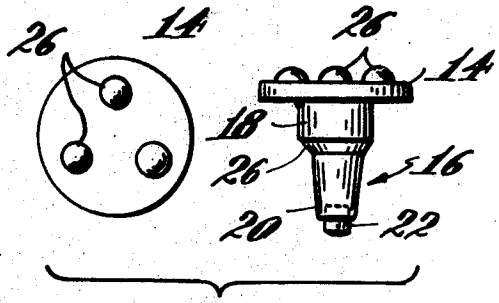


Fig. 5

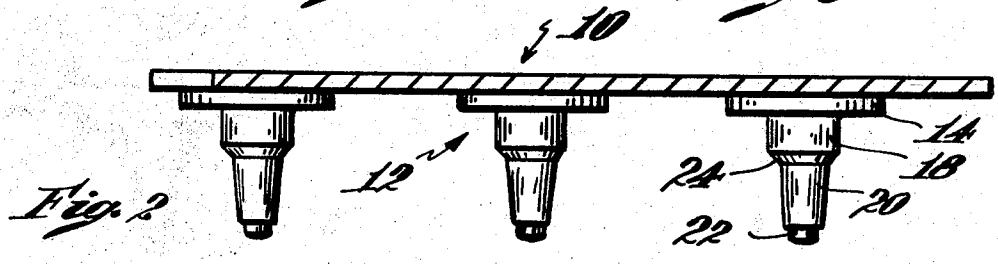


Fig. 2

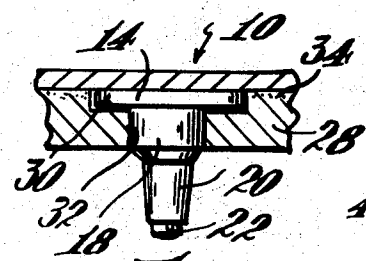


Fig. 3

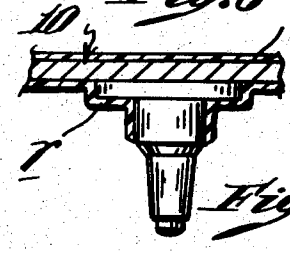


Fig. 4

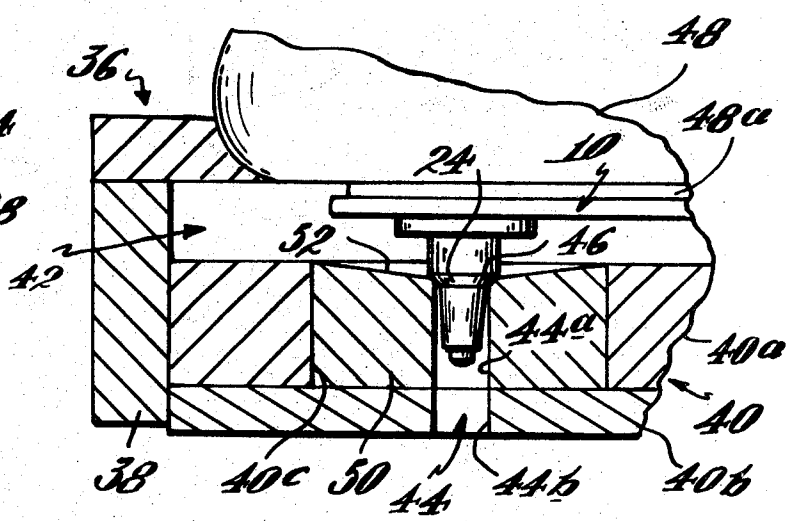


Fig. 6

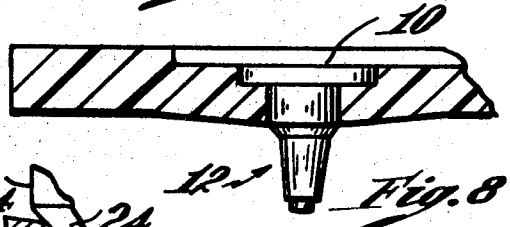


Fig. 8

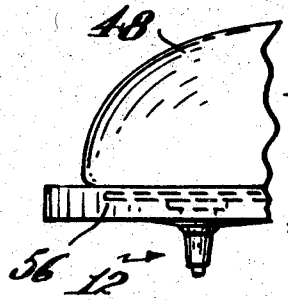


Fig. 7

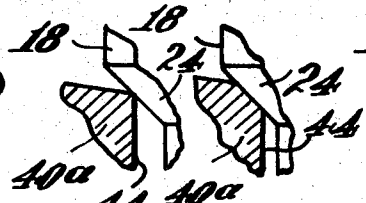


Fig. 9

Fig. 10

Inventors
Louis E. Bernier
James P. Giblin
by Roberts, Cushman & Grover
Attorneys

United States Patent Office 3,559,311
Patented Feb. 2, 1971

3,559,311

GOLF SHOES

Louis E. Bernier, Rockland, and James P. Giblin, Milton, Mass., assignors to E. T. Wright & Co., Inc., Rockland, Mass., a corporation of Massachusetts

Filed June 12, 1969, Ser. No. 832,724
Int. Cl. A43b 23/28
U.S. Cl. 36—59 15 Claims

ABSTRACT OF THE DISCLOSURE

A cleat plate and cleats for use in the manufacture of golf shoes characterized in that the cleats are designed to last for the life expectancy of the shoe, and to a method of incorporating the plates and cleats in the shoe bottom by assembly with a preformed outsole or incorporation in an outsole formed by compression or injection molding processes. Also a golf shoe with a cleated bottom designed to be effective throughout the normal life of the shoe.

BACKGROUND OF THE INVENTION

Cleat plates and cleats of the foregoing kind are the subject matter of the following pending United States applications: Ser. No. 710,973, filed Mar. 6, 1968; Ser. No. 727,819, filed May 9, 1968; Ser. No. 774,286, filed Nov. 8, 1968; Ser. No. 774,382, filed Nov. 8, 1968; and Ser. No. 734,154, filed June 3, 1968. The cleat plates and cleats shown in the aforesaid applications, although exceptionally light and flexible in comparison to other devices used for this purpose, require employing a relatively thick bottom member of leather or elastomer. The present invention accordingly has for its purpose to provide cleat plates and cleats especially designed to enable reducing the thickness of the bottom to give the appearance of light weight without sacrifice in durability or stability.

SUMMARY

As herein illustrated, the cleat plate is a steel plate, to one side of which are brazed or welded a plurality of cleats, each cleat having a flat head of relatively large size and a shank stemming therefrom, said shank having a first cylindrical portion next to the head, a slender tapered portion, and a conical portion at the junction of the cylindrical portion with the tapered portion. The cleat plates and cleats are adapted to be used in combination with a preformed outsole or to be molded into a bottom formed by injection or compression molding. When used in conjunction with a preformed outsole, the cleat plate is adhesively united to the inner surface of the outsole with the cleats extending through appropriate holes in an outsole designed to receive and hold the heads and cylindrical portions, with the conical and tapered portions projecting from the tread surface. When used in making an elastomeric bottom, the cleat plate is embedded in the bottom with the heads and cylindrical portions buried therein and with the conical and tapered portions extending from the tread surface. If the bottom is to be made of a bottom-forming composition which will not adhere to the steel plate and the cleats, the cleat plate, the heads, and cylindrical portions of the cleats are precoated with a layer of elastomer compatible with the bottom-forming composition. To combine the cleat plates and cleats with a preformed sole, the latter is provided with holes of two sizes to receive the heads and shanks. The holes are made somewhat smaller in size than the heads and shanks and the heads and shanks are pressed through the holes until the cleat plate is engaged with the inner side of the outsole. Adhesive is applied to unite the cleat plate and portions of the cleats extending through the holes in the outsole. To incorporate the cleat plate and cleats in an elastomer bottom, an open top mold is provided with a bottom plate containing holes corresponding to the number of cleats. Each hole is smaller in diameter than the larger diameter of the conical or beveled portion of the cleat and is adapted to receive the conical portion of the cleat. Thus the conical portions of the cleats support the cleat plate above the bottom of the cavity and seal the holes around the cleats where they enter the bottom plate. Optionally, the upper end of each hole may have around it a beveled or conical depression for receiving the conical portion of the cleat and if so the larger diameter of the conical depression should be slightly smaller than the larger diameter of the conical portion of the cleat. Bottom-forming composition may be introduced through the open top of the mold and caused to conform to the configuration of the mold cavity and the portions of the cleats situated in the cavity by pressure and heat, or may be injected into the mold cavity to fill the same and to embed the portions of the cleats within the mold cavity therein.

The invention will now be described in greater detail with reference to the accompanying drawings wherein:

FIG. 1 is a plan view of a cleat plate with cleats attached thereto;

FIG. 2 is a section taken on the line 2—2 of FIG. 1;

FIG. 3 is a fragmentary vertical section to larger scale showing a cleat plate and cleat assembled with an outsole and united thereto;

FIG. 4 is a fragmentary section similar to FIG. 2, provided with a thin coating of elastomer on the cleat plate, the heads and cylindrical portions of the cleats;

FIG. 5 is an elevation, to much larger scale, of a cleat and a top view thereof;

FIG. 6 is a fragmentary transverse section of a mold assembly showing a lasted upper resting on the open top of the mold, the cleat plate with a cleat attached thereto supported on the bottom of the mold preparatory to applying pressure and heat to distribute a bottom-forming composition placed in the mold cavity or for injection of a plasticized bottom-forming composition;

FIG. 7 is a fragmentary elevation of the forepart of a shoe showing a molded elastomeric bottom with a cleat plate and cleat embedded therein;

FIG. 8 is a fragmentary vertical section of a unit sole with a cleat plate and cleat incorporated therein by molding;

FIG. 9 is an enlarged fragmentary section at the upper end of one of the holes in the mold bottom having a right section; and

FIG. 10 is an enlarged fragmentary section at the upper end of one of the holes in the mold bottom having a beveled section.

Referring to the drawings (FIG. 1), there is shown a cleat plate **10** and cleats **12** attached thereto, the cleat plate corresponding in configuration to the forepart of the shoe in which it is to be incorporated and having seven (7) cleats attached to it.

The cleat plate is preferably 15 to 17 gauge stainless steel and should be flexible and highly resistant to cracking from repeated bending. Structural material other than steel which will afford substantially the same degree of flexibility and resistance to cracking for the same or lesser thickness and weight may be used in place of the steel.

Each cleat **12** has a flat head **14** and a shank **16** stemming from the head comprising a cylindrical portion **18** next to the head, a tapering portion **20** extending from the cylindrical portion, the distal end of which is recessed to receive a wear-resistant tip **22** and a conical portion **24** at the junction of the cylindrical and tapered portions **18** and **20**. The cleats may be die formed, formed on a screw cutting machine or formed by compression

molding of powdered metal. The heads have formed thereon symmetrically disposed nubs **26**, there being three (3) of these nubs to facilitate brazing or welding the cleats to the cleat plate. Obviously the metal of the cleats must be compatible with the metal of the cleat plate so as to enable brazing or welding the heads to the cleat plate.

The dimensions of a typical cleat suitable for the purposes herein illustrated are as follows, it being understood, however, that these dimensions are not intended to be limiting but will be modified for the particular style and weight of shoe with which they are used.

DIMENSIONS OF CLEAT

	Length	Diameter
Head	.052	.500
First cylindrical portion	.094	.250
Conical portion	.031	45°
Tapered portion	250	[1] .188 [2] .156
Insert	.062	[3] .093
Nub	.040 [4]	

[1] Larger end.
[2] Smaller end.
[3] Tungsten.
[4] Height.

Preferably the cleat plate is of stainless spring steel (Almar No. 362) and the cleats of a steel which can be brazed or welded thereto. The cleat plate and cleats may, however, be made of some material other than steel. For example, non-metallic materials may be used for both the cleat plates and cleats and the cleats may be attached to the plates by fusing or by adhesive.

Although the cleat plate shown in FIGS. 1 and 2 is flat, it may be curved both longitudinally and transversely to approximate the contour of the convexity of the bottom of the lasted upper. To facilitate imparting the desired convexity to the plate a portion at the butt end may be cut away as shown by the dot and dash line marked X in FIG. 1. Removal of this portion within the line X not only makes it easier to impart the desired contour to the plate but also lightens the weight of the cleat plate.

The cleat plate and cleats as shown in FIGS. 1 and 2 may be assembled directly to the inner side of a preformed leather outsole to provide a composite unit adapted to be attached to the bottom of a lasted upper. As shown fragmentarily in FIG. 3 the outsole **28** is provided with a plurality of holes, for example, by routing, corresponding in number to the number of cleats to be used, each hole comprising a large diameter portion **30** at the inner side of the outsole and a smaller diameter portion **32** extending from the bottom thereof through the tread surface at the outer side of the outsole. The holes **30** and **32** are made slightly smaller in size than the head and cylindrical portions of the cleats so that the cleats must be forced through the holes. As illustrated, the axial length of the combined heads and cylindrical portions of the cleats correspond to the thickness of the outsole, so that when the cleats are forced through the holes so as to bring the cleat plate **10** into engagement with the inner surface of the outsole, the conical and tapered portions of the cleats extend from the tread surface of the sole. The cleat plates and portions of the cleats which will be embedded in the outsole may be precoated with an adhesive which can be activated by heat and pressure, or adhesive **34** may be applied to the surfaces of the cleat plate and the sole and to the head and cylindrical portions of the cleats at the time of assembly to unite the cleat plate to the sole and to seal the head and cylindrical portions within the holes **30** and **32**. A composite cleated sole as thus made up can be readily attached to a lasted upper by stitching or cementing. A preformed elastomer sole may be employed in place of the leather sole.

It is also within the scope of the invention to combine the cleat plate and cleats with an elastomeric bottom by a molding process. This is accomplished, as illustrated in

FIG. 6, by providing a mold assembly **36** comprising a ring **38** open at the top and bottom and a bottom mold **40** supported at the bottom for movement through the open bottom which, in conjunction with the ring **38**, provides a mold cavity **42**. The bottom mold **40** contains a plurality of vertically disposed holes **44** of a diameter less than the larger diameter of the conical portions of the cleats and of a greater diameter than the smaller diameters of the conical portions of the cleats adapted to receive the conical portions **24** of the cleats set into the openings. Optionally, conical recesses **46** are provided at the upper ends of the holes for receiving the conical portions **24** of the cleats. Preferably the larger diameters of the conical recesses are slightly smaller than the larger diameters of the conical portions of the cleats so that the conical portions of the cleats set up above the upper surface of the bottom mold by a small amount.

A bottom is formed by mounting a cleat plate in the mold cavity **42** with the cleats engaged with the holes **44**, depositing an elastomer in the cavity and causing it to conform to the configuration of the cavity and to the cleat plate, heads and cylindrical portions of the cleats in the cavity. If it is desirable to form the bottom directly to the shoe (FIG. 6), a lasted upper **48** may be supported at the open top of the mold above the mold cavity. The cleat plate may be supported directly in engagement with the bottom of the lasted upper or a filler **48***a* of suitable material may be placed between the bottom of the lasted upper and the cleat plate. The filler may be comprised of sponge rubber, plastic, felt or the like and preferably is somewhat smaller in overall area than the cleat plate to permit the bottom-forming composition to flow around the edge of the cleat plate in order to enhance the bond. Optionally the filler **48***a* may be in the form of a grid or contain holes to permit the bottom-forming composition to flow through it into engagement with the bottom of the upper. If desired the cleat plate may be held spaced from the bottom of the upper, for example, by spacer pins attached to the top of the cleat plate.

The elastomer maybe caused to conform to the cavity and to the bottom of the lasted upper by a compression molding operation comprising placing a plasticizable quantity of bottom-forming composition in the cavity, closing the cavity with the lasted upper and then raising the bottom mold to apply heat and pressure to cause the bottom-forming composition to fill the cavity, taking the configuration thereof, and to embed the cleat plate and portions of the cleats within the cavity. The cleat plate may be forced directly against the bottom of the lasted upper or as mentioned above it may be held spaced therefrom by means of a filler or by spacing pins so that the bottom-forming composition can flow around the marginal edge of the cleat plate or between the upper surface of the cleat plate and the bottom of the lasted upper.

Instead of compression molding, injection molding may be employed by providing an injection opening in the bottom mold or in the ring and injecting a plasticized bottom-forming composition into the mold cavity about the cleat plate and the portions of the cleats situated in the cavity.

Compression molding is adapted especially to forming bottoms comprised of natural and synthetic rubber or rubber compounds, for example natural or crude rubber or Hycar, a copolymer of butadiene and acrylonitrile. For injection molding, man-made plastics are used such as PVC, polyurethane and polypropylene.

A unit sole may be formed as shown in FIG. 8 by closing the open top of the mold cavity with a flat cover plate or with a cover plate having a slight contour on its undesired corresponding substantially to the curvature of the bottom of the lasted upper, supporting the cleat plate with cleats attached thereto in the mold cavity with the top of the cleat plate engaged with the lower surface of the cover plate, and forming a bottom-forming composi-

tion within the mold cavity about the cleat plate and the portions of the cleats therein. Optionally, the cleat plate and cleats may be incorporated in a unit sole of this kind with the cleat plate completely buried in the outsole or with the cleat plate raised above the surface of the outsole.

In all instances of forming a bottom by molding, it is desirable to cause the bottom-forming composition to flow around the shoulder at the junction of the cylindrical portion **18** with the conical portion **24** so as to form a seal and this is why it is desirable to make the hole at the upper end of the bottom mold slightly smaller in diameter than the larger diameter of the conical portion, so that the upper portion of the conical portion **24** will actually set up into the mold cavity, FIGS. 9 and 10.

Since the cleats are comprised of a relatively hard material and constant re-use would soon wear the holes in the bottom mold out of round or enlarge the same which would reuslt in leakage and rejects, the bottom mold itself is made in two parts **40***a* and **40***b*. The lower part of the hole **44***b* is in the plate **40***b*. The upper plate **40***a* contains a larger hole **44***c* which is concentric with the hole **44***b* in which there is pressed an insert **50** of tool steel. The insert **50** contains the upper part **44***a* of the hole **44** and the conical depression **46**. It is within the scope of the invention, however, to make the bottom mold of one piece, set the insert into the upper side and drill a hole in the lower side of smaller diameter than the insert so that the latter can be driven out of the mold for replacement.

For enhancing the appearance of the tread surface of the bottom the upper surface of the insert **50** may be provided with a relatively large diameter, very shallow circular depression **51** (FIG. 6) so that during the molding operation a slight raised portion is formed on the tread surface of the sole around each cleat where the latter protrudes from the tread surface. The shallow surface **52** is polished so that the surface of the bottom-forming composition is smooth in contrast to the remainder of the tread surface which preferably is slightly roughened to provide a matted appearance.

When incorporating a steel plate and cleats into a bottom comprised of an elastomer such as rubber, it is desirable to degrease the surfaces of the cleat plate and the cleats to obtain a good bond. When the cleat plates and cleats are to be incorporated in a man-made material such as PVC, it may be necessary to first coat the steel plate and the heads and cylindrical portions of the cleats with a layer of an elastomer of varying degrees of thickness compatible with the bottom-forming composition to be used, as shown in FIG. 4, to enable obtaining a bond between the cleat plate and the bottom-forming composition.

FIG. 7 shows a fragmentary portion at the forepart of a shoe with a molded bottom **56** and a portion of a cleat plate and a single cleat embedded in the bottom so that the plate, head and cylindrical portion of the cleat are buried in the substance of the bottom and the conical and tapered portions of the cleats protrude from the bottom.

Throughout the description the cleat plate and cleats have been illustrated for incorporation in the forepart of a shoe; however, it is to be understood that a heel plate and cleats attached thereto of suitable configuration for incorporation in the heel end of the shoe are equally part of the invention.

We claim:

1. A cleat plate comprising a relatively flexible plate corresponding in configuration to the part of the bottom of the shoe in which it is to be incorporated, a plurality of cleats secured to said plate, each cleat embodying a flat head of relatively large size, a shank extending therefrom, said shank having a first portion of relatively large diameter next to the head and a slender portion of circular cross-section extending from the first portion, the distal end of which is adapted to carry a wear-resistant tip, and a conical portion at the junction of the first portion with the slender portion.

2. A cleat plate according to claim **1**, wherein the cleat plate, heads of the cleats and first portions of the shanks are coated with a material adapted to form a bond with the bottom in which the plate is to be incorporated.

3. A cleat plate according to claim **1**, wherein the slender portion tapers.

4. A cleat plate comprising a flexible metal plate corresponding substantially in configuration to the part of the bottom of the shoe in which it is to be incorporated, a plurality of cleats secured to said plate, each cleat comprising a flat head next to the plate, and a shank at right angles thereto, said shank having a first cylindrical portion next to the head adapted to be buried together with the head in the bottom in which the plate is incorporated, a slender portion of circular cross-section extending therefrom adapted to protrude from the bottom and to carry at its distal end a wear-resistant tip, and a conical portion at the junction of the cylindrical portion and the slender portion, the larger diameter of which corresponds to that of the cylindrical portion and the smaller diameter of which corresponds to that of the slender portion.

5. A cleat plate according to claim **1**, wherein the cleat plate is approximately 15 to 17 gauge stainless steel and the cleats are comprised of a metal adapted to be attached to the cleat plate by brazing or welding.

6. A golf shoe having a composite bottom comprising an outsole attached to the bottom of an upper, said outsole containing a plurality of holes corresponding to the number of cleats to be employed, a flat flexible plate of substantially the same configuration as the bottom part of the shoe in which it is incorporated but of smaller area, said plate having at one side a plurality of cleats, each of which has a head fixed to the plate and a shank extending outwardly therefrom, said plate being situated between the bottom of the lasted upper and the outsole with the shanks of the cleats extending through said holes in the outsole, and an adhesive uniting the upper and lower surfaces of the plate to the bottom of the lasted upper and the top of the outsole respectively.

7. A golf shoe according to claim **6**, wherein the outsole is leather.

8. A golf shoe according to claim **6**, wherein the plate is sheet metal.

9. A golf shoe having a composite bottom comprising an elastomeric outsole attached to the bottom of a lasted upper, said outsole embodying a flat flexible plate of substantially the same configuration as the outsole but smaller in area embedded in the outsole between the bottom of the upper and the tread surface of the outsole, said plate carrying a plurality of cleats, each cleat having a head fixed to the plate, a first shank portion next to the head, said head and first shank portion being buried in the outsole, a slender tapered portion extending from the first shank portion and from the tread surface of the outsole, and a conical portion at the junction of the first shank portion and the tapered portion where the cleat emerges from the tread surface.

10. A golf shoe according to claim **9**, wherein said outsole is an elastomer and the plate and cleats are metal.

11. A composite bottom for attachment to a lasted upper comprising a preformed outsole containing a plurality of holes, a metal cleat to one side of which are secured a plurality of cleats corresponding in number to the number of holes in the outsole, each cleat having a head secured to the plate, a cylindrical portion of smaller diameter next to the head, a tapered portion adapted to carry at its terminal end a hardened tip, and a conical portion at the junction of the cylindrical and tapered portions, said hole being slightly smaller than the head and cylindrical portions of the cleats so that the head and cylindrical portions are required to be pressed into the holes and of an axial length such that when pressed into the holes only the tapered portions and the conical portions extend from

the tread surface, and an adhesive forming a bond between the sole and the head and cylindrical portions within said holes.

12. A composite bottom according to claim 11, wherein the sole is leather.

13. A composite bottom according to claim 11, wherein the sole is an elastomer.

14. A composite bottom comprised of an elastomer and a metal cleat plate embedded therein with its upper surface flush with the inner side of the bottom, said cleat plate having fixed to one side a plurality of cleats, each having a head secured to the plate, a cylindrical portion next to the head embedded in the bottom, a tapered portion extending from the tread surface of the bottom, and a conical portion at the junction of the cylindrical portion and the tapered portion, a portion of which is embedded

in the bottom and a portion of which extends therefrom.

15. A composite bottom according to claim 14, wherein the cleat plate is buried in the bottom between the inner and outer surfaces thereof.

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PATRICK D. LAWSON, Primary Examiner