Feb. 9, 1937. M. GOLDENBERG 2,070,269

SHOE

Filed May 1, 1933 2 Sheets-Sheet 1

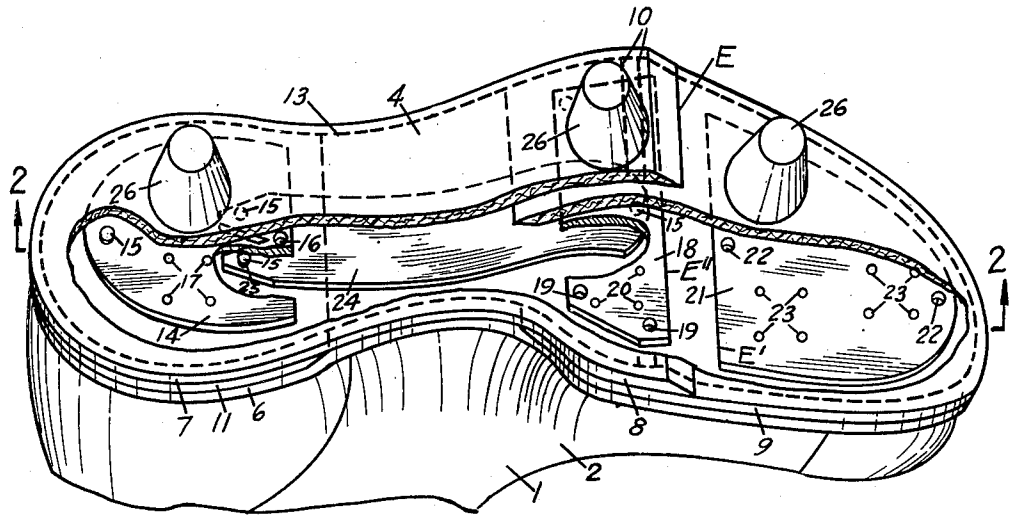


FIG. 1

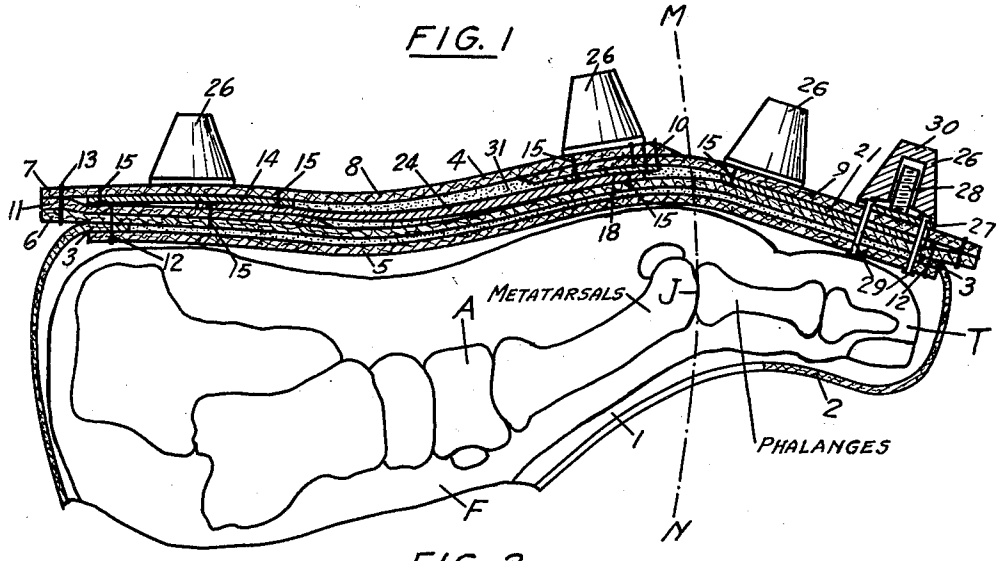


FIG. 2

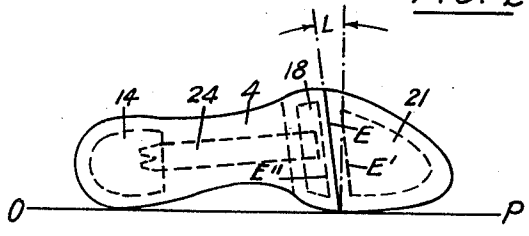


FIG. 6

INVENTOR.
MICHAEL GOLDENBERG
BY
A D Caesar
ATTORNEY.

Feb. 9, 1937. M. GOLDENBERG 2,070,269

SHOE

Filed May 1, 1933 2 Sheets-Sheet 2

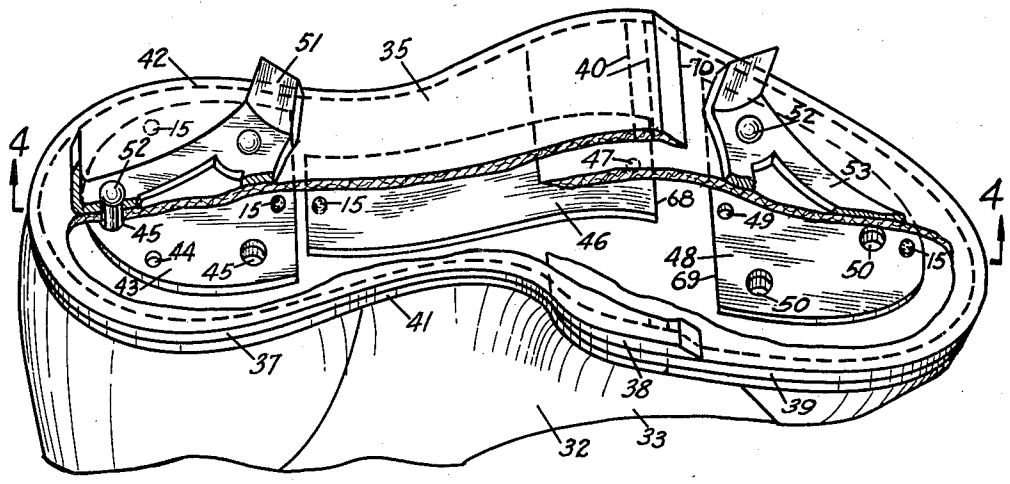


FIG. 3

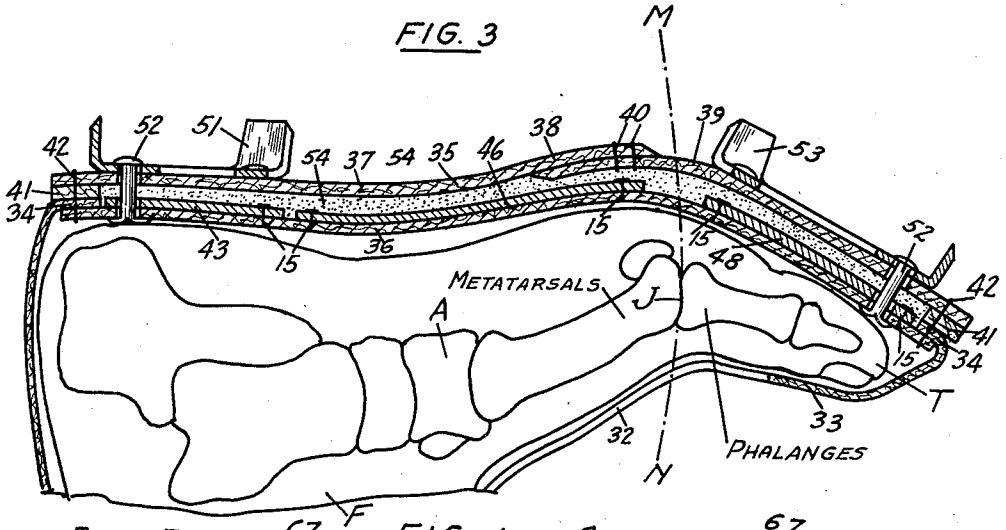


FIG. 4

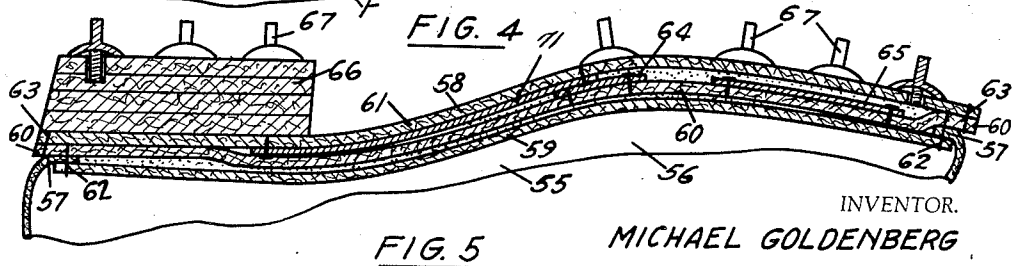


FIG. 5

INVENTOR.
MICHAEL GOLDENBERG
BY
A. D. Caesar
ATTORNEY.

Patented Feb. 9, 1937 2,070,269

UNITED STATES PATENT OFFICE

2,070,269

SHOE

Michael Goldenberg, Philadelphia, Pa.

Application May 1, 1933, Serial No. 668,828

5 Claims. (Cl. 36—2.5)

This invention relates to shoes which are provided with external spikes for ground gripping and traction purposes and has for its object the production of a new and improved shoe of this type.

Spike shoes, that is shoes which have external traction and/or ground gripping spikes attached thereto, are usually provided with steel plates which among other things, serve to distribute the pressure of the spikes over the entire heel and sole area of the foot and act as buffers to prevent the shoe contacting ends of the spike element from pressing directly against the foot. The plates used, however, are so formed and positioned as to result in the loss of the flexibility in the foot when the shoe is worn. It is especially desirable, however, that the flexibility of the foot should not be impaired by spike shoes since they are generally worn by either athletes or by men engaged in heavy outdoor work. It is one of the objects of this invention to produce a spike shoe having plates which will result in the minimum loss of flexibility to the foot of the wearer.

Attempts have been made to impart a greater degree of flexibility to spike shoes by making that portion of the shoe between the ball and heel of the foot of comparatively thin material. This, however, makes the use of an arch brace impossible, or at best impractical. Further, any attempt to avoid the loss of foot flexibility due to stiffness of the shoe base structure by making the shoe flexible or of comparatively flexible material at the instep or arch portion is based on an erroneous assumption. For, the flexibility of the foot necessary for running, walking, making a quick start, etc. is primarily due to the joint at the toes, viz, between the metatarsals and the phalanges. There is in fact comparatively little or no flexibility in that portion of the foot lying between the tarsals and the metatarsals and it is desirable that the arch in this portion of the foot be maintained. It is another object of my invention to produce a spike shoe having plates which will be so formed as to have a comparatively high degree of flexibility along the line of bend formed in the shoe by a flexing of the foot of the wearer along the joint line between the metatarsals and phalanges and in which an arch brace may be inserted without destroying the flexibility of the shoe along the line stated.

It is another object of my invention to produce a spike shoe having plates which will be so formed as to have a comparatively high degree of flexibility along the line of bend formed in the shoe by the flexing of the foot of the wearer along the joint line between the metatarsals and the phalanges.

The above as well as other objects of this invention are attained in the structures which are more particularly described in the following specifications and the drawings which form a part thereof.

In the drawings Figure 1 is a perspective view of the lower portion of a football shoe made in accordance with my novel principles. The shoe is shown in the inverted position with parts of the outer sole and portions of the plate elements broken away for the purpose of more clearly illustrating my novel structure.

Figure 2 is a section taken along the line 2—2 of Figure 1. The lower portion of the foot with the bones in outline is shown in position within the shoe.

Figure 3 is a perspective view, taken similarly to Figure 1, of a baseball shoe made in accordance with my novel principles.

Figure 4 is a section taken along the line 4—4 of Figure 3 with the lower portion of the foot, having its bones outlined therein, shown in position within the shoe.

Figure 5 is a vertical section through a golf shoe having my novel features incorporated therein taken along a line substantially similar to 4—4 of Figure 3.

Figure 6 is a schematic top view of the shoe shown in Figure 1 wherein only the cleat cushioning plates and the shank piece are shown in position under the outsole. The cleats, the cleat attaching apertures, the lines of stitching and other detail elements have been omitted for the purpose of clearness.

Referring more particularly to the drawings wherein similar reference numerals denote similar parts, reference numeral 1 (see Figures 1, 2 and 6) denotes the football shoe as a unit which is composed of upper 2 and the sole portion 4. The sole portion 4 is composed of an insole 5, an "English" or full sole welt 6 and an outsole 7 which is composed of the heel and arch portion 8 and the toe portion 9 joined together by the line of stitching 10. A heel filler piece 11 is positioned between the English welt 6 and the outsole element 8. Positioned between the filler piece 11 and the outsole element 8 is a heel cushioning plate 14 and positioned between the English welt 6 and the outsole element 9 are the two sole cushioning steel plates 18 and 21. A shank piece or arch support element 24 is positioned between the outside elements 8 and 9 and the English welt 6 with its ends terminating under

heel cushioning plate 14 and the back sole cushioning plate 18. The open spaces between the different components of the sole are filled in with ground cork 31 or other filler material.

The heel plate 14 is made of steel, is of the size and shape now in general use, has the usual aperture 16 formed therein through which the attaching tacks 15 extend and has further formed therein a number of groups of cleat attaching apertures 17 equal to the number of cleats 26 (in this case two) to be cushioned.

The back sole cushioning plate 18 is made of steel, is of the size and shape shown, has formed therein the apertures 19, through which the attaching tacks 15 extend, and has further formed therein a number of groups of cleat attaching apertures 17 equal to the number of cleats (in this case two) which are to be cushioned by this element.

The front sole cushioning plate 21 is made of steel, is of the size and shape shown, and has formed therein the apertures 22, through which the attaching tacks 15 extend, and also a number of groups of apertures 23 (in this case 3) equal to the number of cleats 26 which are to be cushioned by this element.

The back and front sole plates 18 and 21 respectively must be so spaced apart and positioned that no portion of either stiffening plate falls along that line in a plateless shoe which is formed by the flexing of the toes along the joints between the metatarsals and phalanges. (When the foot is flexed at the joints J that portion of the foot constituting the tarsals and the metatarsals and the shoe carried thereby may be considered as flexing at the arc MN, herein designated as the flexing arc. Since the toe or phalange portion is stationary this results in a tendency of the shoe sole to bend or flex about the bend line formed between the points of intersection of the shoe sole and flexing arc at each side of the shoe.) In the shoe shown in Figures 1, 2 and 6 the flex or bend line falls slightly in front of the edge E of the sole element 8 (see Figure 2) and is substantially parallel to the line or edge E. The back and front sole plate elements 18 and 21 are so spaced and positioned that their edges E'' and E' respectively are parallel to the line E and fall respectively in back and in front of the line E thereby forming an area between them which is entirely free from any comparatively non-flexible element such as a steel plate. It is to be noted that the edge E and the edges E'' and E' are not perpendicular to the line OP (see Figure 6) which is the straight line drawn along the inside of the foot, but instead are at an angle L to the perpendicular equal to the angle which the joint line between the metatarsals and phalanges forms with the said reference line OP.

It is to be noted that where the type of shoe used requires the use of cleats or spikes over practically the entire sole area (as for instance in football, soccer, golf or track shoes) flexibility of the shoe along the toe joint line is obtained by splitting the comparatively non-flexible sole cushioning plate now in use into two component portions and spacing the said portions one on either side of the joint line. Further, by making the edges of the split cushioning plates which bound the joint line substantially parallel to the normal joint line formed between the metatarsals and phalanges the possibility that an edge of one of the cushioning plates will interfere with the toe flex line because of the difference in angularity between the toe flex line and the said edge is obviated.

The shank piece 24 is made of steel, is of the size and shape shown and has formed therein the apertures 25 through which the attaching tacks 15 extend. Although shank pieces have been used before in shoes generally, my concept makes possible the use of a shank piece in every type of athletic shoe, a use which was not readily feasible in the old art structures generally and particularly in such structures as sought to secure flexibility in the shoe by making the portion under the arch flexible.

The cleats 26 are of the type now on the market consisting of the base portion 27 which terminates in a threaded stud 28 on which is threadably mounted the body portion 30 of the cleat. Each base 28 has four apertures formed therein which register with the four apertures of a group of apertures 17, 20 or 23, depending on where the cleat in question is positioned, and is attached to all of the sole elements including the cushioning plate situated at the point where the cleat is positioned by means of rivets 29.

Although the manner of making the football shoe hereinabove described is believed to be clear from the foregoing disclosure yet for the purpose of obviating any possibility of a misunderstanding, the following detailed description is here given:

The insole 5 and upper 2 are fastened upon the last in the usual manner, the ends 3 of the upper being turned down to occupy the position shown in Figure 2. The English welt 6 and the heel filler piece 11 are then put in position upon the insole 5 and the elements 11, 6, 3 and 5 are then joined together by the line of stitching 3 in the manner well known in the art. The shank piece 24 is then attached in position to the filler piece 11 and the English welt 6 by means of the tacks 15 which extend through the apertures 25 formed in said shank piece. Thereafter the sole member 7, which had been formed by joining together the rear sole portion 8 and the front sole portion 9 by the stitching 10 and to which the cushioning plates 14, 18 and 21 respectively had previously been attached by the tacks 15 extending through the apertures 15, 19 and 22, respectively, is positioned upon the elements 11, 24 and 6 and attached to the elements 11 and 6 by the line of stitching 13 in the manner well known in the art. (Whenever necessary in the course of the formation of the shoe and before any succeeding layer or element is placed upon its predecessor, cork filling material 31 is spread in position in the manner well known in the art.) The base portions 27 of the cleats 26 are now attached in their proper positions by means of the rivets 29 which extend through the aperture groups 17, 20 and 23 and through suitable apertures formed in the elements 8, 9, 11, 6 and 5 in the manner well known in the art. The body portions 30 of the cleat are now mounted in position thus completing the shoe.

Referring to Figures 3 and 4 wherein I have shown my novel structure incorporated in a "baseball" shoe, reference numeral 32 denotes the shoe as a unit composed of the upper 33 which terminates in the turned over end 34 which rests upon the insole 36 of the sole 35 in the manner well known in the art. The sole 35 is made up of the insole 36, the welt 41 and outsole 37. The outsole 37 is made up of the rear sole elements 38 and the front sole element 39 joined together by the line of stitching 40. The elements 36, 34,

41, 38 and 39 are joined together by the line of stitching 42 in the manner well known in the art. Attached to the insole 36 by means of suitable tacks 15 are the heel spike cushioning plate 43, the shank piece 46 and the sole spike cushioning plate 48. The heel spike cushioning plate 43 is made of steel, is of the form well known in the art having the tack apertures 44 and the spike apertures 45 formed therein. The shank piece 46 is made of steel, is of the size and shape shown and has the spike apertures 47 formed therein. The sole spike cushioning plate 48 is made of steel and has the tack apertures 49 and the spike apertures 50 formed therein. Attached to the cushioning plates 43 and 48 respectively by means of the rivets 52 are the heel and sole spike units 51 and 53 respectively. The spaces between the component elements of the sole are filled in by the filler element 54.

It is to be noted that the shank piece 46 is so positioned that its sole plate facing edge 68 falls on the heel side of the flexing arc MN, that is, on the heel side of the bend line of the shoe, said flexing arc or bend line being formed by the bending of the foot at the joints between the metatarsals and phalanges. It is further to be noted that the cushioning plate 48 is so formed and positioned that its straight or shank facing edge 69 falls in front of the said flexing arc MN, that is, in front of the said shoe bend line, and is substantially parallel to the straight edge 70 of the rear sole element 38 which is substantially parallel to the joint line of the metatarsals and phalanges. Because of this positioning of the shank piece and toe cushioning plate the area bounding the toe joint line is free from non-flexible material. The shoe is therefore flexible along the toe joint line.

Referring to Figure 5, wherein I have shown a golf shoe built in accordance with my novel principles, reference numeral 55 denotes the shoe as a unit composed of an upper 56 terminating in the turned over edges 57 which are received between the insole 59 and the English welt 60 of the sole 58 and is attached to these elements by the line of stitching 62 which also attaches the elements 59 and 60 to each other in the manner well known in the art. The single piece continuous outsole 61 of the sole 58 is attached to the English welt 60 by the line of stitching 63 in the manner well known in the art. Positioned between the outsole 61 and English welt 60 and attached to the said welt 60 by means of suitable tacks are the rear and front sole spike cushioning plates 64 and 65 respectively. Positioned between the outsole element 61, the welt 60 and the rear sole spike cushioning plate 64 is the shank piece 71. Spikes 67 are attached to the front sole and also to the heel 66 in the manner well known in the art.

It is to be noted that the rear and front sole cushioning plates 64 and 65 respectively are formed and positioned in a manner generally similar to the plates 18 and 21 respectively, shown in Figures 1, 2 and 6, whereby the line of bend formed in the shoe by flexing or bending of the foot along the joint line of the matatarsals and phalanges is entirely free from the comparatively nonflexible spike cushioning plates. This structure permits the bending of the shoe along the said line and does not materially impair the flexibility of the foot of the wearer along the said joint line.

The above disclosure is to be understood as being by the way of illustration only and not by the way of limitation since many changes may be made in the structures herein shown without departing from the spirit of my invention which consists in so positioning the sole spike cushioning plate of a spike shoe that it does not overlie the line formed in the shoe by a flexing of the foot of the wearer along the joint line of the metatarsals and phalanges, herein designated as the toe bend line; it consists further in splitting the sole spike cushioning plate into two parts, when the said plate is so big or must carry spikes over such a widely scattered area that it cannot be placed so as to avoid covering the said toe bend line, and so placing the component elements as to leave an area in said sole entirely free from the said cushioning elements the said area including the line of bend in the shoe formed by the bending of the foot about the joints of the metatarsals and phalanges; it consists further in so forming and positioning the flexing area bounding edge of the said plate or plates that they run substantially parallel to the said joint line; it consists further in forming a shoe which is flexible along the toe bend line and supported by a rigid plate at the instep or arch portion.

In addition to the variations in structure herein disclosed these changes may be in the material used for any of the elements, in the substitution of equivalents for any or all of the elements herein disclosed, in the incorporation of my novel concepts in spike shoes used for other purposes than those here illustrated, and in the incorporation of some but not all of my inventive concepts into any particular structure. In the light of my disclosure these as well as other changes will suggest themselves to those skilled in the art. For this reason it is my desire that the claims which are hereunto appended for the purpose of defining my invention should be limited only by the prior art.

Definition:—The term "spike" as used in the specifications and claims is used to designate all protuberances attached to or extending from shoes which have as their purpose the aiding of traction or the insuring of a firmer ground grip by the wearer.

Having described my invention what I claim as new and useful is:—

1. As an article of manufacture a spike shoe having front and rear sole spike cushioning plates and a shank member positioned in the sole member thereof, the said cushioning plates being spaced apart and so positioned as to bound and include between them but not to overlie an area of the said sole within which is included the bend line of said sole, and said shank member extending from a point overlying said rear sole cushioning plate to a point at the heel of said shoe.

2. As an article of manufacture a spike shoe having front and rear spike cushioning plates and a shank plate positioned in the sole member thereof, the said cushioning plates being spaced apart and positioned so as to bound and include between them but not to overlie an area of the said sole within which is included the toe bend line of the said sole, the area bounding edges of each of the said plates being substantially parallel to the metatarsal-phalange joint line, and said shank plate extending from a point overlying said rear sole cushioning plate to a point at the heel of said shoe.

3. As an article of manufacture a spike shoe having a multipiece outer sole as a component part thereof, front and rear spike-cushioning

plates and a shank plate positioned in the said sole; the said cushioning plates being spaced apart and positioned so as to bound and include between them but not to overlie an area of the sole within which is included the toe bend line of the said sole, the area bounding edges of each of the said plates being substantially parallel to the metatarsal-phalange joint line; the said multi-piece outer sole being formed of two overlapped units joined together along their common overlapped portion with the free edge of the outer of the said sole units being parallel to and terminating at the arch side of the said metatarsal joint line; and said shank plate extending from a point overlying said rear sole cushioning plate to a point at the heel of said shoe.

4. A spike shoe having a heel spike-cushioning plate, front and rear sole spike-cushioning plates and a shank plate positioned in the sole member thereof; said front and rear sole cushioning plates being spaced apart and positioned so as to bound and include between them but not to overlie an area of said sole within which is included the toe bend line of said sole, the area bounding edge of each of said plates being substantially parallel to the metatarsal-phalange joint line; and said shank plate extending from a point overlying said rear sole cushioning plate to a point overlying said heel spike cushioning plate.

5. A spike shoe having a multi-piece outer sole as a component part thereof; a heel spike cushioning plate, front and rear sole spike cushioning plates, and a shank plate positioned in said sole; said cushioning plates being spaced apart and positioned so as to bound and include between them but not to overlie an area of the sole within which is included the toe bend line of the said sole, the area bounding edges of each of the said plates being substantially parallel to the metatarsal-phalange joint line; the said multi-piece outer sole being formed of two overlapped units joined together along their common overlapped portion with the free edge of the outer of the said sole units being parallel to and terminating on the arch side of the said metatarsal joint line; and said shank plate extending from a point overlying said rear sole spike cushioning plate and extending to a point overlying said heel spike cushioning plate.

MICHAEL GOLDENBERG.