Dec. 15, 1953 D. J. MORTON 2,662,309

ADJUSTABLE ORTHOPEDIC INSOLE

Filed Aug. 22, 1952

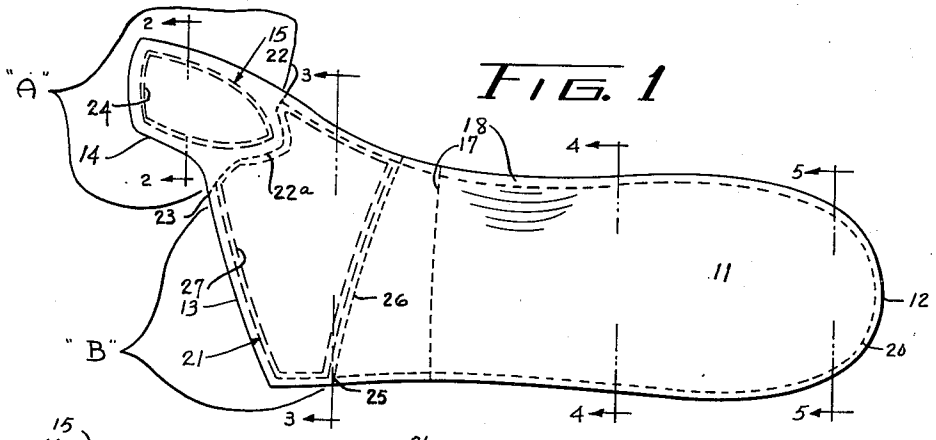


FIG. 1

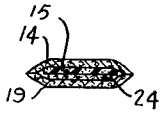


FIG. 2

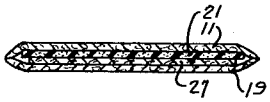


FIG. 3

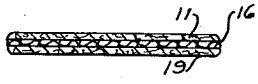


FIG. 4

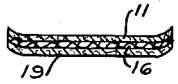


FIG. 5

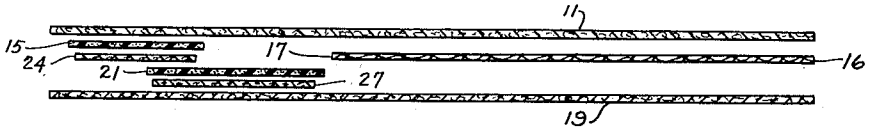


FIG. 6

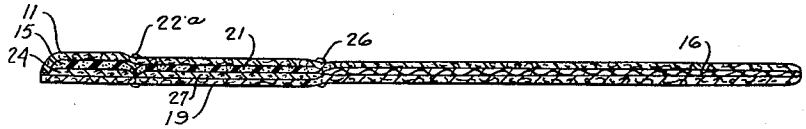


FIG. 7

INVENTOR.
DUDLEY J. MORTON
BY
Van Deventer & Shively
ATTORNEYS

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ADJUSTABLE ORTHOPEDIC INSOLE

Dudley J. Morton, New York, N. Y., assignor to Professional Research Products, Inc., New York, N. Y., a corporation of Delaware

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3 Claims. (Cl. 36—71)

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This invention relates to adjustable orthopedic insoles of the general class described in the co-pending application Serial No. 168,090, filed June 14, 1950, now Patent Number 2,623,307, and has for its object the provision of a personalized insole that can be fitted or adjusted by the orthopedic surgeon to the patient's foot at the surgeon's office where the surgeon can make such changes in a stock insole without the use of machinery to fit it to the patient's foot.

The insole furnished the surgeon is, therefore, an article of manufacture which is completed for use by the surgeon by fitting pads thereto to suit the individual patient's requirements.

In the accompanying drawings:

Figure 1 is a top plan view of an insole embodying the invention for the left foot;

Figures 2 to 5, inclusive, are sectional views of the insole Figure 1, on the lines 2, 3, 4, and 5 of Figure 1;

Figure 6 is an edge view of the insole Figure 4, with the parts separated to show the construction; and

Figure 7 is a sectional longitudinal view of the insole Figure 1.

Referring to Figure 1, the aforesaid co-pending application discloses an insole having an upper top member 11 made of leather, or the like, to fit into a shoe and extend from the extreme rear point 12 of the heel to a point 13 just below the ball of the foot and behind the juncture of the four metatarsal bones and their phalanges.

The top 11 is formed with a forwardly extended portion 14 which extends under the front end of the first metatarsal and forms (together with pad 15) a platform to compensate for any shortness or laxness in this metatarsal and restore even weight distribution, as fully explained in said co-pending application. This corrects weight distribution due to metatarsal disorder.

The top member 11 carrying pad 15 has a stiffening liner 16 of any suitable material such as commonly employed for such liners cemented or otherwise secured thereto, and same covers the insole from heel 12 to a point 17, a short distance in front of the upwardly curved portion 18 of the insole.

A bottom member 19 preferably of leather is now attached to member 11 and is of exactly the same shape as 11, and stitching 20 may pass through the liner 16 which may be of any desired thickness.

The outer edges of members 19 and 11 may be cemented together and tooled to present a

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closed rounded edge, and the curved instep portion 18 may be formed in the insole by pressing same to the desired shape.

The entire insole unit may, if desired, be pressed or otherwise shaped to conform generally to the bottom of the foot, provided the pad 15 and member 21 (hereinafter described) are so placed as to function as herein described when said insole is so shaped.

The second essential object of this invention, to counteract the excessive bruising pressure on the soft tissues immediately under the front end of overloaded metatarsal bones, is attained by securing a weight-diffusing element or member 21 to member 19 by cement or in any suitable manner.

The element 21 may be of rather dense sponge rubber or the like, but is not to be considered as a pad or support, as its real function is to distribute the weight applied thereto by the four lateral metatarsals after same has been corrected as just described over a considerable area as defined by said member which, as best seen in Figure 1, will underlie all the metatarsals immediately rearwardly of the contact points thereof, and then extend rearwardly toward the heel a sufficient distance to diffuse the weight applied during weight-bearing.

It will be observed that the member 21 does not extend to or support the arch of the foot and does not come near the tarsal bones.

The edges of the member 21 may be rounded to present a neat appearance and it may be tapered toward the front and rear edges as shown by dotted lines 22, Figure 6.

Obviously, if the members 11 and 19 are cemented together to produce a rounded edge around the insole as aforesaid and as pointed out in said co-pending application, the surgeon cannot change the height of pad 15 after receiving insoles from the manufacturer. Neither can he easily detach member 21 which is cemented to member 19 to change the height of 21.

As it is necessary that pad 15 and member 21 be varied in height to suit various foot conditions, it is necessary for the manufacturer to make hundreds of combinations necessary to meet these conditions which necessitates a large stock be kept both by the manufacturer and the surgeon. Even if this is done, there are many instances where no stock insole will meet the requirements, which means that special insoles must be ordered from the maker, causing extra expense and delay.

These difficulties are eliminated by the present

invention, whereby the surgeon need only keep a relatively small stock of insoles to correspond with shoe sizes, and can change the heights of the compensating member 15 and weight-diffusing member 21 to suit the individual patient. This is accomplished by stitching across the insole at 22a, and leaving the outer edge of the forwardly extending portion 14 thereof open around the toe between the points 22 and 23.

The pad 15 may be greatly reduced in thickness—in fact may be omitted in most cases, for when the stitching 22a is used, a pocket is formed below the toe portion 14 of the insole and a suitable pad 24 is placed therein and by itself or together with pad 15 elevates the portion 14 of the insole the desired amount. This pad 24 is easily cemented in place after being fitted and the outer edges of the upper layer 11 and bottom member 19 around portion 14 of the insole are cemented together to enclose pads 15 and 24.

Also, the edge of the insole between the points 23 and 25 is left open, a line of stitching being run across the insole at 25. This forms a pocket in which the weight-diffusing member 21 may be placed. It may be greatly reduced in thickness—in fact may be omitted in most cases. Also, in this pocket is placed a pad 27 and by itself or together with pad 21 elevates the portion of the insole above the weight-diffusing member 21 to suit the individual patient.

The pad 27 is easily cemented in place after being fitted and the outer edges of the upper layer 11 and the bottom member 19 around the entrance to the pocket between points 23 and 25 are cemented together to enclose pads 21 and 27.

From the foregoing it will be noted that the surgeon receives from the manufacturer the insole with the seams open at the entrance to the pockets designated A and B in Figure 1, and then adds pads 15, 24 and 21, 27 as required, cementing them in place and cementing the edges of the pockets to completely enclose the pads. By this means personalized insoles can be made without the use of machinery and adjusted to meet the foot condition to be treated.

What is claimed is:

1. An article of manufacture comprising an insole adapted to underlie a human foot and having a front extension adapted to extend only under the forward end of the first metatarsal bone of the foot comprising a top member, a bottom member, means securing said members permanently together adjacent the edges thereof but leaving an open pocket formed between said members and underlying said front extension and a second open pocket underlying that portion of the insole below the shafts of all the metatarsal bones from a point immediately back of the heads of all the metatarsals, said pockets adapted to receive pads of varying thicknesses, to compensate for shortness or laxity of the first metatarsal and to diffuse pressure over an area extending behind and transverse said insole and extending laterally across said insole substantially the full width thereof.

2. An insole adapted to be inserted in a shoe, and comprising top and bottom members adapted to underlie a human foot and having a front extension adapted to extend only under the forward end of the first metatarsal bone of said foot, a pocket formed in said insole between said members, a non-cushioning pad secured in said pocket and underlying the head of the first metatarsal bone only and adapted to compensate for shortness or laxity of said metatarsal, means for securing said members together with said pad therebetween, a second pocket formed in said insole between said members, and a weight-diffusing pad in said second pocket and extending transversely of same, and underlying the shafts of all the metatarsal bones from a point immediately back of the heads of all the metatarsals and adapted, when worn in a shoe, to diffuse pressure over an area extending behind and transverse said insole, said weight-diffusing cushion member extending laterally across said insole substantially the full width thereof.

3. An insole adapted to be inserted in a shoe and comprising top and bottom members adapted to underlie a human foot in said shoe, said members having a front extension adapted to extend only under the forward end of the first metatarsal bone of said foot, a pocket formed in said insole between said members, a non-cushioning pad secured in said pocket and underlying the head of the first metatarsal bone only and adapted to compensate for shortness or laxity thereof, a stiffening element secured between said members and extending from the heel to a point forward of the instep of said insole, means for securing said members together with said pad and said stiffening member therebetween, a second pocket formed in said insole between said members, and a weight-diffusing cushion member in said pocket and extending transversely of the same and forward of said stiffening member and underlying the shafts of all the metatarsal bones from a point immediately back of the heads of all said metatarsals and adapted, when worn in a shoe, to diffuse weight over the entire area defined by said cushion member, said last member extending laterally across said insole substantially the full width thereof.

DUDLEY J. MORTON.

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