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2,917,850

LONG WEARING FOOT RELIEVING DEVICE

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FIG. 1

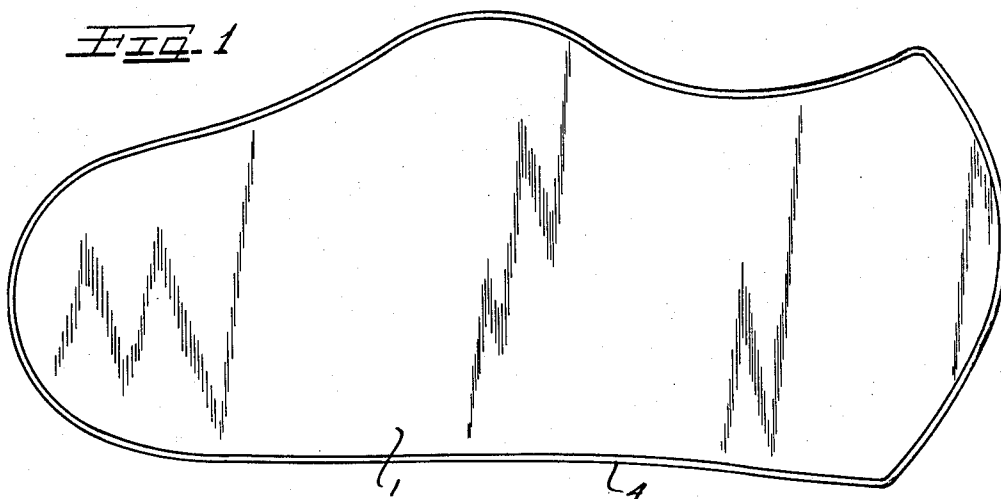


FIG. 2

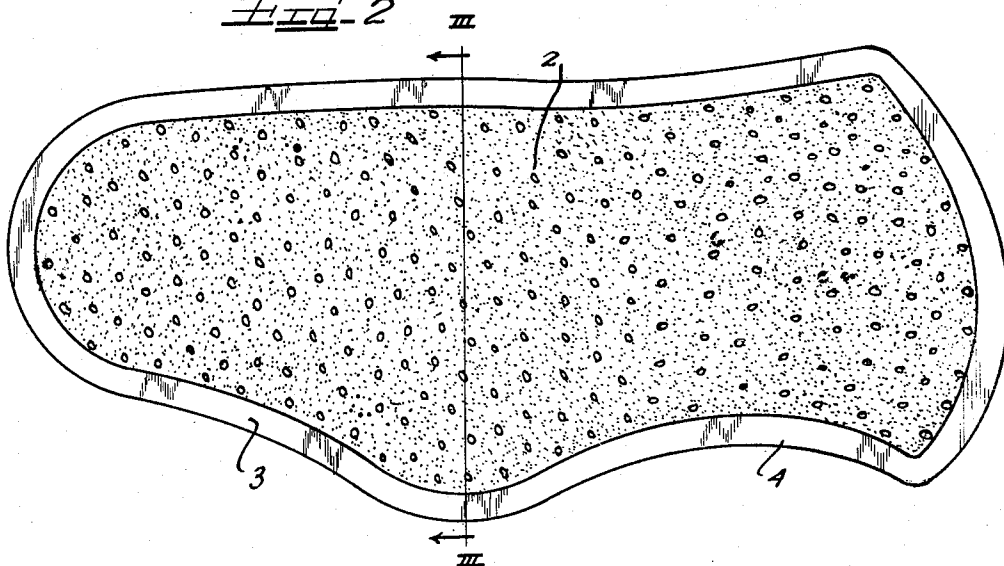
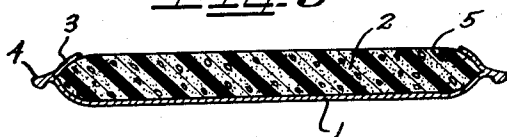


FIG. 3



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LONG WEARING FOOT RELIEVING DEVICE

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3 Claims. (Cl. 36—71)

This invention relates to improvements in a long wearing foot relieving device, and more particularly to a device for disposition in an article of footwear to underlie the plantar surface of the human foot and afford relief to the foot. The device may take the form of a heel seat, full or partial insole, arch support, metatarsal lift, callous reliever, may or may not incorporate a cushioning element, and be made in various other forms, the particular form of the device not being a part of the instant invention, but the invention centering on the means for protecting the marginal portion of the under layer of the device as well as the seam joining the layers from abrasion in a shoe or the like, while the device may have other uses and purposes as will be apparent to one skilled in the art.

In the past, many and various types of foot relieving devices for free disposition in an article of footwear have been developed, and while these formerly known devices apparently lasted a satisfactory length of time when worn in dress shoes or the like, they did not last a satisfactory length of time when worn in heavy working shoes having rough interiors, and rough built-in insoles, due to abrasion of the device by the shoe itself. This was especially true when the shoe was worn under conditions where sand, gravel, or some other abrasive may enter the shoe from an external source. Thus, such devices were prone to wear out prematurely, and prone to loosen at the seams joining the various layers of the structure in the event a laminate structure were used. Obviously, the wearing increased and the life of the device was shortened materially when the device embodied an under or lower layer of relatively soft cushioning material.

With the foregoing in mind, it is an important object of the instant invention to provide a relieving insert for an article of footwear embodying means to effectively resist abrasion from a heavy shoe having a rough interior or from sand, gravel and other extraneous material entering the shoe, at least in the portion of most wear on the insert.

Another object of the instant invention is the provision of a cushion type foot relieving device for insertion in the shoe having an under layer of relatively soft cushioning material with means to protect the marginal portion of that layer, and especially where it is joined to a top layer from abrasive action from within a shoe.

Another feature of the instant invention resides in the provision of a foot relieving insert for disposition in an article of footwear, and which insert may be laminated with means provided to protect the under layer and the seam joining the layers from abrasive action within the shoe without the loss of flexibility or resiliency of the entire device.

Still a further object of the instant invention resides in the provision of a relieving insert for disposition in a shoe which may be made of any desired color or contrasting colors and which is provided with a protective element to render the insert resistant to abrasion from the

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shoe, the protective element also being made of any desirable color to provide a decorative value, if so desired.

A further feature of the instant invention resides in the provision of a laminate insert for an article of footwear comprising a plurality of layers of thermoplastic material heat sealed around the bounding edge thereof, with a protective narrow layer underlying the lower effective layer at the marginal portion thereof to protect that marginal portion as well as the heat sealed seam from abrasion within the shoe.

Still another feature of the instant invention resides in the provision of an insert for a shoe or the like which incorporates an underlayer of foam material, with means attached to the seam at the bounding edge of the device and extending inwardly over the exposed marginal portion of the foam material to protect the same against abrasion adjacent the seam from the article of footwear or extraneous means entering the article of footwear.

A further object of the instant invention resides in the provision of an insert for an article of footwear, which insert comprises a top cover of thermoplastic material, and thicker layer of thermoplastic foam, and a narrow layer, thinner and denser than the foam layer, and covering only the exposed marginal portion of the foam layer to protect the same against abrasion adjacent a heat sealed seam at the bounding edge of the device which secures all the layers to each other.

While some of the most salient features, characteristics and advantages of the instant invention have been above pointed out, others will become apparent from the following disclosures, taken in conjunction with the accompanying drawing, in which:

Figure 1 is a top plan view of a foot relieving device embodying principles of the instant invention;

Figure 2 is a bottom plan view of the structure seen in Figure 1; and

Figure 3 is a transverse vertical sectional view taken substantially as indicated by the line III—III of Figure 2, looking in the direction of the arrows.

As shown on the drawings:

While, as stated above, the instant invention may take numerous forms or shapes for numerous purposes of aid to various afflictions of the human foot, by way of illustration and not by way of limitation, the embodiment of the instant invention shown in the drawings is in the form of a cushion type insole for free disposition in a shoe or other article of footwear. Such insole, of course, is not to be confused with the built-in insole made of leather or equivalent material and incorporated in a shoe during the manufacture of the shoe. The instant invention rests on top of such built-in insole which is an integral part of the shoe.

The illustrated embodiment of the invention discloses an insole which might be termed a three-quarter insole in that it terminates just beyond the first and fifth metatarsal heads, leaving the toes or phalanges extending beyond the insole so that there will be ample toe room within the article of footwear after placing the insole therein. The illustrated insole is a laminated structure comprising a cover layer 1, an underlayer 2, and a narrow protective layer 3. These layers are joined together by a bounding marginal seam as indicated at 4 in Figure 3 particularly, and which is shown in exaggerated manner in comparison with the remainder of the structure in this figure for purposes of clarity.

Preferably the three layers incorporated in the instant invention are of thermoplastic material capable of being heat sealed, and the seam 4 is preferably a heat sealed seam at the very bounding edge of the device. The cushioning layer 2 is initially flat, but when the heat sealed seam is made, it is made in such a manner that

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the marginal portions of the cushioning layer 2 become curvate as clearly seen at 5 in Figure 3, so that the device better fits within the shoe and compensates for any irregularities that frequently occur in a shoe adjacent the jointure between the upper and the built-in insole.

By way of example, it may be said that a highly satisfactory material for this purpose is a vinyl material, such for example as a plastisol comprising a dispersion or suspension of polyvinyl chloride resin, or a copolymer in one or more plasticizers selected from a large number of high boiling esters, for example, such as dioctyl phthalate, dioctyl adipate, dicapryl phthalate, etc. All layers may satisfactorily be made of the same material, but under different treatment. The cushioning layer 2 is in the nature of a plastic foam, and the plastisol may be expanded by the use of an inert gas, and then cured in the expanded condition to provide a light weight structural material that is highly flexible, highly resilient, possesses extreme restorative powers, and has intercommunicating cells for ventilation purposes.

The cover layer 1 and the narrow protective layer 3 may satisfactorily be an unsupported vinyl film, and in such case, the resins and plasticizers may be charged directly into a Banbury mill and from there passed to a calender which rolls out the finished product providing a thinner and denser structure than is the case with the foam. For example, these layers may have a density of about 80 lbs. or better per cubic foot as opposed to the 5 to 7 lbs. per cubic foot density for the foam layer.

All of the layers may be in any desirable color, and in the completed article the layers may vary in color so as to give contrasting appearances to make the device more pleasing to the eye and also to render the device companionable with various colored articles of footwear, and particularly open toed or open heeled shoes.

The foam layer 2 being very soft and resilient as well as light in weight, affords a clinging action to the built-in insole of a shoe, so that the device will remain in place and not tend to shift position during use. This foam layer is preferably united to the two other layers by the electronic heat seal seam 4 as mentioned above. Without any protective means, if the device were placed in a rather heavy and rough article of footwear such as a workman's shoe, and particularly so if sand or gravel might enter that shoe during its use, there would be an abrasive action upon the soft foam layer immediately adjacent the heat sealed seam 4, and in an objectionably short period of time there would be a good likelihood that the marginal portion of the foam layer would become abraded or torn, and there is the possibility that the heat sealed seam might be broken or torn through.

To offset such possibility, the narrow layer 3 has been provided which may be of the same consistency as the top layer 1, but which is preferably somewhat denser and exceedingly smooth in character. It will be noted that this protective layer 3 is of sufficient width to overlie the marginal portion on the exposed side of the foam layer 2 wherever that foam layer comes in contact with the shoe. Thus, there is adequate protection to insure the foam layer and the heat sealed seam against adverse effects of abrasion within the shoe.

Preferably, the various layers are not secured to each other in any manner except at the heat sealed seam 4 at the bounding edge. Thus, there is no danger of objectionable wrinkling or buckling of the device during use because relative movement of the cover layer and the foam layer is readily permitted. Normally, there will be a slight space between the foam layer and the cover layer, and during the application and release of pressure during walking, air will be pumped out and in the foam

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layer and some of that air will reach the space between the cover and the foam layer, thereby providing an added cushioning effect.

It will be especially noted that not any of the normal and expected flexibility of the device is lost to any but a negligible extent by the provision of a protective layer 3 and the value of the soft foam layer 2 is maintained at all times. Ornamental effects may also be produced by giving the protective marginal layer 3 different colors than the other layers. As stated above, it is to be especially noted that the instant invention is not to be limited to the particular shape of device shown in the drawings but may be made in many and various shapes for many and various purposes.

From the foregoing, it is apparent that I have provided a foot relieving device for insertion in a shoe which may be made of extremely light and soft cushioning material and which is adequately protected against abrasion from within the shoe. The device may readily be used in rough workman's shoes and put to severe tests, and still have an adequately long life and more so than devices of the same character heretofore developed. Further, the structure of the device is such that it may be economically produced since the addition of the protective marginal layer 3 adds but negligibly to the cost of production.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention.

The instant invention is an improvement upon the invention more fully set forth, described, and more broadly claimed in my previously filed copending application entitled "Foot Cushioning Devices," filed September 12, 1956, Serial No. 609,453.

I claim as my invention:

1. In a foot relieving device for insertion in a shoe, a thermoplastic cushion layer, a thermoplastic cover thereover, and a thermoplastic narrow protective layer extending over the margin of the exposed face of the cushion layer, all said layers being secured together by a heat seal seam at the bounding edge of the device, said cover and protective layers being unsupported film, and said cushion layer being foam.

2. In a foot relieving device for insertion in a shoe, an underlayer, a cover layer thereover, and a narrow protective layer underlying the margin only of said underlayer, all said layers being joined together at the bounding edge of the device with the protective layer protecting the underlayer adjacent the line of jointure against abrasion, all said layers being of a vinyl thermoplastic and joined by a heat seal seam.

3. In a foot cushioning device, a cover layer, an underlayer of relatively soft cushioning material, and a protective layer of relatively dense material, said layers joined together by a fine line heat seal seam defining the bounding edge of the device, and said protective layer underlying the marginal portion only of said cushioning layer to protect the same adjacent the jointure line from abrasion.

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