SHOE HEEL WITH CUSHION WEDGE

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References Cited
UNITED STATES PATENTS
1,541,320  6/1925  Briggs et al. .................... 36/35 A
2,016,215  10/1935  Pietzuch ....................... 36/35 R
1,606,187  11/1926  Scholl .......................... 36/37
2,616,190  11/1952  Darby .......................... 128/585
1,818,731  8/1931  Mattison ....................... 36/35 A
1,264,127  4/1918  Pietzuch ....................... 36/35 A

1,798,807  3/1931  Posner ........................ 128/585

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ABSTRACT

A shoe heel having a wedge configured cushion. A ground engaging plate is mounted beneath the rear portion of the shoe with the cushion wedge disposed there-between. Spacing means between the shoe sole and plate extends from the edge of the heel to partially across the heel. The cushion extends from the spacing means across the remainder of the heel to a position flush with the outside edge of the heel. The cushion has a smaller thickness adjacent to the spacing means as compared to a greater thickness outwardly thereof.

4 Claims, 6 Drawing Figures
SHOE HEEL WITH CUSHION WEDGE

BACKGROUND OF THE INVENTION

1. Field of the Invention
This invention is in the field of shoe heel corrective devices.

2. Description of the Prior Art
The efficient control of excessive mediolateral motions of the foot has been a problem for many years. Prior art devices for controlling abnormal varus or valgus motion of the os calisus or heel bone share the common feature of static control. The prior art devices statically preposition the heel bone in a position to 'correct' foot imbalance and, in so doing, forcibly position the heel bone on an inclined surface, not parallel to the floor. It can be appreciated that when walking, the rear edge of the heel first strikes the ground. It is desirable that the rotation of the foot begin immediately upon heel strike, before the foot receives its full share of body weight, so as to obtain the best possible correction. Disclosed herein is a heel having a flexible wedge mounted therein which extends completely back to the rear edge of the heel thereby providing maximum cushion. Some of the prior art devices are inserts which are inserted into the shoe through the foot opening. The bottom inside wall of the shoe contacting the user's heel and receiving these inserts generally has a depressed or shallow basin contour in the center portion thereof. The depression increases in depth to some degree as the shoe is worn thereby reducing the effectiveness of the insert. The cushioned area of the insert is soon below the level of the firm higher outer edges of the inside bottom wall and therefore is not as effective. An outside heel construction is free of such problems. Some of the prior art inserts have flexible portions with the thick edge of the flexible portion being positioned on the opposite side of the heel which exhibits the most wear. I have discovered the best results are obtained when the thick portion of the flexible wedge is positioned on the outer edge of the heel when a person is pronated and on the inner side of the heel when the person is supinated.

One of the better known prior art devices is disclosed in the U.S. Pat. No. 1,606,187 issued to W. M. Scholl. The Scholl device is an insert having a flexible wedge which is inserted into the shoe so as to directly contact the user's heel. The flexible portion of the Scholl insert does not extend back to the edge of the heel. In addition, the thick portion of the Scholl insert is positioned on the opposite side of the heel exhibiting the maximum wear. Another U.S. Pat. No. 1,818,731 issued to N. D. Mattison discloses a shoe heel formed of materials of relatively different firmness and resiliency. Other prior art devices are disclosed in the U.S. Pat. Nos. 2,016,190 issued to R. U. Darby and 3,470,879 issued to T. J. Meiller.

SUMMARY OF THE INVENTION

One embodiment of this invention is a shoe heel comprising: a top wall mountable to a shoe sole and having an edge extending circumferentially therearound; a ground engaging heel plate mounted beneath the wall; spacing means mounted between the wall and the plate and extending from the edge to only partially across the plate; and a wedge-shaped cusion of greater resiliency than the wall, the plate and the means and being mounted adjacent the means between the top wall and the plate, the cushion having a smaller thickness adjacent the means with a greater thickness outwardly thereof being flush with the edge and the plate. It is an object of the present invention to provide a shoe heel having a cushioned wedge therein.

It is a further object of the present invention to provide a new and improved shoe heel for correcting certain foot disorders, by providing a dynamic means of maintaining foot balance during periods of weight bearing and by preventing certain foot disorders during periods of growth.

Related objects and advantages of the present invention will be apparent from the following description.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view of a shoe incorporating the present invention.

FIG. 2 is an end view of the shoe of FIG. 1 looking in the direction of arrows 2—2.

FIG. 3 is a side view of the shoe of FIG. 2 looking in the direction of arrows 3—3.

FIG. 4 is a diagrammatic view of an alternate embodiment of the foot and wedge of FIGS. 1—3 with the wedge shown in the uncompressed state.

FIG. 5 is the same view as FIG. 4 only with the wedge shown in the partially compressed state.

FIG. 6 is an end view of a right and left shoe incorporating the present invention per the wedge of FIGS. 4 and 5.

DESCRIPTION OF THE PREFERRED EMBODIMENT

For the purposes of promoting an understanding of the principles of the invention, reference will now be made to the embodiment illustrated in the drawing. Specific language will be used to describe the same. It will nevertheless be understood that no limitation of the scope of the invention is thereby intended, such alterations and further modifications in the illustrated device, and such further applications of the principles of the invention as illustrated therein being contemplated as would normally occur to one skilled in the art to which the invention relates.

Referring now more particularly to FIG. 1, there is shown a shoe 10 having a top flexible portion 11 for wrapping around the upper portion of the foot and being mounted atop sole 12. Sole 12 extends from the toe portion of the shoe to the heel portion of the shoe. The heel shown in FIGS. 1 through 3 has a top wall 12' which is mounted to the shoe sole 12 by conventional fastening means. Wall 12' has an edge which extends circumferentially around the heel. A ground engaging heel plate 15 is mounted beneath wall 12' with a spacing member 13 mounted between wall 12' and plate 15. The spacing member 13 extends from one edge of the heel to a location approximately midway across the heel. That is, spacing ember 13 extends only partially across the width of the heel. A wedge-shaped cushion 14 is mounted adjacent spacing member 13 between top wall 12' and plate 15. The cushion 14 has a greater resiliency than sole 12, top wall 12', spacing member 13 or plate 15. Cushion 14 may be made from a variety of materials, however, excellent results have been obtained by producing the cushion from foam rubber. The cushion is flush with the rear edge and one of the side edges of the heel. That is, the cushion extends completely back to the rearmost portion of the heel.
Spacing member 13 and cushion 14 are shown in FIGS. 1-3 as being spaced from sole 12 by wall 12', however the spacing member 12 and cushion 14 may be affixed directly to sole 12 as shown in FIGS. 4-6. The right foot 20 of a person having pronation is shown in FIGS. 4 and 5. In addition, FIG. 4 depicts the instant that the foot is flat with respect to the ground with the leg just beginning to rotate forward over the foot which is fixed to the floor to receive the weight of the body. The flow exerts a floor reaction force in the direction of arrow 17 equal to the weight force shown by arrow 18. Although the force shown by arrow 17 must be equal, in total, to the force shown by arrow 18, the cushion wedge makes possible an unequal distribution of the floor reaction force, either side of the parasagittal line of the heel of the shoe. The cushioned heel must begin to depress immediately in the direction of the axis 21 of the os calcis. Should there be a delay in the depression of the cushion, as would be the case if the material used in the cushion portion of the heel was too firm, the weak medial structures would cause the body weight to place a counterclockwise moment about the axis of the os calcis. Thus, the combination of the body weight from above and the instantaneous depression of the cushion heel wedge below dynamically prepositions and maintains the os calcis in normal alignment for a mid-stance and/or standing position.

As the standing position is reached, the cushion should be made so that the amount of depression has been sufficient to bring the whole heel parallel to the floor. The os calcis will then rest on a level horizontal plane, parallel to the floor. The floor reaction force shifts to the medial half of the heel so that it is substantially greater under its firm medial portion. The amount and type of cushion material must be such that as the peak of the vertical load is achieved, the cushion does not "bottom out" when the heel becomes parallel to the floor. If the cushion wedge were to "bottom out," the effect would be similar to a solid medial wedge, i.e., the os calcis would then rest upon an inclined surface in the horizontal plane. Thus the lateral portion of the os calcis is somewhat floating on the remaining thin layer of air within the cushion. The combination of the body's weight having been forced to create a clockwise moment, and a preponderance of the floor reaction force being shifted to the medial side, under the medial half of the os calcis, results in what appears to be a constant force couple about the subtalar joint which remains in balance whenever the limb is in the standing position. It should be noted, that cushion 14 (FIG. 5) bows outwardly on the edge of the top wall and plate 15, when compressed, thereby forming projection 16. FIG. 5 depicts the heel as the body weight is being applied to the heel and with the sole 12 moving toward a plane horizontal with the floor. Cushion 14 is only partially compressed when the top wall is substantially parallel with the plate. In cases where the person is pronated, the cushion wedge should be positioned (as shown in FIG. 4 and FIG. 5) on the outer side of the shoe which would be opposite the shoe's medial side. Likewise, where the person is supinated, then the cushion wedge should be placed on the side of the shoe corresponding to its medial side. FIG. 6 shows a pair of shoes enclosed by bracket 34 with the cushion wedge 32 being placed on the outside for left foot 30 and cushion wedge 33 being placed on the outside for foot 31.

While the invention has been illustrated and described in detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character, it being understood that only the preferred embodiment has been shown and described and that all changes and modifications that come within the spirit of the invention are desired to be protected.

The invention claimed is:

1. A shoe heel comprising:
   a top wall having an edge extending circumferentially therearound;
   a ground engaging heel plate mounted beneath said wall;
   spacing means mounted between said wall and said plate and extending flush from said edge to only partially across said plate; and,
   a wedge-shaped cushion of greater resiliency than said wall, said plate and said means and being mounted adjacent said means between said wall and said plate, said cushion having a smaller thickness adjacent said means with a greater thickness outwardly thereof being flush with said edge and said plate, said wedge-shaped cushion initially positions said top wall at an acute angle with respect to said heel plate and upon weight applied to said top wall yields immediately until said top wall is substantially horizontal to said heel plate, said cushion being positioned on a shoe to cause a clockwise rotation of the heel bone.

2. The heel of claim 1 wherein said cushion bows outwardly of said edge and said plate when compressed.

3. The heel of claim 2 wherein said cushion is partially compressed when said top wall is substantially parallel with said plate.

4. A shoe heel comprising:
   a top wall having an edge extending circumferentially therearound;
   a ground engaging heel plate mounted beneath said wall;
   spacing means mounted between said wall and said plate and extending flush from said edge to only partially across said plate; and,
   a wedge-shaped cushion of greater resiliency than said wall, said plate and said means and being mounted adjacent said means between said wall and said plate, said cushion having a smaller thickness adjacent said means with a greater thickness outwardly thereof being flush with said edge and said plate, said wedge-shaped cushion initially positions said top wall at an acute angle with respect to said heel plate and upon weight applied to said top wall yields immediately until said top wall is substantially horizontal to said heel plate, said cushion being positioned on a shoe to cause a clockwise rotation of the heel bone.