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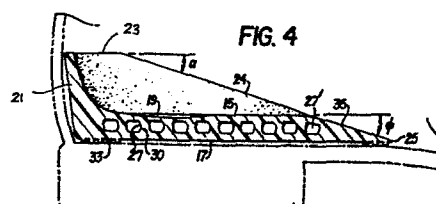
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54 **Heel shock absorber.**

57 A flexible heel shock absorber (11) for insertion within a shoe which absorber (11) has a base with upper (15) and lower (17) faces, said base having a predetermined thickness extending forward along a major portion of the longitudinal axis with the upper face (15) tapering downwardly (at 35) at the forward end (25) thereof. A wall (21) extends above the periphery of the upper face (15) substantially conforming to the shape of the heel of the user. A plurality of open channels (27), separated by partitions (30), extend laterally across the longitudinal axis of the base. Gripping means (33) may be provided on the lower face (17) of the base.



Heel shock absorber

This invention relates generally to a shoe insert and more specifically to a shoe insert for the heel of the shoe which acts as a heel shock absorber.

Numerous shoe inserts have been proposed and are
5 on the market today. These inserts range from a general type of soft cushioning material as well as to inserts which seek to establish air circulation within the shoe, and to inserts which are designed to reduce foot odour. In all cases of which I am aware, these inserts are
10 designed for purposes such as the above and are not designed so as to act as shock absorbers relative to the effect of foot impact on the ground during walking, jogging or running. It is well known that, in the normal walking gait, the heel of a shoe worn by a walker strikes
15 the ground first and causes an impact on the heel of the person wearing the shoe. This can be uncomfortable and in some cases highly undesirable if the person is suffering from any foot, ankle or leg ailments.

Accordingly, this invention seeks to provide a shoe
20 insert which acts as a heel shock absorber.

The features which define a heel shock absorber in accordance with this invention are set out in the following claim 1.

Desirably the heel shock absorber easily fits as
25 a shoe insert within the heel end of the user's shoe and geometrically conforms to the heel end of the shoe so as to provide a substantially snug fit within the shoe.

Preferably the shoe insert which acts as a heel shock absorber has an upper surface with its surrounding wall
30 which substantially conforms to the shape of the heel of the person wearing the shoe.

Suitably the material from which the shock absorber insert is made is flexible while providing substantial protection against wear.

The invention will now be further described, by way of example with reference to the accompanying drawing, in which:-

Figure 1 is a perspective view of one embodiment of heel shock absorber according to the present invention;

Figure 2 is a plan from above of the shock absorber of Figure 1;

Figure 3 is a sectional view taken along the lines 3-3 of Figure 2; and

Figure 4 is a sectional view taken along the lines 4-4 of Figure 2.

There is shown in the drawing a heel shock absorber 11 which is adapted for insertion into a shoe shown partially in chain lines in Figure 4. The shock absorber includes a base 13 having an upper face 15 and a lower face 17. Additionally, there is provided a shallow heel recess 19 in the upper face 15.

A wall 21 extends upwardly from the base 13 to a predetermined height of an upper edge 23 at its rear end. The upper edges 24 of the sides of the wall 21 taper downwardly from the edge 23 at the rear end of the absorber 11 to a front edge 25 of the base 13. The thickness of the wall 21 diminishes from the vicinity of the surface 15 to the respective edges 23, 24.

The shock absorber 11 is an insert made of flexible material of a consistency such that it will have good



wearing characteristics and will also be firm enough to maintain its configuration in use. The material is preferably a plastics material having a specific gravity between 0.8 and 1.2 and a durometer hardness of between 5 36 and 50. One such material which is available in the USA is known by the trademark Kraton 5152 owned by Shell Chemical. This particular material has a specific gravity of 1.00 and a durometer hardness of 46. In the preferred embodiment illustrated, the entire shock absorber 11 is 10 moulded in one piece so as to be integral throughout.

In order to use the material described above in a configuration which will provide the desired shock absorbing characteristics, a plurality of substantially open parallel channels 27 extend laterally across the width 15 of the base 13 and are spaced apart along its longitudinal axis, being separated by partitions 30. It is preferred that the channels are designed such that the upper portion of each partition 30 is wider than its central portion. This configuration allows for flexibility of the parti- 20 tions 30 between the channels so as to give the necessary shock absorbing effect. One reason that it is preferred that the upper part of each partition is wider than its central part is that this shaping of the channels at least reduces and at best prevents any sensation on the heel 25 of the existence of the partitions.

As is more clearly shown in Figure 4, the thickness between the faces 15 and 17 remains substantially constant from a portion adjacent the rear heel area to a portion well forward thereof until, at the forward end thereof, 30 the width of the base diminishes as the forward portion tapers (at an angle ϕ as indicated) to the front edge 25. This downwardly sloping region is indicated at 35 in Figure 4 and it will be noted that the frontmost channel (27') also narrows slightly to conform to the 35 sloping surface 35.

As is clear from the drawing, the wall 21 maintains the predetermined height of the edge 23 around the rear part of the heel and then tapers downwardly along the edges 24 to the point at which the base thickness begins to diminish. The angle of this taper is designated a in Figure 4.

Referring particularly to Figure 3, it can be seen that the shock absorber is designed so as to include an arcuate area 31 between the base 13 and the wall 21 so as to more comfortably conform to the sides and rear of the heel of the person who is using the shock absorber. This configuration is generally carried forward for the entire length of the wall 21 although the radius of curvature of the arcuate area reduces the closer it is to the forward end of the absorber 11.

In order to ensure that the absorber insert 11 remains in place in the heel end region of the shoe, gripping means 33 are provided which depend from the lower face 17 of the base 13. In the particular configuration illustrated, the gripping means takes the form of a plurality of pegs. Since the pegs are of the same material as the rest of the shock absorber, they provide flexibility while still providing the desired gripping feature.

While not limiting the invention in any way, a satisfactory construction for a shock absorber heel insert includes the following dimensions.

	BASE THICKNESS:	9.5 mm (0.375 inches)
	CHANNEL HEIGHT:	5 mm (0.200 inches)
	CHANNEL WIDTH :	5 mm (0.200 inches)
30	ANGLE <u>a</u>	: 18°
	ANGLE ϕ	: 15°

It is to be understood that shock absorbers according

to the present invention will normally be made in varying sizes (such as small, medium and large) so as to fit properly in the different sizes of shoes available. The present invention has been proven to provide extremely
5 noticeable comfort and relief from the shock normally accompanying the impact of the heel during a walking motion. By relieving this shock, the entire foot, ankle and the leg are benefited.

The above description and drawing are illustrative
10 only and are not intended to limit the invention, the scope of which is to be determined by the following claims.

CLAIMS

1. A heel shock absorber (11) for insertion within a shoe comprising a base (13) having upper (15) and lower (17) faces and substantially geometrically conforming to the heel end of said shoe, characterised in that said
5 base (13) has a predetermined thickness extending along a major portion of the longitudinal axis thereof with said upper face (15) tapering downwardly at the forward end (25) thereof, in that a wall (21) extends above said upper face (15) at the outer periphery thereof, said wall
10 (21) having a predetermined thickness adjacent said upper face (15) and diminishing in thickness as the height of said wall (21) increases, said wall having an upper edge (23) at a predetermined height above the rear end of said base (13) and side edges (24) tapering downwardly towards
15 said forward end (25); and in that a plurality of substantially open parallel channels (27) are provided in said base, each said channel (27) extending laterally across the width of said base (13) and being separated from adjacent channels (27) by a partition (30).

20 2. A heel shock absorber as claimed in claim 1, characterised in that said base (13) and wall (21) are integrally formed from a mass of flexible material.

3. A shock absorber as claimed in claim 1 or claim 2, characterised in that the material from which the
25 absorber (11) is made has a specific gravity between 0.8 and 1.2.

4. A shock absorber as claimed in any preceding claim, characterised in that the material from which the absorber (11) is made has a durometric hardness between
30 36 and 50.

5. A shock absorber as claimed in any preceding claim, characterised in that the wall (21) thereof has

an arcuate inner face (31) so as to substantially conform to the shape of the heel of the user.

6. A shock absorber as claimed in any preceding claim, characterised in that a heel recess (19) is provided in a rear portion of said upper face (15).

7. A shock absorber as claimed in any preceding claim, characterised in that the major longitudinal length of said base (13) includes said channels (27).

8. A shock absorber as claimed in any preceding claim, characterised in that gripping means (33) depend from said lower face (17) of said base (13) to facilitate holding of the absorber (11) stationary in a heel region of a shoe.

9. A shock absorber as claimed in claim 8, characterised in that said gripping means (33) is integral with said base (13).

10. A shock absorber as claimed in claim 9, characterised in that said gripping means comprises a plurality of pegs (33) subtending from said lower face (17).

11. A shock absorber as claimed in any preceding claim, characterised in that said partitions (30) have a greater thickness at their upper ends than at the centre thereof.

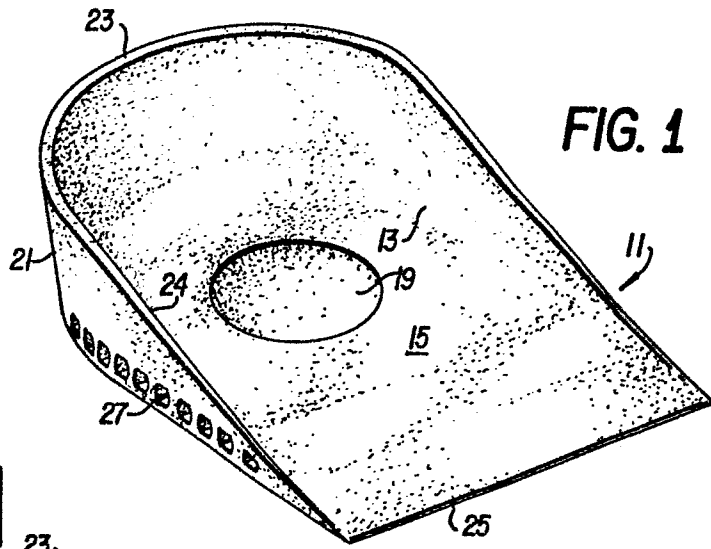


FIG. 1

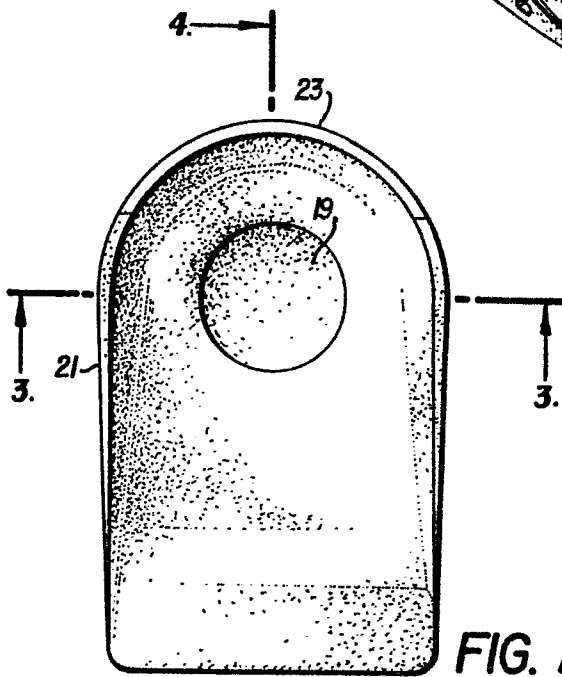


FIG. 2

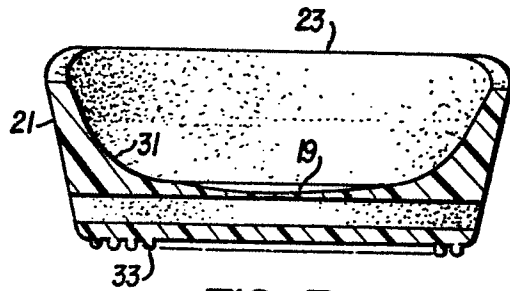


FIG. 3

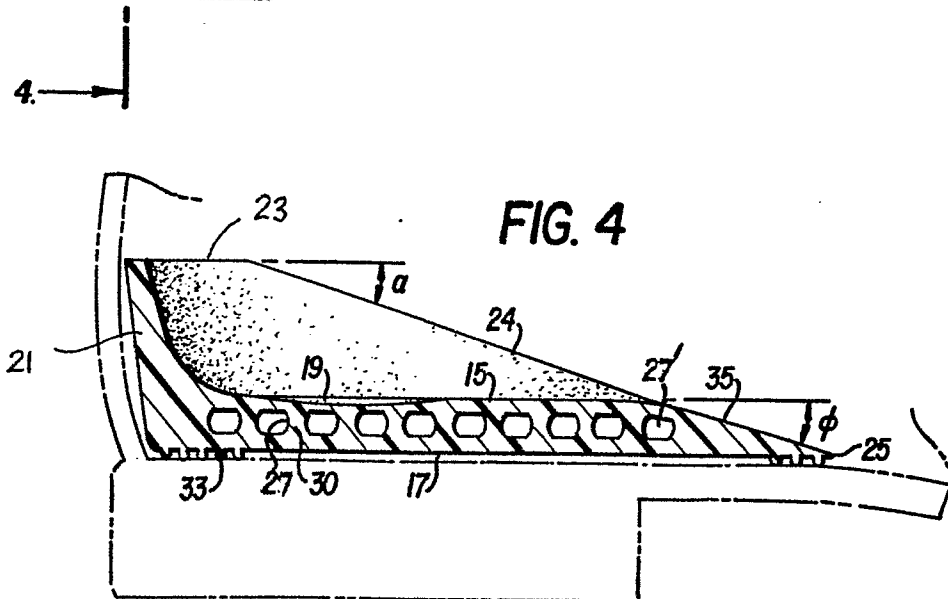


FIG. 4



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. *)
X	EP-A-0 019 673 (M.R. DAVIDSON) * Whole document *	1, 2, 5, 7-11	A 43 B 17/02
A	--- US-A-3 050 878 (H.L. GOECKNER) * Figures 1-4 *	1, 2, 5, 8-10	
A	--- GB-A- 878 486 (F. SCHREIBER) * Figures 1-3 *	1, 2, 5, 8-10	
			TECHNICAL FIELDS SEARCHED (Int. Cl. *)
			A 43 B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 16-03-1984	Examiner MALIC K.
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons</p> <p>& : member of the same patent family, corresponding document</p>			