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(54) **Anti-static sole assembly for footwear**

(57) The object refers to a sole assembly which in principle comprises of a structure determined by an insole (2) above, a main interposed piece (1) and a an external piece or outsole (3) which makes contact with the ground.

The interposed piece (1) incorporates a conductive filling or compound which is in direct contact with the outsole (3), while also being in direct or indirect contact with the foot of the wearer in order to facilitate the shunting or flow of unpleasant static electricity charges to ground.

The outsole also incorporates conductive properties to shunt said static electricity charges to ground.

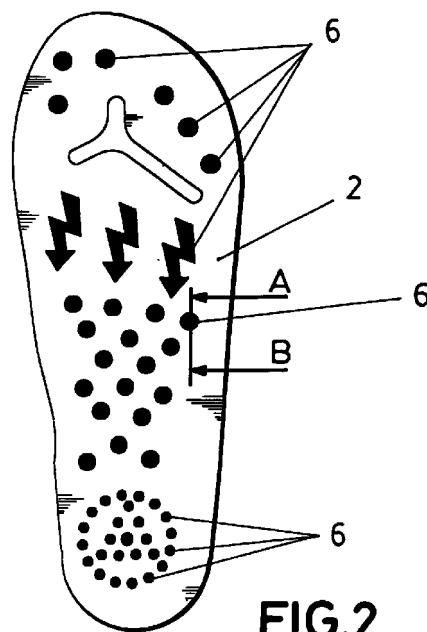


FIG. 2

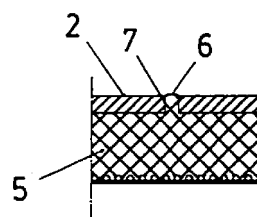


FIG. 3
A-B

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Description

OBJECT OF THE INVENTION

[0001] The present invention, as stated in the title to this specification, refers to an anti-static sole assembly for footwear, the purpose of which is to assist and facilitate the discharge of static electricity which has built up in the wearer for whatever reason.

[0002] It is quite usual to become charged with static electricity when driving a car. Electrical charges tend to concentrate on the body surface and more specifically in the extremities, particularly the feet.

[0003] When the build-up of electrical charge is very high, the discharge can be sufficient to produce a spark when contact is made with a conductive body with which there is a significant potential difference, at which time a most unpleasant sensation results for the wearer.

[0004] The sole assembly of the invention has the advantage of favouring the discharge of electricity which it conducts or shunts to ground, avoiding thereby the disagreeable effects produced by the electrical charges mentioned.

BACKGROUND TO THE INVENTION

[0005] At the present time, walking shoes, sports shoes and any other type of footwear, all incorporate sole assemblies which have different structures that, in general, are not specifically designed to suppress the unpleasant static electricity charges that at times build up on the feet of the wearer.

[0006] On the other hand, the composition of some soles does incorporate a means for removing these static charges which is often inadequate, for which reason their suppression is only partial.

DESCRIPTION OF THE INVENTION

[0007] In order to overcome the serious problem referred to in the preceding paragraph, the invention proposes an anti-static sole for footwear which facilitates the discharge of static electricity when this has built up on the feet of the wearer for whatever reason.

[0008] To this end, the sole has a suitably beneficial structure which in principle incorporates several elements, which are as follows:

- An insole on which the wearer's foot rests directly;
- An interposed body which includes a conductive body and, finally;
- An external body conforming the outsole, the underside of which is in contact with the ground.

[0009] The conductive body is in direct contact with the outsole and with the foot of the wearer for the purpose of facilitating the conduction of static electrical charges to ground. To which end the conductive body

includes on its top side small nodules which traverse the insole and, consequently, said nodules are in direct contact with the foot of the wearer, as well as the top side of the insole.

[0010] The conductive body is also in close contact with the external body or outsole in order to facilitate the flow of static electricity into said outsole and from there to ground; said outsole clearly also having conductive properties.

[0011] Apart from the structure described above, the sole can also have any other structure which facilitates the discharge of static electricity which has built up on the foot of the wearer.

[0012] In all cases the intervening body includes a conductive body which serves to facilitate the flow of static electricity which has built up on the feet of the wearer to ground.

[0013] Consequently the novelty of the invention is essentially centred in advantageous means for conducting static electricity discharges from the foot of the wearer into the outsole or external body which is in contact with the ground.

[0014] Hereunder, to facilitate a better understanding of this specification and forming an integral part thereof, a number of figures are attached which show the object of the invention in an illustrative and not restrictive manner.

BRIEF DESCRIPTIONS OF THE FIGURES

[0015]

Figure 1.- Shows an exploded view of the main elements that constitute the anti-static sole assembly for footwear, object of the invention. It comprises basically a main piece provided with a conductive filling, an insole above and an external piece or outsole.

Figure 2.- Shows a top view of an anti-static sole assembly of the invention.

Figure 3.- Shows a sectional side view on the plane A-B of the previous figure.

Figure 4.- Shows a top view of another sole assembly different to that shown in the two previous figures.

Figure 5.- Shows a sectional side view on the plane C-D of the previous figure.

Figure 6.- Shows a top view of another anti-static sole assembly.

Figure 7.- Shows a top view of another anti-static sole assembly.

Figure 8.- Shows a sectional view on the plane E-F of the previous figure.

Figure 9.- Shows a top view of a sole assembly of the invention.

Figure 10.- Shows a sectional side view on the plane G-H of the previous figure.

DESCRIPTION OF A PREFERRED EMBODIMENT

[0016] With reference to the numbering scheme adopted in the figures, the anti-static sole assembly is determined from a structure which comprises, in principle, a main interposed piece 1, an upper insole 2 and an outsole or external piece 3 which is in contact with the ground.

[0017] The main piece 1 consists of a perimetric frame 4 and a conductive filling 5 which, in principle, is in close contact with the outsole or external piece 3.

[0018] The insole 2 is attached to the upper side of the main piece 1, at the same time as means have been provided for contact between the foot of the wearer and the conductive filling 5 in order to permit discharging of static electricity from the wearer's feet, the insole 2 being affected by said means.

[0019] These means of contact permit the static electricity which has built up on the feet of the wearer to be shunted and conducted to ground by flowing through the outsole 3 which, as has already been stated, is in close contact with the conductive filling 5 which forms part of the main piece 1.

[0020] The conductive filling 5 together with the perimetric frame 4 of the main piece 1 are subjected to a vulcanising process for shaping purposes.

[0021] The means of contact has various structural embodiments which are described below.

[0022] In a first case, the conductive filling 5 incorporates small modules 6 distributed over its upper surface, said nodules also fitting into small complementary through-holes 7 made in the insole 2. In this manner the feet of the wearer come into direct contact with these small nodules 6 which form part of the conductive filling 5 in order to shunt the electrical charges from the feet of the wearer to ground.

[0023] In a second case, the means of contact comprises one or more seams stitched with wire conductor 8 which traverses the insole 2, as well as the conductive filling 5 and the perimetric frame 4, these last two items forming the main piece 1. In this case, the feet are in contact with said wire 8 which serves to conduct the discharged static electricity to the conductive filling 5 and the latter, to the sole 3 in contact with the ground, which is the final recipient of the discharged electricity.

[0024] In a third case, the means of contact comprises a wire conductor 9 which only traverses the insole 2, at the same times as it makes connection with the conductive material or filling 5.

[0025] In a fourth case, the means of contact comprises inserts 10 of conductive material which are in direct contact with the filling 5 of the main piece 1. In this case, in the insole 2, one or more recesses 11 are implemented, said recesses being occupied by the aforementioned inserts 10 joined to the insole 2 by means of stitching or whatever other means.

[0026] In a fifth case, the fabric constituting the upper insole 2 incorporates conductive compounds 12

which have been incorporated during the manufacturing process of said insole 2. In this case, the conductive filling of the main piece 1 shall be preferentially distributed as various small bodies, cylindrical in shape or otherwise, which are in direct contact with the underside of the insole 2 and with the outsole or external piece 3. In this case, a thin laminar sheet 14 is attached to the lower face of the main piece 1, said laminar sheet 14 being interrupted by the lower extremities of the cylindrical bodies 13 which are in direct contact with the outsole or external piece 3.

[0027] Clearly, this outsole 3 also has conductive properties, since it is this element which finally transmits the static electricity charges on the feet of the wearer to ground.

[0028] The elements which constitute the sole assembly of the invention are independent items which can be sold separately.

Claims

1. **ANTI-STATIC SOLE ASSEMBLY FOR FOOT-WEAR**, which comprises at least an outsole or external piece which rests on the ground and an insole which is in contact with the foot of the wearer; the outsole having conductive properties with respect to static electricity charges; characterised in that it includes a main interposed piece (1) collocated between the insole (2) above and the outsole (3) below which are joined to said main piece (1); the latter incorporating at least one portion of conductive material or filling (5) which is in close contact with the outsole (3), while also being in direct or indirect contact with the foot of the wearer; all the foregoing in order to permit the shunting of static electricity charges to the ground on which the sole rests.
2. **ANTI-STATIC SOLE ASSEMBLY FOR FOOT-WEAR**, in accordance with the preceding claim, characterised in that the conductive filling (5) incorporates small nodules (6) which fit into small through-holes (7) in the insole (2) above; all the foregoing in order to permit the foot of the wearer to be in direct contact with said small nodules (6) which form part of the conductive filling (5).
3. **ANTI-STATIC SOLE ASSEMBLY FOR FOOT-WEAR**, in accordance with claim 1, characterised in that there is a wire conductor (8) which joins the insole (2) above to the main piece (1) by means of at least one seam stitched with said wire (8) which affects the conductive filling (5) and the rest of the assembly of the main piece (1), said stitched seam appearing on the topside of the outside face of the insole (2) above; all the foregoing in order to permit the foot of the wearer to be in contact with the wire conductor (8) which transfers the static electricity

charges to the conductive filling (5) and the latter to the sole (3) which finally conducts them to ground.

4. **ANTI-STATIC SOLE ASSEMBLY FOR FOOT-WEAR**, in accordance with claim 1, characterised 5
in that there is a wire conductor (9) which binds the
insole (2) above to the conductive filling (5) of the
main piece (1) by means of at least one seam of
stitching, said stitching appearing on the topside of
the outside face of the insole (2) above. 10
5. **ANTI-STATIC SOLE ASSEMBLY FOR FOOT-WEAR**, in accordance with claim 1, characterised
in that the insole (2) above has one or more
recesses (11) practised in it, said recesses being 15
occupied by inserts of conductive material (10)
which are in contact with the conductive filling (5) of
the main piece (1).
6. **ANTI-STATIC SOLE ASSEMBLY FOR FOOT-WEAR**, in accordance with claim 1, characterised 20
in that the insole (2) above includes conductive
compounds (12) distributed over the whole surface
of said insole (2) above, at the same time as said
conductive compounds (12) being in contact, on the 25
upper side with the foot of the wearer, while on the
under side they are in contact with the conductive
filling (5) of the main piece (1).
7. **ANTI-STATIC SOLE ASSEMBLY FOR FOOT-WEAR**, in accordance with claim 1, characterised 30
in that the conductive filling (5) occupies an exten-
sive central part of the main piece (1) which incor-
porates a perimetric frame (4) which surrounds the
conductive filling (5). 35
8. **ANTI-STATIC SOLE ASSEMBLY FOR FOOT-WEAR**, in accordance with claim 1, characterised
in that the conductive filling of the main piece (1)
occupies one or several spaces, preferentially cylin- 40
drical (13).
9. **ANTI-STATIC SOLE ASSEMBLY FOR FOOT-WEAR**, in accordance with the preceding claim,
characterised in that there is a thin laminar sheet 45
(14) laid against the underside of the main piece
(1), said laminar sheet being interrupted by the
lower ends of the cylindrical bodies (13), compo-
nents of the conductive filling. 50

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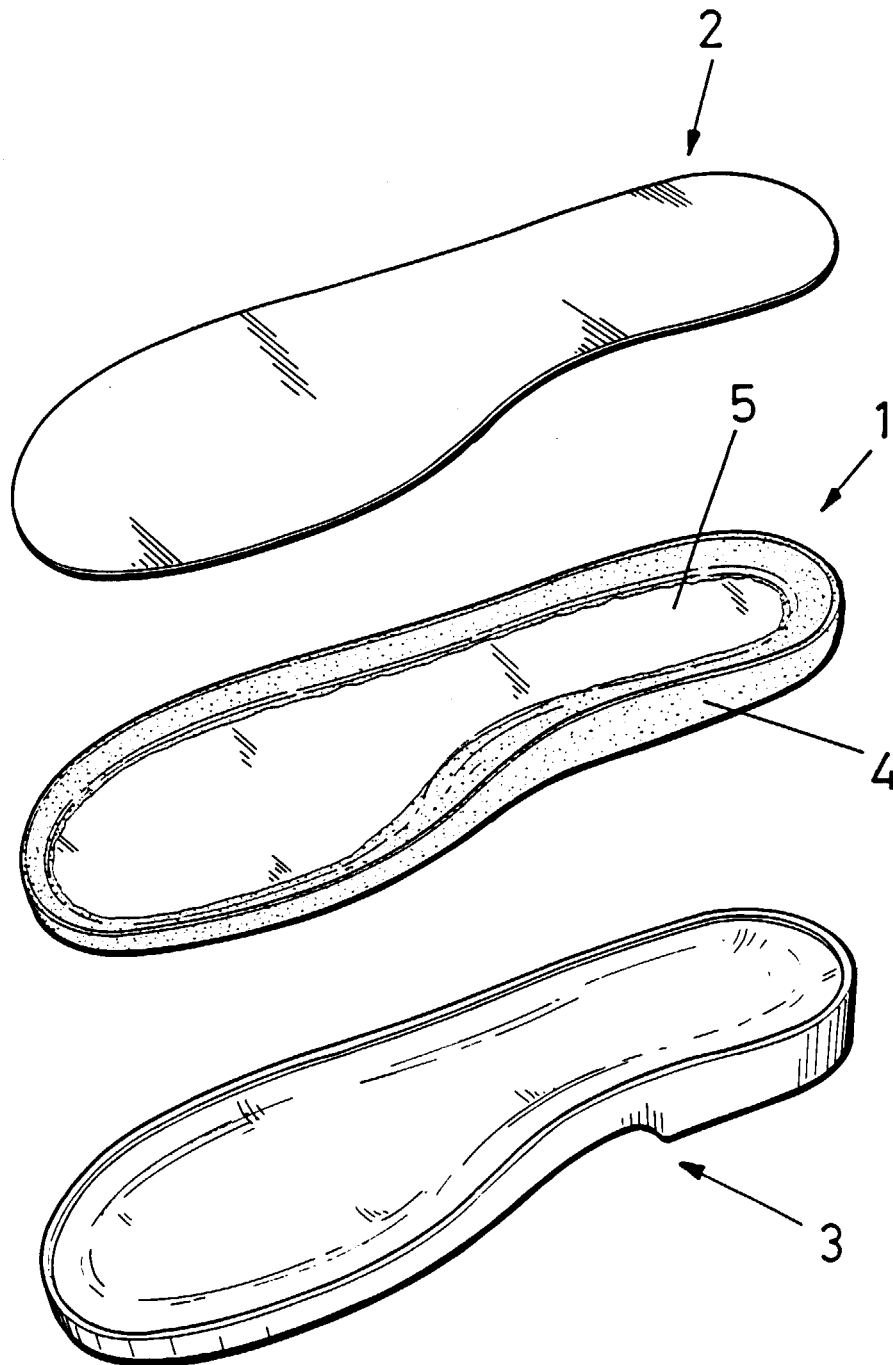
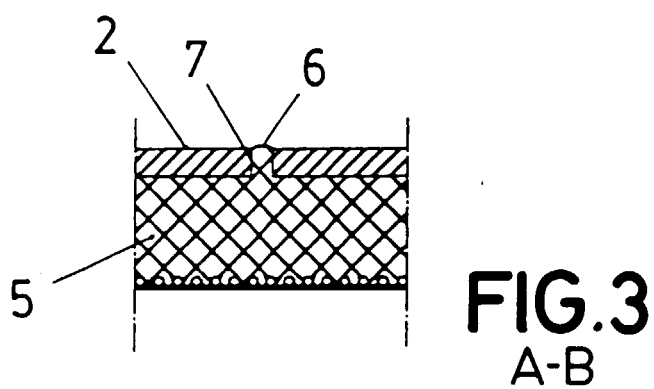
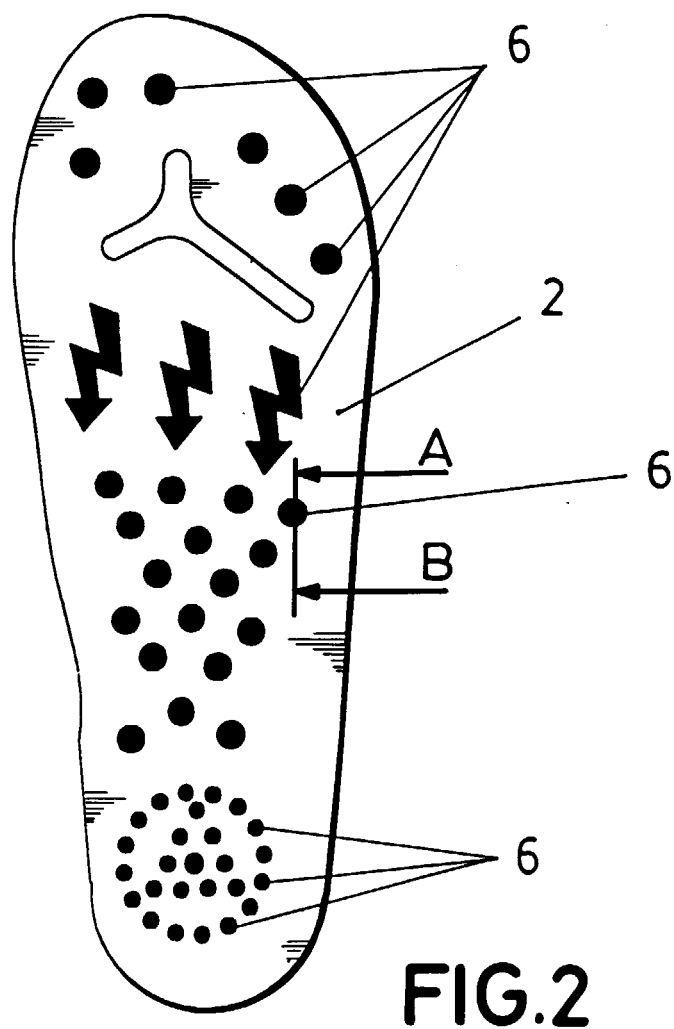


FIG.1



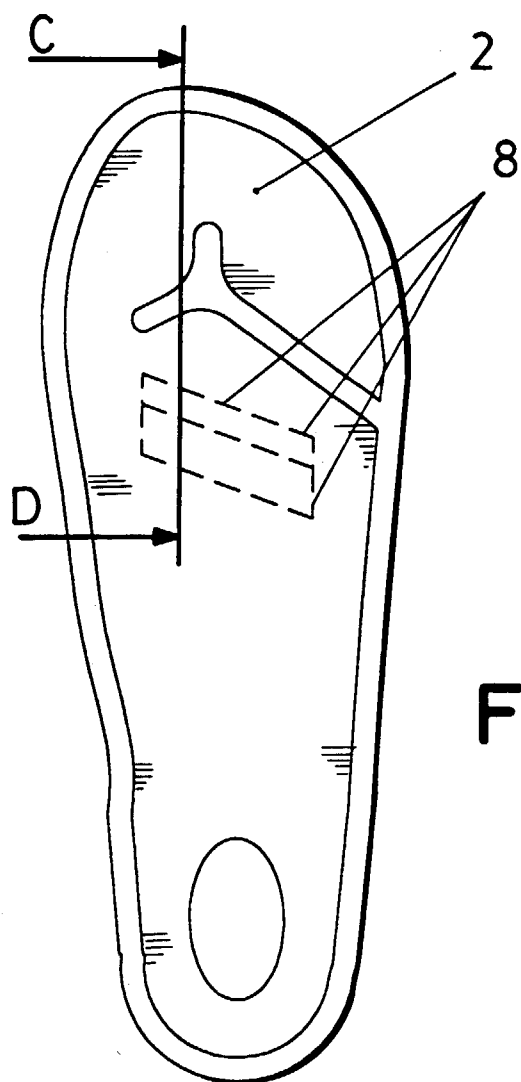


FIG. 4

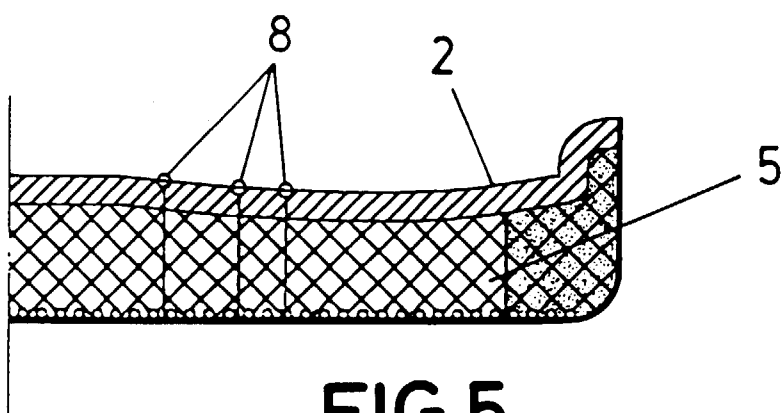


FIG. 5
C-D

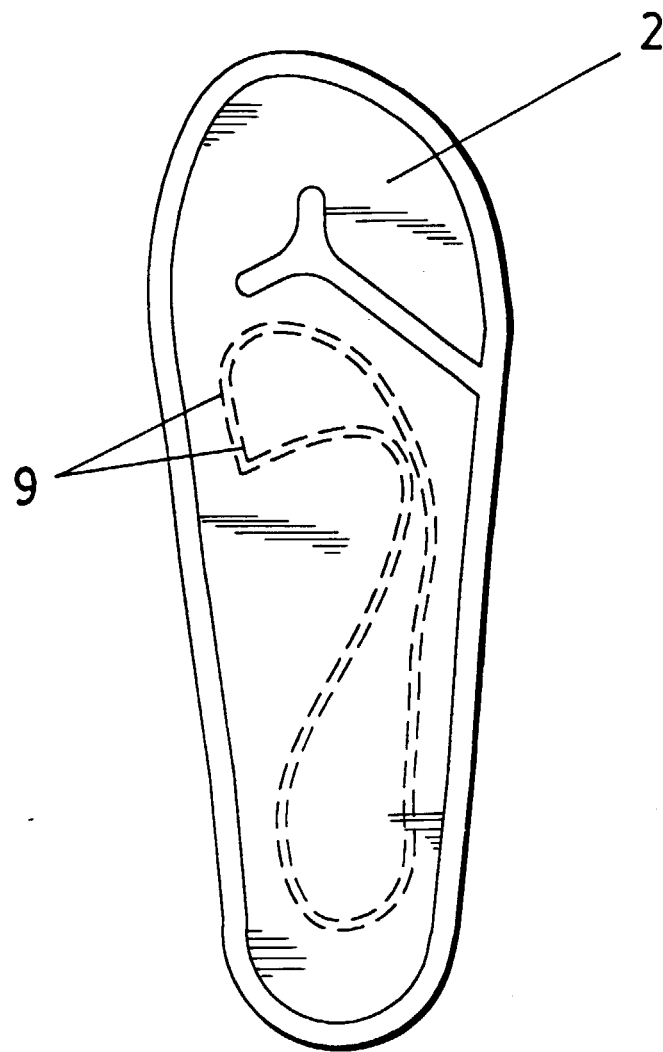


FIG.6

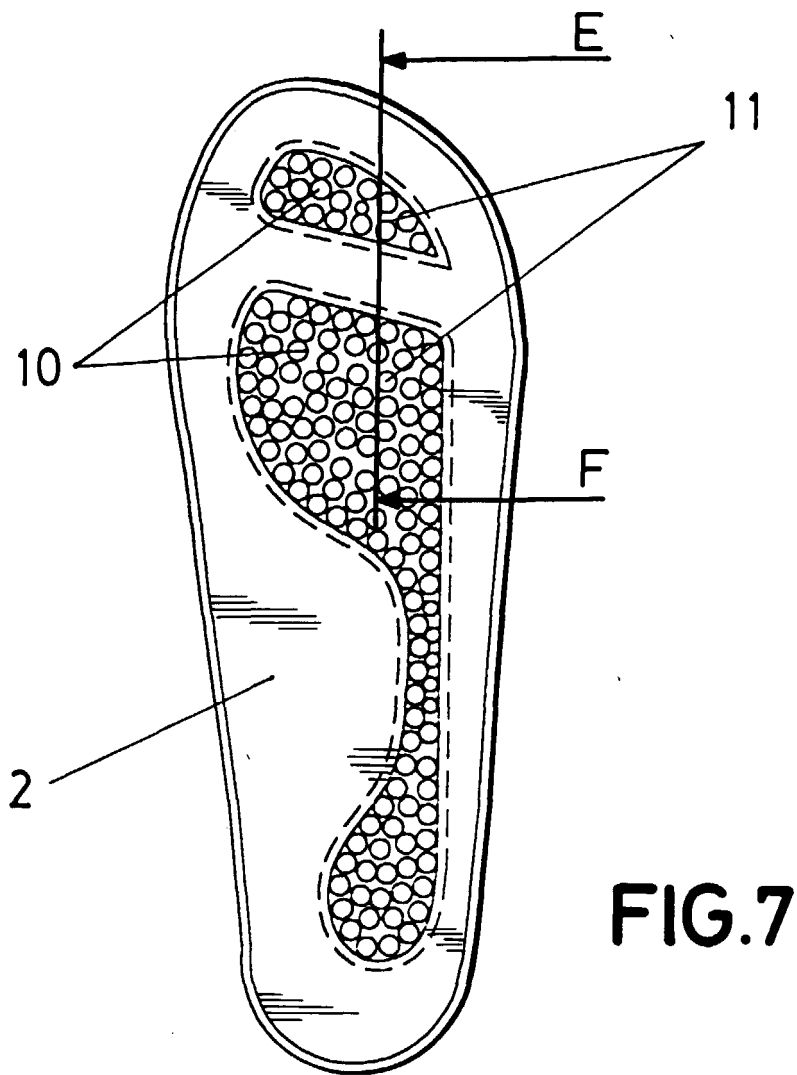


FIG. 7

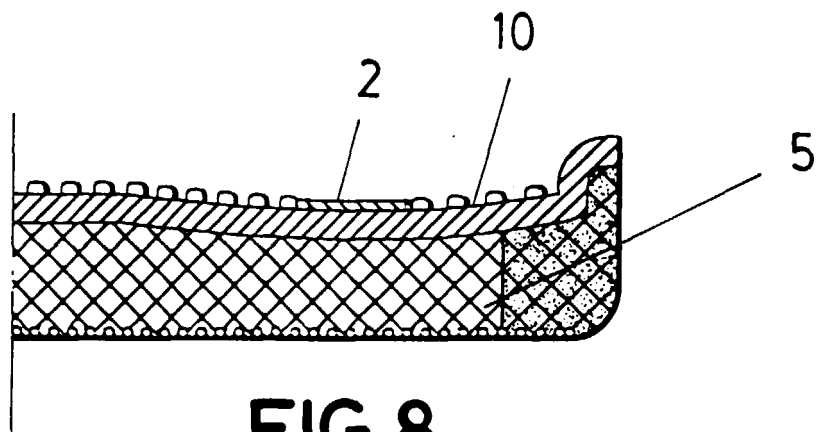


FIG. 8
E-F

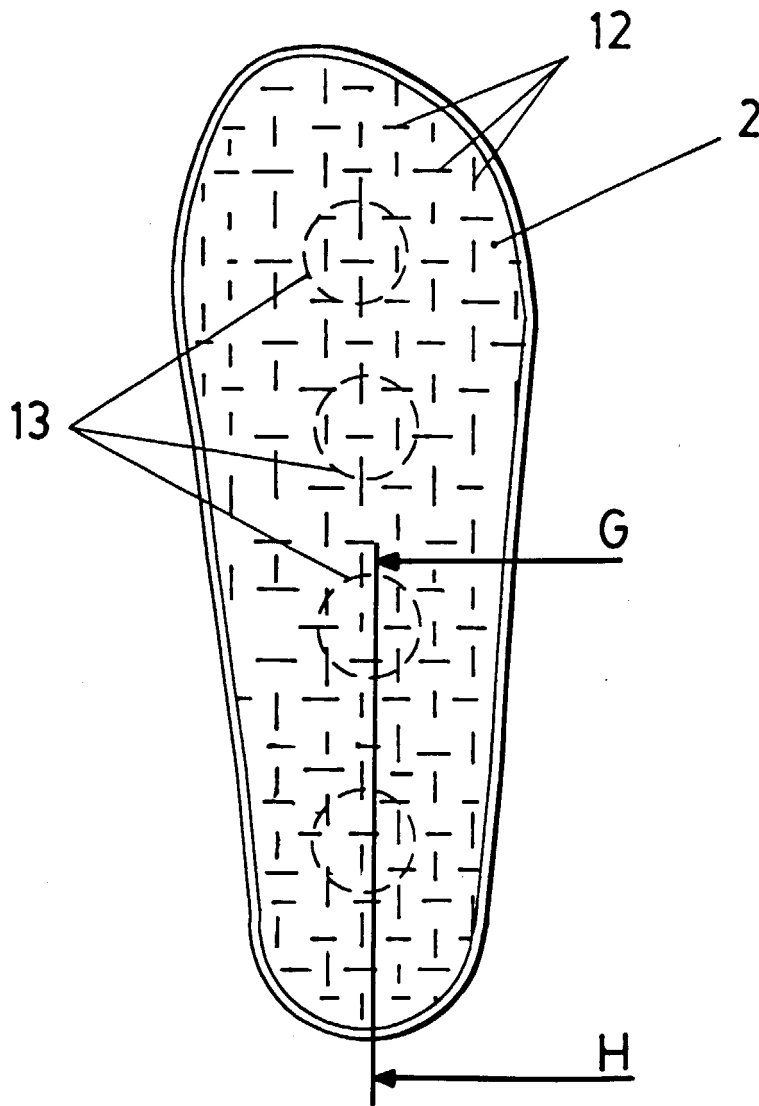


FIG. 9

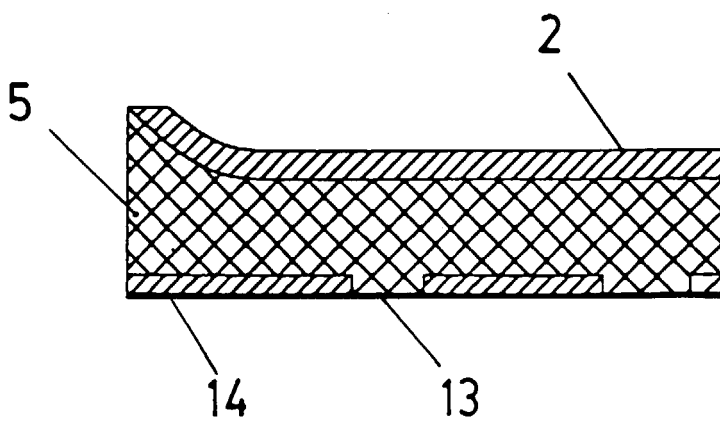


FIG. 10
G-H



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Application Number
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Place of search THE HAGUE		Date of completion of the search 10 May 2000	Examiner Scholvinck, T
CATEGORY OF CITED DOCUMENTS 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 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 & : member of the same patent family, corresponding document			

EPO FORM 1503 03 82 (P04C01)



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EUROPEAN SEARCH REPORT

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