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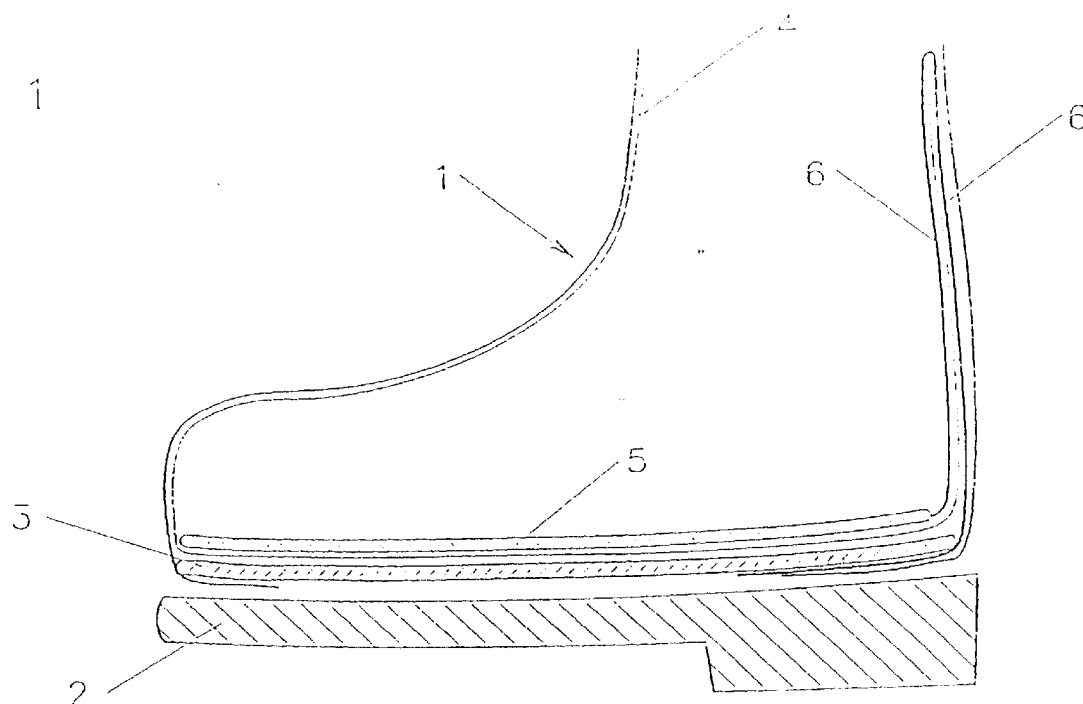
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(54) **Footwear having a device for electrostatic discharge to the ground**

(57) This invention provides footwear in which a midsole of an antistatic material is connected to an outsole by means of a plate or tape made of a conductor material that extends upward along the lining of an upper in the rear zone, is bent over to the outer surface of

the lining, and is then connected to an antistatic grip sole. This tape is then covered with a protective ribbon that is stitched to the lining, whereby an electrical continuity is ensured between the midsole and the outsole without the need to perforate the protective layer and without exposing the tape of a conductor material.

FIG. 1



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Description

FIELD OF THE INVENTION

The present invention relates to footwear and, in particular, it deals with a liquid water impervious but water vapor permeable footwear having means for electrostatic discharge to the ground.

BACKGROUND OF THE INVENTION

There are many industrial applications where operators make use of antistatic and/or conductive footwear capable of transmitting an eventual charge accumulated during a certain working time with the aim of avoiding accidents that may arise from electrostatic discharge. For example, such footwear is mandatory for working on oil platforms and in numerous other applications where flammable or explosive materials are handled. It is known to use for that purpose a piece of footwear having an outsole of an antistatic and/or conductor material with wires or other conductor members connecting the midsole to the outsole for discharging to the ground electricity that may accumulate on the cloth during work.

Also known in the art is footwear internally lined with a layer of a liquid water impermeable but water vapor pervious material, such as porous, stretched PTFE which contributes to a free respiration of the foot while preventing liquids on the outside from getting into the footwear.

These shoes are very practical, and it would be advantageous to make use of these properties in antistatic and/or conducting footwear. With this object in view, there was provided a footwear comprising an internal lining of an liquid water impervious water vapor permeable material and an antistatic midsole connected to the outsole through appropriate conductors. This solution requires, however, that the lining of the liquid impervious material be perforated for the passage of such conductors. As such, the perforations need to be sealed and thus make it difficult to obtain good results that would remain unchanged with time.

In use, the footwear, hence the layer of a liquid water, breathable material, is subjected to numerous repeated bending, abrasion, and the like so that the seal is rapidly destroyed, and liquids can get into the interior of the shoes after a short while.

SUMMARY OF THE INVENTION

It is the goal of this invention to eliminate the above-mentioned disadvantage and to provide footwear in which a midsole of an antistatic material is connected to an outsole by means of a plate or tape made of a conductor material that extends upward along the lining of an upper in the rear zone, is bent over to the outer surface of the lining, and is then connected to an antistatic grip sole.

This tape is then covered with a protective ribbon that is stitched to the lining, whereby an electrical continuity is ensured between the midsole and the outsole without the need to perforate the protective layer and without exposing the tape of a conductor material.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 schematically shows a piece of footwear according to the invention in vertical section; Figure 2 is a detail of Fig. 1 showing conductor means for connection; Figure 3 is a detail of a piece of footwear according to the invention.

DETAILED DESCRIPTION OF THE INVENTION

The invention is characterized by a particular construction of parts allowing the interior of the footwear to be connected to the ground without the need to perforate a layer of impervious and transpirable material.

More specifically, footwear, according to the invention, comprises an antistatic insert connected through a copper plate or a plate of another conductor material to a zone located between a midsole and an outsole which is also antistatic, wherein the plate of a conductor material covered with a protective ribbon extends rearward to the lining of the footwear to be positioned between the lining and the upper.

As described above, a strip of a conductor material is completely hidden. At the same time, it is not necessary to perforate the impervious transpirable material of the footwear to connect the midsole to the antistatic outsole.

With reference to the drawings, a piece of footwear according to the invention comprises an upper 1, a outsole 2 made of an antistatic and/or conductor material, and a midsole 3 inserted between the outsole and the inner lining of the shoe.

According to the invention, the interior of the footwear, in the zone of the upper and the midsole, is lined with a layer 4 of a liquid water impermeable but water vapor pervious (breathable) material, in particular, with a layer of porous, stretched polytetrafluoroethylene.

An antistatic insert or insole 5 is provided inside the footwear and is connected to a bus or similar conductor material 6, e. g., to a plate or bus made of copper of another appropriate conductor material.

Bus 6 is connected to midsole 3 at a point adjacent to the rear portion and extends upward along the rear side of the lining where it is covered with a protective tape or ribbon 8 made of leather or another appropriate material. Bus 6 is then bent back at the top edge of the upper and extends along the outer surface of the lining between the lining and the upper, also in the rear portion of the shoe.

In this manner, the bus of a conductor material can extend from the interior of the footwear where it is con-

nected to midsole 3 to the outside between the outsole and midsole while remaining protected by the lining all the way through.

The end of bus 6 is then bent to be positioned between the lining and the midsole in contact with the anti-static grip sole. 5

As described above, an electric connection is established between the midsole and the antistatic grip sole without the need to perforate the inner lining 4 made of an impervious transpirable material and without exposing the bus. 10

In addition, the same leather ribbon that serves to protect bus 6 is also used to prevent the heel from abrading the bus during walking thus eliminating the adverse effect of such abrasion and the risk of the bus breakage. 15

It will be apparent that dimensions and materials used may vary depending on specific application.

Claims 20

1. Footwear constructed to discharge electrostatic charges to the ground, comprising an internal lining of a liquid water impermeable and water vapor permeable material, an insole made of an antistatic material positioned in the interior of the footwear, and means for connecting said antistatic insert to a grip sole of the footwear, characterized by the fact that said means comprise a conductor member that extends along the lining of the upper upward to the collar of the shoe and is then bent over downward to bring its end in contact with said outsole. 25 30
2. The footwear of Claim 1, characterized by the fact that said means comprise a bus or a similar member of a conductor material that extends upwardly along the interior rear side of the lining, is bent and then extends downward while remaining in permanent contact with the outer rear part of the lining of the upper to be clamped at the grip sole. 35 40
3. The footwear of Claims 1 and 2, characterized by the fact that said bus of a conductor material is covered with a protective ribbon. 45
4. The footwear of Claim 1, characterized by the fact that said conductor means extend outside the lining. 50

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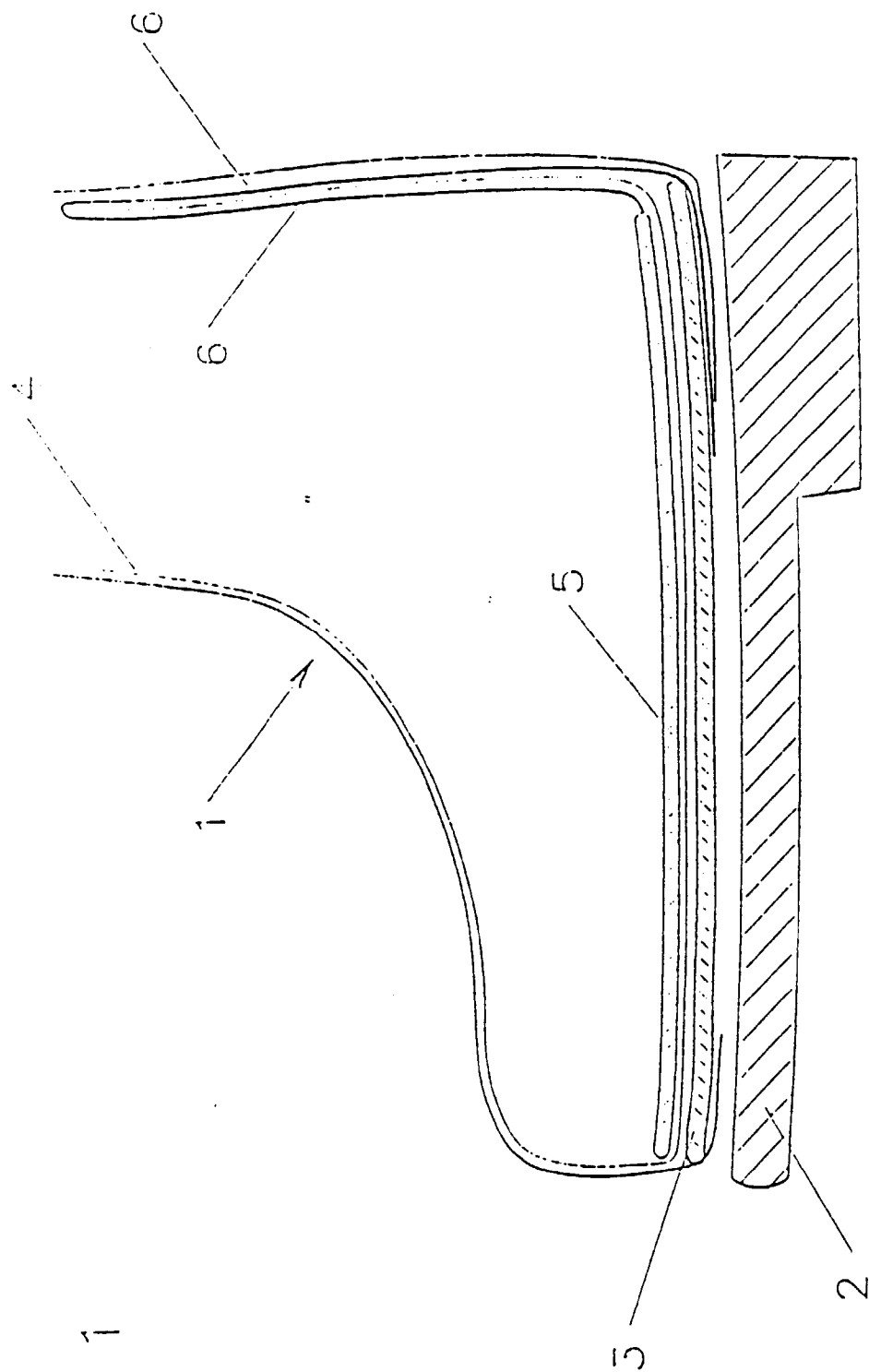


FIG. 2

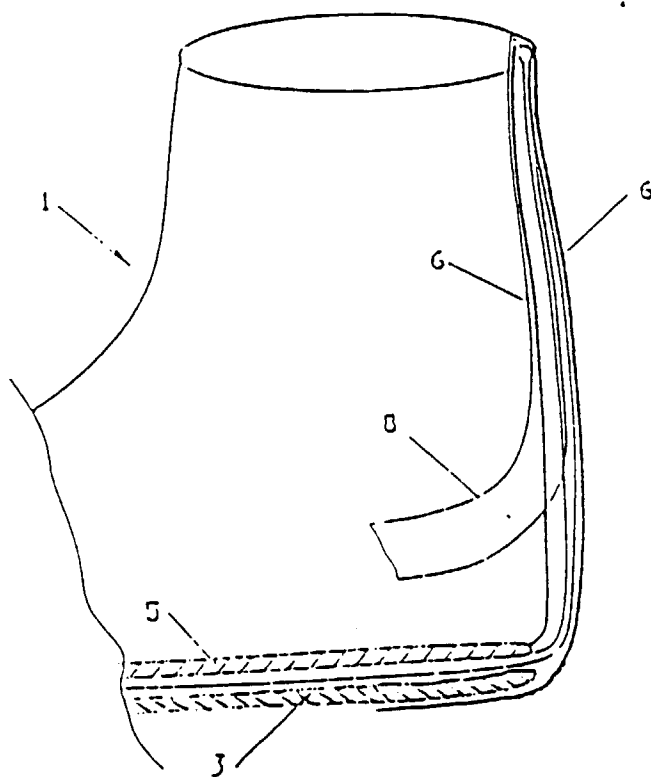
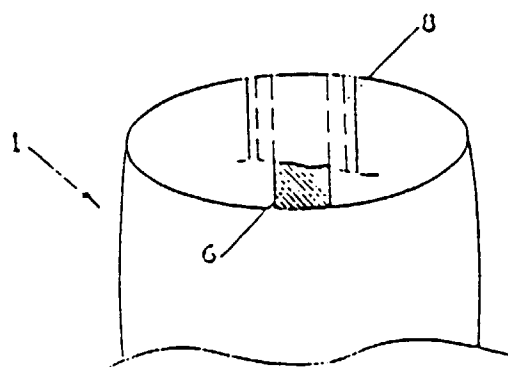


FIG. 3





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EUROPEAN SEARCH REPORT

Application Number
EP 97 20 0543

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.6)
A	US 2 879 452 A (N. PAGE) * the whole document *	1	A43B7/36

A	US 2 785 344 A (W. HINES) * the whole document *	1	

A	US 2 671 185 A (O. BLOOM) * the whole document *	1	

A	US 3 200 292 A (J. MELTZER) * the whole document *	1	

			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			A43B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 5 June 1997	Examiner Declerck, J
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			

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