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(54) Water-proof footwear and process for its preparation

(57) A water-proof footwear is disclosed, comprising an internal, functional layer (2), enclosed in the upper (1), the upper (1) and the functional layer (2) having different length. The edge (3) of both the functional layer (2) and the upper (1) is made of a thermoplastic material and both edges (3) are fixed together and the obtained structure is in turn fixed to the sole (4).

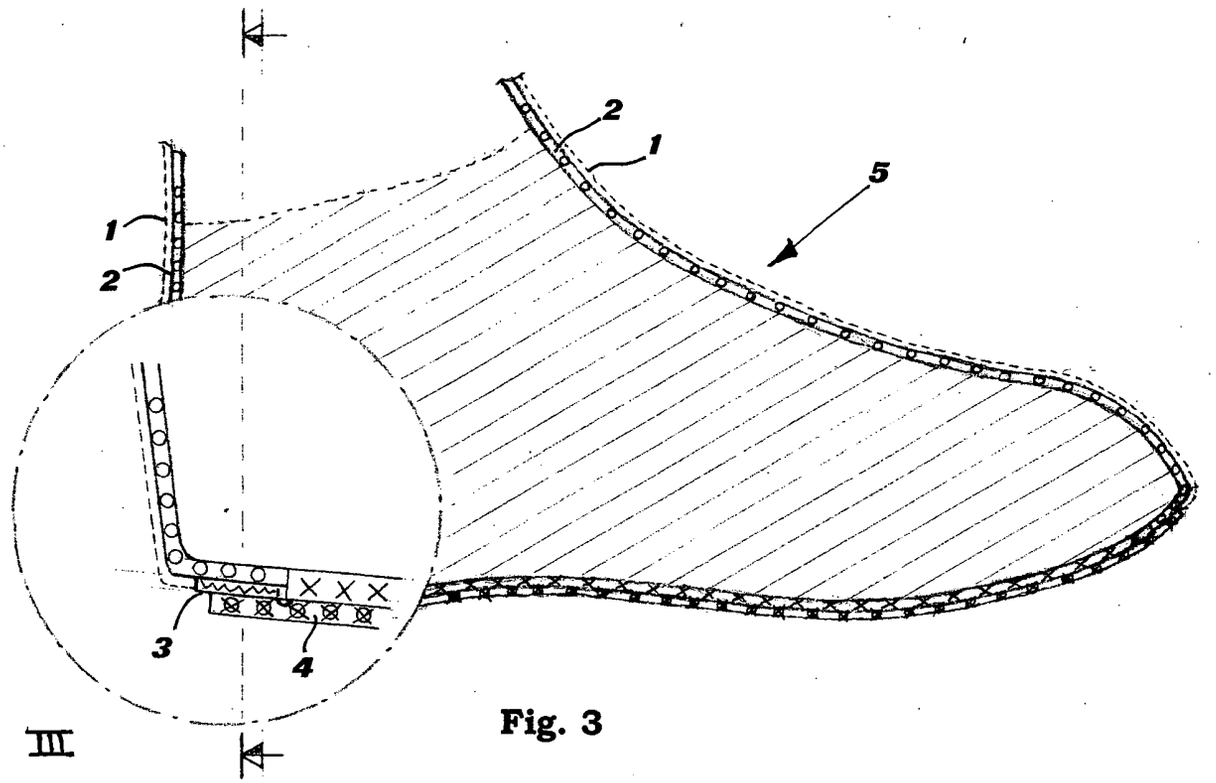

Fig. 3

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Description

[0001] The present invention refers to a water-proof footwear and to a process for its preparation, and particularly to a winter footwear, such as a boot.

[0002] Particularly during autumn and winter, when the temperature is relatively low, it is important that a footwear does not allow the contact of external water or moisture with the foot. This has been accomplished in different ways. First of all, the sole has been produced in a plastic or rubber material, which does not allow the passage of water.

[0003] However, a little amount of water can still reach the foot, since the bond between sole and toe is difficult to be produced water-proof.

[0004] Such a problem has recently been faced by the EP-B1-0 679 347. According to such a patent, an internal, functional layer is provided. Such a layer and the toe have a different length, the inner sole is produced in a material which allows the permeation of the material of the sole in the molten condition and the lower edge of the functional layer is embedded in the sole.

[0005] The procedure to obtain such a sole is very complicate and it is by no way suitable for footwear obtained by sticking the toe to the sole.

[0006] The problems above and other problems may be readily solved by the present invention, referring to a water-proof footwear, comprising an internal, functional layer, enclosed in the toe, the toe and the functional layer having different length, characterised in that the edge of both the functional layer and the toe is made of a thermoplastic material and in that both edges are fixed together and the resulting structure is in turn fixed to the sole.

[0007] The present invention is now described more in depth, by reference to the annexed drawings, which depict exemplary embodiments, wherein:

Fig. 1 is a scheme of the footwear structure;
Fig. 2 is a scheme, illustrating the assembly of the footwear;
Fig. 3 is a side view of a footwear according to the present invention; and
Fig. 4 is a rear cross-section of a footwear according to the present invention.

[0008] In Fig. 1 a toe 1, a functional layer 2 and an edge layer 3 in thermoplastic material are shown.

[0009] The same layers, after connection of layers 3 both to the toe 1 and the functional layer 2 are represented in Fig. 2. The connection above can be obtained in any known way. The most preferred method is by a strobel joint. Otherwise, the layer 3 can be soldered or glued to the toe 1 and to the functional layer 2, respectively. A strobel sole 4 is represented in Fig. 2 before the final assembly.

[0010] The footwear 5 of the present invention is represented in Fig. 3, whilst the rear cross-section is represented in Fig. 4. As it is to see, a toe 1 is represented over a functional layer 2. The toe is connected in any known way to a sole 4. Between the sole 4 and the functional layer 2 a thermoplastic edge layer 3 is sandwiched. Preferably, the thermoplastic layer 3 is made of a thermoplastic polyurethane (TPU).

[0011] During the preparation of the footwear, the toe 1 overlaps the functional layer 2 (see Fig. 2). Both thermoplastic layers 3 are fixed together and connected to the sole 4.

[0012] As it is best shown in Figs 3 and 4, the functional layer 2 and the toe 1 are overlapped and shaped. The thermoplastic layer 3 - formed by the fixed together, original edge layers 3 - projects from the toe 1 and is bent under the zone where the foot leans.

[0013] The present invention provides a water-tight construction, which can be both soldered and glued to the sole 4. In the first case, the connection of the sole to the toe is done by melting the thermoplastic layer 3 and by embedding it into the molten sole. In the second case, a pre-formed sole 4 is glued to the thermoplastic layer 3. Preferably, the water-proof layer 3 is glued to the insole. Subsequently, the assemble is glued to the sole. It is apparent for the skilled man that the present invention allows to get a footwear which is water-proof and easy to produce. Furthermore, it is suitable for both soldering and gluing to a sole.

Claims

1. A water-proof footwear, comprising an internal, functional layer (2), enclosed in the toe (1), the toe (1) and the functional layer (2) having different length, **characterised in that** the edge (3) of both the functional layer (2) and the toe (1) is made of a thermoplastic material and **in that** both edges (3) are fixed together and the resulting structure is in turn fixed to the sole (4).

2. A water-proof footwear as claimed in claim 1., **characterised in that** the thermoplastic layers (3) are connected respectively to the toe (1) and to the functional layer (2) by a strobel joint.

3. A water-proof footwear as claimed in claim 1., **characterised in that** the thermoplastic layers (3) are soldered to the toe (1) and to the functional layer (2), respectively.

4. A water-proof footwear as in claim 1., **characterised in that** the thermoplastic layers (3) are glued to the toe (1) and to the functional layer (2), respectively.

5. A water-proof footwear as claimed in any previous claim, **characterised in that** the thermoplastic layer is a thermoplastic polyurethane (TPU).

6. A water-proof footwear as in any previous claim, **characterised in that** the thermoplastic layer (3) is soldered with the sole (4).

7. A water-proof footwear as in any claim 1. to 5, **characterised in that** the thermoplastic layer (3) is glued to the sole (4).

8. A water-proof sole as in claim 7., **characterised in that** the thermoplastic layer (3) is embedded in the sole (4).

9. Method for the production of a thermoplastic footwear, comprising the overlapping of the toe (1) to a functional layer (2), both of which end with a thermoplastic layer (3), **characterised in that** the thermoplastic layers are fixed together and glued to the sole (4) of the footwear.

10. Method for the production of a thermoplastic footwear, comprising the overlapping of the toe (1) to a functional layer (2), both of which end with a thermoplastic layer (3), **characterised in that** the thermoplastic layers are fixed together, molten and embedded in the molten sole (4).

11. Method according to claim 9. or 10., **characterised in that** the water-proof layer (3) is glued to the insole.

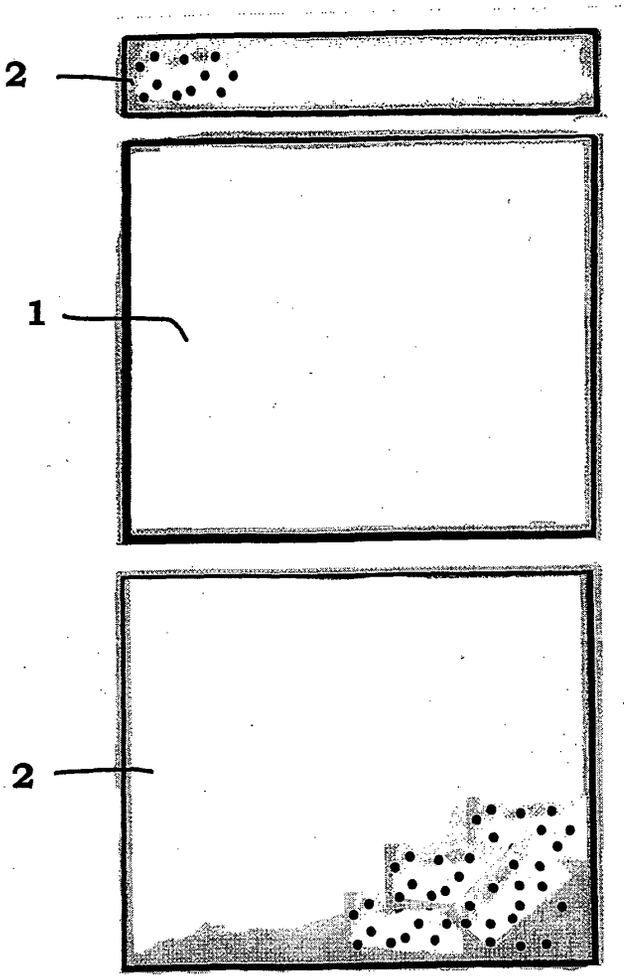

Fig. 1

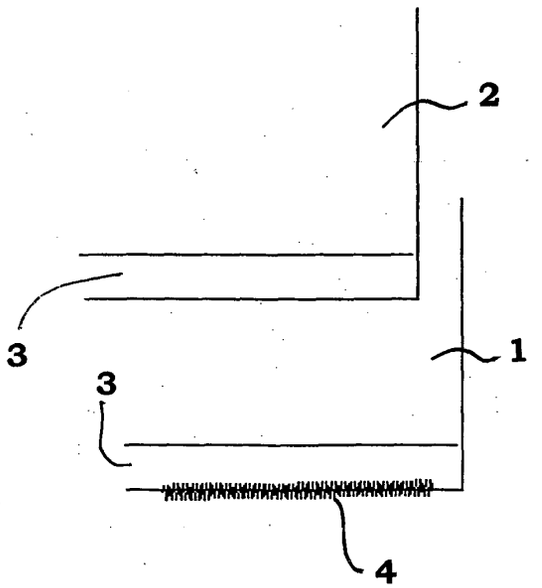

Fig. 2

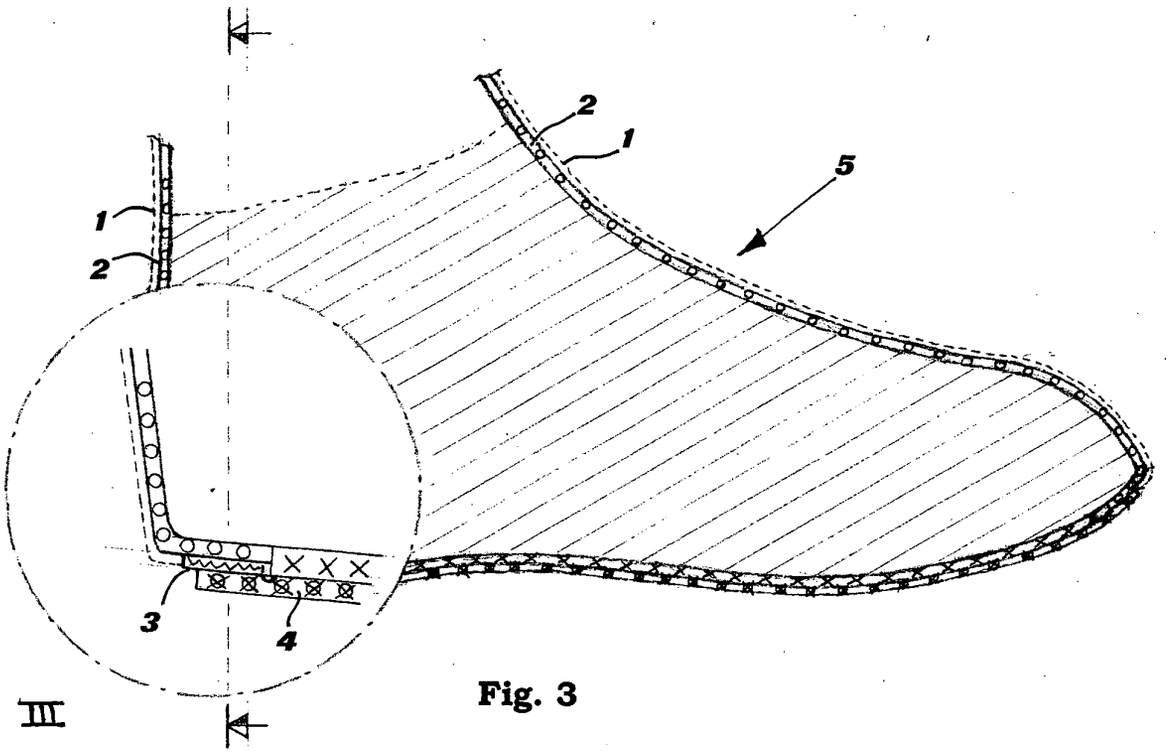

Fig. 3

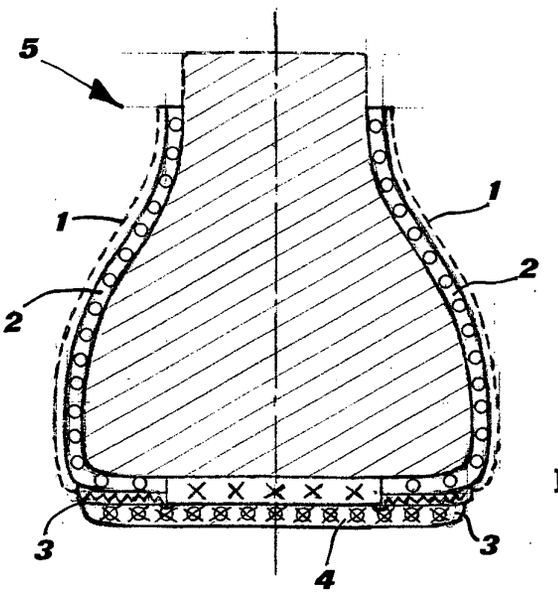

Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 03 42 5592

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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TECHNICAL FIELDS SEARCHED (Int.Cl.7)

A43B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	9 February 2004	Schölvinck, T.S.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 03 42 5592

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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