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(54) **Shoe with upper having system for transpiration of the interior of the shoe**

(57) A shoe transpiring upper (12, 12') characterised in that it comprises at least one transpiration system (1, 1', 1'') consisting of:

- a portion (16) of perforated upper for the passage of air;
- an intermediate element (24) in water-impermeable and air-transpiring material for covering the internal side of said perforated portion (16) and attached with its peripheral edge along a line of the internal side of the upper (12, 12') surrounding said perforated portion (16); and
- a final element (26) in naturally air-transpiring material or rendered transpiring by means of holes through its thickness for covering said intermediate element (24) and attached with its peripheral edge along the peripheral contacting line between said perforated portion (16) and said intermediate element (24) for the protection of said intermediate element (24);

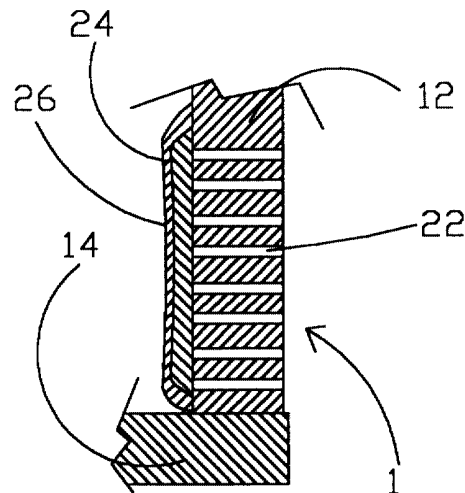


Fig. 3

and in that the attachment of at least one of said intermediate element (24) or final element (26) is water-impermeable or water-proofed.

Description

[0001] The present invention relates to a shoe wherein special systems have been provided to allow easy transpiration of the foot in the same shoe.

[0002] Shoes are currently known wherein, to allow transpiration of the foot in the shoe, the sole of the shoe is provided with holes designed to allow easy passage of the air outside of the shoe during walking.

[0003] This arrangement of a shoe with perforated sole, although at first sight appearing suitable for enabling easy elimination of the moisture which is formed in the same shoe, in practice has not always been found to be suitable for achieving the desired results. The arrangement of said holes in the sole of the shoe could have the disadvantage that, during use, grains of dust, mud or another substance enter the holes, obstructing them and preventing or reducing transfer of air between the interior of the shoe and the outside environment.

[0004] Moreover, and most importantly, particularly in children's shoes and also in adult ones, the perforated sole in question does not ensure the necessary hygiene for contaminated environments (for example public baths etc.). The membrane can in fact become impregnated with organic or non-organic materials contaminated by bacterial or miscellaneous forms which, in the case of scuffing of the same, can infiltrate and come into contact with the foot of the person wearing the shoe.

[0005] Shoes are also currently available on the market wherein the upper is formed completely or almost totally by synthetic materials, which transpire air yet which are impermeable to the passage of the water.

[0006] The abovementioned transpiring and impermeable materials forming the upper, due to the fact that they are woven, cannot be used to define the external part of the upper in shoes of a traditional type where the upper is notoriously decorated in a material such as leather or the like, with adequate forming. Making an upper entirely in these transpiring and impermeable materials is therefore only possible for those shoes which are intended for after-ski use, but definitely not for traditional or sports shoes, duly formed, and in place of the traditional materials of the upper, such as leather or the like.

[0007] Use of these transpiring and impermeable materials adopted as internal linings of the uppers of traditional shoes with the superimposing of an external element in leather, albeit improving the properties of impermeability of the traditional shoe, does not however allow exploitation of those properties of transpirability which these impermeable and transpiring materials would allow. In fact the leather on the external element of the upper must be of a particular type, not dyed or covered, must be perfectly natural and even then does not allow adequate passage of air, so that the use of these materials in association one with the other does not allow adequate transpiration between the interior of the shoe and the exterior.

[0008] It should also be noted that the abovementioned transpiring and impermeable woven materials in

a synthetic material are in general particularly expensive so that their large-scale use as linings for uppers entails a considerable increase in the overall cost of footwear.

[0009] Additionally it is also necessary to observe particular machining techniques when these synthetic and transpiring materials are used as linings, which contribute to increasing the cost of the footwear due to a high waste of labour, and not all footwear manufacturers are capable of performing such a machining process, but only those who, with great sacrifice, adapt to performing the detailed instructions given by the manufacturers of transpiring and impermeable materials.

[0010] Moreover, and very importantly, these transpiring and impermeable materials adopted as linings of the uppers of traditional shoes do not function when the uppers are in materials such as synthetic materials, imitation leather materials or even dyed, covered or polished leather, which do not allow any transpiration.

[0011] In FR 2 116 790 a transpiring upper structure is disclosed, made by perforating a portion of upper and covering it internally with an impermeable and transpiring material, the latter being attached peripherally to the perforated upper portion by stitching.

[0012] This transpiring upper structure has the disadvantage that water can in any case infiltrate through the holes of the stitching and reach the interior of the upper, jeopardising the actual impermeability of the shoe.

[0013] The impermeable and transpiring element is also subjected from the interior of the upper to the action of the foot, which in time causes its wear through rubbing, jeopardising its efficiency.

[0014] The object of the present invention is therefore that of providing an impermeable shoe wherein high transpiration or exchange of air between the interior of the upper and the environment external thereto is however guaranteed.

[0015] Another object of the present invention is also that of providing a shoe, in particular a traditional or sports shoe, wherein said high transpiration of the foot inside the shoe is provided in combination with an upper made entirely with traditional materials, such as leather or the like, even if not in themselves transpiring.

[0016] A further object of the present invention is also that of providing a shoe of the type referred above, such as to have good durability and low production cost.

[0017] Yet another object of the present invention is that of providing a shoe having an aeration device inside the shoe, wherein application of said device does not entail modifications of the model or the intended use of the same shoe.

[0018] The previous objects are achieved thanks to a shoe having the features of claim 1 attached.

[0019] The dependent claims refer to particular embodiments of the invention.

[0020] The present invention will in any case be made clearer on reading of the following description relating to a preferred embodiment of the same invention. Said

description having to be read with reference to the accompanying drawings, in which:

Fig. 1 represents a side elevation view of the shoe of an embodiment of the present invention;

Fig. 2 represents a sectioned view of the shoe along line 2-2 of Fig. 1;

Fig. 3 represents an enlarged sectioned view relating in particular to the portion of transpiration of the shoe of Fig. 1;

Fig. 4 represents a sectioned view of a shoe in accordance with another embodiment of the present invention.

Fig. 1 shows a shoe 10 comprising an upper 12 and a sole 14, wherein, according to the present invention, a system 1 has been provided for transpiration of the foot inside the shoe.

[0021] In the embodiment shown, the system of transpiration comprises a performed transpiration portion 16 provided in the side part of the upper, on the side of the latter which is turned inwards or, during use, towards the other foot or shoe of the user.

[0022] As shown, the perforated portion 16 for transpiration is also formed in a substantially central position of the inner side part of the shoe in such a way that, as also shown in Fig. 2, it is substantially positioned at the central zone of the sole of the foot P where said sole of the foot has the typical arched configuration, raised from the ground in such a way that, between the wall of the upper corresponding to the portion 16 and the same foot, a sort of air chamber C is formed with variable volume during walking which allows easy expulsion of air to the exterior of the shoe. In this way a maximum transpiration effect is achieved.

[0023] It should however be noted that, for the present invention, an application of the transpiration device 1 in any other position of the upper can however be foreseen or a series of holes in other parts of the upper.

[0024] As shown in Figs. 1-3, in the transpiration system 1, the portion 16 for transpiration is internally provided with an element 24 in an air-transpiring yet water-impermeable material, which element 24 completely covers the portion 16 provided with holes 22 for transpiration.

[0025] The peripheral edge of the element 24 of transpiring and impermeable material is attached by simple or waterproofed stitching, gluing or welding along a line of the internal side of the upper 12 surrounding the perforated portion 16.

[0026] In accordance with the present invention a further element 26 for covering the intermediate element 24, is also present.

[0027] Preferably the final covering element 26 is at-

tached with its peripheral edge along the peripheral contacting line between the portion 16 for transpiration and the intermediate element 24.

[0028] The element of covering 26 must in any case allow passage of the moist air from the interior of the upper to the external environment through the intermediate element 24 and the portion of perforated upper 16.

[0029] The final covering element 26 has a dual purpose in the case wherein attachment of the intermediate element 24 to the portion 16 of perforated upper is performed by simple stitching or by any other technique which does not form an impermeable attachment: it in fact has to be attached by any technique (waterproofed stitching, impermeable welding or gluing) capable of impermeably sealing the peripheral contacting line between the intermediate element 24 and the portion of perforated upper 16, and simultaneously has to guarantee protection for the internal element 24 against rubbing of the foot which would gradually lead to deterioration and loss of efficiency of the internal element 24 itself.

[0030] In the case wherein attachment between the internal element 24 and the portion 16 of perforated upper is already watertight, it is not necessary, albeit preferable, for the covering element 26 to form an impermeable or waterproofed attachment on the rest of the transpiration device 1. Instead it is mainly necessary as an element for protecting the intermediate element 24.

[0031] As can be seen, in this embodiment the portion of perforated upper 16 has a triangular configuration, nevertheless other configurations, different from the triangular one, can also be foreseen for the present invention, and the perforated portion can even extend substantially to the whole upper, particularly in the case of sports footwear.

[0032] The internal transpiring and impermeable element 24 is preferably made in Goretex™ or Simpatex™, however any other material suitable for allowing effective passage of air, but such as to prevent the passage of water, is suitable for the present invention.

[0033] The covering element 26 must be preferably resistant to wear from rubbing but at the same time must be comfortable for the lateral resting of the foot, and can be made in rubber or another synthetic material with perforations for the passage of moist air, or in another material, for example untreated, naturally transpiring, leather.

[0034] In Fig. 4 a second embodiment of the present invention shows that on the upper 12' several transpiration systems of the type illustrated above can be provided.

[0035] In the present case, in addition to the transpiration system 1' on the adjacent side walls of the upper of a pair of shoes, a further transpiration system 1" is provided at the opposite side walls of the uppers of a pair of shoes.

[0036] Naturally the structure of transpiring upper provided by the present invention can be adapted univer-

sally to uppers in any material, in the sector of both classic and sports footwear, and guarantees effective and lasting transpiration of the footwear without appreciably changing its appearance.

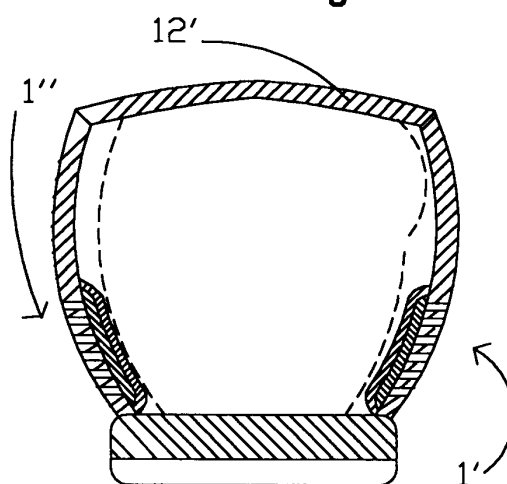
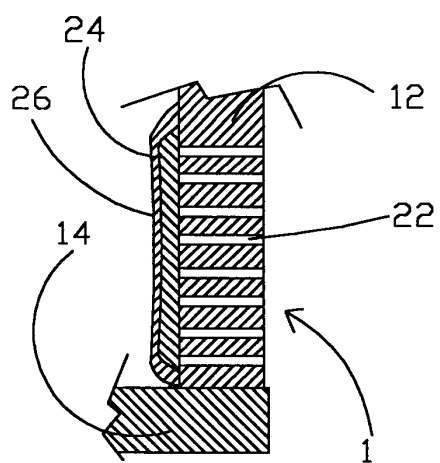
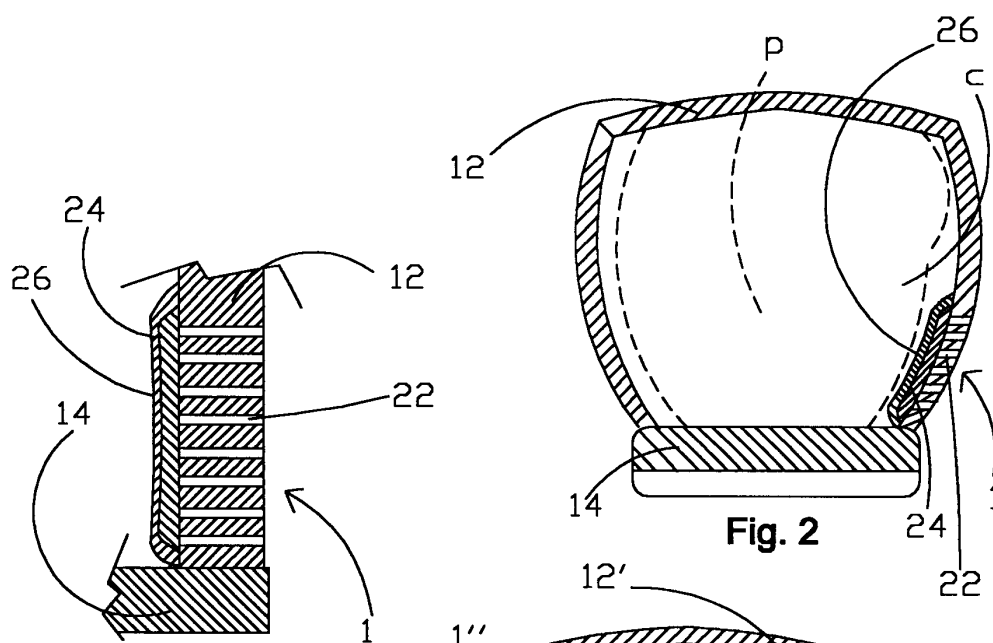
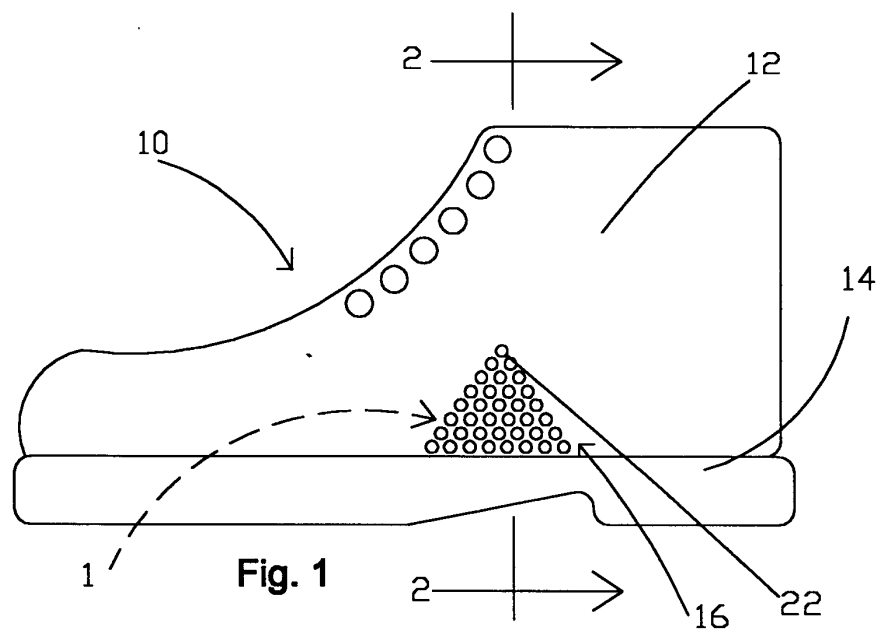
[0037] It is understood that what has been stated with reference to the preferred embodiments of the present invention has been given solely by way of a non-limiting example of the concept claimed.

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Claims

1. A shoe transpiring upper (12, 12') characterised in that it comprises at least one transpiration system (1, 1', 1'') consisting of:
 - a portion (16) of perforated upper for the passage of air;
 - an intermediate element (24) in water-impermeable and air-transpiring material for covering the internal side of said perforated portion (16) and attached with its peripheral edge along a line of the internal side of the upper (12, 12') surrounding said perforated portion (16); and -
 - a final element (26) in naturally air-transpiring material or rendered transpiring by means of holes through its thickness for covering said intermediate element (24) and attached with its peripheral edge along the peripheral contacting linea between said perforated portion (16) and said intermediate element (24) for the protection of said intermediate element (24);

and in that the attachment of at least one of said intermediate element (24) or final element (26) is water-impermeable or water- proofed.
2. An upper (12, 12') according to the previous claim, characterised in that said attachments of said intermediate (24) and final (26) elements are made by stitching or gluing or welding.
3. An upper (12, 12') according to any one of the previous claims, characterised in that said perforated portion (16) of the upper extends over a zone of the upper or over the whole upper (12, 12').
4. An upper (12, 12') according to any one of the previous claims, characterised in that said upper (12, 12') comprises a transpiration system (1, 1', 1'') provided at the internal side part of the upper (12, 12') in a substantially central position of the latter.
5. An upper (12, 12') according to any one of the previous claims, characterised in that said intermediate element (24) is preferably in Goretex™ or Simpatex™ or another equivalent transpiring and impermeable material.





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 12 5297

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.7)
X	EP 0 792 595 A (GORE W L & ASS SRL) 3 September 1997 (1997-09-03) * column 2, line 46 - line 47 *	1-5	A43B7/12
E	EP 1 074 193 A (OPAL LTD) 7 February 2001 (2001-02-07) * the whole document *	1-5	
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		13 March 2001	Claudel, B
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 00 12 5297

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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