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(54) Breathable and waterproof shoe

(57) A breathable and impermeable shoe, suitable for use by men, women, and children, preferably for sport use, characterized by the incorporation of a first breathable and impermeable base (2) made of an elastomer (8), a base especially adapted for insertion into the shoe sole, and/or a second breathable and impermeable base (3) made of an elastomer, a base especially adapted for insertion in the shoe upper, preferably in the side panels, providing greater comfort and hygiene to the user.

These bases (2,3) comprise a membrane (7) injected over elastomers (8) or derivatives thereof, giving them the rigidity required for their use, which upon being inserted into the appropriate openings and attached in place with contact glue or sewn around their entire perimeter, will permit optimal breathing.

The invention presented above provides the user a high degree of comfort as a result of the high level of impermeability and breathability, thereby assisting his rapid action in terms of the foot movements during walking.

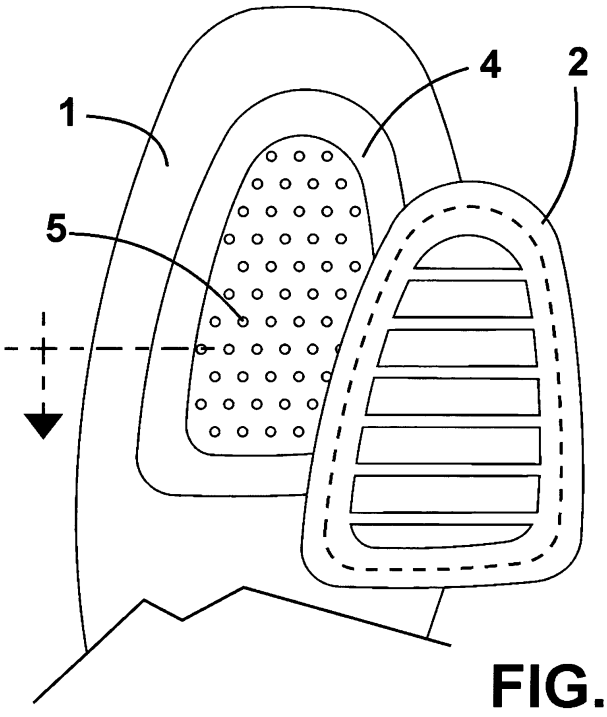

FIG.1

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Description

[0001] A breathable and impermeable shoe, suitable for use by men, women, and children, preferably as a sports shoe, characterized by the incorporation of a breathable and impermeable base especially adapted for insertion into the shoe's sole, and/or a breathable and impermeable base especially adapted for insertion into the shoe's body, preferably in the side panels, to provide greater comfort and hygiene for the user.

[0002] These bases comprise a membrane injected over elastomers or derivatives thereof, giving them the rigidity required for their use, which upon being inserted into the appropriate openings and attached in place with contact glue or sewn around their entire perimeter, will permit optimal breathing.

[0003] Many and varied kinds of shoes with breathable insoles, made of a laminar body, are currently well known; they are made to be placed inside the shoe, over the sole, with the user's foot resting on them. They are manufactured with flexible and breathable materials, but have the disadvantage that, though they initially perform their function, they deteriorate and lose breathability very quickly and need to be replaced in a short time.

[0004] With regard to sports shoes, we encounter the problem of breathability because, though materials conducive to the foot's comfort are currently in use, these materials cannot absorb the sweat generated by the physical effort involved in any sports activity; as a result, the shoe steadily deteriorates, and the perspiration produces unpleasant odors.

[0005] Attempts have been made to solve the problem of shoe breathability by making a kind of shoe whose upper part, i.e., the tongue, has perforations or hemstitching on the leather or similar material, to permit breathing. But this has the disadvantage of increasing manufacturing costs and undermining the material's strength.

[0006] We can also find other solutions, such as the *"improved vapor-permeable shoe"* described in Patent 2202863, and the *"vapor-permeable shoe with breathing action"* described in Patent 2205355; these are more complex because they are made of the following combination of components:

1 - A vapor-permeable upper associated with a vapor-permeable or perforated sheath.

2 - An outer sole made of a perforated elastomer.

3 - An intermediate sole piece comprising a membrane made of a waterproof and vapor-permeable material, associated with a lower protective layer made of a hydrolysis-resistant material, the protective layer being water-repellent and perforated.

4 - A perforated vapor-permeable insole

5 - A layer of vapor-permeable or perforated filler material attached to the aforementioned membrane and the aforementioned lower protective layer.

[0007] Naturally, the purpose to make a vapor-permeable and breathable shoe is fully achieved, but with the disadvantage of high cost, since a large number of components must be brought together, which greatly increases the cost of production.

[0008] To overcome the current problems and achieve effective breathability and low cost, we have created a breathable and impermeable shoe, the subject of this invention, characterized by the incorporation of a breathable and impermeable base especially adapted for insertion into the shoe's sole, and/or a breathable and impermeable device especially adapted for insertion into the shoe's body, preferably in the side panels.

[0009] These bases include a membrane injected over elastomers or derivatives thereof, giving them the rigidity required for their use, which upon being inserted into the appropriate openings and attached in place with contact glue or sewn around their entire perimeter, will permit optimal breathing.

[0010] This is a commercial membrane, used in another type of application, whose special characteristics make it a suitable component for use in this type of application for shoes. The membrane is a tissue which, by itself, provides the necessary properties to ensure an impermeable and breathable shoe. It is made of a long-lasting material based on microscopic polyethylene fibers and is light, offers high mechanical resistance, and is strong and durable.

[0011] One of its most important properties is its high permeability to water vapor, which results in a rapid drying of moist components.

[0012] It is a breathable membrane made of two components with geotextiles. Its impermeability is very high because it has a resistance to penetration exceeding 1000 mm. water column, meaning that moisture does not pass through it when it is in contact with water in liquid state. It is also impermeable to wind.

[0013] The breathable and impermeable base, especially adapted to be inserted into the shoe's sole, comprises a membrane injected over elastomers or derivatives thereof, giving it an oval shape of a certain width around its entire perimeter, and has equidistant rectangular perforations.

[0014] The entire membrane adheres over this perimeter zone and over horizontal bands over which the layer that will come in contact with the user's foot will subsequently be placed.

[0015] This layer will have perforations in the area that coincide with the breathable and impermeable base.

[0016] The breathable and impermeable base is inserted into an opening made in the shoe's sole and attached in place by contact glue around its entire perimeter.

[0017] The part of the sole that coincides with the breathable and impermeable base also has perforations,

to ensure the invention's effective breathability.

[0018] Moreover, the breathable and impermeable base, especially adapted to be inserted into the body thereof, includes a membrane injected over elastomers or derivatives thereof with perforations, and is inserted into an opening made in the shoe's body and attached in placed with contact glue around its entire perimeter or by sewing; the base is positioned, with its perforations visible on the outside of the shoe, once it has been inserted into the opening made for that purpose in the shoe's body, thereby permitting breathing through the perforations.

[0019] The location of the base in the shoe's body, preferably in its side panel, improves breathing because the foot's movement within the shoe when walking produces a bellows effect permitting a regeneration of the air within the shoe.

[0020] The base, visible on the outside of the shoe, can have any shape depending on the shoe manufacturer's aesthetic requirements; emblems, logos, or trademarks can be reproduced on it without impairing its effectiveness. It can also be placed on any part of the shoe (the side panel, the vamp or instep, or the heel), though it is preferable to place it in the side panel because the foot's movement within the shoe when walking produces a bellows effect that aids in the regeneration of the air within the shoe.

[0021] The breathable and impermeable shoe described herein offers multiple advantages over the currently available shoes, the most important of which is that with the combination of only two components, comprising a membrane injected over an elastomer or similar material and inserted into the shoe's sole and/or its side panels, a high degree of impermeability and breathability is achieved, in addition to giving the user a high level of comfort.

[0022] Another important advantage of this invention is its low cost in comparison with that of other solutions in whose manufacture a large number of components are required.

[0023] We call attention to the membrane's undeniable advantages of permeability to vapor, impermeability to water and wind, and breathability.

[0024] To better understand the purpose of this invention, the attached illustration represents a preferential practical embodiment of it.

[0025] In illustrated figure - 1- shows a detailed description of the opening in the sole of the breathable and impermeable shoe, and the positioning of the base therein.

[0026] Figure - 2 - shows a detailed cross-section of the breathable and impermeable base's placement over the sole of the breathable and impermeable shoe.

[0027] The illustration in figure - 3 - shows the breathable and impermeable base especially adapted to be inserted into the shoe's sole, in top/bottom view, profile, and cross-section detail.

[0028] Figure - 4 - shows a breathable and impermeable sports shoe with the base inserted into the side panel.

[0029] Figure - 5 - shows a breathable and impermeable shoe with the base inserted into the side panel, and a detail of the sheath which covers it.

[0030] Figure - 6 - shows a breathable and impermeable sports shoe with the base inserted into the side panel, reflecting a variety of shapes.

[0031] Figure - 7 - shows a breathable and impermeable sports shoe with the base inserted into the side panel and the upper part of the shoe's body.

[0032] Figure - 8 - shows the breathable and impermeable base especially adapted for insertion into the side panel openings.

[0033] Figure - 9 - shows a cross-section detail of the breathable and impermeable base for insertion into the side panel openings.

[0034] The breathable and impermeable shoe (1) which is the substance of this invention is characterized by the incorporation of a breathable and impermeable base (2) especially adapted for insertion into the shoe's sole, and/or a breathable and impermeable base (3) especially adapted for insertion into the shoe's body (1), preferably in the side panels.

[0035] The breathable and impermeable base (2) is inserted into an opening (4) made in the shoe's sole (1) and attached in place with contact glue around its entire perimeter. The area of the shoe's sole (1) which coincides with the breathable and impermeable base (2) also has perforations (5), to allow effective breathing.

[0036] The inside area of the breathable and impermeable shoe (1) has a layer (6) which will remain in contact with the user's foot; it has perforations (5) in the area coinciding with the breathable and impermeable base (2).

[0037] The breathable and impermeable base (2) comprises a membrane (7) injected over an elastomer or derivative thereof (8), giving it an oval shape of a certain width around its entire periphery (9), having centered equidistant rectangular perforations (10), over horizontal bands (11) over which the layer (6) located in the inside of the breathable and impermeable shoe (1) will subsequently be placed.

[0038] The breathable and impermeable base (3) is inserted into an opening (12) made in the side panel of the shoe (1) and attached in place with contact glue or sewn around its entire perimeter; its perforated side (16) is visible while the inside of the breathable and impermeable shoe (1) is covered with a perforated sheath (13) to avoid direct contact between the foot and the membrane (7).

[0039] The breathable and impermeable shoe (3) comprises a membrane (7) injected over an elastomer or derivative thereof (13), which is given a shape of a certain width around its entire perimeter (14), and has centered regular perforations (15). The membrane (7) is located at the back end of the elastomer or derivative thereof (13) and is attached in place entirely in the area of its periphery (14) through the use of a high-strength adhesive.

[0040] We voluntarily omit a detailed description of the rest of the system's unique features or those of its components, since we consider that the remaining unique features cannot be claimed.

[0041] Having provided a sufficient description of this invention's nature, as well as how it is to be put into practice, we must only add that its description is not limiting and the invention allows for variations in both the materials and the shapes, sizes, or devices. We remark that the base, visible on the outside of the shoe, can take any shape to satisfy the shoe manufacturer's aesthetic requirements, and emblems, logos, or trademarks can be reproduced on it without impairing its effectiveness.

Claims

1. A breathable and impermeable shoe, suitable for use by men, women, and children, and preferably for sport use, **characterized by** the incorporation of a breathable and impermeable base (2) made of an elastomer (2), which base (2) is especially adapted for insertion into the shoe's sole (1), and/or a breathable and impermeable base (3) made of an elastomer, which base (3) is especially adapted for insertion into the shoe's body (1), preferably in the side panels, thereby providing greater comfort and hygiene to the user.

2. A breathable and impermeable shoe as indicated in claim 1, **characterized by** the insertion of the breathable and impermeable base (2) into an opening (4) made in the shoe's sole (1), attached in place with contact glue around its entire periphery and incorporating perforations (5) in the area of the shoe's sole (1) where it coincides with the breathable and impermeable base (2).

3. A breathable and impermeable shoe as indicated in claim 2, **characterized by** the presence in the inside of the breathable and impermeable shoe (1) of a layer (6) which will remain in contact with the user's foot, having perforations (5) in the area of contact with the breathable and impermeable base (2).

4. A breathable and impermeable shoe as indicated in claims 2 and 3, **characterized by** the composition of the breathable and impermeable base (2) as a membrane (7) injected over an elastomer or a derivative thereof (8), giving it an oval shape of a certain width around its entire periphery (9), having centered equidistant rectangular perforations (10).

5. A breathable and impermeable shoe as indicated in claims 2, 3, and 4, **characterized by** the full attachment of the membrane (7) over the perimeter area (10) and over horizontal bands (11), over which the layer (6) located in the interior of the breathable and impermeable shoe (1) will subsequently be placed.

6. A breathable and impermeable shoe as indicated in claim 1, **characterized by** the insertion of the breathable and impermeable base (3) into an opening (12) made in the side panel of the shoe (1), attached in place by contact glue or sewn around its entire perimeter, with the perforated part thereof (6) visible while the inside of the breathable and impermeable shoe (1) is covered by a perforated sheath (13) to prevent direct contact between the foot and the membrane (7).

7. A breathable and impermeable shoe as indicated in claim 6, **characterized by** the composition of the breathable and impermeable base (3) by a membrane (7) injected over an elastomer or derivative thereof (13) which is given a shape of a certain width around its entire periphery (14), having centered regular perforations (15).

8. A breathable and impermeable shoe as indicated in claims 6 and 7, **characterized by** the location of the membrane (7) at the back end of the elastomer or derivative thereof (13), entirely attached in place in the area of its periphery (14) through the use of a high-strength adhesive.

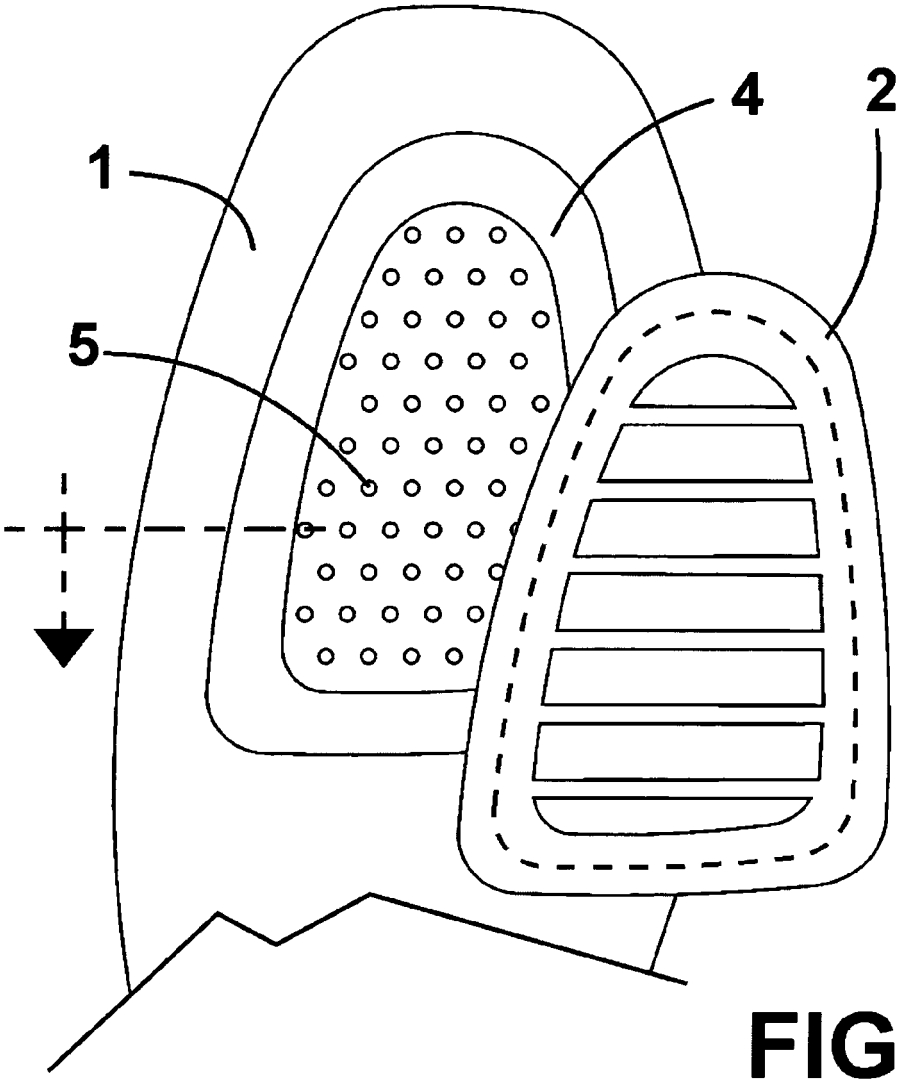

FIG.1

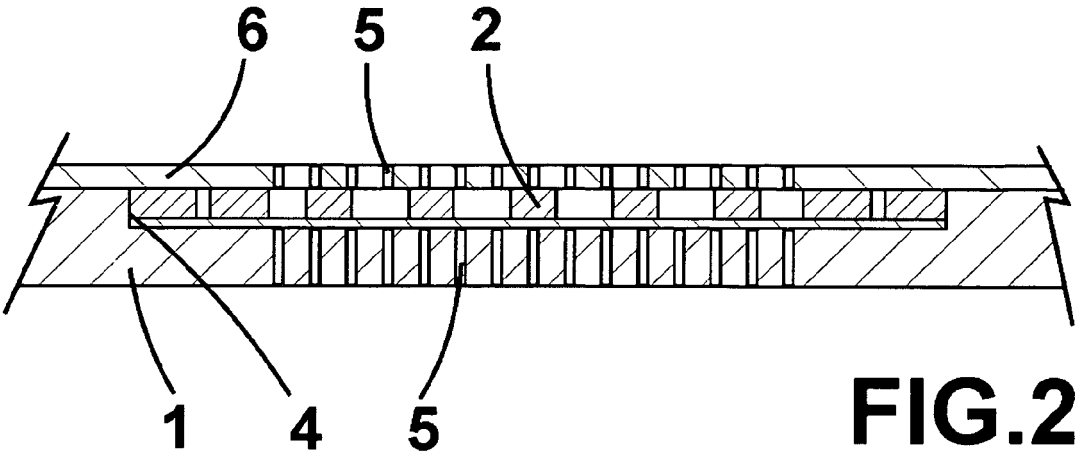

FIG.2

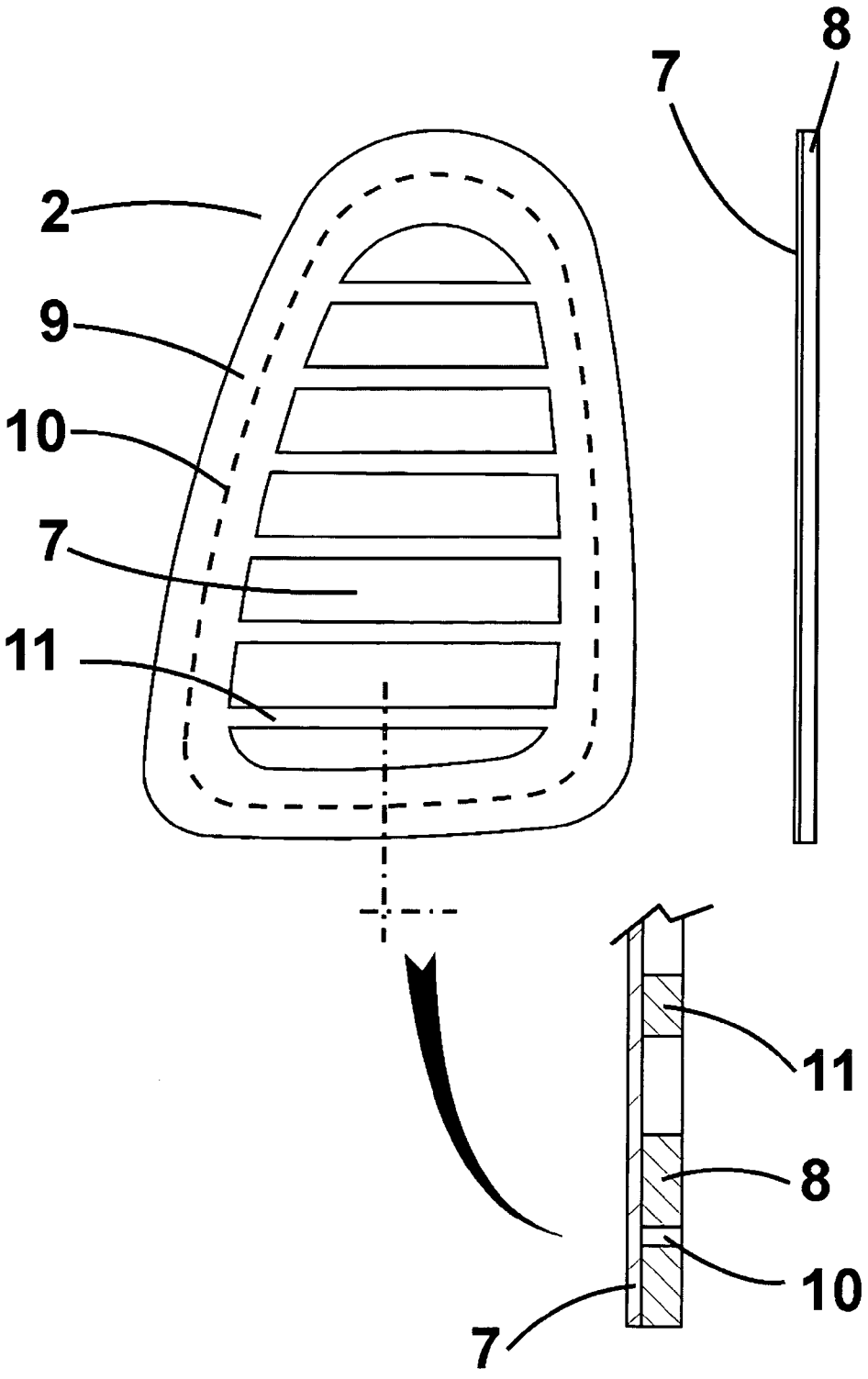

FIG.3

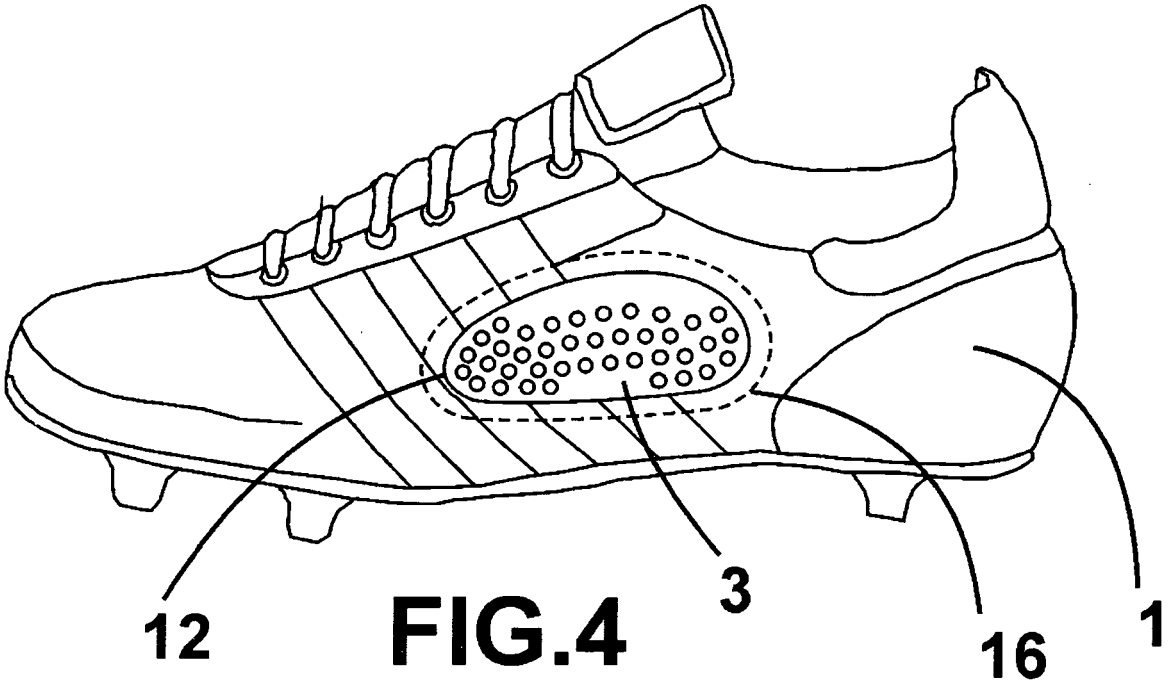

FIG.4

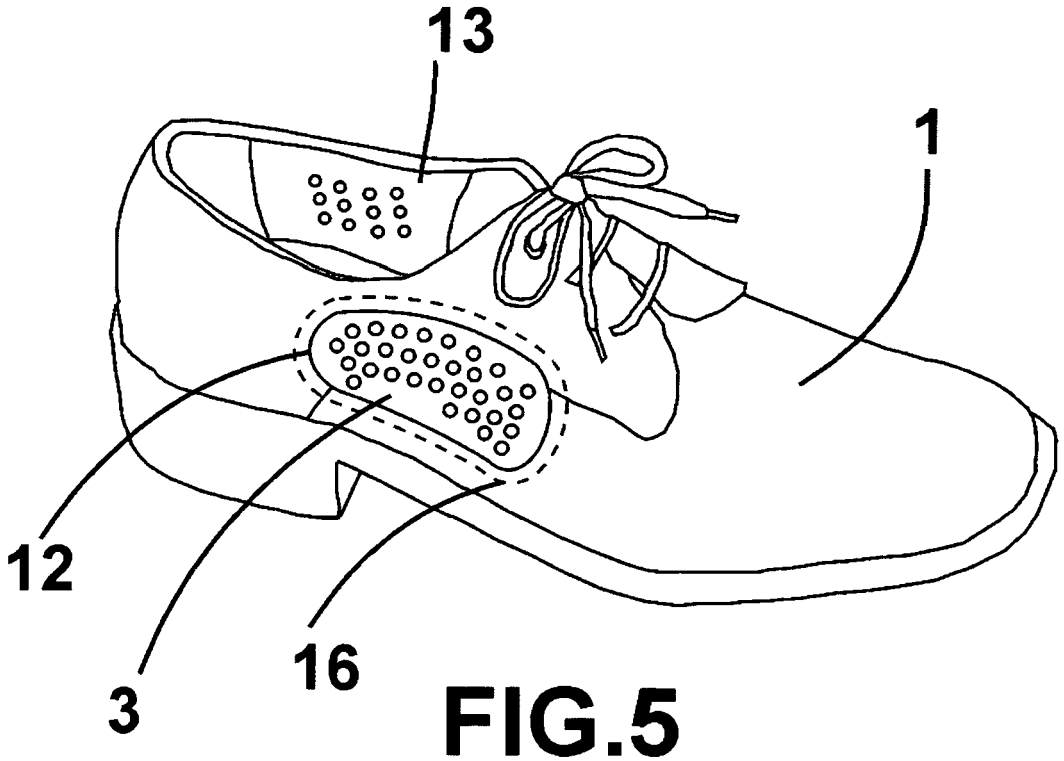

FIG.5

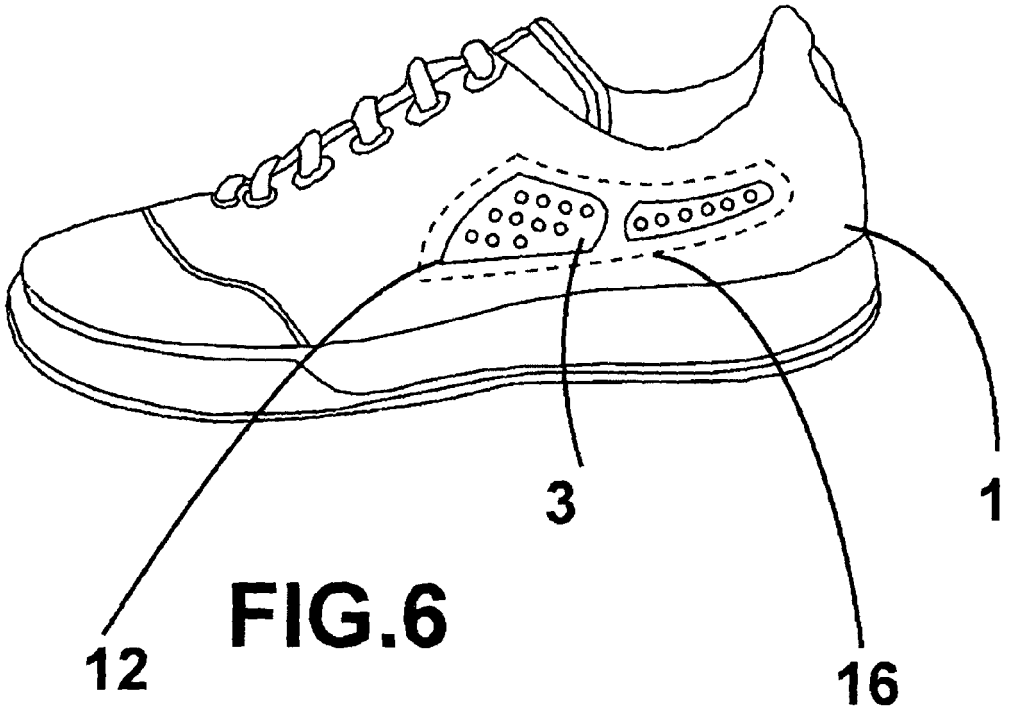

FIG.6

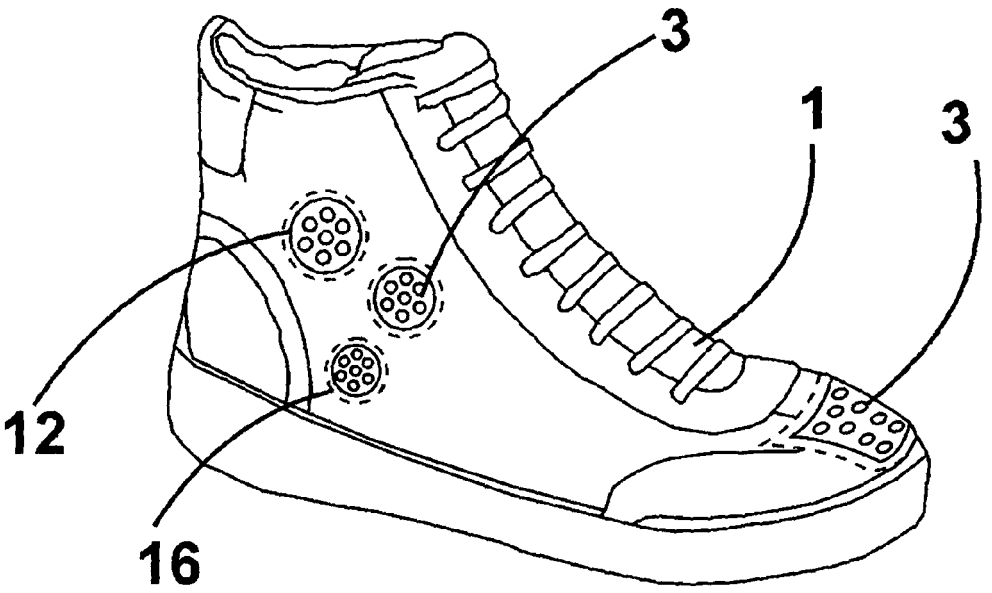

FIG.7

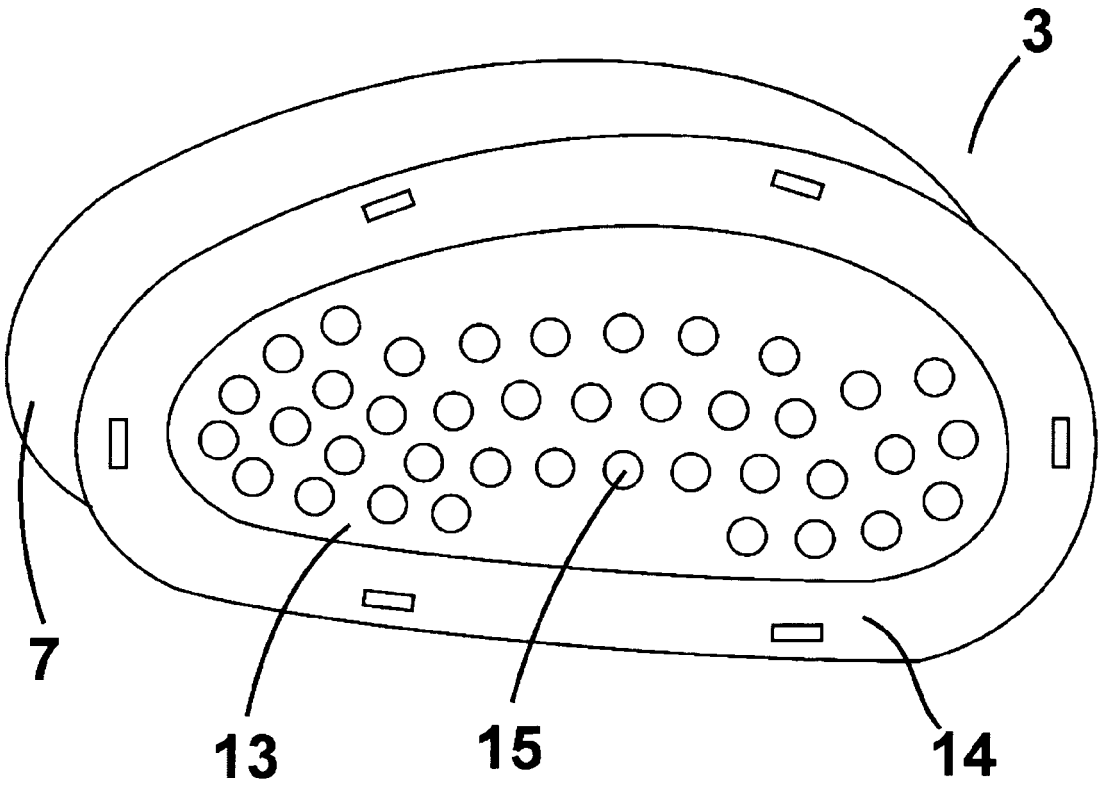

FIG.8

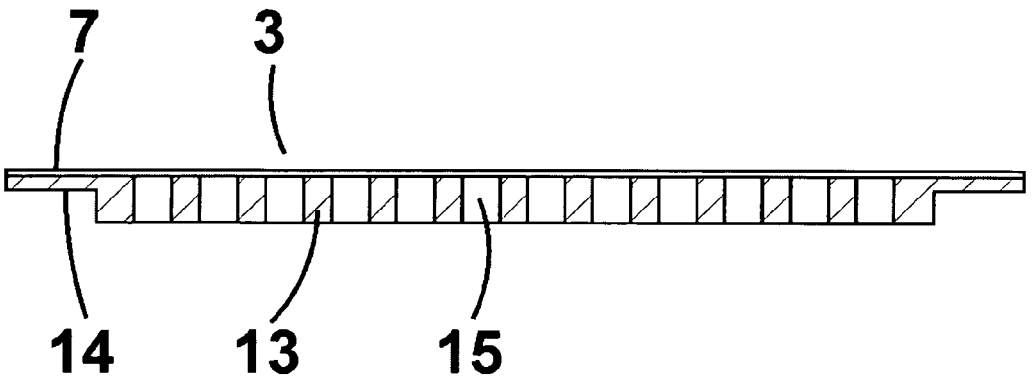

FIG.9

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EUROPEAN SEARCH REPORT

Application Number
EP 06 01 5808

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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
Munich	8 November 2006	Vesin, Stéphane

CATEGORY OF CITED DOCUMENTS

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