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## Description

The present invention relates to a sole structure for footwear.

The current widespread use of footwear with soles made of synthetic material or rubber is known (GB-A- 1407 372).

Such footwear has undoubted advantages from the point of view of production and economy as well as from the point of view of being very practical in use.

The soles are in fact waterproof, wear-resistant, antislip, and can be produced in various shapes with desirable aesthetic effects, as well as being easy to use and economical.

However, such known types of soles have a considerable disadvantage, which resides in the fact that no outward transpiration of the sole of the foot is allowed, causing discomfort for the user or even giving rise to the condition known as "athlete's foot".

The aim of the present invention is to provide a sole structure made of synthetic material or rubber, which is produced in such a manner as to allow the transpiration of the foot despite being waterproof.

A consequent primary object of the invention is to provide a sole structure which has the same advantages as those currently commercially available, as well as being waterproof and allowing transpiration.

Another important object of the invention is to provide a sole structure which can be manufactured at low cost and which can therefore be sold at a competitive price.

A further object of the invention is to provide a sole structure which can be manufactured with known devices and methods.

A not least object of the invention is to increase the user's comfort.

This aim, these objects and others which will become apparent hereinafter are achieved by a sole structure for footwear, comprising at least one lower part having a tread, a plurality of micro-pores traversing the thickness of said at least one lower part and being covered by at least one membrane made of waterproof microporous material capable of permitting transpiration, and at least one upper part attached to said lower part and having through holes which traverse its thickness.

Further characteristics and advantages of the invention will become apparent from the detailed description of a preferred embodiment thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a longitudinal sectional view of a preferred embodiment of the parts which compose the sole structure according to the invention;

figure 2 is an exploded view of a sole structure according to the invention;

figure 3 is a longitudinal sectional view of the sole structure according to the invention when assembled.

With reference to the above described figures, a sole structure for footwear according to the invention, which permits transpiration while being waterproof, is generally indicated by the reference numeral 1 and essentially comprises a lower part 2, with a tread 3, made of synthetic material or rubber or similar material and provided with a series of fine holes or micro-pores 4 which traverse its thickness and are conveniently arranged in its inner regions.

A waterproof microporous membrane 5, which permits transpiration, is arranged above said part 2. The membrane 5 is preferably made of material such as the material known by the Trade Mark "Gore-Tex" or another equivalent material.

The structure is completed by an upper part 6 on which the foot rests. The upper part is attached to the lower part 2 and has a series of holes 7 which traverse its thickness.

Said upper part 6 is also made of synthetic material or rubber or similar material and is assembled and coupled to the upper part 2 in the regions which are not affected by said microporous membrane 5.

The structure according to the invention can be manufactured by means of current methods without any difficulty. The assembly of the lower part 2 and the upper part 6 must be effected to finally form a monolithic structure so as to prevent the infiltration of water through the joint defined between the two parts.

The fact should furthermore be stressed that during assembly, no adhesive or other material must affect the regions provided with micro-pores 4, with the holes 7 and the regions occupied by the membrane 5.

Examples of methods usable to produce the structure of sole according to the invention can be injection-molding or press-glueing.

In the case of injection moulding, once the lower part 2 is injected into the mold, the membrane 5 can be positioned and the upper part 6 can then be injected.

The resultant structure is monolithic and the microporous membrane 5 is embedded therein.

In the case of press-glueing, the lower part 2 and the upper part 6 are molded beforehand and are subsequently coupled by means of adhesives after interposing said membrane 5.

The final result is a structure which, by virtue of the presence of the membrane, is waterproof in one direction while allowing the foot to transpire, through the various perforations and the mem-

brane, in the opposite direction.

In practice it has thus been observed that the invention has brilliantly achieved the intended aim and objects, a sole structure having been provided which can be produced with current methods and devices and is suitable for achieving a greater comfort of the foot by permitting transpiration while remaining waterproof, thereby completely eliminating the main disadvantage of known sole structures.

The invention thus conceived is susceptible to numerous modifications and variations, all of which are within the scope of the inventive concept; all the details may furthermore be replaced with technically equivalent elements.

In practice, any materials, shapes and dimensions may be employed, providing that they are compatible with contingent requirements and the intended use.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

#### Claims

1. Sole structure for footwear, comprising at least one lower part (2) having a thread (3) and at least one upper part (6) attached to said lower part (2), characterized in that said lower part (2) has a plurality of micro-pores (4) traversing its thickness and is covered by at least one membrane (5) made of microporous waterproof material capable of permitting transpiration, and said upper part (6) is attached to said lower part (2) and has through holes (7) which traverse its thickness.
2. Sole structure according to claim 1, characterized in that said micro-pores extend on the entire extension of said lower part or only on a part thereof.
3. Sole structure according to claim 1, characterized in that the material which constitutes said membrane is preferably of the kind commonly termed "Gore-Tex" or of another equivalent kind of material.
4. Sole structure according to claim 1, characterized in that said through holes are arranged on the entire extension of the upper part or only on a part thereof.
5. Sole structure according to one or more of the preceding claims, characterized in that said lower and upper parts are assembled with the interposition of said membrane so as to form a monolithic body with no fissures in the coupling regions.
6. Sole structure according to one or more of the preceding claims, characterized in that the coupling between said parts can be effected by a method selected from among injection-molding and glueing together previously molded parts, regions affected by said micropores being unaffected by materials used for effecting coupling of said parts.

#### Patentansprüche

1. Sohlenaufbau für Schuhwerk, welcher wenigstens einen unteren Teil (2), welcher eine Trittfläche (3) hat, und wenigstens einen oberen Teil (6) aufweist, welcher an dem unteren Teil (2) angebracht ist, **dadurch gekennzeichnet**, daß der untere Teil (2) eine Mehrzahl von Mikroporen (4) hat, welche die Dicke desselben durchsetzen, und der durch wenigstens eine Membrane (5) bedeckt ist, welche aus mikroporösem, wasserdichtem Material hergestellt ist, welche eine Transpiration gestattet, und daß der obere Teil (6) an dem unteren Teil (2) angebracht ist und die Dicke durchsetzende Durchgangsöffnungen (7) hat.
2. Sohlenaufbau nach Anspruch 1, **dadurch gekennzeichnet**, daß die Mikroporen auf der gesamten Erstreckung des unteren Teils oder nur an einem Teil desselben verlaufen.
3. Sohlenaufbau nach Anspruch 1, **dadurch gekennzeichnet**, daß das Material, welches die Membrane bildet, vorzugsweise ein solches ist, welches im allgemeinen mit "Gore-Tex" bezeichnet wird, oder daß sie aus einem anderen Material äquivalenter Art hergestellt ist.
4. Sohlenaufbau nach Anspruch 1, **dadurch gekennzeichnet**, daß die Durchgangsöffnungen auf der gesamten Erstreckung des oberen Teils oder nur an einem Teil desselben angeordnet sind.
5. Sohlenaufbau nach einem oder mehreren der vorangehenden Ansprüche, **dadurch gekennzeichnet**, daß der untere und der obere Teil unter Zwischenlage der Membrane derart angeordnet sind, daß ein monolithischer Körper ohne Nähte in den Verbindungsbereichen gebildet wird.

6. Sohlenaufbau nach einem oder mehreren der vorangehenden Ansprüche, **dadurch gekennzeichnet**, daß die Verbindung zwischen den Teilen gemäß einer Methode erfolgen kann, welche aus der Gruppe gewählt ist, die das Spritzgießen und das Zusammenkleben der vorgeformten Teile umfaßt, wobei die Bereiche mit den Mikroporen durch Materialien unbeeinflusst sind, die für die Herstellung der Verbindung der Teile eingesetzt werden.

moulées, les régions dans lesquelles se situent les micropores n'étant pas affectées par les matières utilisées pour réaliser l'assemblage desdites parties.

## Revendications

1. Structure de semelle pour chaussure comprenant au moins une partie inférieure (2) ayant une surface d'usure (3) et au moins une partie supérieure (6) fixée sur la partie inférieure (2), caractérisée en ce que la partie inférieure (2) présente une pluralité de micropores (4) traversant son épaisseur et en ce qu'elle est recouverte par au moins une membrane (5) fabriquée en matière microporeuse étanche à l'eau susceptible de permettre la transpiration, et en ce que la partie supérieure (6) est fixée sur la partie inférieure (2) et présente des orifices (7) qui traversent toute son épaisseur.
2. Structure de semelle selon la revendication 1, caractérisée en ce que les micropores s'étendent sur toute la surface de la partie inférieure ou uniquement sur une région de cette partie.
3. Structure de semelle selon la revendication 1, caractérisée en ce que la matière qui constitue la membrane est, de préférence, du type communément désigné sous le nom de "Gore-Tex" ou d'un autre type de matière équivalente.
4. Structure de semelle selon la revendication 1, caractérisée en ce que lesdits orifices traversants sont disposés sur toute la surface de la partie supérieure ou uniquement sur une région de cette dernière.
5. Structure de semelle selon l'une ou plusieurs des revendications précédentes, caractérisée en ce que les parties supérieure et inférieure sont assemblées avec interposition de la membrane de façon à constituer un élément monolithique sans fissure dans les régions d'assemblage.
6. Structure de semelle selon l'une ou plusieurs des revendications précédentes, caractérisée en ce que l'assemblage entre les parties peut être effectué soit par moulage par injection soit par collage de deux parties préalablement

