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(54) **SOLE STRUCTURE HAVING DISTINGUISHED THREE-DIMENSIONAL PATTERNS**
SOHLENSTRUKTUR MIT HERVORRAGENDEN DREIDIMENSIONALEN MUSTERN
STRUCTURE DE SEMELLE AYANT DES MOTIFS TRIDIMENSIONNELS DISTINCTIFS

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EP 3 338 581 B1

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a sole structure which has distinguished three-dimensional patterns and abrasion resistance.

BACKGROUND OF THE INVENTION

[0002] A conventional shoe sole is not waterproof and is abraded easily, thus decreasing service life. Furthermore, the conventional shoe sole fades easily after a period of using time.

[0003] An improved sole structure is disclosed in TW Publication No. 00583919 and contains a body and a thermoplastic polyurethane urethane (TPU) film which adheres with the body, after the TPU film is hot pressed and melts. However, when the body has a bumpy outer surface or patterns, the TPU film cannot matingly adhere with the body, hence gaps produce between the TPU film and the body, and water flows into the gaps easily. Furthermore, the TPU film is so thick that the improved sole structure cannot have distinguished patterns.

[0004] The present invention has arisen to mitigate and/or obviate the afore-described disadvantages.

[0005] US 4 026 044 A discloses a sole structure with a body formed in a foam molding manner, and at least one layer.

SUMMARY OF THE INVENTION

[0006] The primary objective of the present invention is to provide a sole structure which has distinguished three-dimensional patterns and abrasion resistance.

[0007] Another objective of the present invention is to provide a sole structure which is water proof and avoids air trap.

[0008] To obtain the above-mentioned objectives, a sole structure as specified in appended independent claim 1 is provided. Preferred embodiments of the invention are disclosed in the dependent claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009]

FIG. 1 is a perspective view showing the exploded components of a sole structure according to a preferred embodiment of the present invention.

FIG. 2 is a perspective view showing the assembly of the sole structure according to the preferred embodiment of the present invention.

FIG. 3 is a cross sectional view showing the operation of the sole structure according to the preferred embodiment of the present invention.

FIG. 4 is another cross sectional view showing the operation of the sole structure according to the pre-

ferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0010] With reference to FIGS. 1-4, a sole structure according to a preferred embodiment of the present invention comprises: a body 10 and at least one external layer 20.

[0011] The body 10 is formed in a foam molding manner (such as infusion foaming, fill foaming, hot press foaming or injection foaming manner) and corresponds to human foot, and the body 10 includes multiple three-dimensional ribs 11 and at least one three-dimensional pattern portion 12. The body 10 is made of any one of polyurethane (PU), ethylene vinyl acetate (EVA), thermoplastic polyurethane urethane (TPU), thermo plastic rubber (TPR), acrylonitrile butadiene styrene (ABS), polycarbonate (PC) and rubber.

[0012] Each of the at least one external layer 20 is an annular sheet and includes a protective part 21 arranged on an outer wall thereof and includes a connection part 22 arranged on an inner wall of each external layer 20. The protective part 21 is made of any one of fabric, artificial leather, rubber film, plastic film, color film and animal leather (such as ostrich skin), and the connection part 22 is hot melt adhesive which is heated to melt and to adhere with an inner wall of the body 10. The connection part 22 has multiple raised portions 23 formed on an inner wall thereof, and each of the multiple raised portions 23 is any one of a ball, an elongated strip, and a protrusion. Thereby, each external layer 20 is fixed on the body 10 and is heated and vacuumed so as to matingly adhere with the multiple three-dimensional ribs 11 and the at least one three-dimensional pattern portion 12. A thickness of the protective part 21 is at least 10 μ m (micrometre), and a hardness of the protective part 21 is Shore A30 to Shore D72, wherein the protective part 21 is heated by using an electric heater or a hot air heater. In this embodiment, each external layer 20 is in a U shape or in a sheet shape.

[0013] Referring to FIG. 3, when each external layer 20 is fixed on the body 10 and is heated and vacuumed, the multiple raised portions 23 abut against the body 10 so that multiple channels 24 are formed between the connection part 22 and the body 10, wherein the multiple channels 24 are in communication with one another, hence when the multiple raised portions 23 melt after being heated, air in the multiple channels 24 are vacuumed so that each external layer 20 matingly adheres with the multiple three-dimensional ribs 11 and the at least one three-dimensional pattern portion 12, thus avoiding air trap in the sole structure. Preferably, distinguished three-dimensional patterns produce between each external layer 20 and the body 10, as shown in FIG. 4.

[0014] In addition, the sole structure of the present invention is waterproof and has abrasion resistance by way

of each external layer 20.

[0015] While the preferred embodiments of the invention have been set forth for the purpose of disclosure, modifications of the disclosed embodiments of the invention as well as other embodiments thereof may occur to those skilled in the art.

Claims

1. A sole structure comprising:

a body (10) formed in a foam molding manner and corresponding to human foot, and the body (10) including multiple three-dimensional ribs (11) and at least one three-dimensional pattern portion (12);

at least one external layer (20), each of the at least one external layer (20) including a protective part (21) arranged on an outer wall thereof, and each external layer (20) also including a connection part (22) arranged on an inner wall of each external layer (20);

wherein the connection part (22) is heated to melt and to adhere with an inner wall of the body (10), and each external layer (20) is fixed on the body (10) and is heated and vacuumed so as to matingly adhere with the multiple three-dimensional ribs (11) and the at least one three-dimensional pattern portion (12);

wherein the protective part (21) is made of any one of fabric, artificial leather, rubber film, plastic film, color film and animal leather;

wherein the connection part (22) is hot melt adhesive;

wherein the connection part (22) has multiple raised portions (23) formed on an inner wall thereof, and each of the multiple raised portions (23) is any one of a ball, an elongated strip, and protrusion;

wherein when each external layer (20) is fixed on the body (10), the multiple raised portions (23) abut against the body (10) so that multiple channels (24) are formed between the connection part (22) and the body (10), wherein the multiple channels (24) are in communication with one another, and when the multiple raised portions (23) melt after being heated, air in the multiple channels (24) is vacuumed so that each external layer (20) matingly adheres with the multiple three-dimensional ribs (11) and the at least one three-dimensional pattern portion (12).

2. The sole structure as claimed in claim 1, wherein the foam molding manner is any one of infusion foaming manner, fill foaming manner, hot press foaming manner, and injection foaming manner.

3. The sole structure as claimed in claim 1, wherein each external layer (20) is an annular sheet.

4. The sole structure as claimed in claim 1, wherein each external layer (20) is in a U shape.

5. The sole structure as claimed in claim 1, wherein each external layer (20) is in a sheet shape.

Patentansprüche

1. Sohlenstruktur, Folgendes umfassend:

einen Körper (10), der durch Schaumstoffformen gebildet worden ist und einem menschlichen Fuß entspricht, wobei der Körper (10) mehrere dreidimensionale Rippen (11) und mindestens einen Abschnitt (12) mit dreidimensionalem Muster beinhaltet,

mindestens eine äußere Schicht (20), wobei jede der mindestens einen äußeren Schicht (20) einen Schutzteil (21) beinhaltet, der an deren Außenwand angeordnet ist, und jede äußere Schicht (20) außerdem einen Verbindungsteil (22) beinhaltet, der an einer Innenwand jeder äußeren Schicht (20) angeordnet ist,

wobei der Verbindungsteil (22) erwärmt wird, um zu schmelzen und sich an eine Innenwand des Körpers (10) anzuhafte, und jede äußere Schicht (20) an dem Körper (10) befestigt ist und derart erwärmt und unter Unterdruck gesetzt wird, dass sie passgenau an den mehreren dreidimensionalen Rippen (11) und dem mindestens einen Abschnitt (12) mit dreidimensionalem Muster haftet,

wobei der Schutzteil (21) aus einer Textilie, Kunstleder, Kautschukfolie, Kunststoffolie, Farbfolie oder echtem Leder besteht,

wobei der Verbindungsteil (22) Heißkleber ist, wobei der Verbindungsteil (22) mehrere erhöhte Abschnitte (23) aufweist, die an seiner Innenwand gebildet sind, und jeder der mehreren erhöhten Abschnitte (23) eine Kugel, ein länglicher Streifen oder ein Vorsprung ist,

wobei die mehreren erhöhten Abschnitte (23), wenn jede äußere Schicht (20) an dem Körper (10) befestigt ist, derart an dem Körper (10) anliegen, dass mehrere Kanäle (24) zwischen dem Verbindungsteil (22) und dem Körper (10) gebildet sind, wobei die mehreren Kanäle (24) miteinander in Verbindung stehen und, wenn die mehreren erhöhten Abschnitte (23) schmelzen, nachdem sie erwärmt wurden, Luft in den mehreren Kanälen (24) unter Unterdruck steht, so dass jede äußere Schicht (20) passgenau an den mehreren dreidimensionalen Rippen (11) und dem mindestens einen Abschnitt (12) mit

dreidimensionalem Muster haftet.

2. Sohlenstruktur nach Anspruch 1, wobei das Schaumstoff-Formen Infusionsschäumen, Füllschäumen, Heißpressschäumen oder Schaumstoff-Spritzgießen ist. 5
3. Sohlenstruktur nach Anspruch 1, wobei jede äußere Schicht (20) eine ringförmige Bahn ist. 10
4. Sohlenstruktur nach Anspruch 1, wobei jede äußere Schicht (20) in U-Form vorliegt.
5. Sohlenstruktur nach Anspruch 1, wobei jede äußere Schicht (20) in einer Bahnform vorliegt. 15

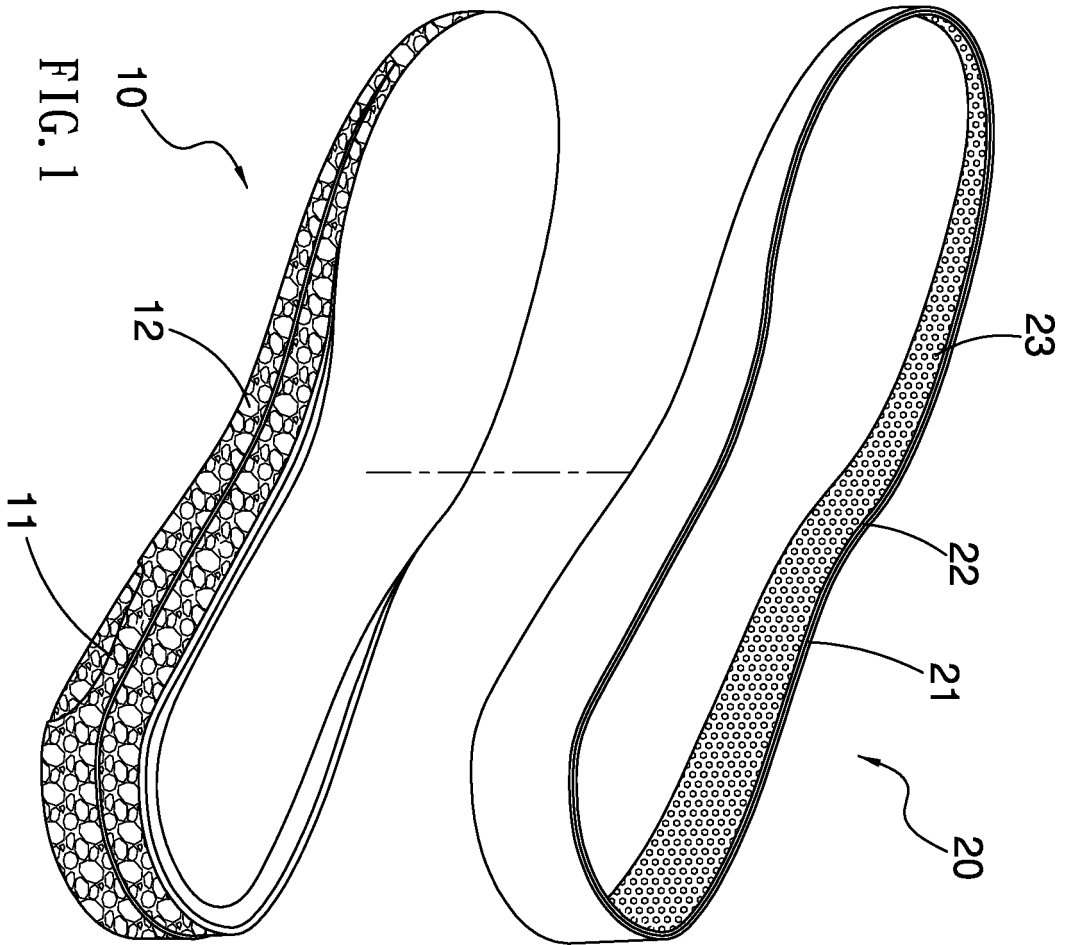
Revendications

1. Structure de semelle comprenant : 20

un corps (10) formé par moulage de mousse et correspondant à un pied humain, et le corps (10) comprenant de multiples nervures tridimensionnelles (11) et au moins une partie de motif tridimensionnel (12) ;
 au moins une couche externe (20), chacune parmi l'au moins une couche externe (20) comprenant une partie de protection (21) disposée sur une paroi externe de celle-ci, et chaque couche externe (20) comprenant également une partie de liaison (22) disposée sur une paroi interne de chaque couche externe (20) ;
 la partie de liaison (22) étant chauffée pour fondre et adhérer à une paroi interne du corps (10), et chaque couche externe (20) étant fixée sur le corps (10) et étant chauffée et vidée de façon à adhérer de manière correspondante aux multiples nervures tridimensionnelles (11) et à l'au moins une partie de motif tridimensionnel (12) ;
 la partie de protection (12) étant faite de l'un quelconque parmi un tissu, un cuir artificiel, un film de caoutchouc, un film de matière plastique, un film coloré et un cuir animal ;
 la partie de liaison (22) étant un adhésif thermofusible ;
 la partie de liaison (22) ayant de multiples parties en relief (23) formées sur une paroi interne de celle-ci, et chacune des multiples parties en relief (23) étant l'une quelconque parmi une bille, une bande allongée et une saillie ;
 lorsque chaque couche externe (20) est fixée sur le corps (10), les multiples parties en relief (23) étant en butée contre le corps (10) de telle sorte que de multiples canaux (24) sont formés entre la partie de liaison (22) et le corps (10), les multiples canaux (24) étant en communication les uns avec les autres et, lorsque les mul-

tiples parties en relief (23) fondent après avoir été chauffées, de l'air dans les multiples canaux (24) étant évacué de telle sorte que chaque couche externe (20) adhère de manière correspondante aux multiples nervures tridimensionnelles (11) et à l'au moins une partie de motif tridimensionnel (12).

2. Structure de semelle selon la revendication 1, dans laquelle le moulage de mousse est l'un quelconque parmi le moussage par infusion, le moussage par remplissage, le moussage par presse à chaud et le moussage par injection.
3. Structure de semelle selon la revendication 1, dans laquelle chaque couche externe (20) est une feuille annulaire.
4. Structure de semelle selon la revendication 1, dans laquelle chaque couche externe (20) est en forme de U.
5. Structure de semelle selon la revendication 1, dans laquelle chaque couche externe (20) est en forme de feuille.



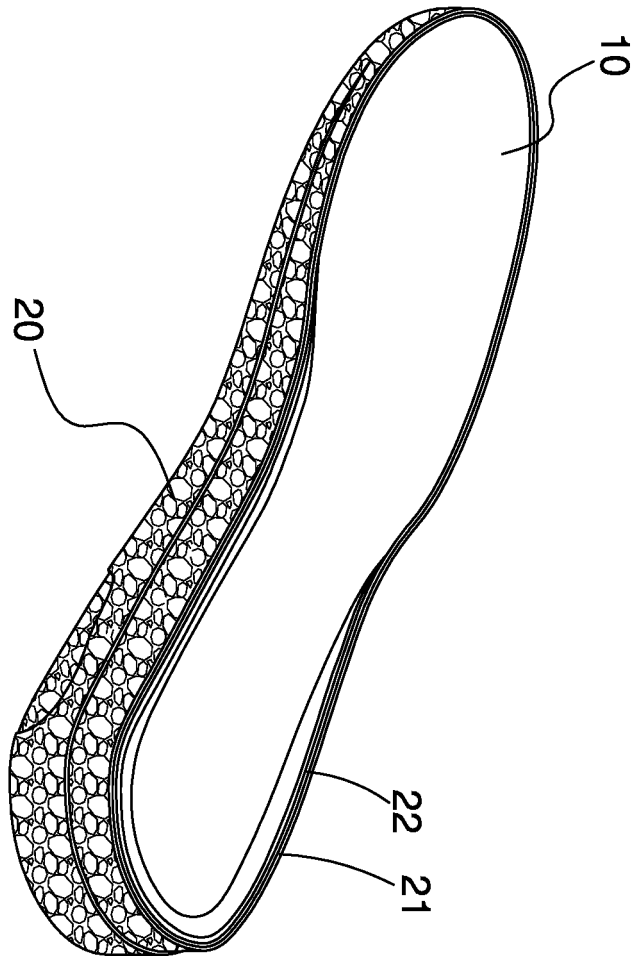


FIG. 2

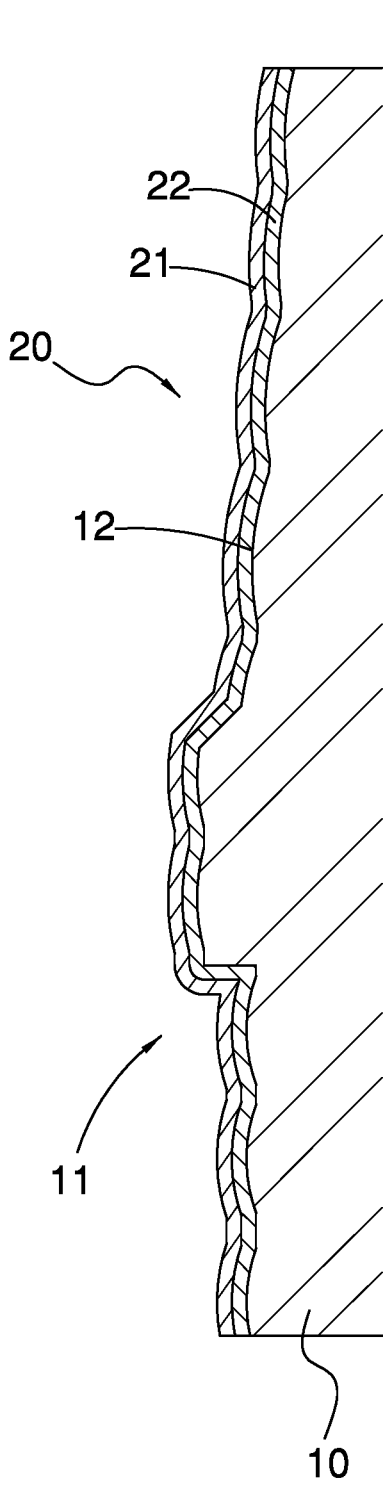


FIG. 4

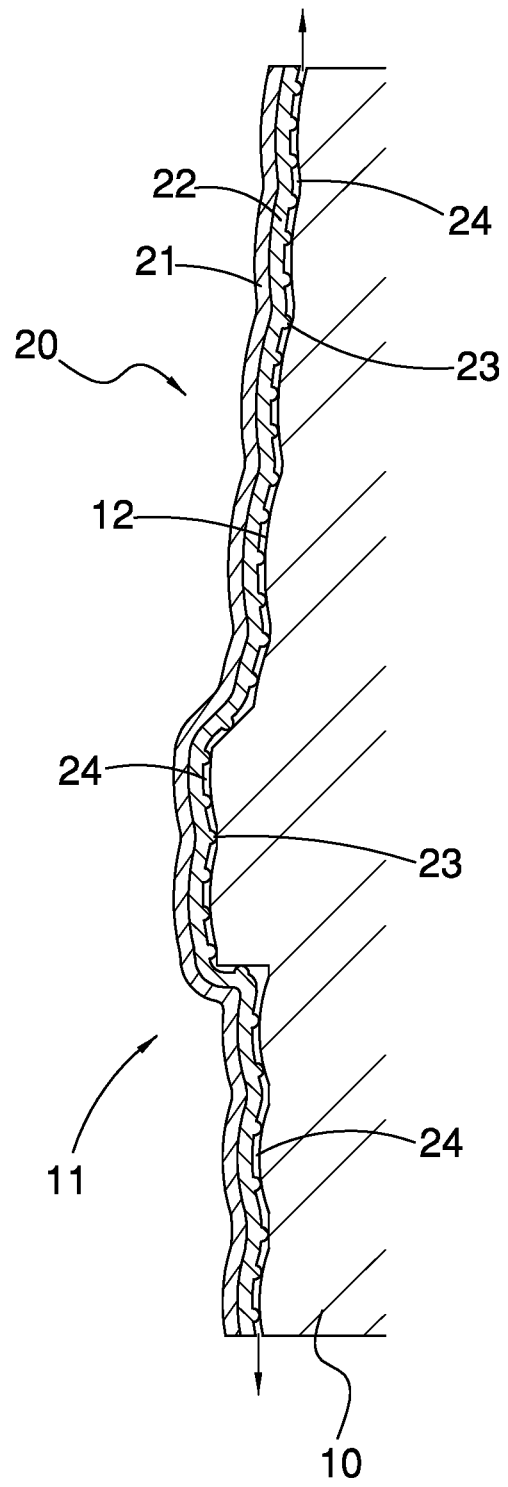


FIG. 3

REFERENCES CITED IN THE DESCRIPTION

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