

(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

EP 0 959 705 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

17.12.2003 Bulletin 2003/51

(21) Application number: **96923995.3**

(22) Date of filing: **12.07.1996**

(51) Int Cl.7: **A43B 13/38**, A43B 13/12

(86) International application number:
PCT/FI96/00413

(87) International publication number:
WO 9700/2764 (30.01.1997 Gazette 1997/06)

(54) **METHOD FOR MANUFACTURING A SHOE INSOLE**

VERFAHREN ZUR HERSTELLUNG EINER BRANDSOHLE

METHODE DE FABRICATION D'UNE PREMIERE DE CHAUSSURE

(84) Designated Contracting States:
DE DK SE

(30) Priority: **12.07.1995 FI 953404**

(43) Date of publication of application:
01.12.1999 Bulletin 1999/48

(73) Proprietor: **Lenkki Oy**
38710 Kankaanpää (FI)

(72) Inventor: **LAAKSONEN, Reijo**
FIN-38710 Kankaanpää (FI)

(74) Representative: **Hakola, Unto Tapani**
Tampereen Patenttitoimisto Oy,
Hermiankatu 12B
33720 Tampere (FI)

(56) References cited:
US-A- 2 767 490 **US-A- 3 835 558**
US-A- 4 602 442

EP 0 959 705 B1

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

[0001] The invention relates to a method for manufacturing a shoe insole which comprises an insole blank and a model piece attached thereto.

[0002] Document US-A-2 767 490 shows a slip sole which does not give a shape to the footwear sole but rather is shaped by the sole when put inside a shoe.

[0003] An essential part of the footwear sole construction is the insole which gives the desired form to the inner sole of the shoe. In such insole it is customary to use an uppermost insole blank made of cellulose-based special material, and a special model piece attached underneath the insole blank. The model piece has a spring part between it and the lower surface of the insole blank, the spring part providing the insole with sufficient rigidity and the right form. Conventionally, a hard paper board manufactured by using a special method has been used as the model piece, this board tapering off towards the front end in order to form a regularly curved lower surface together with the insole blank.

[0004] Although the board material of the model piece remains inside the shoe, it will, however, be subject to ambient conditions in long-term use. Cellulose contained in the board tends to absorb humidity, which is apt to deteriorate its strength and consequently the entire construction of the shoe. It is even possible that the spring part which is attached mechanically to the model piece comes loose. Furthermore, when fastening the heel nails into the model piece it is required to use a separate metal piece between the insole blank and the model piece to support the nail heads. The ability to shape and thin the rigid board when manufacturing the model piece is neither as good as it should be.

[0005] Document US-A-3 835 558 discloses a method where an insole is assembled from a long layer and one or more short layers in one step.

[0006] The object of the invention is to eliminate the above mentioned drawbacks and to present a method for manufacturing an insole and model piece which lack the disadvantages caused by the prior art. To attain this object, the method according to the invention is mainly characterized by the fact that the model piece is a multi-layer construction having a plastic film providing the rigidity and shape of the model piece and textile layers formed of fibres and attached on both sides of the plastic layer and the model piece is attached as said multi-layer material to the lower surface of the insole blank. The plastic film in the middle of the model piece provides the construction of the insole with rigidity and tightness. Due to the textile surfaces the model piece can be properly glued and the insole has good stretching properties both by nailing and gluing tools. Due to the plastic layer the mechanical fixing means, such as heel nails and rivets and barbs of the spring part, remain well fixed in the model piece. As raw material of the model piece it is possible to use blank having the same thickness from one end to the other, the rigidity of the blank being pro-

vided by an intermediate plastic layer. By means of this plastic layer the model piece can be molded to its final shape having substantially bending stiffness required by the shoe sole structure, which shape is curved both in longitudinal section and cross section.

[0007] The textile layers are advantageously of non-woven fabric forming a surface which is easy to handle. The fibre material of the textile layers is advantageously of synthetic plastic material which does not absorb humidity as much as cellulose fibre.

[0008] In the following, the invention is described in more detail with reference to the accompanying drawing, wherein Fig. 1 illustrates the insole of the invention in a longitudinal vertical section and Fig. 2 illustrates the same directly from the back, i.e., seen from the heel direction, and Fig. 3 illustrates the insole from the top.

[0009] The insole comprises an insole blank 2, to the lower surface of which a model piece 1 is attached. The model piece has three layers, an intermediate layer formed of plastic sheet 1b, and textile layers 1a and 1c on both sides thereof, the former of which forms the lower surface of the insole in the area where the model piece 1 is attached to the insole blank 2. The upper layer 1c forms mainly a surface which is to be attached to the lower surface of the insole blank, and on the front side thereof the upper layer of the model piece is formed of the material of the plastic sheet 1b and on the front side thereof of the material of the lower textile layer 1a because the model piece 1 is made thinner at its front end from the side of the upper layer. In the drawing there is also illustrated a metallic spring part 3 attached to the model piece 1 by rivets or other mechanical attaching means 3a, which spring part 3 remains between the model piece 1 and the insole blank 2, and by broken lines there is illustrated heel nails 4 penetrating the model piece, the heads of which nails are located in the upper surface of the model piece 1 between the model piece 1 and the insole blank 2, and they remain here well without separate support due to the mechanical endurance of the plastic sheet.

[0010] The insole blank can be of any previously known flexible material, such as material available with trade names "TEXON" and "BONTEX", which is cut to a shape required for the shoe sole.

[0011] Textile layers 1a and 1c formed of fibres can be textile constructions of several types, the fibres of which textile structures have a good gluing ability e.g. with heat-activated glues when different phases in manufacturing of insole and shoe are considered. Although no textile construction, e.g. woven fabric, is excluded, the most advantageous textile material is a non-woven fabric, i.e., non-woven, which is relatively easy to manufacture of desired fibre materials, also of mixtures of different staple fibres, and which is easy to work in different manufacturing phases. The construction fibre of the textile layers is advantageously a synthetic plastic fibre, e.g. polyester fibre. The plastic sheet 1b can be of any plastic having suitable strength values, advanta-

geously some thermoplastic plastic which can be shaped by heat, and which, when cold, regains such a rigidity that it gives the rear portion the required form when attached to the blank 2. In this situation, the insole bends only at the front part to be situated under the ball of the foot.

[0012] The model pieces can be cut in desired shapes of a ready-made sheet-like material manufactured by gluing non-woven fabric layers on both sides of a large plastic sheet, such manufacturing techniques of multi-layer materials being previously known. In the following, an example of manufacturing an insole according to the invention is given.

[0013] An insole is manufactured by combining a special model piece with normal insole materials in use. According to the need, the model piece has alternatively a material thickness of:

- 2.5 to 3.0 mm,
- 3.0 to 3.5 mm,
- 3.5 to 4.0 mm, or
- 4.0 to 4.5 mm.

[0014] The thickness of the intermediate plastic sheet can be selected according to the rigidity values characteristic to each material. The thickness is most commonly between 0.5 and 2 mm.

[0015] Model piece blanks are detached from the sheet in desired shapes by die cutting on both sides. The blanks are thinned to suitable shapes at their front edges and, if necessary, also at their sides. If needed, in each piece a groove is cut for the spring part. The spring part is attached to the piece by riveting or pressing by using attaching barbs (at both ends). The model piece, as well as the insole blank, is glued by PU-glue. The glue: surface of the model piece is dried by heat and ventilation. The dry model piece is softened by means of heat and simultaneously the PU-glue in the piece is activated. The activated model piece activated in this way is attached to its place in the insole blank and pressed together. The united insole is immediately shaped by an insole-shaping press by employing a shaping mould of the right shape, the right pressing time and pressure. The shaped insole which is sufficiently cooled is edge bevelled at the area of the model piece to the required extent by means of an edge bevelling tool. If necessary, the insole is still neatened whereafter it is ready to be packed.

[0016] A separate metal spring is not necessarily required, particularly in flat heel shoes, because the operation of the spring can then be replaced with the plastic sheet 1b having a large area.

[0017] The insole can be used in connection with footwear manufacturing in a normal manner. Thus, in the performed stretching, the upper is stretched tight at its edge to the lower surface of the insole and attached by nailing (nails penetrating the insole and clinched against the upper surface of the last), or with a gluing method.

[0018] The model piece provides the following advantages:

- good shaping ability by heat in the manufacturing of the insole,
- good shape stability under normal conditions (not when hot),
- good bending strength also at temperatures below 0°C,
- good torsional stiffness of the insole,
- manufacturing of flat heeled and wedge heeled shoes even without a spring part,
- good moisture resistance in shoes intended for difficult conditions,
- non-destructibility and hold of the spring part in the shoe,
- safe to the user (no dangerous agents are dissolved),
- good stretching properties in shoe industry, both by nailing and by gluing method.
- better preservation of heel fixation nails than with prior art model piece board (no special plates required),
- possibility to use also as a so-called nail protection in long insoles, wherein no special intermediate sole protectors are required.

Claims

1. A method for manufacturing a shoe insole giving the desired form to the inner sole of the shoe, in which method a model piece (1) is attached to the lower surface of the insole blank (2), **characterized in that** the model piece (1) is attached to the lower surface of the insole blank (1) as a ready made sheet-like multi-layer material having a plastic layer (1b) providing the rigidity and shape of the model piece and textile layers (1a, 1b) formed of fibres and attached on both sides of the plastic layer (1b), the model piece (1) being attached to the insole blank (2) so that the surface of the upper textile layer (1c) is attached to the lower surface of the insole blank (2)
2. A method as set forth in claim 1, **characterized in that** the textile layers (1a, 1c) are of non-woven fabric.
3. A method as set forth in claim 1, **characterized in that** the fibre of the textile layers (1a, 1c) is of synthetic plastic fibre.
4. A method as set forth in claim 1,2 or 3, **characterized in that** the heel nails (4) are supported directly on the material of the model piece (1).
5. A method as set forth in any of the preceding claims

1 to 4, **characterized in that** the model piece (1) is shaped by means of the plastic layer (1b) to a form that stiffens the insole by applying heat, pressing and cooling.

6. A method as set forth in any of the preceding claims, **characterized in that** the model piece (1) is attached to the lower surface of the insole blank (2) by gluing.

Patentansprüche

1. Ein Verfahren zur Herstellung einer Brandsohle für einen Schuh, die der Innensohle eines Schuhs eine gewünschte Form gibt, wobei gemäß dieses Verfahrens ein Gelenkstück (1) an der unteren Oberfläche des Brandsohlenzuschnitts (2) angebracht ist, **dadurch gekennzeichnet, dass** das Gelenkstück (1) in Form eines schichtförmigen mehrlagigen Fertigmaterials an der unteren Oberfläche des Brandsohlenzuschnitts (2) angebracht ist, wobei jenes eine Kunststoffschicht (1b), die das Gelenkstück mit Festigkeit und Form versieht, und aus Fasermaterial erstellte textile Schichten (1a, 1c), die an beiden Seiten der Kunststoffschicht (1b) angebracht sind, aufweist und das Gelenkstück (1) derart an dem Brandsohlenzuschnitt (2) angebracht ist, dass die Oberfläche der oberen Textilschicht (1c) an der unteren Oberfläche des Brandsohlenzuschnitts (2) angebracht ist.
2. Ein Verfahren gemäß Anspruch 1, **dadurch gekennzeichnet, dass** die textilen Schichten (1a, 1c) aus non-woven Gewebe bestehen.
3. Ein Verfahren gemäß Anspruch 1, **dadurch gekennzeichnet, dass** die Fasern der textilen Schichten (1a, 1c) aus synthetischen Kunststofffasern bestehen.
4. Ein Verfahren gemäß Anspruch 1, 2 oder 3, **dadurch gekennzeichnet, dass** die Absatznägel (4) direkt durch das Material des Gelenkstückes (1) gehalten werden.
5. Ein Verfahren gemäß eines der vorstehenden Ansprüche 1 bis 4, **dadurch gekennzeichnet, dass** das Gelenkstück (1) durch die Kunststoffschicht (1b) unter Verwendung von Hitze, Pressen und Abkühlen in eine die Brandsohle aussteifende Form gebracht wird.
6. Ein Verfahren gemäß eines beliebigen der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** das Gelenkstück (1) mittels Verklebung an der unteren Oberfläche des Brandsohlenzuschnitts (2) angebracht ist.

Revendications

1. Méthode de fabrication d'une première de chaussure donnant la forme désirée à la semelle intérieure de la chaussure, méthode dans laquelle un cambrion (1) est fixé à la surface inférieure de l'ébauche de première (2), **caractérisée en ce que** le cambrion (1) est fixé à la surface inférieure de l'ébauche de première en tant que matériau multicouche en forme de feuille prêt à l'emploi présentant une couche plastique (1b) fournissant la rigidité et la forme du cambrion et des couches textiles (1a, 1c) formées de fibres et fixées sur les deux faces de la couche plastique, le cambrion (1) étant fixé à l'ébauche de première de telle sorte que la surface de la couche textile supérieure (1c) est fixée à la surface inférieure de l'ébauche de première (2).
2. Méthode selon la revendication 1, **caractérisée en ce que** les couches textiles (1a, 1c) sont en tissu non tissé.
3. Méthode selon la revendication 1, **caractérisée en ce que** la fibre des couches textiles (1a, 1c) est en plastique synthétique.
4. Méthode selon la revendication 1, 2 ou 3, **caractérisée en ce que** les clous du talon (4) sont portés directement par le matériau du cambrion (1).
5. Méthode selon l'une quelconque des revendications 1 à 4, **caractérisée en ce que** le cambrion (1) est conformé par l'intermédiaire de la couche plastique en une forme qui rigidifie la première par application de chaleur, compression et refroidissement.
6. Méthode, selon l'une quelconque des revendications précédentes, **caractérisée en ce que** le cambrion (1) est fixé par collage à la surface inférieure de l'ébauche de première (2).

