



(11)

EP 3 081 108 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
19.10.2016 Bulletin 2016/42

(51) Int Cl.:
A43B 7/28 (2006.01) **A43B 5/16** (2006.01)
A43B 5/04 (2006.01) **A43B 23/07** (2006.01)

(21) Application number: **16163111.4**

(22) Date of filing: **31.03.2016**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(72) Inventors:
• **MARTINAZZO, Ivan**
31040 Giavera del Montello (TV) (IT)
• **QUAGLIOTTO, Silvio**
31040 Giavera del Montello (TV) (IT)

(74) Representative: **Robba, Pierpaolo**
Interpatent S.R.L.
Via Caboto, 35
10129 Torino (IT)

(30) Priority: **15.04.2015 IT TO20150217**

(71) Applicant: **Tecnica Group S.p.A.**
31040 Giavera del Montello (TV) (IT)

(54) **INSERT FOR THE CUSTOMIZATION OF A FOOTWEAR, CUSTOMIZABLE FOOTWEAR AND METHOD FOR THE CUSTOMIZATION OF A FOOTWEAR**

(57) The present invention relates to an insert (1) for the customization of a footwear (100), more particularly of a sports footwear. The present invention further relates to a footwear that is customizable by using the aforementioned insert as well as to a method for the customization of a footwear, said method using the aforementioned insert. The insert (1) according to the invention comprises a layer made of thermo-formable material (3) and a layer made of cork (5) coupled to each other. The presence of the layer made of thermoformable material (3) allows customization of the footwear according to the morphology of the foot of the individual user; the presence of the layer made of cork (5) allows good thermal insulation and effective transmission of the movements from the user's foot to the footwear.

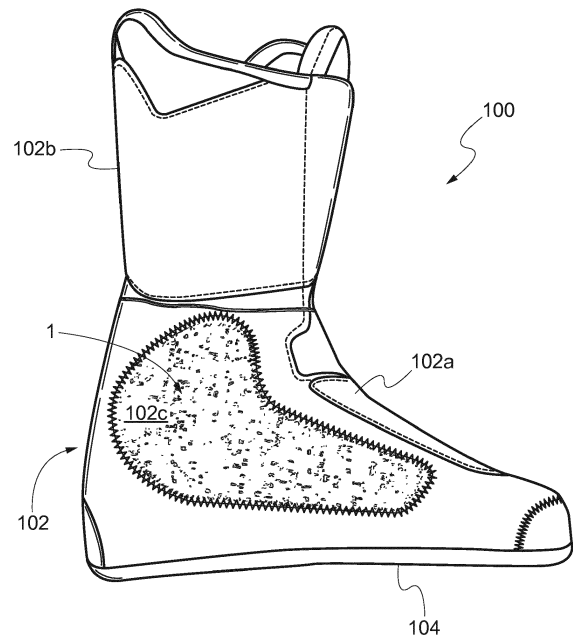


Fig. 1

EP 3 081 108 A1

Description

Technical Field

[0001] The present invention relates to an insert for the customization of a footwear, i.e. for adapting said footwear to the specific foot morphology of the particular user.

[0002] More specifically, the present invention relates to an insert for the customization of a sports footwear, more particularly a sports footwear comprising a substantially soft inner element or liner and a substantially rigid outer element or shell.

[0003] The present invention further relates to a footwear that is customizable by using the aforementioned insert as well as to a method for the customization of a footwear, said method using the aforementioned insert.

Prior Art

[0004] According to prior art, footwear are manufactured in a variety of sizes that are different in length and width.

[0005] However, each footwear size has standard length and width and not all the users with the same foot size have feet with the same morphology.

[0006] It results that, while the size is correct, often the footwear does not fit the particular morphology of the user's foot.

[0007] This drawback is particularly felt in the field of sports footwear, as the user's feet - during sports practice - are subject to considerable efforts.

[0008] Moreover, in the field of sports footwear, the conformity of the footwear to the specific morphology of the particular user remarkably affects not only the user's comfort, but also his/her performances.

[0009] The aforesaid drawback turns to be particularly limiting in the case where the sports footwear comprises a substantially rigid element.

[0010] Reference can be made, by way of example, to ski boots, which usually comprise a substantially soft inner element or inner liner and a substantially rigid outer element or outer shell.

[0011] In the case of ski boots, not only does the conformity of the footwear to the morphology of the foot of the particular user increases the user's comfort, but it also improves the maneuverability of the ski, since even minimal movements of the user's foot are transmitted effectively to the ski boot and from this to the ski.

[0012] Similar improvements to the user's comfort as well as to his/her performances can be obtained for other similar sports footwear comprising a substantially rigid outer shell, such as, for instance, roller skates or ice skates.

[0013] It is apparent that making custom-made footwear, while allowing efficient customization on one hand, would on the other hand involve high manufacturing costs and, consequently, very high, non-competitive market prices.

[0014] Consequently, in the past methods and arrangements for the customization of sports footwear were developed starting from a standard, non-customized article, which could therefore be manufactured on a large scale.

[0015] With respect to sports footwear of the kind comprising a substantially soft inner element or liner and a substantially rigid outer element or shell, and more particularly to ski boots, products and methods for the customization of ski boots have been developed, which provide for using one or more thermo-formable insert(s) applied to the inner liner so that they are arranged between said inner liner and the outer shell of the ski boot: once the user has put on the inner liner of the ski boot, the thermo-formable insert is heated above its thermo-forming temperature and a pressure is subsequently applied to said insert from the outside so that the insert adapts itself perfectly to the morphology of the user's foot; the insert is then let to cool down below its thermo-forming temperature, whereby it stiffens in the desired configuration.

[0016] The use of cork in sports footwear has turned out to be very advantageous.

[0017] Still referring to the example of ski boots, this involves two different advantages. First of all, cork is an effective natural thermal insulator. Secondly, it allows effective transmission of movements from the ski boot (therefore from the user's foot) to the ski: unlike inserts made of foamed materials and intended for ski boot liners, cork is incompressible and therefore allows a more precise and reactive transmission of movements to the ski.

[0018] In order to insert cork into sports footwear in order to exploit the aforementioned properties, inserts have been developed which comprise small fragments of cork dispersed in a resin matrix, which can be shaped for adapting to the morphology of the user's foot. Such insert is used, for instance, in the ski boot marketed by the Applicant under the trade mark Nordica® with the name "NRGy Pro".

[0019] This solution, though allowing to introduce cork into a customizable sports footwear, is however susceptible of improvements.

[0020] First of all, as the resin matrix in which cork is dispersed is sticky also at room temperature, it is necessary to provide a suitable housing for receiving, in its inside, each insert, separated from the rest of the liner and from the outer environment.

[0021] In addition, the resin matrix does not offer absolute guarantee of stability, as it can undergo slight deformations also at not very high temperatures.

[0022] Finally, the dispersion of cork fragments in the resin matrix does not offer guarantees in terms of uniform distribution of these fragments over the entire area of the insert, and consequently of obtainment of uniform properties over the entire area of the insert.

[0023] US patent No. 2,033,727 describes a stiffening element for footwear, in which a layer of a composition

capable of conferring rigidity and made substantially of thermoplastic material or of rubber and thermoplastic material is confined between two fabric layers. The layer of thermoplastic material or rubber and thermoplastic material can contain an adequate quantity of cork powder as filler.

[0024] The drawbacks of this solution are the same as those listed before and lie in particular in the need to provide an outer housing made of fabrics and, most of all, in the impossibility of guarantees in respect of uniform distribution of the cork powder.

[0025] In addition, in US 2,033,727 the cork powder is used merely as a filler, without any reference to the insulating properties of cork.

[0026] The main object of the present invention is to provide a solution that allows to improve the aforementioned aspects and - in particular - allows to obtain a customizable footwear which has a simple structure, reliably affords a possibility of customization and is comfortable and cost-effective.

[0027] These and other objects are achieved with the insert for the customization of a footwear, with the customizable footwear as well as with the method for the customization of a footwear as claimed in the appended claims.

Summary of the Invention

[0028] The present invention provides for making an insert for the customization of a footwear, said insert comprising a layer made of thermo-formable material and a layer made of cork coupled to each other.

[0029] Unlike the prior art solutions, the insert according to the invention provides a layer entirely made of thermo-formable material and a layer entirely made of cork.

[0030] In this way, the insert according to the invention has uniform properties over its entire area.

[0031] In addition, replacing resin with a layer of thermo-formable material eliminates a series of drawbacks and allows to simplify the structure of the footwear.

[0032] According to the invention, both the layer made of thermo-formable material and the layer made of cork have a substantially uniform thickness over the entire area of the insert.

[0033] In particular, the thicknesses of said layer will be chosen so as to allow deformation thereof and adaptation thereof to the morphology of the user's foot.

[0034] In an embodiment of the invention it is possible to provide that the insert extends over the whole surface of the footwear upper. According to this embodiment, the effect of thermal insulation provided by cork is maximized.

[0035] However, in a preferred embodiment of the invention, the insert extends over a portion only of the footwear upper. In this embodiment, the insert will extend in those areas that are most sensitive from the viewpoint of the user's comfort and of the efficiency in the transmission of movements from the user's foot to the foot-

wear.

[0036] By way of example, in the case of application to ski boots, said insert may extend, for instance, in the malleolar area.

[0037] In any case, according to the applications, the shape and arrangement of the insert according to the invention can be chosen each time so as to ensure optimum customization of said article in the most delicate areas.

[0038] The insert according to the invention can advantageously be applied to a wide variety of footwear, in particular of sports footwear, and even more particularly to sports footwear comprising a substantially soft inner element and a substantially rigid outer element such as ski boots, roller skates, ice skates and so on.

Brief Description of the Drawings

[0039] Further features and advantages of the invention will become more apparent from the following detailed description of a preferred embodiment of the invention, given by way of non-limiting example with reference to the annexed drawings, in which:

- Figure 1 shows the application of an insert for the customization of a footwear according to the invention to the inner liner of ski boot;
- Figure 2 shows in greater detail the insert of Figure 1;
- Figure 3 shows the insert of Figure 2 seen from a different perspective;
- Figure 4 is a cross-sectional view of the insert of Figures 2 and 3.

Detailed Description of a Preferred Embodiment of the Invention

[0040] The preferred embodiment of the invention described below in detail refers to the application of the invention to a ski boot, and more particularly to the inner liner of a ski boot.

[0041] Such embodiment is in no way to be intended as limiting the scope of the invention and the invention can be applied to any footwear for which it is deemed necessary or advantageous to customize the shape of the footwear for adapting it to the specific morphology of a particular user.

[0042] Referring to Figure 1, there is schematically illustrated the inner liner 100 of a ski boot. The liner 100 is made of a soft material and comprises a sole 104 and an upper 102, said upper comprising a first portion 102a arranged for receiving the user's foot and a second portion 102b arranged for receiving the user's ankle.

[0043] The liner 100 is made as non-customized article, with standard dimensions for the same footwear size.

[0044] As is visible in Figure 1, an insert 1 according to the invention is incorporated in the liner 100 for customizing said liner in accordance to the user's morphology.

[0045] Said insert 1 may also be applied to the liner 100 instead of being incorporated therein.

[0046] It is apparent that, according to the applications, the insert 1 can be sized and shaped so as to extend in those areas of the user's body that are most sensitive and relevant for the specific use.

[0047] In particular, in the illustrated example the insert is shaped and sized so as to extend substantially in the malleolar region 102c of the upper 102 of the inner liner 100, on both sides of said liner.

[0048] Said insert is shown in greater detail in Figures 2 - 4.

[0049] According to the invention, the insert 1 comprises at least one layer made of thermo-formable material 3 and a layer made of cork 5 coupled to each other.

[0050] The presence of the layer made of thermo-formable material 3 offers the possibility to customize the footwear by adapting the insert 1 to the morphology of the foot of the individual user.

[0051] The thermo-formable material can be for instance chosen from the group comprising polyethylene (PE), ethylene-vinyl acetate (EVA), polyurethane (PU) and polypropylene (PP).

[0052] The presence of the layer made of cork 5 allows to exploit the insulating properties of this material.

[0053] In addition, in the case of sports footwear, such as ski boots, the presence of the layer made of cork 5 allows to improve the transmission of movements from the user's foot to the sports footwear with respect to the use of foamed materials and the like.

[0054] According to the invention, the layer made of thermo-formable material 3 and the layer made of cork 5 preferably have a uniform thickness over the whole area of the insert 1. This guarantees that the insert 1 has uniform properties over its entire area. Moreover, this makes it possible to manufacture the insert 1 in a very simple and cost-effective manner. The layer made of thermo-formable material 3 will preferably have a thickness so as to allow to adapt the insert 1 to a wide variety of users having different foot morphologies. In particular, the thickness of said thermo-formable layer 3 will preferably be comprised between 2.0 and 10.0 mm.

[0055] The layer made of cork 5 will preferably have a thickness large enough to ensure an effective thermal insulation of the user's foot; on the other hand, said layer made of cork 5 will be thin enough to follow the deformations of the layer made of thermo-formable material 3 associated thereto, without the risk of formation of cracks or fissures. In particular, the thickness of said layer made of cork 5 will preferably be comprised between 0.5 and 4.0 mm.

[0056] As is apparent from Figure 4, in the insert 1 according to the invention the cork is not dispersed in the form of powder or fragments in the thermoplastic material; instead, it provides for a first, substantially homogeneous layer entirely made of thermo-formable material and a second, substantially homogeneous layer entirely made of cork.

[0057] The layer made of thermo-formable material 3 and the layer made of cork 5 are preferably coupled to each other by gluing or heat lamination. However, this is not to be intended in a limiting sense, and any other technique within the reach of the person skilled in the art can also be used for coupling said layers.

[0058] As can be readily seen from Figures 2 and 3, it is possible to make the insert 1 starting from a sheet 30 of thermo-formable material having a desired thickness and a sheet 50 of cork having a desired thickness coupled to each other.

[0059] Starting from said coupled sheets, it will be possible to obtain the insert with the desired shape: in the illustrated embodiment, said insert will comprise a pair of substantially symmetrical lateral portions 7a,7b joined by a central portion 7c; once the insert 1 is applied to the inner liner 100, the lateral portions 7a,7b will extend substantially in the malleolar region of the upper of said inner liner, on both sides of said liner, whereas the central portion 7c will extend substantially in the region of the Achilles tendon of the upper of said inner liner.

[0060] As anticipated above, the present invention further relates to a spots footwear comprising an insert 1 of the type described above.

[0061] The invention finds particular application within the field of sports footwear and more particularly within the field of sports footwear comprising an inner element or liner made of a substantially soft material and an outer element or shell made of a substantially rigid material, in which case the insert 1 according to the invention is applied to or incorporated in said inner liner made of a substantially soft material.

[0062] However, this preferred application is not be intended in a limiting sense.

[0063] In principle, the footwear according to the invention may comprise an insert of the type described above, having shape and size so as to extend over the whole surface of the footwear upper.

[0064] Alternatively, and according to a preferred embodiment of the invention, the footwear according to the invention may comprise one or more insert(s) of the type described above having shape and size so as to extend over one portion only or corresponding portions only of the upper.

[0065] In this case, the insert or inserts will be provided in those regions which are most sensitive from the viewpoint of the user's comfort, such as for instance the malleolar region or the metatarsal region.

[0066] In principle, the method for the customization of a footwear comprising one or more insert(s) according to the invention comprises the following steps:

- heating the layer made of thermo-formable material 3 of the insert 1 until its temperature rises above a predetermined threshold, said threshold being chosen so that at temperatures equal to or higher than said threshold said layer made of thermo-formable material can be deformed and shaped;

- while maintaining the temperature of said layer made of thermo-formable material 3 above said predetermined threshold, deforming said layer made of thermo-formable material 3 for adapting it to the morphology of the user's foot; and
- letting the thus shaped layer made of thermo-formable material 3 cool down below the aforementioned threshold.

[0067] At least the step of adapting the shape of the layer made of thermo-formable material - and possibly also the steps of heating and subsequent cooling - are carried out while the user's foot is placed in the footwear.

[0068] From the above description, it is apparent that the invention allows to achieve the objects set forth above.

[0069] It is further evident that the embodiment described above in detail is not to be regarded as limiting and that several modifications and variants within the reach of the person skilled in the art are possible without departing from the scope of the invention as defined in the appended claims.

[0070] In particular, although the invention has been described with reference to a ski boot, it is also applicable to a large number of different footwear.

Claims

1. Insert (1) for the customization of a footwear (100), more particularly of a sports footwear, of the kind comprising at least an upper (102) and a sole (104), wherein said insert is intended to be incorporated into or applied to said upper (102) of said footwear, **characterized in that** said insert (1) comprises a layer made of thermo-formable material (3) and a layer made of cork (5) coupled to each other.
2. Insert (1) according to claim 1, wherein said layer made of thermo-formable material (3) and said layer made of cork (5) have a substantially uniform thickness over the whole area of said insert (1).
3. Insert (1) according to claim 2, wherein said layer made of thermo-formable material (3) has a thickness of 2.0 to 10.0 mm.
4. Insert (1) according to claim 2 or 3, wherein said layer made of cork (5) has a thickness of 0.5 to 4.0 mm.
5. Insert (1) according to any of the preceding claims, wherein said layer made of thermo-formable material (3) and said layer made of cork (5) are coupled to each other by a technique selected from the group comprising gluing and heat lamination.
6. Insert (1) according to any of the preceding claims,

wherein said layer made of thermo-formable material (3) is made of a material selected from the group comprising polyethylene, ethylene-vinyl acetate, polyurethane and polypropylene.

7. Footwear (100), more particularly sports footwear, of the kind comprising at least an upper (102) and a sole (104), **characterized in that** it comprises at least one insert (1) according to any of the claims 1 to 6 incorporated into or applied to said upper (102) of said footwear.
8. Footwear, more particularly sports footwear, comprising a substantially soft inner element or liner (100) and a substantially rigid outer element or shell, wherein at least said substantially soft inner element (100) comprises an upper (102) and a sole (104), **characterized in that** it comprises at least one insert (1) according to any of the claims 1 to 6 incorporated into or applied to said upper (102) of said substantially soft inner element (100).
9. Footwear according to claim 7 or 8, wherein said at least one insert (1) extends over the whole surface of said upper.
10. Footwear according to claim 7 or 8, wherein said at least one insert (1) extends over a portion only of said upper.
11. Method for the customization of a footwear (100), more particularly of a sports footwear, of the kind comprising at least an upper (102) and a sole (104), **characterized in that** it comprises the steps of:
 - incorporating into or applying to said upper (102) of said footwear an insert (1) comprising a layer made of thermo-formable material (3) and a layer made of cork (5) coupled to each other;
 - heating at least said layer made of thermo-formable material (3) of said insert (1) until its temperature rises above a predetermined threshold;
 - while maintaining the temperature of said layer made of thermo-formable material (3) above said predetermined threshold, deforming said layer made of thermo-formable material (3) for adapting it to the morphology of a user's foot;
 - letting said layer made of thermo-formable material (3) of said insert (1) cool down until its temperature lowers below said predetermined threshold.
12. Method according to claim 11, wherein at least said step of deforming said layer made of thermo-formable material (3) for adapting it to the morphology of a user's foot is carried out while the user's foot is

placed in the footwear.

5

10

15

20

25

30

35

40

45

50

55

6

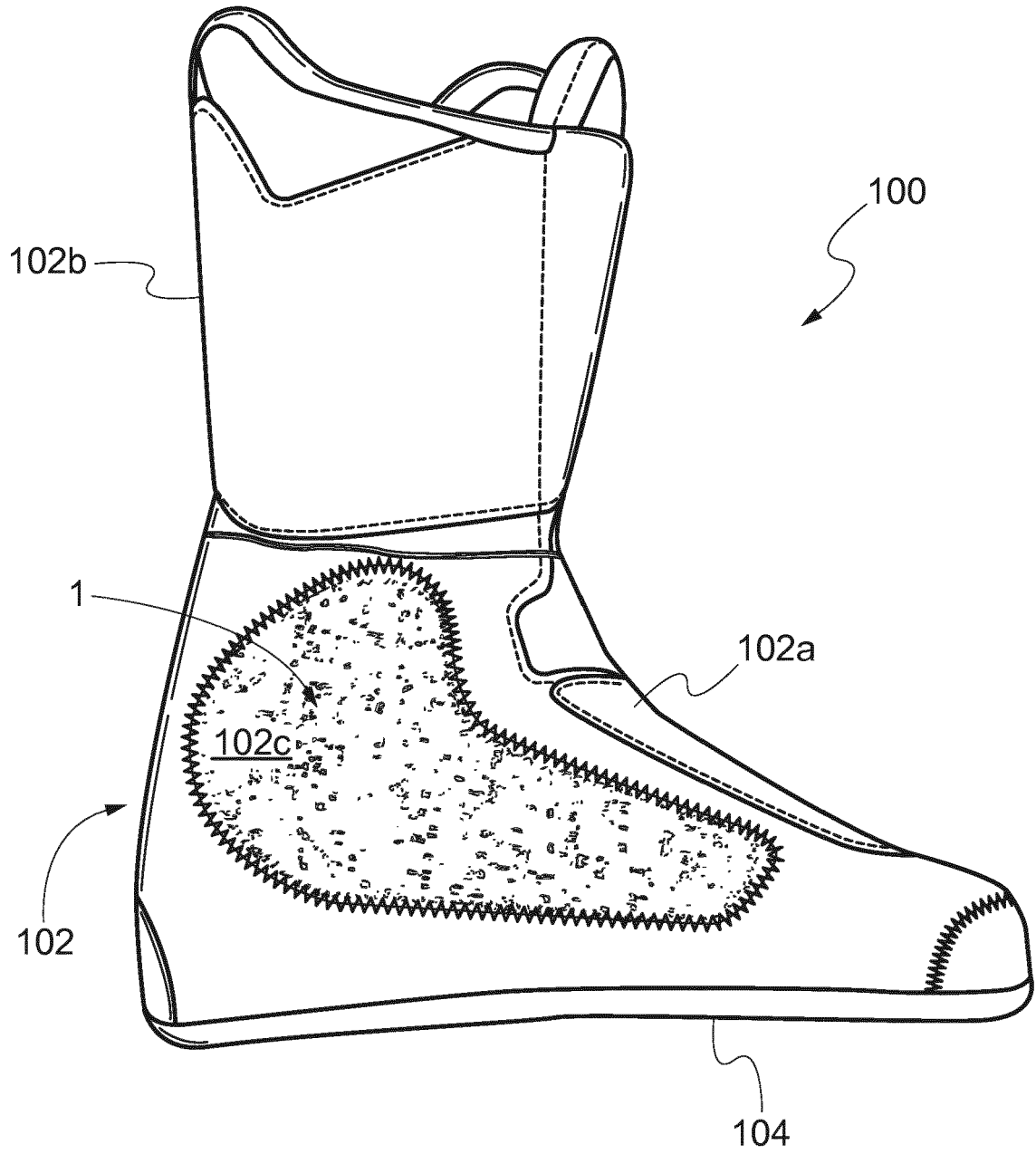


Fig. 1

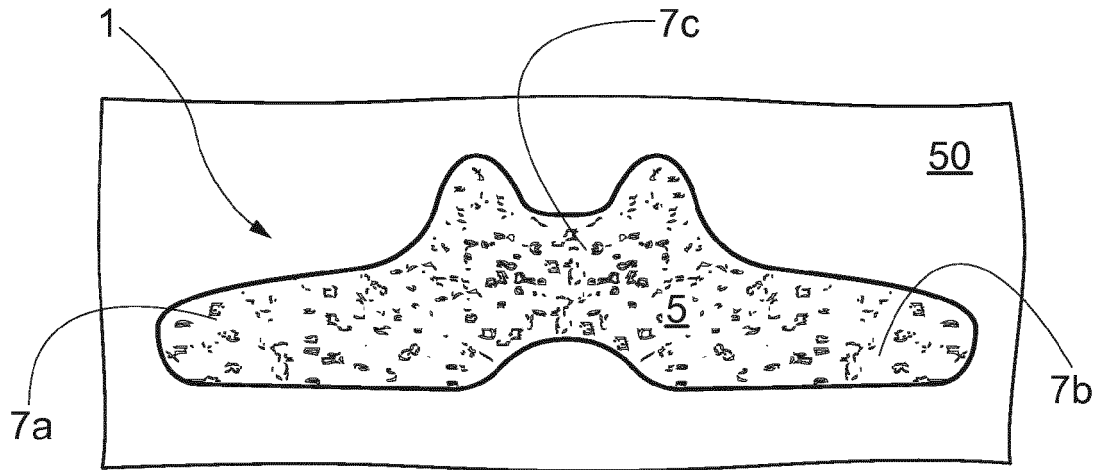


Fig. 2

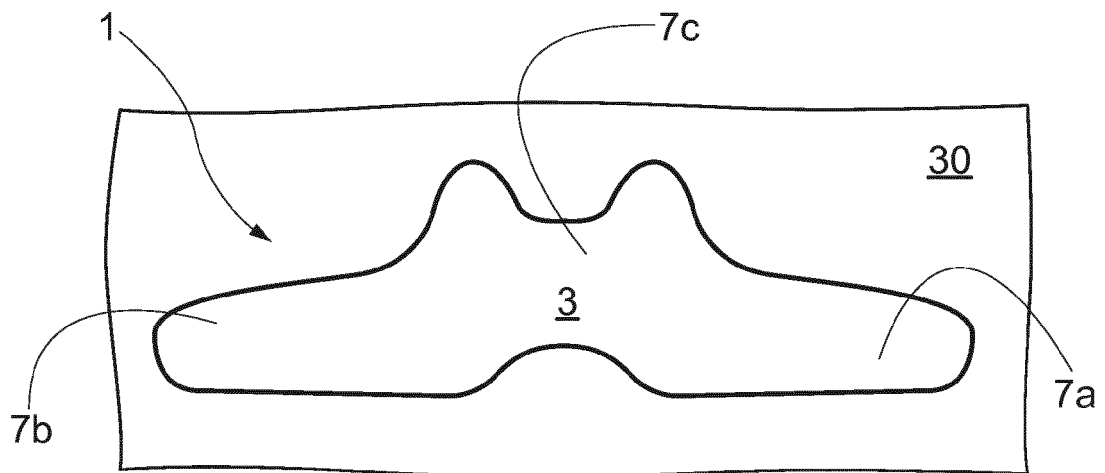


Fig. 3

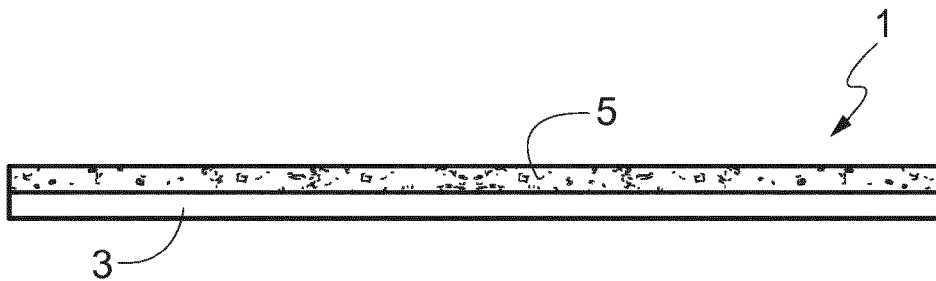


Fig. 4



EUROPEAN SEARCH REPORT

Application Number
EP 16 16 3111

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2 033 727 A (MILLER HAROLD S ET AL) 10 March 1936 (1936-03-10)	1,7,11	INV. A43B7/28 A43B5/16 A43B5/04 A43B23/07
Y	* columns 14-55; claims 1-4 *	2-6, 8-10,12	
Y	EP 2 832 248 A1 (TECNICA GROUP S P A [IT]) 4 February 2015 (2015-02-04) * paragraphs [0008], [0009], [0038]; claim 1; figures 1,2 *	2-6, 8-10,12	
A	WO 2014/019078 A1 (ADRENALINE DESIGN INC [CA]) 6 February 2014 (2014-02-06) * page 13, lines 6-16; claims; figure 1 *	1,7,8,11	
A	US 3 325 919 A (LEON ROBINSON) 20 June 1967 (1967-06-20) * column 4, lines 35-58; claims 1,2; figures *	1,7,11	
A	DE 35 17 312 A1 (BERKEMANN HEINRICH A GMBH [DE]) 20 November 1986 (1986-11-20) * claims 1,3; figure 2 *	1,7,11	
A	US 8 463 657 B1 (BENTVELZEN JOE [US] ET AL) 11 June 2013 (2013-06-11) * column 6, lines 1-12; claim 1; figures *	1,7,11	TECHNICAL FIELDS SEARCHED (IPC) A43B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 31 August 2016	Examiner Claudel, Benoît
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/02 (P04/C01)

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 16 16 3111

5 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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

31-08-2016

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2033727 A	10-03-1936	NONE	
EP 2832248 A1	04-02-2015	NONE	
WO 2014019078 A1	06-02-2014	CA 2871519 A1 US 2015216261 A1 WO 2014019078 A1	06-02-2014 06-08-2015 06-02-2014
US 3325919 A	20-06-1967	NONE	
DE 3517312 A1	20-11-1986	NONE	
US 8463657 B1	11-06-2013	NONE	

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 2033727 A [0023] [0025]