



(19)

Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

EP 0 786 210 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
30.07.1997 Bulletin 1997/31

(51) Int. Cl.⁶: **A43B 5/04**, A43B 7/28

(21) Application number: **96120507.7**

(22) Date of filing: **19.12.1996**

(84) Designated Contracting States:
AT CH DE FR IT LI

(30) Priority: **09.01.1996 IT TV960003**

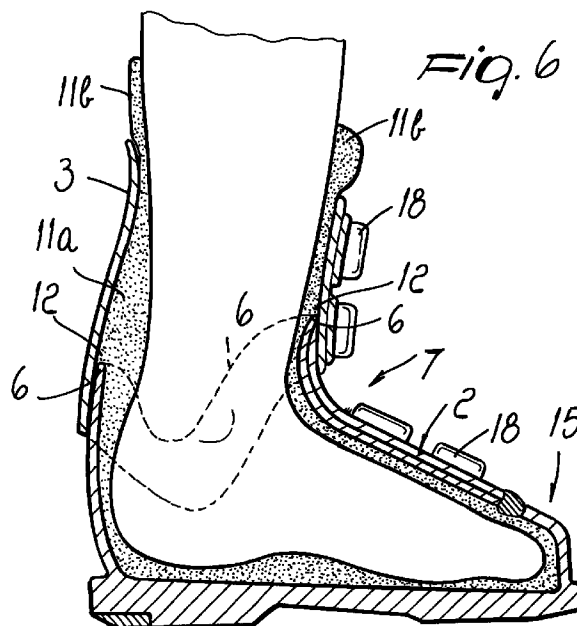
(71) Applicants:
• **NORDICA S.p.A**
31040 Trevignano (Treviso) (IT)
• **Intuition Inc.**
Vancouver, B.C. V5Y 1J6 (CA)

(72) Inventors:
• **Watt, Robert**
Vancouver, B.C. - V6N 1P6 (CA)
• **Bottin, Angelo**
31010 Maser (Prov. of Treviso) (IT)

(74) Representative: **Modiano, Guido, Dr.-Ing. et al**
Modiano & Associati S.r.l.
Via Meravigli, 16
20123 Milano (IT)

(54) **Method for producing innerboots for sports shoes, and products obtained with said method**

(57) Method for producing innerboots (8) for sports shoes made of thermoformable material; the method provides for the formation of the outer surface of the innerboot so as to reproduce the internal shape of the shoe and for the subsequent formation of the inner surface of the innerboot so as to reproduce the anatomical shape of the foot. The process thus provides an innerboot, particularly for sports shoes made of thermoformable material, whose outer shape is complementary to the inner shape of the sports shoe and whose inner shape is complementary to the anatomical shape of the user's foot so as to increase comfort for the skier.



EP 0 786 210 A2

Description

The present invention relates to a method for producing innerboots for sports shoes.

Conventional sports shoes, such as for example ski boots, are generally constituted by a rigid upper inside which a soft innerboot is inserted, said innerboot being adapted to increase the comfort of the shoe throughout sports practice, and cooperating, with the upper, to secure the foot.

Innerboots allow to fully surround the user's foot and ankle and in many cases reach beyond the top edge of the upper, so as to constitute a soft resting element for the user's tibia.

Figure 1 illustrates a conventional sports shoe, generally designated by the reference numeral 1, which is constituted by an upper 2 where to a quarter 3 can be articulated, an innerboot 8 being inserted in said shoe.

Empty spaces, generally designated by the reference numeral 6, form between the upper 2 and the innerboot 8 of said conventional sports shoes and are present where the thickness of the upper 2 is uneven and therefore mainly in the tip region 15, where the fastening means are arranged, in the heel region 5, or above the foot instep region 7 at the tongue, if provided.

Said conventional innerboots have some drawbacks: the empty spaces 6 that form between the upper 2 and the innerboot 8 in fact allow said innerboot a freedom of relative movement that reduces, for the user, sensitivity in controlling the sports implement, thus increasing discomfort for said user and reducing comfort during sports practice.

Some sports shoes provide, between the upper and the innerboot, adapted inserts made of plastics in order to increase the stiffness of the shoe in preset regions. These inserts, arranged appropriately, do not allow to eliminate all empty spaces, and therefore the relative movements of the innerboot with respect to the upper, and in some cases these inserts further decrease the comfort of the shoe and are particularly annoying.

Likewise, other shoes provide for the addition of adapted empty pouches filled with form-fitting material, such as for example silicone materials, so that the innerboot may optimally contact the user's foot, but they do not fully solve the mentioned drawbacks.

Likewise, it is known to produce thermoformable innerboots which, after preheating, assume a desired internal shape, clinging perfectly to the external shape of the foot.

These conventional innerboots, too, have drawbacks: despite an increase in comfort thanks to the perfect fit of the user's foot with respect to the innerboot, said innerboot still has the mentioned empty spaces with respect to the upper, which still allow the formation of relative movements of the foot, with respect to said upper, causing the user to lose sensitivity and control of the sports implement.

The aim of the present invention is therefore to solve the mentioned technical problems, eliminating the

drawbacks of the mentioned prior art by providing an innerboot that allows to achieve optimum connection to the upper, eliminating the relative movements between said upper and said innerboot during sports practice.

Within the scope of the above aim, an important object is to provide an innerboot that allows to achieve optimum securing of the foot inside it and the securing of the innerboot with respect to the sports shoe in which it is inserted.

Another object is to provide an innerboot that is structurally simple and can be optimally adapted to the specific requirements of the user.

Another object is to provide an innerboot that ensures optimum transmission of the movements imparted by the user during sports practice, allowing optimum control of the sports implement in full safety.

Another object is to provide an innerboot that has low costs and can be produced with conventional machines and equipment.

This aim, these objects, and others, which will become apparent hereinafter, are achieved by a method for producing innerboots for sports shoes made of thermoformable material, characterized in that it comprises the steps of: hot pre-forming the outer surface of said innerboot on a mold, so as to reproduce the internal shape of said shoe, and inserting said pre-formed innerboot in said sports shoe and subsequently hot forming the inner surface while the foot of the user is inserted in said sports shoe, so as to reproduce the anatomical shape of the foot.

Accordingly, the method provides, after the insertion of said innerboot in said shoe, for the heating of the innerboot, then for the insertion of the foot in said innerboot to achieve, once said shoe has been fastened, the internal molding of said innerboot as to follow the anatomical shape of the foot.

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

figure 1 is a transverse sectional view of a conventional boot, inside which a conventional innerboot is inserted;

figure 2 is a perspective view of an innerboot according to the invention prior to external thermoforming;

figure 3 is a view, similar to figure 2, of the externally thermoformed innerboot;

figure 4 is a sectional view, taken along a longitudinal median plane, of a sports shoe with the innerboot according to the invention;

figure 5 is a view, similar to figure 4, of the invention with the innerboot during heating performed by using appropriate means;

figure 6 is a view, similar to figure 5, of the innerboot, now perfectly adapted to the configuration of the foot, which is inserted therein.

With reference to the above figures, the reference numeral 1 designates a sports shoe, such as a ski boot, which is constituted by an upper 2 with which it is possible to articulate a quarter 3 that is associated at the malleolar region by means of adapted studs or rivets.

Said upper 2 is formed monolithically, preferably in plastics, and has a lower region that forms a sole 4.

The quarter 3, starting from the heel region 5 of the shoe 1, has a partial overlap with respect to the upper 2 so as to form a step 6 inside said shoe 1; said step 6 continues along the inner side walls of the shoe 1 and reaches the region that lies above the foot instep 7, along a path that is preferably U-shaped in the particular illustrated embodiment.

An innerboot 8 according to the invention, made of thermoformable material is inserted in the upper 2 and has an outer surface 9 and an inner surface 10, both of which are initially smooth, as shown in figure 2.

The method provides for the pre-formation of the smooth outer surface 9 of the innerboot 8 by virtue of methods such as preliminary heating and molding by means of an appropriate mold that reproduces the exact internal shape of the shoe 1.

By way of example, said outer surface 9 therefore has, as shown in figure 3 at the end of pre-formation, a first increase in thickness that is adapted to form a first band 11a, whose lower perimeter 12 is shaped complementarily to the step 6 that is present inside the shoe 1.

The innerboot 8 has, starting from the upper perimeter edge 13 and at the first band 11a, a second increase in thickness that is adapted to form a second band 11b that protrudes beyond the quarter 3.

Likewise, depending on the shape of the mold that reproduces the internal shape of the shoe 1, the innerboot 8 has further increases or reductions in thickness at the tip region 15 or proximate to the sole 4 of the shoe 1, so as to form recesses and/or protrusions 14 that are shaped complementarily to the internal shape of said shoe 1.

Once the innerboot 8 has been inserted in the shoe 1, the method entails subjecting the inner surface 10 to a forming process by artificial heating with conventional hot air heaters, designated by the reference numeral 16 in figure 5, then inserting a foot 17 of the user, and then fastening the shoe 1 by virtue of the adapted means, designated by the reference numeral 18.

The innerboot 8 thus has an internal surface 10 that is shaped complementarily with respect to the anatomical shape of the foot 17 of the user; said shaping remains until a new internal forming process is performed by means of the heaters 16.

Operation is as follows: external pre-formation of the innerboot 8 is performed by means of a mold that exactly reproduces the internal shape of the shoe 1; then the innerboot 8 is inserted, achieving perfect securing with respect to the shoe; then the desired internal shaping of the innerboot 8 is achieved by preliminary heating with heaters 16, the foot 17 is inserted, and the shoe is closed by virtue of the fastening means

18.

It has thus been shown that the invention has achieved the intended aim and objects, a method having been provided which allows to obtain a shoe in which foot securing inside the innerboot is absolute and perfect, like the securing of said innerboot with respect to the upper; a shoe has thus been obtained which allows optimum control of the sports implement by means of perfect sensitivity, which is achieved by eliminating the empty spaces between the innerboot and the upper and/or quarter.

This method also allows to obtain an innerboot that is structurally simple and can be optimally adapted to the specific requirements of the user, ensuring maximum comfort and optimum transmission of the movements imparted by the user to the sports implement throughout sports practice.

The invention is of course susceptible of numerous modifications and variations, all of which are within the scope of the same inventive concept.

The materials and the dimensions that constitute the individual components of the structure may of course be the most pertinent according to the specific requirements.

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 interpretation of each element identified by way of example by such reference signs.

Claims

1. A method for producing innerboots (8) for sports shoes made of thermoformable material, characterized in that it comprises the steps of: hot pre-forming the outer surface of said innerboot on a mold, so as to reproduce the internal shape of said shoe, and inserting said pre-formed innerboot in said sports shoe and subsequently hot forming the inner surface while the foot of the user is inserted in said sports shoe, so as to reproduce the anatomical shape of the foot.
2. Method according to claim 1, characterized in that it comprises inserting said innerboot in said shoe and, after heating said innerboot, inserting the foot in said innerboot to achieve, once said shoe has been fastened, the internal molding of said innerboot with respect to the anatomical shape of the foot.
3. Method according to claim 2, characterized in that said shoe comprises an upper to which a quarter is articulated, said quarter being associated at the malleolar region and having, starting from the heel region of said shoe, a partial overlap with respect to said upper, characterized in that said pre-formation

of the outer surface of said innerboot occurs by virtue of methods such as preliminary heating and molding by means of a mold that reproduces the exact internal shape of said shoe.

5

4. Method according to claim 3, characterized in that said forming step produces, in said innerboot, thicker or thinner regions so as to form hollows and/or protrusions that are shaped complementarily with respect to the inner shape of said shoe. 10
5. Method according to one or more of the preceding claims, characterized in that said inner surface of said innerboot is formed by a process that entails artificial heating with hot-air heaters, the subsequent insertion of a foot of the user, and the fastening of said shoe, said anatomical shape of the foot persisting until a new internal forming process is performed by means of said heaters. 15
6. An innerboot, particularly for sports shoes, made of thermoformable material, characterized in that its outer shape is complementary to the inner shape of said sports shoe and its inner shape is complementary to the anatomical shape of the foot. 20
- 25

30

35

40

45

50

55

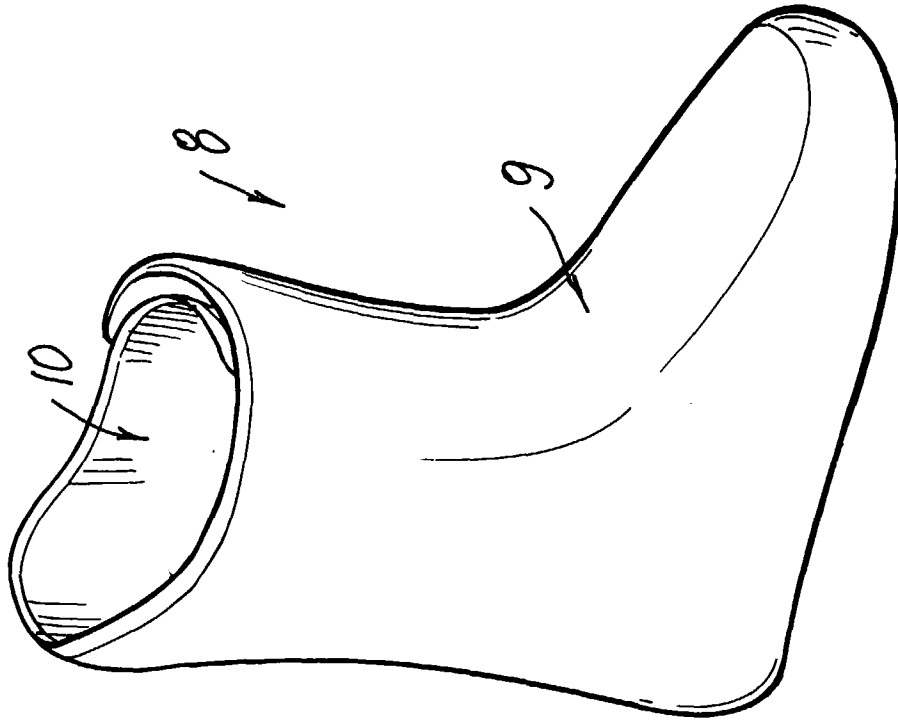


Fig. 2

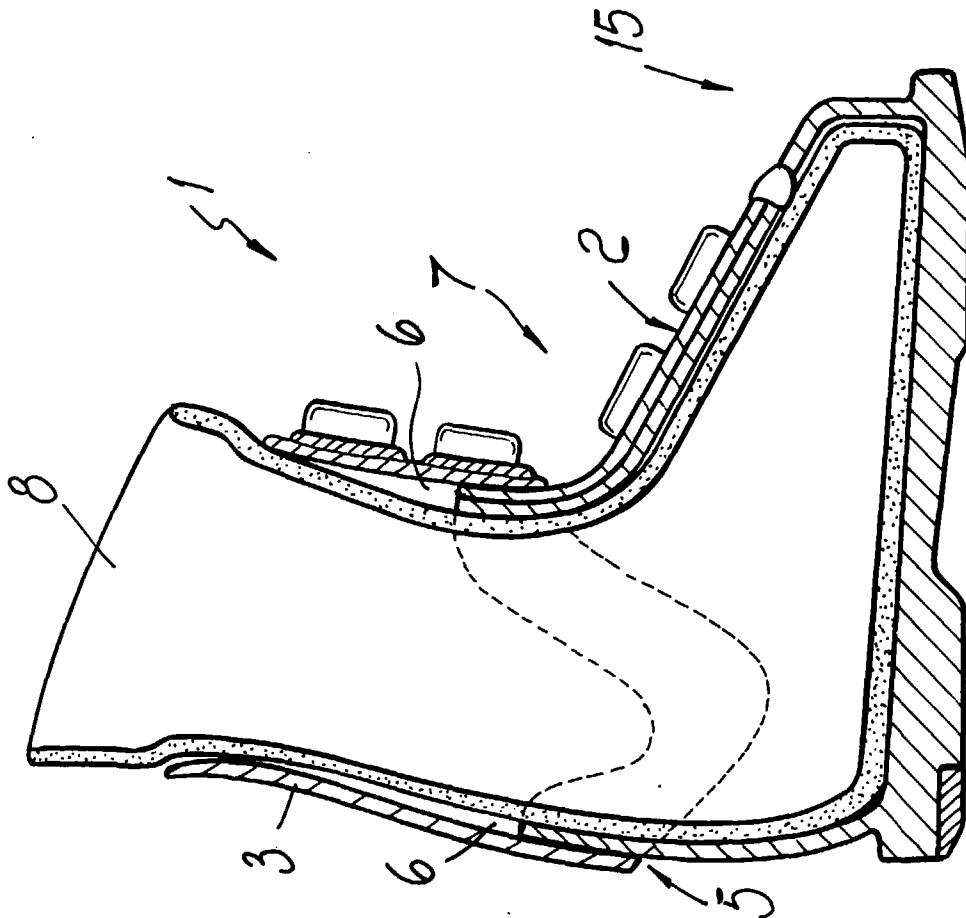


Fig. 1 PRIOR ART

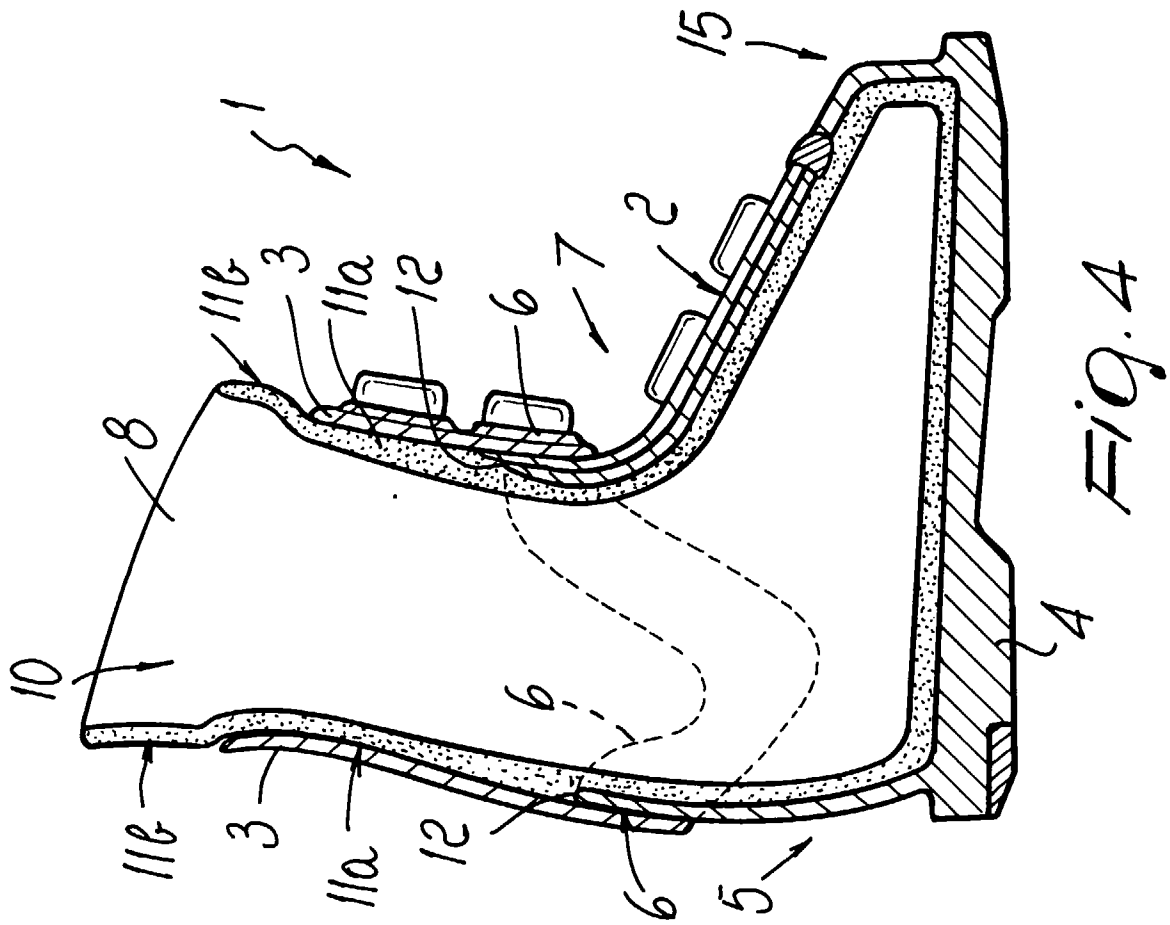


Fig. 3

