(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 779 041 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
18.06.1997 Bulletin 1997/25

(51) Int. Cl.[6]: **A43B 5/04**

(21) Application number: **96119791.0**

(22) Date of filing: **10.12.1996**

(84) Designated Contracting States:
AT DE FR IT

(30) Priority: **14.12.1995 IT TV950157**

(71) Applicant: **NORDICA S.p.A**
I-31040 Trevignano (Treviso) (IT)

(72) Inventors:
- **Bottin, Angelo**
  31010 Maser (Prov. of Treviso) (IT)
- **Martignago, Pietro**
  31044 Montebelluna (Prov. of Treviso) (IT)
- **Desiro' Nicola**
  35010 Curtarolo (Prov. of Padova) (IT)
- **Benvenuto, Ernesto**
  31044 S. Gaetano Di Montebelluna Treviso (IT)
- **Trentin, Stefano**
  31050 Villorba (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 manufacturing an innerboot, particularly for sports shoes

(57) A method for manufacturing innerboots, particularly for sports shoes, composed of an upper (1) and of a sole (7) made of thermoplastic materials, which entails the steps of: cutting the upper on a flat plane and then perimetrically paring it down, pressing the upper and the sole along the perimeter, and perimetrically sewing the upper to the sole so as to form the innerboot (10), which is then turned inside out and heated so as to embed the seam inside it.

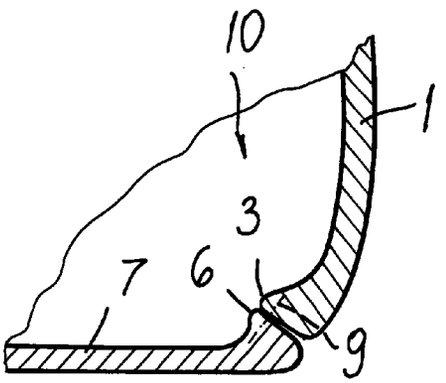

Fig. 9

EP 0 779 041 A1

Description

The present invention relates to a method for manufacturing an innerboot, particularly for sports shoes, such as ski boots, roller skates, ice skates, or climbing boots.

There are currently several innerboots adapted to be applied inside sports shoes: some innerboots are constituted by an upper sewn on a last through an assembly operation which entails, in sequence, perimetrically sewing an internal insole, inserting the last, spreading an adhesive, activating the adhesive by heating, gluing a sole by pressing, and then extracting the innerboot from the last.

It is also known to manufacture innerboots having a Strobel seam on the edge of the sole for fixing the upper.

Innerboots are also known which have a tongue or two overlapping flaps, at the foot instep region: these innerboots are used exclusively for shoes, such as ski boots, of the front-entry type and are used to facilitate the insertion of the foot.

If instead ski boots of the rear-entry type are used, again to facilitate foot insertion, innerboots are used in which a rear opening is provided whereon a tongue can be partially superimposed.

All these conventional innerboots have drawbacks that are mainly due to the fact that in the lower lateral region of the innerboot there is provided a large seam which joins the upper and the sole: this seam, because of its constructive characteristics, does not ensure that the innerboot provides ideal comfort for the foot due to its imperfect internal shape. Indeed, comfort is reduced and a structural flaw is also observed, because the lateral strength of the innerboot is entrusted exclusively to the seam, which is therefore subjected to considerable stresses.

WO-A-94/09663 discloses a method for producing an innerboot for sports shoes that is provided by a single sheet of thermoplastic material of uniform thickness. The innerboot includes two wings that can be mutually overlapped at the tibial region of the user.

The innerboot can be obtained by cutting a sheet of material and by then folding it at the rear region of the leg, subsequently sewing it along a median plane that lies longitudinally with respect to the foot at the lower region of the heel, at the sole of the foot, and at the upper region of the toe of said foot.

The innerboot can be obtained starting from a loose-fitting part that is then heated to the thermoforming temperature of the material and is simultaneously made to closely fit the shape of the shell and the foot of the user's leg through the following steps: inserting the user's foot in the loose-fitting innerboot; producing the wings that wrap around the front part of the user's tibia; keeping the loose-fitting innerboot in its seat by means of an elastic sock; inserting the user's foot, the loose-fitting innerboot, and the elastic sock in the shell; and cooling the loose-fitting innerboot.

This solution has considerable drawbacks, which are mainly due to the presence of the seam and to its particular location, which does not allow optimum comfort for the skier. Moreover, the seam is subjected to lateral tensions, caused by the movements of the foot during sports practice, which may lead to the complete splitting of seam.

A principal aim of the present invention is therefore to eliminate the drawbacks described above of conventional innerboots by providing a method that allows to obtain a thermoplastic innerboot having high technical properties as well as providing high comfort.

Within the scope of this aim, an important object is to provide a method that allows to obtain a thermoplastic innerboot that combines optimum foot securing with the lack of seams in direct contact with the foot.

Another important object is to provide a method that allows to obtain a thermoplastic innerboot having high strength and resistance to the stresses applied thereto by the foot during sports practice.

Another object is to provide a method that allows to obtain a thermoplastic innerboot of improved aesthetic appearance with respect to the prior art.

Another object is to provide a method and a thermoplastic innerboot for sports shoes which are reliable and safe in use and can be obtained with conventional machines and equipment.

This aim, these objects, and others which will become apparent hereinafter are achieved by a method for manufacturing innerboots, particularly for sports shoes, composed of an upper and of a sole that are made of thermoplastic materials, characterized in that it comprises the steps of:

a) cutting said upper on a flat plane and then perimetrically paring it down;
b) pressing said upper and said sole along the perimeter;
c) perimetrically sewing said upper to said sole so as to form said innerboot;
d) turning said innerboot inside out;
e) heating said innerboot so as to embed said seam inside it.

Further characteristics and advantages of the invention will become apparent from the following detailed description of some particular but not exclusive embodiments thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a view of the upper on a flat plane after cutting, in which part of its perimeter has already been pared down;
figure 2 is a view, similar to figure 1, of the upper, cut on a flat plane, wherein pressing along part of its perimeter has occurred;
figure 3 is a perspective view of the sole, premed along its entire edge;
figure 4 is a sectional view, taken along the plane

IV-IV of figures 2 and 3;

figure 5 is a sectional view, taken along the plane V-V of figure 1;

figure 6 is a view, similar to figure 5, of the pressed edge of the upper;

figure 7 is a sectional view of the perimetric seam that couples the upper to the sole;

figure 8 is a view, similar to figure 7, of the innerboot turned inside out;

figure 9 is a view, similar to figure 8, of the configuration assumed by the innerboot at the seam as a consequence of the heating and therefore of the embedding of the seam inside said innerboot;

figure 10 is a view, similar to figure 9, of a further embodiment.

With reference to the above figures, the reference numeral 1 designates an upper obtained by cutting a sheet of thermoplastic material on a flat plane.

The method entails, after cutting the upper 1 on a flat plane, its subsequent paring down, designated by the reference numeral 2, at at least part of the edge 3 thereof and particularly at the first portions 4a and 4b, which will correspond to the sides of the user's foot, and at second portions 5a and 5b, which will correspond, at the end of the method, to the foot instep region.

Advantageously, the paring down can be performed by a mill.

The method entails the subsequent pressing of the upper 1 at its entire edge and a similar pressing at the edge 6 of a sole 7 that is also made of thermoplastic material.

A region 8 is thus obtained which is pressed both for the upper and for the sole.

Advantageously, as regards the upper 1, the region 8 affects part of the edge 3 that is subsequently affected by a seam for connection to the sole 7.

The method in fact entails coupling the upper 1 and the sole 7 by means of a seam 9 applied at the region 8 of the edge 3 of the upper 1 and at the edge 6 of the sole 7, which are arranged mutually adjacent beforehand.

An innerboot 10, shown partially in the figures, is thus obtained that is subsequently turned inside out, as shown in figures 7 and 8, so as to arrange the sewn edges 3 and 6 inside said innerboot.

The method then entails heating the innerboot, so as to allow the thermoplastic material to embed the seam 9 inside it, as shown in figure 9.

It has thus been observed that the method allows to obtain a thermoplastic innerboot having high technical properties, since it has optimum consistency at the region where the upper is sewn to the sole, and at the same time allows to optimize the comfort for the user because the seam is embedded inside the edges of the upper and sole.

This solution therefore allows to achieve maximum strength and resistance of the seam, furthermore improving the aesthetic appearance of the innerboot since the seam is not visible.

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

Thus, for example, figure 10 is a partial sectional view of an innerboot 110, wherein the upper 101 is still of the type described above and is made of thermoplastic material with a partially pared-down and subsequently pressed edge, and with a sole 107 made of non-thermoplastic material, for example a semirigid plastic material, the edge 106 whereof is coupled, by means of a seam 109, at the pared-down and pressed region of the edge 103 and of the upper 101. The innerboot is then turned inside out and heated to embed the seam 109 in the upper and in the sole.

The extents of the pared-down and pressed regions can of course be changed according to the specific requirements, and the same applies to the type of paring down performed and to the number of seams applied at the perimetric edges of the sole and of the upper.

The materials and the dimensions constituting the individual elements of the invention may of course also be the most appropriate 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. Method for manufacturing innerboots, particularly for sports shoes, composed of an upper (1) and of a sole (7) made of thermoplastic materials, characterized in that it comprises, the steps of:

   a) cutting said upper on a flat plane and then perimetrically paring it down;
   b) pressing said upper and said sole along the perimeter;
   c) perimetrically sewing said upper to said sole so as to form a seam (9) and to define said innerboot;
   d) turning said innerboot inside out;
   e) heating said innerboot so as to embed said seam inside it.

2. Method according to claim 1, characterized in that said upper (1), obtained by cutting a sheet of thermoplastic material on a flat plane, is pared down at at least part of its edge (3).

3. Method according to claim 2, characterized in that said paring down is obtained at first portions (4a,4b) corresponding to the sides of the user's foot

and at second portions (5a,5b) corresponding, at the end of said method, to the foot instep region.

4. Method according to claim 2, characterized in that said paring down is obtained by means of an adapted mill.

5. Method according to one or more of the preceding claims, characterized in that said upper is subjected to pressing at said edge.

6. Method according to one or more of the preceding claims, characterized in that said sole, made of thermoplastic material or semirigid plastics, is subjected to pressing at said edge.

7. Method according to one or more of the preceding claims, characterized in that said pressing steps form a pressed region (8) for both said upper and said sole.

8. Method according to one or more of the preceding claims, characterized in that said pressed region (8) of said upper (1) affects part of said edge (3) that is subsequently affected by said seam (9) for connection to said sole.

9. Method according to one or more of the preceding claims, characterized in that said upper (1) and said sole (7) are coupled to each other by means of at least one seam (9) applied at said pressed region of said edges of said upper and said sole, which are placed mutually adjacent beforehand.

10. Method and innerboot according to one or more of the preceding claims, characterized in that the innerboot is subsequently turned inside out, so as to place said sewn edges inside said innerboot.

11. Method and innerboot according to one or more of the preceding claims, characterized in that the innerboot is heated so as to allow said thermoplastic material to embed said at least one seam inside itself.

12. An innerboot for sports shoes, characterized in that it comprises at least one perimetric seam (9) for connection between an upper (1) and a sole (7), said seam being embedded in said upper and said sole.

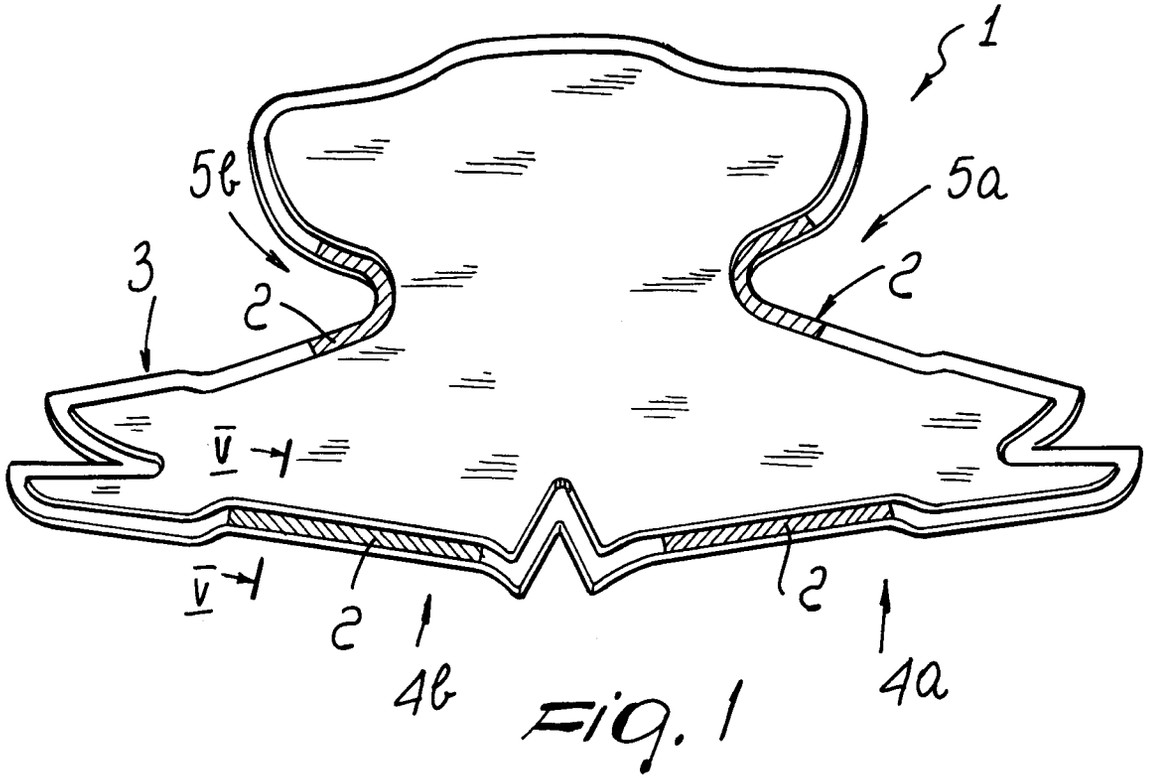

Fig. 1

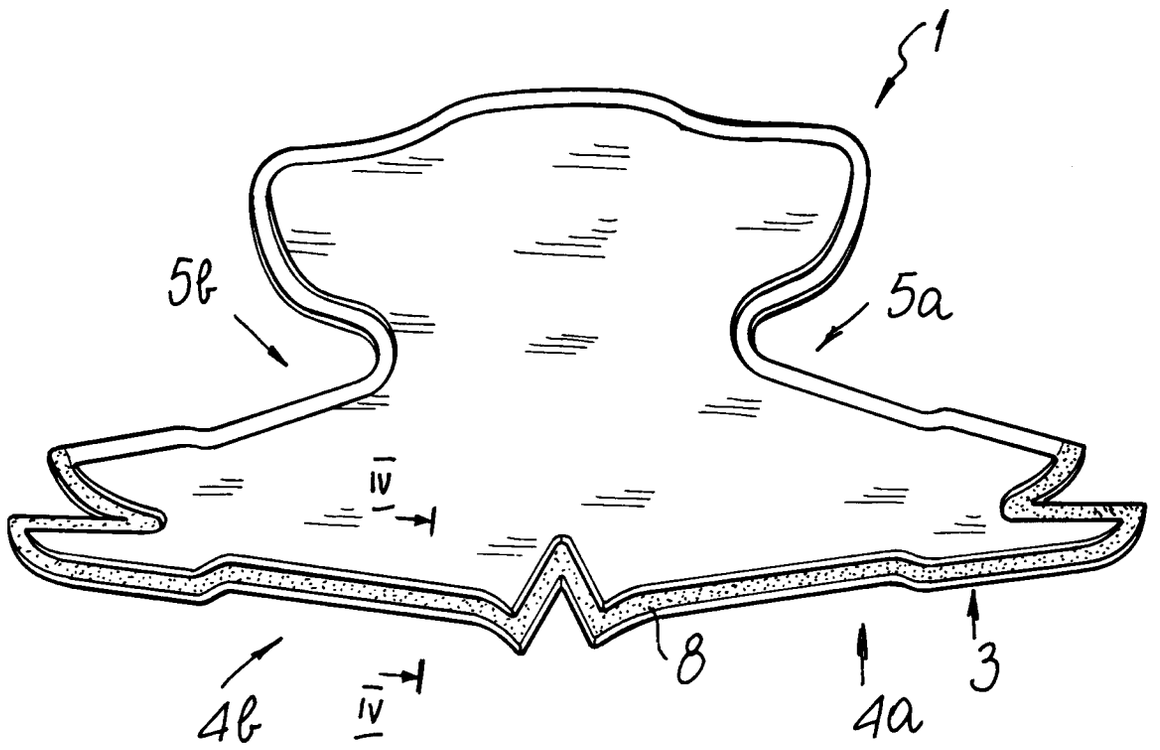

Fig. 2

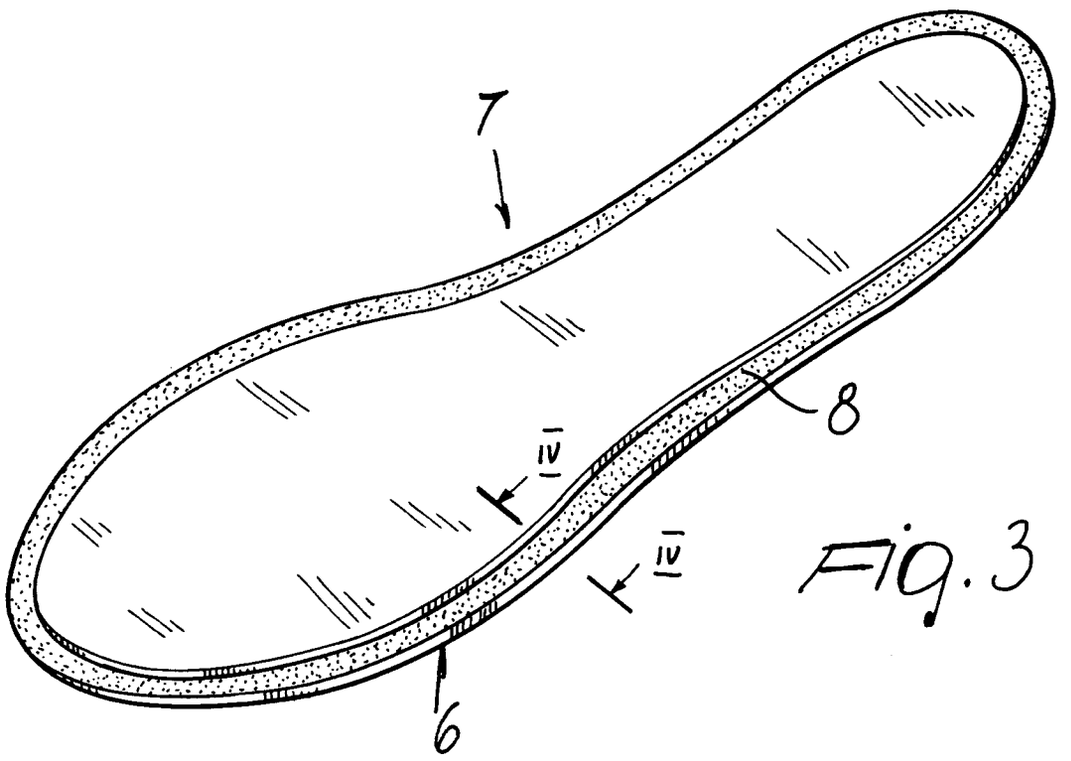

FIG. 3

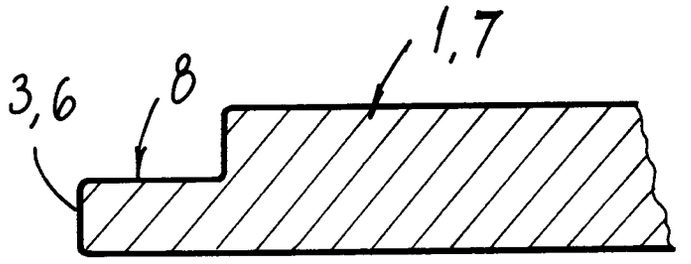

FIG. 4

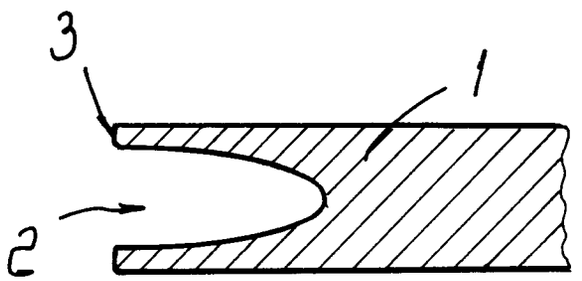

FIG. 5

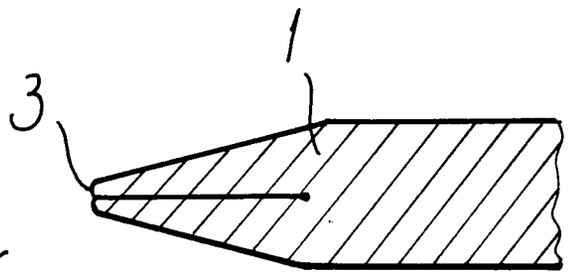

FIG. 6

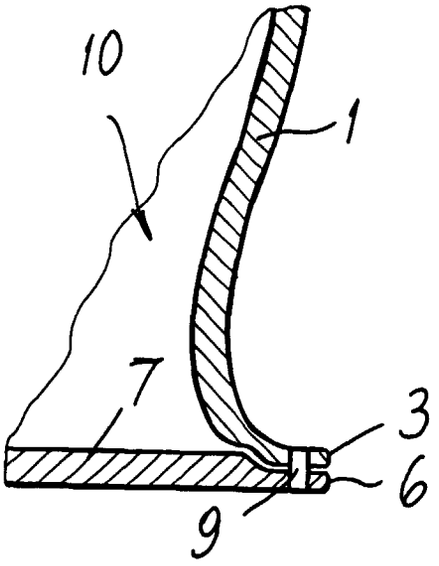

Fig. 7

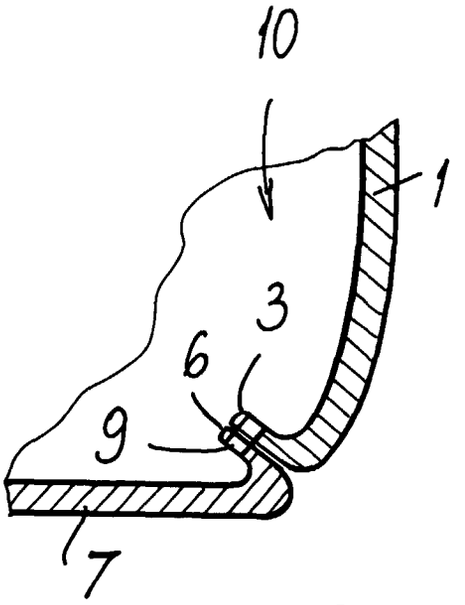

Fig. 8

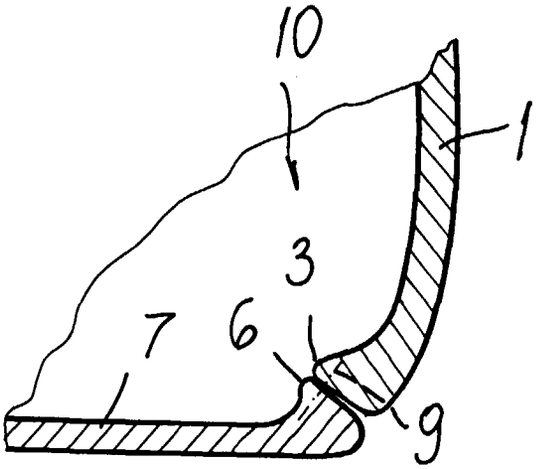

Fig. 9

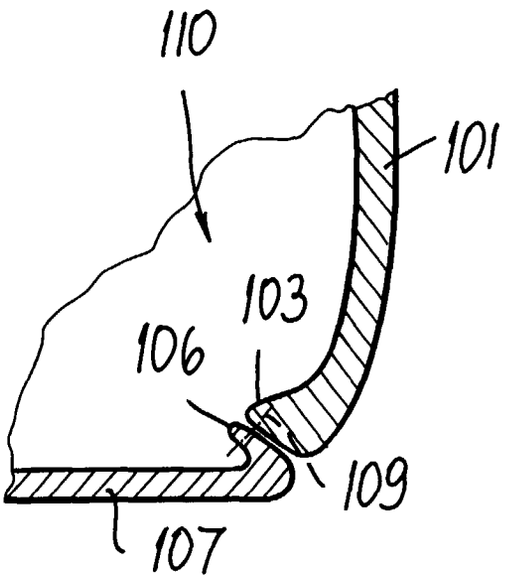

Fig. 10

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 96 11 9791

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	EP 0 071 088 A (NORDICA) * the whole document * ---	1	A43B5/04
A	EP 0 250 892 A (NORDICA) * the whole document * ---	1	
A,D	WO 94 09663 A (INTUITION SPORTS) * the whole document * -----	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

A43B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	28 February 1997	Declerck, J

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 03.82 (P04C01)