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(54) **Ski boot**

(57) The present invention refers to a ski boot comprising an internally hollow lower shell (1) provided with a sole (2), a soft inner boot and at least a support member (3) for the inner boot adapted to be fitted inside the lower

shell (1) for accommodation in proximity of, or resting against, the sole (2); the support member (3) is selectively attachable to the lower shell (1) at the toe region and/or the plantar region and/or the heel region.

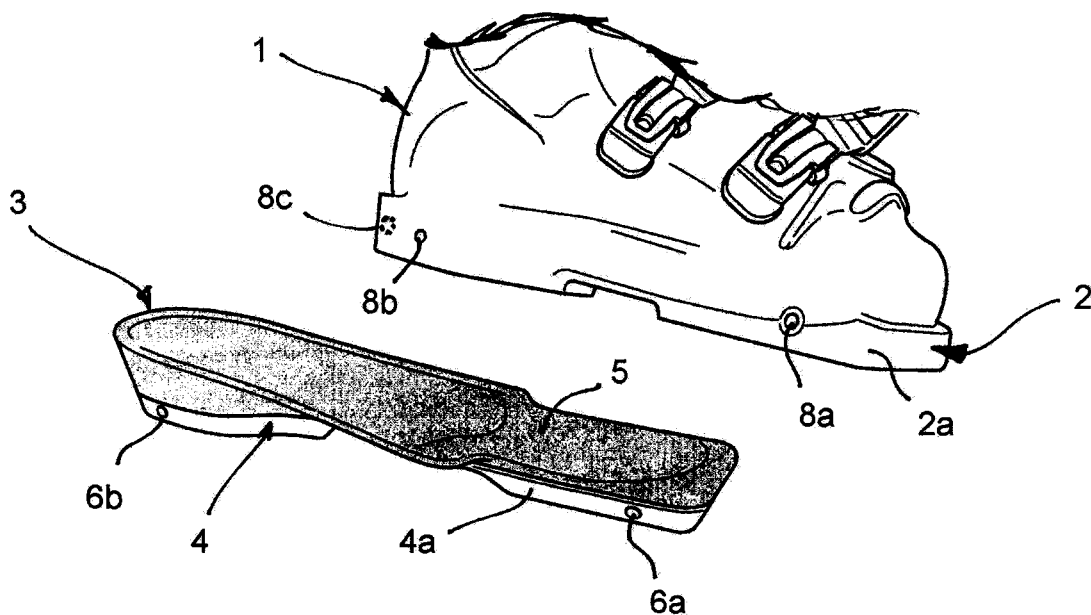


FIG.1

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Description

[0001] The present invention refers to a ski boot.

[0002] Ski boots are known nowadays to basically comprise a lower shell which is provided with a sole and is adapted to accommodate and contain the foot of the wearer, a cuff rotatably associated to the lower shell and adapted to wrap the lower part of the wearer's leg, and a soft, removable inner boot forming a padding lying between the wearer's foot and leg on one side and the plastic parts of the boot, constituted by the lower shell and the cuff, on the other side.

[0003] Generally, between the inner surface of the sole of the lower shell and the outer surface of the sole of the inner boot there is positioned a support member for the inner boot, usually formed by a wedge, the purpose of which is to make it much more comfortable for the foot bottom to rest upon the boot sole. Such support member is generally made of a substantially rigid or semi-rigid material, such as a thermoplastic material, and basically has a wedge-shaped longitudinal section that is higher at the heel region, while gradually decreasing in its height towards the toe region of the boot. The upper surface of the support member, upon which the inner boot is due to rest, is preferably shaped and contoured anatomically so as to enhance the level of comfort and stability of the foot resting thereupon.

[0004] The support member is simply laid down freely, i.e. without any restraint to keep it locked in position, inside the lower shell onto appropriate recessed accommodations that are generally provided at the heel region and/or the toe region of the lower shell of the boot.

[0005] A main object of the present invention is to increase the effectiveness in transmitting the efforts from the foot of the skier to the ski boot, in view of improving the effectiveness with which a ski associated thereto can be steered, driven and controlled.

[0006] Within the above general object, a purpose of the present invention is to enable a wearer to easily and conveniently vary the setup of the ski boot in view of optimizing the way in which efforts shall be transmitted from the foot to the boot depending on the different kinds of ski racing, such as slalom, downhill or giant slalom.

[0007] Another purpose of the present invention is to enable a wearer to modify in an optimum manner those features of the boot, which are necessary for controlling the ski, in accordance with his/her own physical characteristics, such as weight, ability, skiing style, and the like.

[0008] Still another purpose of the present invention is to provide a ski boot that enables the afore-noted objects and purposes to be achieved at competitive costs, and is further capable of being manufactured using generally and readily available tools and machinery.

[0009] According to the present invention, these aims, along with further ones that will be apparent in the following description, are reached in a ski boot as defined in claim 1.

[0010] Further characteristics and advantages of a ski

boot according to the present invention, as defined in the sub-claims, will be more readily understood from the description of a preferred, although not sole embodiment that is given below by way of non-limiting example with reference to the accompanying drawings, in which:

- Figure 1 is a perspective exploded view of the lower shell of a ski boot, to which there is associable a support member according to the present invention;
- Figure 2 is a bottom view of the support member and the sole of the lower shell shown in Figure 1;
- Figure 3 is a side view of the support member illustrated in Figures 1 and 2;
- Figure 4 is a rear view of the support member illustrated in Figures 1, 2 and 3.

[0011] With reference to the Figures mentioned above, a ski boot according to the present invention comprises an internally hollow lower shell 1 adapted to receive and accommodate a wearer's foot; the lower shell 1 is provided with a sole 2, which is appropriately shaped and contoured at the heel region and the toe region thereof so as to be able to be coupled to and locked into position in a ski binding.

[0012] A preferably removable, soft inner boot (not shown) is contained in a generally known manner inside the lower shell 1, where it forms a padding interposed between the wearer's foot and the lower shell 1.

[0013] The ski boot further comprises at least one support member 3, such as a wedge, adapted to be fitted inside the lower shell 1 and be accommodated in proximity of the sole 2, generally resting upon adapted accommodations formed on the inner surface of the sole 2 of the lower shell 1.

[0014] The support member 3 is formed integrally - or at least partially at a lower portion thereof resting upon the inner surface of the sole 2 of the lower shell 1 - of a rigid and mechanically tough material. In the embodiment illustrated by way of example in the accompanying drawings, the support member 3 is comprised of a base 4 of a rigid and mechanically tough material, such as a metal material, on top of which there is associated a plate 5 made of a semi-rigid material having lower-grade mechanical properties, such as a thermoplastic material or a silicone rubber.

[0015] Such plate 5 may be associated to the base 4 by either using techniques ensuring a permanent attachment, such as gluing or over-injection moulding, or by means of mechanical fasteners, such as screws, for a releasable attachment.

[0016] The plate 5, upon which there comes to rest the sole of the inner boot, is advantageously anatomically-contoured shaped so as to make it possible for the sole of the wearer's foot to rest thereupon in a much more comfortable and stable manner.

[0017] The base 4 is provided with a plurality of engagement means, such as apertures or the like, arranged along the peripheral edge 4a and/or along the bottom surface 4b thereof, which are adapted to couple up - when the support member 3 is fitted into the lower shell 1 - to a corresponding plurality of receptacles arranged, either inside or outside, along the lower peripheral edge 2a and/or on the bottom surface 2b of the lower shell 1. Even these receptacles or corresponding engagement means provided on the lower shell may be formed of appropriate apertures that are capable of selectively coupling up to the afore-cited engagement means with the help of appropriate coupling means, as this shall be described in greater detail further on.

[0018] In particular, on the peripheral edge 4a of the base 4 there are provided:

- first engagement means 6a arranged on opposite sides relative to the longitudinal axis of the support member 3 at the region where the toe portion of the foot is accommodated; in the embodiment being described by way of illustrative example with reference to the accompanying drawings, only a single one of the two apertures forming the engagement means 6a is shown in the Figures, the other aperture being provided - preferably in a symmetrical relationship - on the opposite side relative to the afore-mentioned longitudinal axis;
- second engagement means 6b arranged on opposite sides relative to the longitudinal axis of the support member 3 at the region where the heel portion of the foot is accommodated; in the embodiment being described by way of illustrative example with reference to the accompanying drawings, only a single one of the two apertures forming the engagement means 6b is shown in the Figures, the other aperture being provided - preferably in a symmetrical relationship - on the opposite side relative to the afore-mentioned longitudinal axis;
- third engagement means 6c provided on the rear side, at a site roughly corresponding to the longitudinal axis of the support member 3 in the region accommodating the heel.

[0019] On the bottom surface 4b of the base 4 there are provided:

- fourth engagement means 7a, 7b arranged - preferably in a symmetrical relationship - on opposite sides relative to the longitudinal axis of the support member 3 at the region where the toe portion of the foot is accommodated;
- fifth engagement means 7c, 7d arranged - preferably in a symmetrical relationship - on opposite sides relative to the longitudinal axis of the support member

3 at the region where the plantar arch of the foot is accommodated;

- sixth engagement means 7e, 7f arranged - preferably in a symmetrical relationship - on opposite sides relative to the longitudinal axis of the support member 3 at the region where the heel portion of the foot is accommodated.

[0020] To such plurality of engagement means as mentioned above there corresponds - on the sole 2 of the lower shell 1 of the boot - the following plurality of receptacles:

- a first pair of receptacles 8a, corresponding to the first engagement means 6a on the support member 3, provided on the peripheral edge 2a, and on opposite sides relative to the longitudinal axis of the sole 2, at the region where the toe portion of the foot is accommodated; in the embodiment being described by way of illustrative example with reference to the accompanying drawings, only a single one of the two apertures forming the first pair of receptacles 8a is shown in the Figures, the other aperture being provided - preferably in a symmetrical relationship - on the opposite side relative to the afore-mentioned longitudinal axis;
- a second pair of receptacles 8b, corresponding to the second engagement means 6b on the support member 3, provided on the peripheral edge 2a, and on opposite sides relative to the longitudinal axis of the sole 2, at the region where the heel portion of the foot is accommodated; in the embodiment being described by way of illustrative example with reference to the accompanying drawings, only a single one of the two apertures forming the second pair of receptacles 8b is shown in the Figures, the other aperture being provided - preferably in a symmetrical relationship - on the opposite side relative to the afore-mentioned longitudinal axis;
- a third receptacle 8c, corresponding to the third engagement means 6c, provided on the peripheral edge 2a of the sole 2, at a site roughly corresponding to the longitudinal axis of the same sole in the region accommodating the heel;
- a fourth pair of receptacles 9a, 9b, corresponding to the fourth engagement means 7a, 7b on the support member 3, provided on the bottom surface 2b, and on opposite sides - preferably in a symmetrical relationship - relative to the longitudinal axis of the sole 2, at the region where the toe portion of the foot is accommodated;
- a fifth pair of receptacles 9c, 9d, corresponding to the fifth engagement means 7c, 7d on the support

member 3, provided on the bottom surface 2b, and on opposite sides - preferably in a symmetrical relationship - relative to the longitudinal axis of the sole 2, at the region where the plantar arch of the foot is accommodated;

- a sixth pair of receptacles 9e, 9f, corresponding to the sixth engagement means 7e, 7f on the support member 3, provided on the bottom surface 2b, and on opposite sides - preferably in a symmetrical relationship - relative to the longitudinal axis of the sole 2, at the region where the heel portion of the foot is accommodated.

[0021] The support member 3 is therefore capable of being attached in a selective manner to the lower shell 1 by the coupling of one or more such engagement means of said plurality of engagement means 6a, 6b, 6c, 7a, 7b, 7c, 7d, 7e, 7f into one or more such corresponding receptacles of said plurality of receptacles 8a, 8b, 8c, 9a, 9b, 9c, 9d, 9e, 9f with the help of appropriate releasable coupling means, such as screws, studs, rotating cams or similar mechanical members, preferably capable of being actuated or operated by the wearer from the outside of the lower shell 1 so as to be able to carry out a desired adjustment even in the condition in which the boot is worn.

[0022] The way in which the present invention works is as follows: prior to putting on the ski boot - or even when the ski boot is being worn, if the coupling means allows it - the user will be able to attach the support member 3 to the lower shell 1 of the boot at one or more of the sites where the engagement means are provided for coupling with the appropriate receptacles, in accordance with his/her own physical characteristics, such as weight and/or abilities, or skiing style, or - again - in accordance with the kind of ski racing one is going to perform. It has in fact been found that the boot is capable of performing in an optimum manner when special slalom is the intended kind of ski racing, which is a kind of racing requiring swift, sharp and frequent changes in direction so that the ski needs to be run and guided in an extremely accurate and reactive manner, if the support member 3 is fully and completely secured to the lower shell 1, i.e. a condition in which such member 3 is attached thereto at all engagement means provided to this purpose all along the peripheral edge and the bottom surface thereof or, in other words, a condition in which the first engagement means 6a will be coupled to the corresponding first pair of receptacles 8a, the second engagement means 6b will be coupled to the corresponding second pair of receptacles 8b, the third engagement means 6c will be coupled to the corresponding third pair of receptacles 8c, the fourth engagement means 7a, 7b will be coupled to the corresponding fourth pair of receptacles 9a, 9b, the fifth engagement means 7c, 7d will be coupled to the corresponding fifth pair of receptacles 9c, 9d and, finally, the sixth engagement means 7e, 7f will be coupled to the

corresponding sixth pair of receptacles 9e, 9f.

[0023] In the case that faster-running kinds of ski races that do not involve so swift or frequent changes in direction are going to be dealt with, as this may for instance be the case of giant slalom, in which curves need to be controlled at high speeds, it has on the other hand been found that an optimum result is obtained if the support member 3 is solely secured to the lower shell 1 of the boot at the toe region of the same boot, i.e. a condition in which the first engagement means 6a are coupled to the first pair of receptacles 8a and/or the fourth engagement means 7a, 7b are coupled to the fourth pair of receptacles 9a, 9b and/or the fifth engagement means 7c, 7d are coupled to the fifth pair of receptacles 9c, 9d. In the case of downhill racing, in which it is extremely important for the speed of the ski to be appropriately controlled, since changes in direction are in this case represented essentially by mere adjustments to the orientation of the slope through wide curves, it has finally been found that optimum results are obtained if the support member 3 is solely secured to the lower shell 1 of the boot at the rear or heel region of the same boot, i.e. a condition in which the second engagement means 6b are coupled to the second pair of receptacles 8b and/or the third engagement means 6c are coupled to the third pair of receptacles 8c and/or the sixth engagement means 7e, 7f are coupled to the sixth pair of receptacles 9e, 9f.

[0024] Fully apparent from the above description is therefore the ability of the ski boot according to the present invention to effectively reach the afore-cited aims and advantages, in that it provides a boot that effectively enables the efforts of the skier's foot aimed at improving the way in which the ski is guided and controlled to be transmitted to the ski in a much more efficient and - moreover - really personalizable or individualizable manner, thanks to the possibility for the support member 3 to be selectively secured at different regions of the sole 2 of the lower shell 1 of the boot in view of optimizing the way in which the above-cited efforts are transmitted to the ski, the wearer being in addition fully capable of easily and conveniently varying the set-up of the boot in accordance with his/her own physical characteristics, such as weight, ability or skiing style, kind of ski racing selected, and the like.

[0025] It shall be appreciated that the inventive ski boot as described above to illustrative purposes may of course be the subject of a number of modifications and may be embodied in a number of different manners without departing from the scope of the present invention as defined in claim 1, wherein all afore-cited details may furthermore be replaced with technically equivalent elements.

[0026] It should finally be noticed that the materials used to manufacture the footwear structure of the present invention, as well as the shapes and the sizing of the individual component parts thereof, may each time be selected so as to more appropriately meet the particular requirements or suit the particular application, again without departing from the scope of the present invention as

defined in claim 1.

Claims

1. Ski boot comprising an internally hollow lower shell (1) provided with a sole (2), a soft inner boot and at least one support member (3) for said inner boot adapted to be fitted inside said lower shell (1) for accommodation in proximity of, or resting against, said sole (2), **characterized in that** said support member (3) is selectively attachable to said lower shell (1) at the toe region and/or the plantar arch region and/or the heel region.
2. Ski boot according to claim 1, wherein said support member (3) is adapted to be selectively secured by means of appropriate releasable coupling means at one or more receptacles of a plurality of receptacles (8a, 8b, 8c, 9a, 9b, 9c, 9d, 9e, 9f) provided along the lower peripheral edge (2a) and/or the bottom surface (2b) of said lower shell (1) of the boot.
3. Ski boot according to claim 2, wherein said plurality of receptacles (8a, 8b, 8c, 9a, 9b, 9c, 9d, 9e, 9f) are provided on the inside of said lower peripheral edge (2a) and/or said bottom surface (2b) of said lower shell (1) of the boot.
4. Ski boot according to claim 2, wherein said plurality of receptacles (8a, 8b, 8c, 9a, 9b, 9c, 9d, 9e, 9f) are provided on the outside of said lower peripheral edge (2a) and/or said bottom surface (2b) of said lower shell (1) of the boot.
5. Ski boot according to claim 2, wherein said support member (3) is provided with a plurality of engagement means (6a, 6b, 6c, 7a, 7b, 7c, 7d, 7e, 7f) provided along the peripheral edge (4a) and/or the bottom surface (4b) of said support member (3) that are capable to be coupled, by means of said releasable coupling means, to one or more corresponding receptacles of said plurality of receptacles (8a, 8b, 8c, 9a, 9b, 9c, 9d, 9e, 9f).
6. Ski boot according to claim 5, wherein said peripheral edge (4a) of said support member (3) is provided with first engagement means (6a) arranged on opposite sides relative to the longitudinal axis of said support member (3) at the region where the toe portion of the foot is accommodated, said first engagement means (6a) being capable of being coupled to a corresponding first pair of receptacles (8a) provided on the peripheral edge (2a) of said lower boot (1) on opposite sides relative to the longitudinal axis of said sole (2) at said region where the toe portion of the foot is accommodated.
7. Ski boot according to claim 5, wherein said peripheral edge (4a) of said support member (3) is provided with second engagement means (6b) arranged on opposite sides relative to the longitudinal axis of said support member (3) at the region where the heel portion of the foot is accommodated, said second engagement means (6b) being capable of being coupled to a corresponding second pair of receptacles (8b) provided on the peripheral edge (2a) of said lower boot (1) on opposite sides relative to the longitudinal axis of said sole (2) at said region where the toe portion of the foot is accommodated.
8. Ski boot according to claim 5, wherein said peripheral edge (4a) of said support member (3) is provided with third engagement means (6c) provided on the rear side, at a site roughly corresponding to the longitudinal axis of said support member (3) in the region accommodating the heel portion of the foot, said third engagement means (6c) being capable of being coupled to a corresponding third pair of receptacles (8c) provided on the peripheral edge (2a) of said lower boot (1) at a site roughly corresponding to the longitudinal axis of said sole (2) in said region where the heel portion of the foot is accommodated.
9. Ski boot according to claim 5, wherein said bottom surface (4b) of said support member (3) is provided with fourth engagement means (7a, 7b) arranged on opposite sides relative to the longitudinal axis of said support member (3) at the region where the toe portion of the foot is accommodated, said fourth engagement means (7a, 7b) being capable of being coupled to a corresponding fourth pair of receptacles (9a, 9b) provided on the bottom surface (2b) of said lower boot (1) on opposite sides relative to the longitudinal axis of said sole (2) at said region where the toe portion of the foot is accommodated.
10. Ski boot according to claim 5, wherein said bottom surface (4b) of said support member (3) is provided with fifth engagement means (7c, 7d) arranged on opposite sides relative to the longitudinal axis of said support member (3) at the region where the plantar arch portion of the foot is accommodated, said fifth engagement means (7c, 7d) being capable of being coupled to a corresponding fifth pair of receptacles (9c, 9d) provided on the bottom surface (2b) of said lower boot (1) on opposite sides relative to the longitudinal axis of said sole (2) at said region where the plantar arch portion of the foot is accommodated.
11. Ski boot according to claim 5, wherein said bottom surface (4b) of said support member (3) is provided with sixth engagement means (7e, 7f) arranged on opposite sides relative to the longitudinal axis of said support member (3) at the region where the heel portion of the foot is accommodated, said sixth en-

gagement means (7e, 7f) being capable of being coupled to a corresponding sixth pair of receptacles (9e, 9f) provided on the bottom surface (2b) of said lower boot (1) on opposite sides relative to the longitudinal axis of said sole (2) at said region where the heel portion of the foot is accommodated. 5

12. Ski boot according to claims 2 and 5, wherein said plurality of receptacles (8a, 8b, 8c, 9a, 9b, 9c, 9d, 9e, 9f) and said plurality of engagement means (6a, 6b, 6c, 7a, 7b, 7c, 7d, 7e, 7f) are formed of apertures adapted to be engaged by said releasable coupling means. 10

13. Ski boot according to any of the preceding claims, wherein said releasable coupling means are actuable on the outside of said lower shell (1). 15

14. Ski boot according to any of the preceding claims, wherein said support member (3) is comprised of a base (4) of a rigid and mechanically tough material, on top of which there is associated a plaque (5) of a semi-rigid material, preferably provided so as to feature an anatomically contoured shape, said plurality of apertures (6a; 6b; 6c; 7a, 7b; 7c, 7d; 7e, 7f) being provided along the peripheral edge (4a) and/or the bottom surface (4b) of said base (4). 20 25

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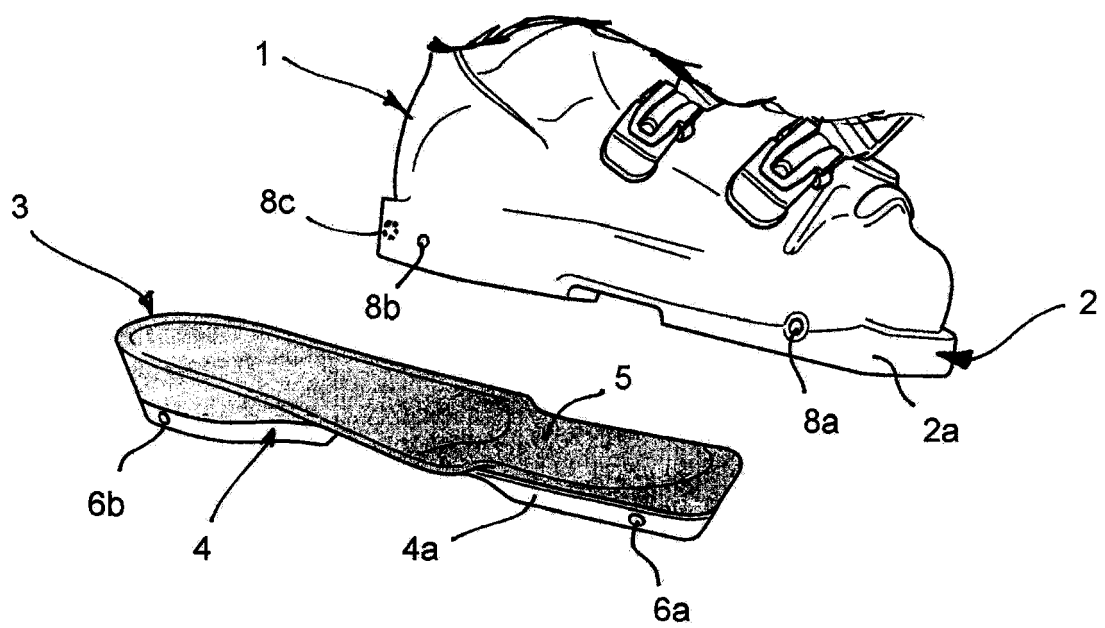


FIG.1

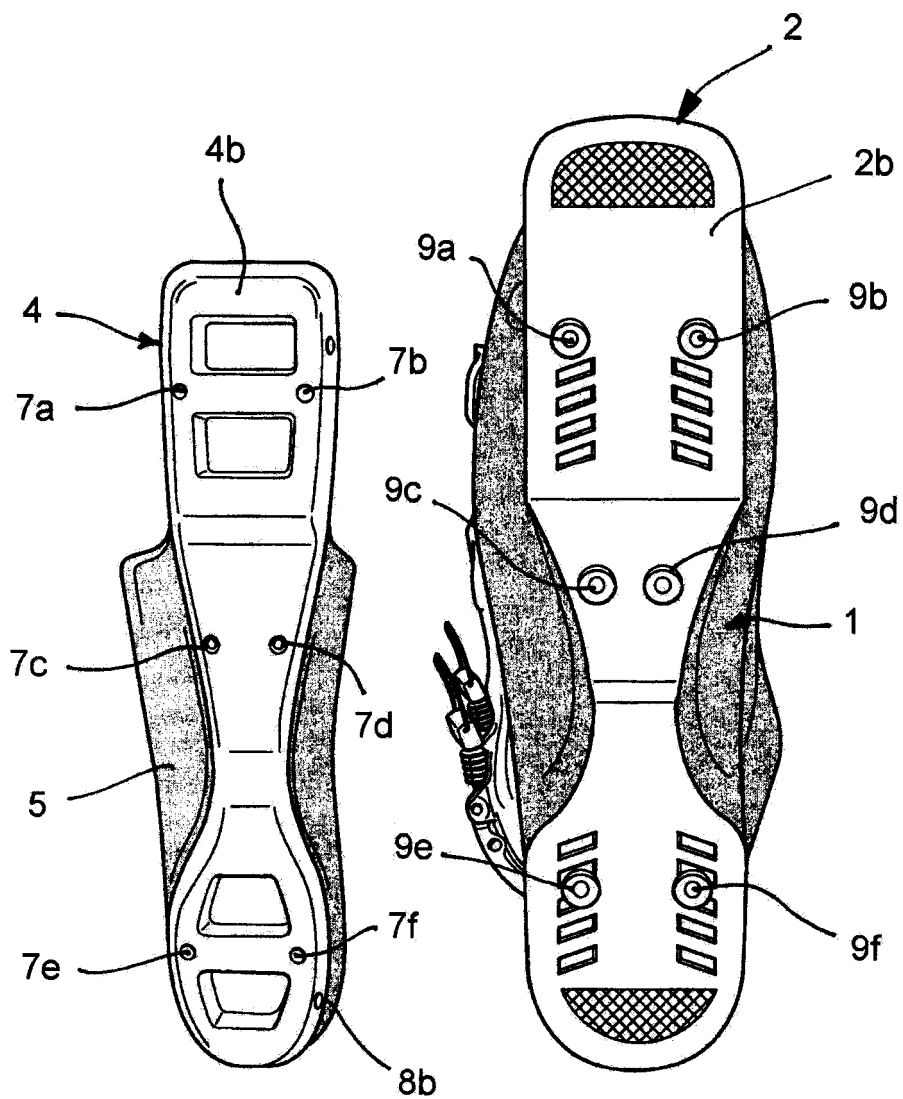


FIG.2

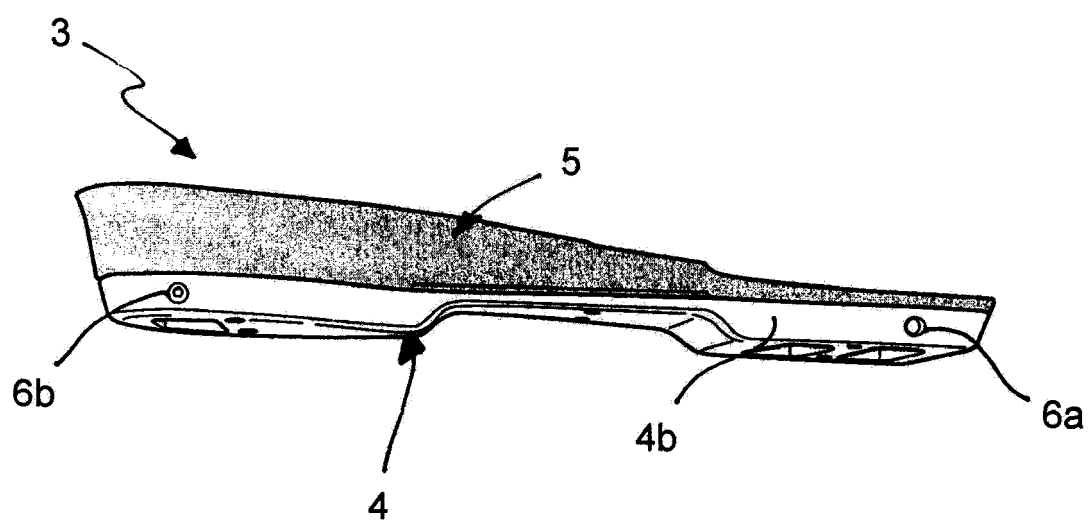


FIG.3

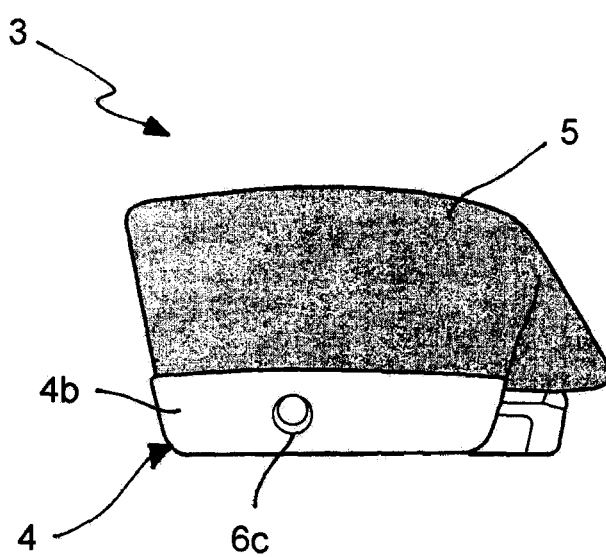


FIG.4



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	FR 2 354 065 A (SALOMON & FILS F [FR]) 6 January 1978 (1978-01-06) * page 8, lines 25-35; claims 1-5; figures 1,13,14,27,28,33,37 *	1-14	INV. A43B5/04 A43B13/36
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
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Place of search		Date of completion of the search	Examiner
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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			

**ANNEX TO THE EUROPEAN SEARCH REPORT
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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
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