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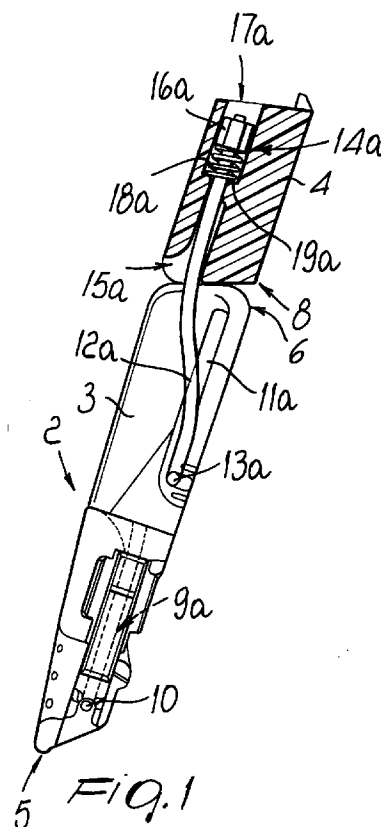
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(54) Lever particularly for ski boots

(57) A lever for ski boots includes a free lever arm (2) and a support (4) associated with the boot. The lever arm and the support are provided with seats (9a) for guiding first traction element (10) connected, at its ends, to the boot. The lever includes second traction element (12a) connected, at its ends, respectively to the support (4) and to the lever arm (2) with the interposition of a flexible element (18a).



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Description

The present invention relates to a lever particularly for ski boots.

Levers are currently used to apply tension to traction elements, such as cables or straps, for fastening the flaps of a quarter or of the shell of a shoe, such as for example a ski boot.

Conventional levers are basically constituted by a lever arm wherein one end is pivoted at two shoulders protruding from a base that is fixed to a flap of the shell or of the quarter of the ski boot.

These levers have drawbacks: first of all, the lever arm is subjected to accidental impacts both during skiing and during walking, when the lever is open and the lever arm is raised; these accidental impacts cause deformations at the shoulders of the base, thus hindering the operation of the lever.

Moreover, the use of a base entails additional costs, mainly related to the technological difficulties arising from fixing said base to the boot and from pivoting it to the lever arm.

French Patent no. 2,450,575 discloses a lever device for fastening a ski boot, provided with a plurality of ridges that form a rack and are orientated along the longitudinal axis. The ridges are arranged between two retention bars provided with longitudinal openings, whereat a cable is passed. The cable can be manually made to interact at the desired point of the rack.

One end of the lever arm is arrangeable at a desired point provided to the rear of the quarter.

Although this solution eliminates the use of a base with the corresponding shoulders for pivoting of the lever arm, drawbacks are still observed: in fact, once the skier has opened the lever arm, thus disengaging it from the quarter, the lever arm dangles to the rear of the boot because the cable is slack.

On one hand, therefore, the lever arm interacts with the ground, for example during walking, with the consequent risk of collisions and breakage, and on the other hand its random arrangement causes the skier to close said lever in an incorrect position or forces him in any case to restore its correct position performing a movement that is certainly awkward, because the skier has to visually check an element located to the rear of the boot.

Furthermore, the cable must be positioned at the rack manually by the skier, and this is certainly not an easy operation.

As a solution to the above mentioned drawbacks, Italian Patent application no. TV93A000054 discloses a lever for ski boots constituted by a free lever arm and by a support associated with the quarter of the boot.

The supporting lever arm has a seat for guiding and/or redirecting two cables connected, at their ends, respectively to the quarter or to the shell and to said support.

The two traction elements also connect the lever arm and the support in a hinge-like manner, so as to force the

lever arm to assume the desired orientation in the open condition.

Although this solution obviates most of the drawbacks mentioned above, it still has inconveniences: in particular, it has been observed that when the closure force is low, the lever arm tends to open in case of accidental impacts directly or indirectly affecting the lever arm.

Furthermore, if the two ends of the cables that lie opposite to the lever arm are connected to the shell, during flexing, the tension in the cables decreases since the distance between the point where the cables are anchored to the shell and the support associated with the quarter decreases. This will cause the lever to flap against the quarter, which in the long run can cause breakages and is in any case unpleasant for the skier. The loosening of the cables may also cause the lever to open while skiing, with dangerous consequences, such as the skier's fall.

The aim of the present invention is to solve the above-described technical problems, eliminating the drawbacks of the prior art by providing a lever having, in closed condition, optimum stability in all phases of skiing even in case of accidental impacts.

Within the scope of this aim, an object of the present invention is to provide a lever having a lever arm that does not swing when the lever is open.

Another object of the present invention is to provide a compact lever having a structure which protrudes to a limited extent with respect to the boot.

Another object of the present invention is to provide a lever that adequately maintains structural integrity even under the action of accidental impacts.

Another object of the present invention is to provide a lever that is reliable and safe in use and has low manufacturing costs.

This aim, these objects, and others which will become apparent hereinafter are achieved by a lever particularly for ski boots, comprising a free lever arm and a support associated with said boot, said lever arm and said support having at least one seat for guiding at least one first traction element connected, at its ends, to said boot, characterized in that it comprises at least one second traction element connected, at its ends, respectively to said support and to said lever arm with the interposition of at least one flexible element.

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

figure 1 is a partially sectional side view of the lever in closed condition;

figure 2 is a partially sectional side view of the lever in open condition;

figure 3 is a front view of the lever in the condition shown in figure 1;

figure 4 is a view, similar to figure 1, of a further embodiment of the lever according to the invention; figure 5 is a view, similar to figure 2, of the lever of figure 4.

With reference to the above figures, the reference numeral 1 designates the lever, which comprises a lever arm 2 constituted by a body 3 that is free and separate from a support 4. The support 4 is associated to the rear of the rear quarter, not shown, of a shoe preferably in a region that is adjacent to the upper edge of said shoe quarter.

The body 3 has a first end 5, which is free and can be gripped by the user, and a second end 6, which is rounded or shaped like an inclined plane forming an obtuse angle with the base 7 of the lever arm 2, assuming a counterclockwise rotation as positive.

The second end 6 is arranged adjacent to a complementarily shaped and facing third end 8 of the support 4.

A first seat 9a is formed axially with respect to the lever arm 2, starting from the second end 6, and is connected, proximate to the first end 5 of the body 3, to a guide 9b so as to constitute a seat for the sliding of a first traction element, such as a first cable 10.

The ends of the first cable are connected to the quarter or to the shell of the shoe.

Two second seats 11a and 11b, approximately mutually parallel, are also formed axially with respect to the lever arm 2, starting from the second end 6. Second traction elements, such as two separate second cables 12a and 12b, are arranged at said seats.

Each one of said second cables 12a and 12b has a first end 13a and 13b that can be retained inside said second seats 11a and 11b. Said seats allow the second cables 12a and 12b to exit from the body 3 towards the support 4. The second ends 14a and 14b of the cables are arranged at third seats 15a and 15b formed axially to said support 4.

The second cables thus form a hinge member for connection between the support 4 and the body 3 constituting the lever arm 2.

The third seats 15a and 15b affect the entire length of the support 4, so as to allow the passage of the second ends 14a and 14b of the second cables, which are advantageously threaded so as to allow connection to two complementarily threaded locking nuts 16a and 16b. The locking nuts 16a, 16b abut at a recess 17a and 17b formed coaxially to the third seats 15a and 15b on the opposite side with respect to the third end 8 of the support 4.

The lever provides for the interaction of said second cables 12a and 12b with at least one flexible element, such as a rubber fitting or a pair of springs 18a and 18b adapted to force the takeup of the working section of said second cables.

The springs 18a and 18b are arranged coaxially to the second cables at the second ends 14a and 14b thereof and can be interposed, as shown in figures 1, 2, and 3, between said lock nuts 16a and 16b and the step

member 19a and 19b connecting said third seats 15a and 15b to said recesses 17a and 17b.

As an alternative, as shown in figures 4 and 5, the flexible elements are arranged coaxially to the first ends 13a and 13b of the second cables 12a and 12b that are interposed between a tooth 20, formed at one end of the second seats 11a and 11b, and a locking ring 21 rigidly coupled to said first ends 13a and 13b.

As an alternative, the flexible element can be constituted by a rubber fitting or by another equivalent element.

It has thus been observed that the intended aim and objects have been achieved, since the presence of the two separate second cables and of the springs allow to stabilize the positioning of the lever arm in the open or closed conditions of said lever.

The flexible element in fact absorbs any accidental impacts affecting the lever arm, making it resume a stable position both when closed and when open.

When the closure force is low, the springs prevent possible disengagements, by keeping the support and the lever arm mutually adjacent.

Furthermore, if the ends of the first cable 10 are connected to the shell, the springs compensate for the reduction of the distance between the support associated with the quarter and the point where the cables are anchored to the shell, maintaining at all times a constant tension in the second cables in all phases of skiing, in order to ensure the closure of the lever and avoid unpleasant flapping thereof against the quarter.

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

The dimensions and the materials that constitute the individual components of the lever may 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. Lever particularly for ski boots, comprising a free lever arm (2) and a support (4) associated with said boot, said lever arm and said support having at least one seat (9a, 9b) for guiding at least one first traction element (10) connected, at its ends, to said boot, characterized in that it comprises at least one second traction element (12a, 12b) connected, at its ends, respectively to said support (4) and to said lever arm (2) with the interposition of at least one flexible element (18a, 18b).
2. Lever according to claim 1, characterized in that said lever arm (2) is constituted by a body (3) that is free

and separate with respect to said support (4), said body having a first end (5), which is free and can be gripped by the user, and a second end (6), which is rounded or shaped like an inclined plane forming an obtuse angle with respect to the base (7) of said lever arm (2), assuming a counterclockwise rotation as positive, said second end being arranged adjacent to a complementarily shaped and facing third end (8) of said support (4), a first seat (9a) being formed axially with respect to said lever arm (2), said first seat being connected to a guide (9b) so as to constitute a seat for the sliding of a first cable (10), two second seats (11a,11b) being formed axially with respect to said lever arm (2) starting from said second end (6) and are approximately mutually parallel, second cables (12a,12b) being arranged at said second seats.

3. Lever according to claim 2, characterized in that each one of said second cables (12a,12b) has a first end (13a,13b) that can be rigidly coupled inside said second seats (11a,11b), said second seats allowing said second cables to exit from said body (3) towards said support (4).

4. Lever according to claim 3, characterized in that said second cables (12a,12b) are arranged, at their second ends (14a,14b) lying outside said second seats, at third seats (15a,15b) formed axially with respect to said support.

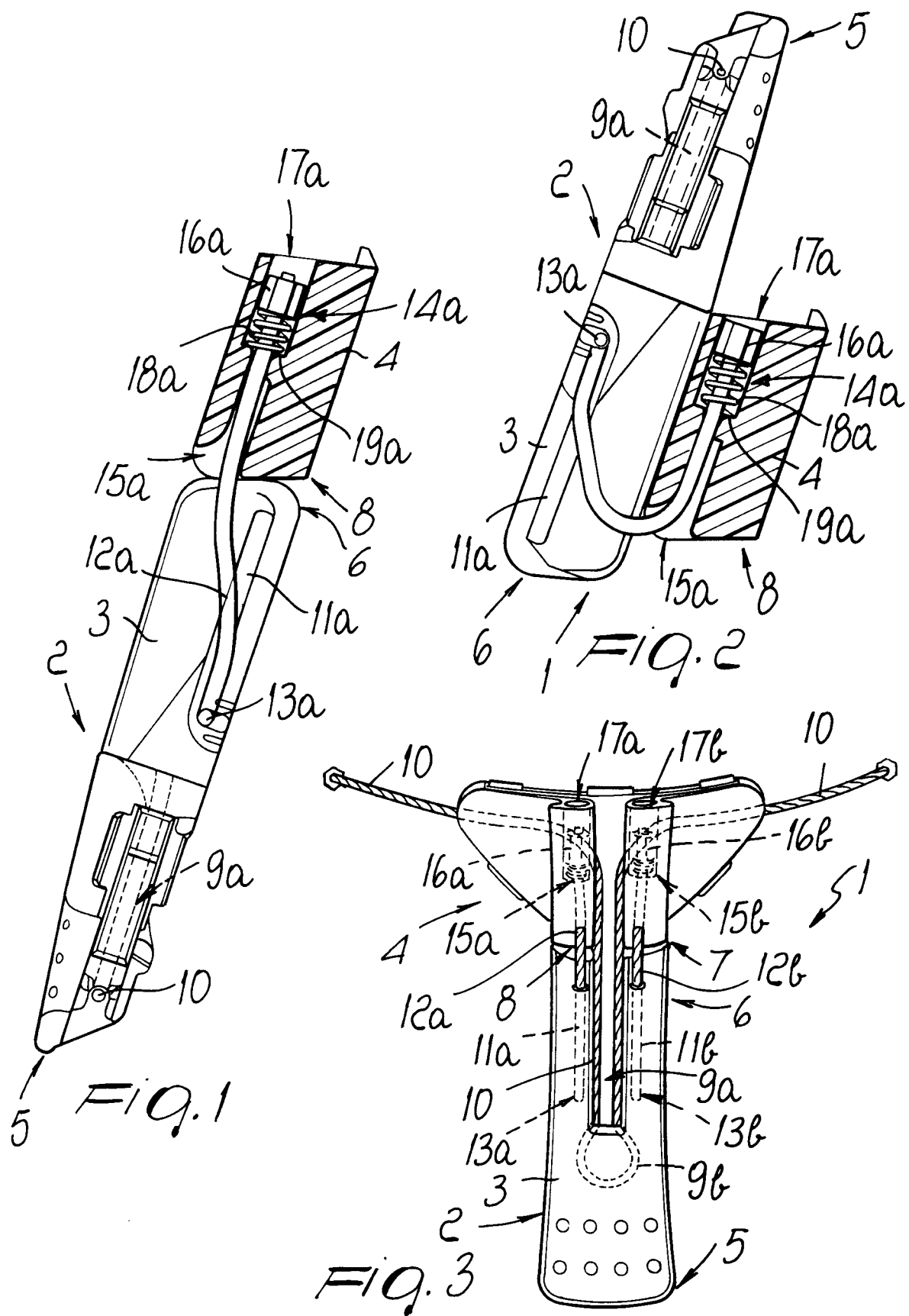
5. Lever according to claim 4, characterized in that said third seats (15a,15b) affect the entire length of said support (4), so as to allow the passage of said second ends (14a,14b) of said second cables (12a,12b), said second ends (14a,14b) being threaded so as to allow connection to two complementarily threaded locking nuts (16a,16b) abutting at a recess (16a,17b) formed coaxially to said third seats (15a,15b) on the opposite side with respect to said third end (8) of said support (4).

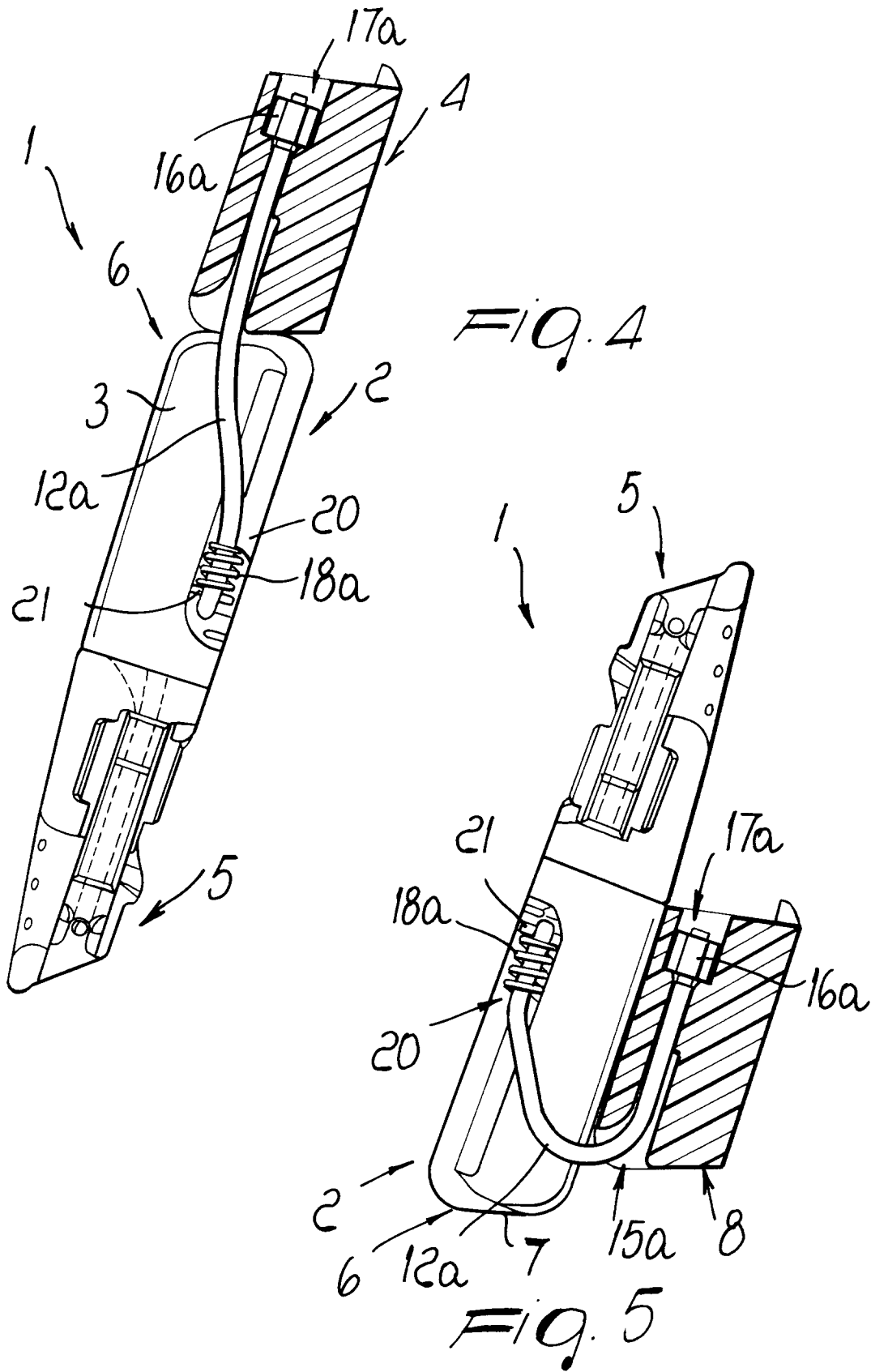
6. Lever according to one or more of the preceding claims, characterized in that said first or second ends of said second cables (12a,12b) interact with a pair of springs (18a,18b) adapted to force the takeup of the working section of said second cables.

7. Lever according to claim 6, characterized in that said springs (18a,18b) are arranged coaxially to said second cables (12a,12b) at said second ends thereof and are interposed between said locking nuts (16a,16b) and a step member (19a,19b) connecting said third seats (15a,15b) to said recesses (17a,17b).

8. Lever according to claim 6, characterized in that said springs (18a,18b) are arranged coaxially with respect to said second cables (12a,12b) at said first

ends (13a,13b) thereof and are interposed between a tooth (20) formed at one end of said second seats (11a,11b) and a locking ring (21) rigidly coupled to said first ends (13a,13b).







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EUROPEAN SEARCH REPORT

Application Number
EP 95 11 1635

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)
P,D, A	EP-A-0 625 321 (NORDICA S.P.A.) * the whole document *	1-8	A43C11/14 A43C11/16
A	FR-A-2 664 176 (SALOMON S.A.) * page 6, line 1 - page 9, line 13; figures 1-10 *	1,2	
D,A	FR-A-2 450 575 (SALOMON S.A.) * figures *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			A43C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 31 October 1995	Examiner Scholvinck, T
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			

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