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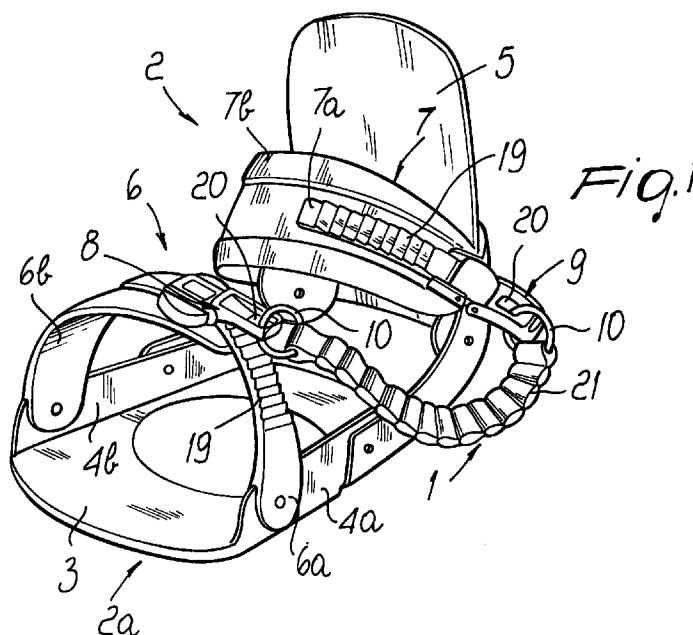
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(54) Device for opening fastening members of a sports implement or of a sports shoe

(57) A device for opening two or more fastening members of a sports implement or of a sports shoe, such as for example a binding (2) for a snowboard, a ski boot, an ice skate, or a roller skate. The device is constituted by a flexible element (21) that mutually connects

the two or more fastening members (8,9); when traction is applied to the flexible element by the user, the flexible element causes the simultaneous opening of the fastening members.



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Description

The present invention relates to a device for opening fastening members of a sports implement or sports shoe, such as for example a binding for a snowboard, a ski boot, an ice skate, or a roller skate.

In the field of sports equipment it is known to use fastening means usually constituted by a lever arm, by a traction element, and by an engagement element. Examples of this type of lever systems can be found in ski boots, in which the lever systems are used to mutually fasten the flaps, in roller skates or ice skates with a similar use, or to couple a generic shoe to the frame of the skate by means of two or more straps, and more recently in the field of snowboard bindings, in which two or more straps, fastened by means of said lever systems, rigidly couple the boot to the board.

The operations for opening the fastening means usually require the manual intervention of the user for each individual lever system. If one considers that in a pair of ski boots there may be as many as ten levers, it is evident that opening is an extremely long and awkward operation, considering the uncomfortable bent-down position assumed by the user and the environmental conditions (low temperatures, need to wear gloves, uneven ground) in which this operation takes place.

Furthermore, it is often necessary to open the levers quickly, in order to be able to rapidly disengage the foot from the shoe or binding. This is the case, for example, of snowboard bindings, in which this operation is repeated every time the user returns uphill with the lift-line, or becomes suddenly necessary to avoid a fall. In this case, too, the same drawbacks mentioned above are observed and are worsened by the fact that both feet are secured to the board and movements are therefore hindered.

The aim of the present invention is therefore to eliminate the drawbacks of the cited prior art by providing a device that allows to open the fastening means of a sports implement or of a sports shoe quickly and easily.

Within the scope of the above aim, an important object is to provide a device that allows to minimize the manual intervention of the user during opening operations.

Another important object is to provide a device that is reliable and safe in use.

Another object is to provide a device that is structurally simple, has low manufacturing costs, and is obtained with conventional machines and equipment.

This aim, these objects, and others which will become apparent hereinafter are achieved by a device for opening a plurality of fastening members of a sports implement or of a sports shoe, characterized in that it comprises at least one flexible element that mutually connects said fastening members, said flexible element causing the simultaneous opening of said fastening members when traction is applied to said element.

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

figure 1 is a perspective view of the device for opening two or more fastening means, applied to a snowboard binding;

figure 2 is a view, similar to the preceding one, of the device during the opening of the fastening means;

figure 3 is a sectional front view of one of the fastening means, provided with the device, according to the invention;

figure 4 is a perspective view of the device applied to a ski boot.

With reference to the above figures, the reference numeral 1 designates a device for opening two or more fastening members of a sports implement or of a sports shoe, according to the invention, applied to a snowboard binding that is generally designated by the reference numeral 2. The snowboard binding comprises a base plate fastened to the board, according to what is already known in the state of the art, which is constituted for example by US patent No. 5,261,689. The base plate 3 has two vertical walls 4a and 4b and a rear support 5, for the leg, associated with the vertical walls. A first locking element 6 for a boot is connected to the two vertical walls 4a and 4b approximately at the front part 2a of the binding 2, whereas a second locking element 7 is connected to the rear support 5 approximately at the level of the region of the boot that corresponds to the foot instep. The first locking element 6 and the second locking element 7 are constituted respectively by a first pair of straps 6a, 6b and by a second pair of straps 7a, 7b that can be mutually fastened by a first fastening member 8 and a second fastening member 9. The opening device 1 is constituted by a flexible element 21, such as a preferably sheathed cable or a band, which is provided at its ends with an engagement element 10, such as openable rings, for connection to the first fastening member 8 and to the second fastening member 9. The flexible element 21 therefore connects the first fastening member 8 to the second fastening member 9. The fastening members can be constituted, for example, by a ratchet-like lever system shown in detail in figure 3.

Although such lever systems are known, the ratchet device shown in figure 3 is briefly described with reference to the first locking element 6, for the sake of convenience. However, the description can be likewise transferred to the second locking element 7. The ratchet device that constitutes the first fastening member 8 comprises a lever arm 11 that is articulated about a first axis 12 to a base 13, which is in turn fixed to one of the two straps that constitute the first locking element 6, in this case the strap 6b. The lever arm 11 has a cam 14 at

the end that is articulated to the first axis 12, and a seat 20, such as a through hole, in a region proximate to the free end 11b. The flexible element 21 is associated at the seat 20 by means of the engagement element 10.

A first ratchet 15 is articulated to the lever arm 11 at a second axis 16 and has an abutment surface 15a that interacts with an abutment 11a of the lever arm 11, whereas a second ratchet 17 is articulated to the base 13 at a third axis 18. The other one of the two straps, in this case the strap 6a, can be slidably inserted in the base 13 and has a portion that is provided with a set of teeth 19 that is adapted to engage the teeth of the first pawl 15 and of the second pawl 17.

Of course, there are adapted elastic means, not shown, which are arranged in a conventional manner coaxially to the first, second, and third axes 12, 16, and 18, in order to provide an adequate elastic contrast respectively to the lever arm 11, to the first ratchet 15, and to the second ratchet 17, as will be immediately evident to the expert in the field.

The locking element 6 is fastened by the alternating rotation of the lever arm 11 up to a maximum angle of approximately 90°. During the clockwise rotation shown in figure 3, the strap 6a is kept motionless in position by the second ratchet 17, which is pressed against it by the elastic element that is arranged coaxially to the third axis 18, whereas the first ratchet 15, which is rigidly coupled to the lever arm 11, is moved away from said strap 6a. During the return step, in which the lever arm 11 is made to perform a counterclockwise rotation, the first ratchet 15 moves toward the strap 6a, engaging the set of teeth 19. The abutment 11a, in contact with the abutment surface 15a, keeps the first ratchet 15 pressed against the set of teeth 19, thus causing the advancement of the strap 6a in the direction indicated by the arrow 22 and therefore the mutual fastening of the straps 6a and 6b.

The fastening member 8 can be opened, therefore releasing the locking element 6, by a clockwise rotation of the lever arm 11 beyond a 90° angle, until the cam 14 is moved into contact with the second ratchet 17. The pressure applied by the cam 14 to the second ratchet 17 causes said ratchet to rotate counterclockwise about the third axis 18, thus disengaging it from the set of teeth 19 and allowing the sliding of the strap 6a in the opposite direction with respect to the one indicated by the arrow 22.

The operation of the device is as follows: once the user has rigidly coupled the boot to the binding 2 by fastening the first locking element 6 and the second locking element 7, it is possible to quickly achieve the simultaneous opening of the first fastening member 8 and of the second fastening member 9 by gripping the flexible element 21 and pulling it in the direction in which the lever arms 11 open, as shown in figure 2. In this manner, in the illustrated embodiment, the cam 14 of the lever arm 11 is made to press against the second ratchet 17, which is disengaged from the set of teeth 19 and allows to release the straps 6a and 7a and thus to

release the locking elements 6 and 7.

It has thus been observed that the invention has achieved the intended aim and objects, a device having been provided that allows to open the fastening means quickly and easily, minimizing the number of manual actions on the part of the user.

The user in fact merely has to grip the flexible element 21 and pull it upwards to achieve immediate and complete opening of the binding in order to quickly release the boot from the board.

The opening operation is extremely simple and easy and can also be performed by the user while wearing gloves.

The device thus conceived is susceptible of numerous modifications and variations, as well as applications to different products, all of which are within the scope of the same inventive concept.

Thus, for example, figure 4 illustrates the application of the device for opening two or more fastening means, generally designated by the reference numeral 101, to a sports shoe, such as for example a ski boot 102 provided with a first flap 106 and a second flap 107 that can be mutually overlapped and fastened by a first fastening member 108 and a second fastening member 109 that are constituted by conventional levers, such as for example the lever described in Italian Utility Model No. 182322, in the name of this same Applicant. The opening device 101 is constituted by a flexible element 121, such as a preferably sheathed cable or a strap, which is provided at its ends with engagement elements 110 for connection to the first fastening member 108 and to the second fastening member 109 at a seat 120 that is provided on each lever arm 111. The seat 120 is constituted, for example, by a through hole that is formed on each lever arm 111. In this application, too, the flexible element 121 therefore connects the first fastening member 108 to the second fastening member 109.

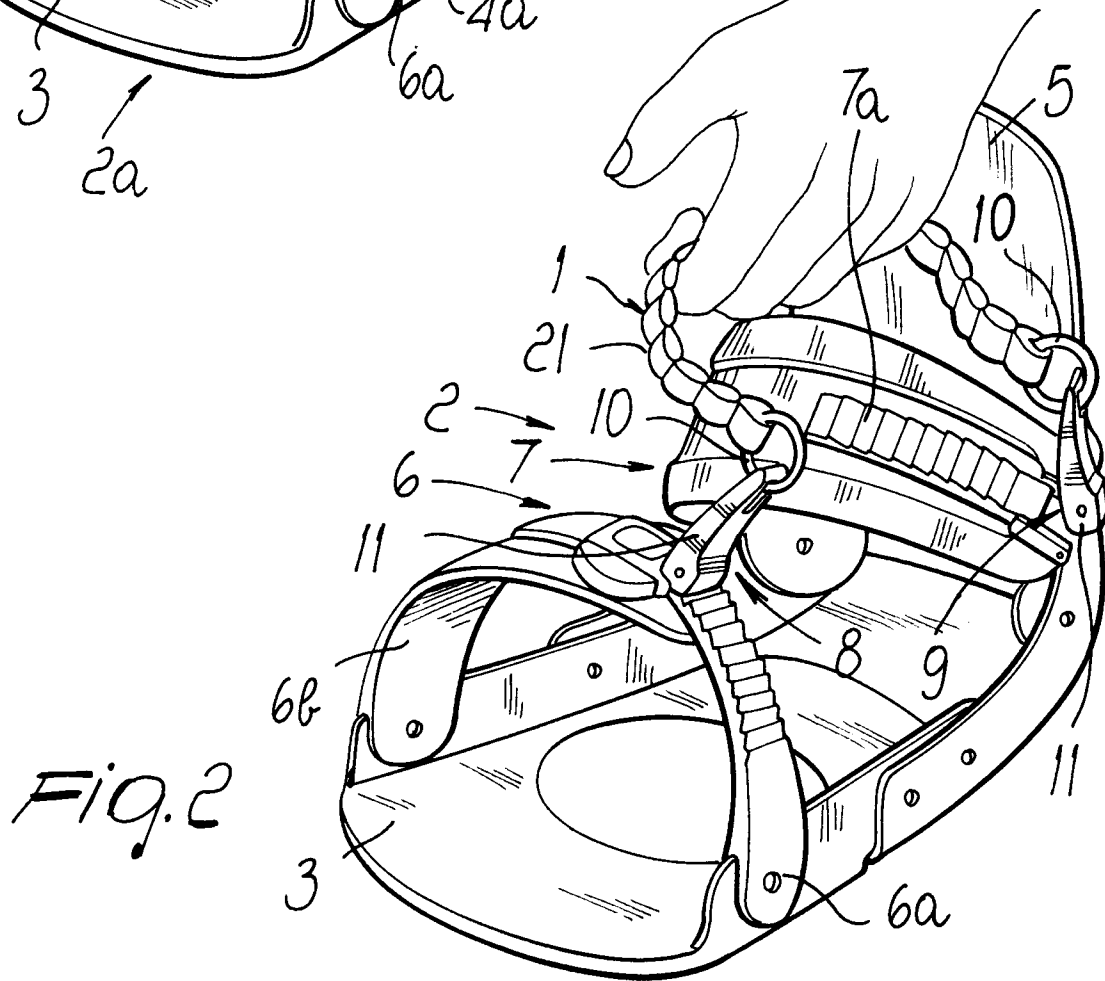
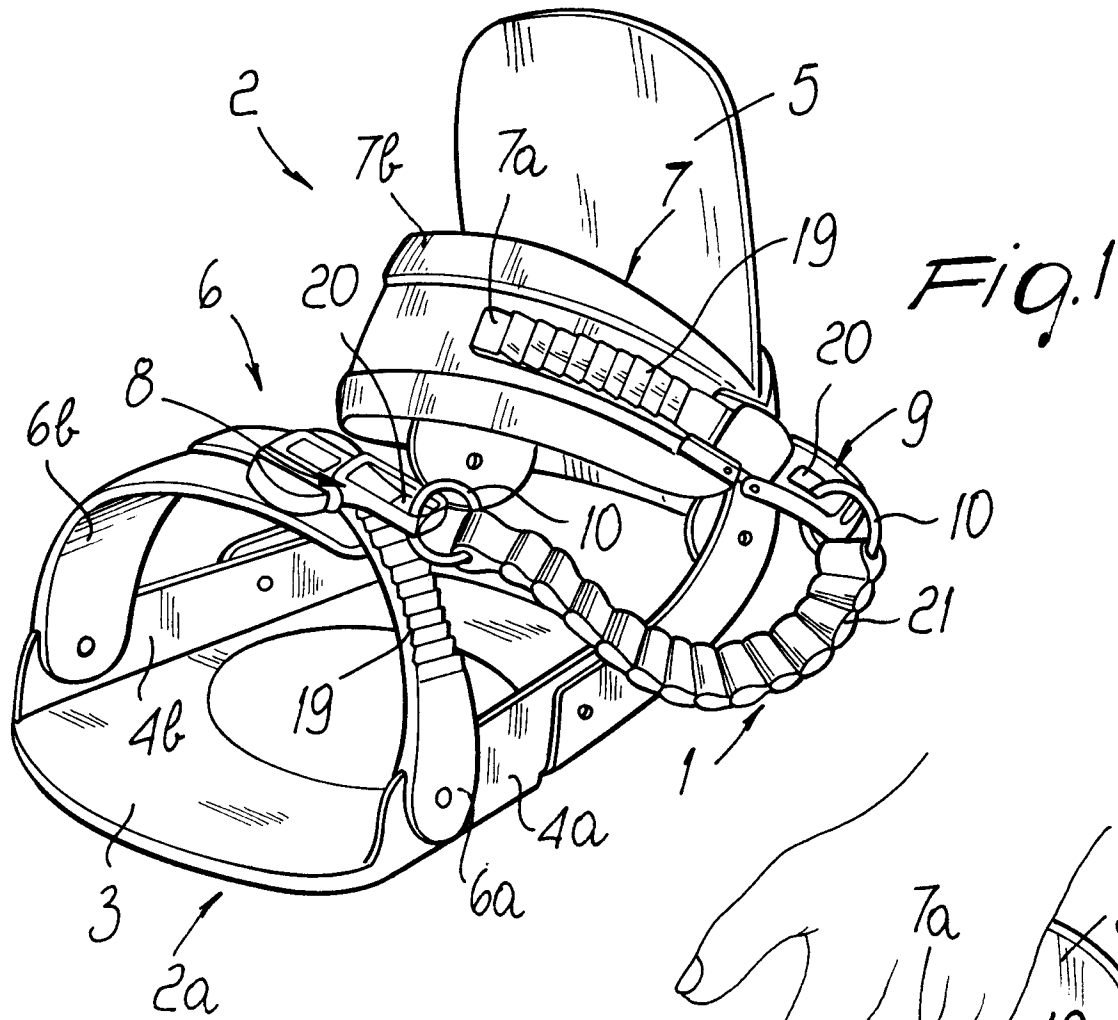
Advantageously, the flexible element 121 can be made of an elastic material, so as to remain stretched between the first fastening member and the second fastening member, in order to avoid accidental catching on external objects, such as poles, branches, etcetera, while skiing.

All the details of the invention may of course be replaced with other technically equivalent elements. Furthermore, the materials employed, as well as the contingent shapes and dimensions of the individual components of the device, 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. A device for opening a plurality of fastening members of a sports implement (2) or of a sports shoe (102), characterized in that it comprises at least one flexible element (21,121) that mutually connects said fastening members (8,9,108,109), said flexible element causing the simultaneous opening of said fastening members when traction is applied to said element. 5
2. The device according to claim 1, characterized in that said flexible element (21) is constituted by a sheathed cable and is provided, at its ends, with engagement elements (10) for connection to said first and second fastening members. 15
3. The device according to claim 2, wherein each one of said fastening members (8,9) comprises a lever arm (11) that is articulated, at one end, to a base (13) that is fixed to said sports implement or to said sports shoe, said lever arm having a seat (20), in a region that is proximate to the other end, which is free, said end of said flexible element (21) being associated with said seat (20) by means of said engagement elements (10). 20 25
4. The device according to claim 2, characterized in that said engagement elements are constituted by openable rings (10). 30
5. The device according to claim 4, characterized in that said seat is constituted by a through hole (20) inside which one of said openable rings (10) can be engaged. 35
6. The device according to one or more of the preceding claims, characterized in that said device is applied to a snowboard binding that comprises: 40
 - a base plate (3), from which two vertical walls (4a,4b) protrude, a leg rear support (5) being associated with said walls;
 - a first locking element (6) for a boot that is connected to said two vertical walls approximately at the front part of said binding; 45
 - a second locking element (7) that is connected to said rear support (5) approximately at the level of said boot that corresponds to the foot instep. 50
7. The device according to claim 6, characterized in that said first and second locking elements (6,7) of said snowboard binding (2) are constituted respectively by a first pair of straps (6a,6b) and by a second pair of straps (7a,7b) that can be mutually fastened by said first and second fastening members (8,9). 55
8. The device according to one or more of the preceding claims, characterized in that said device is applied to a sports shoe, such as for example a ski boot, which comprises a first flap (108) and a second flap (109) that can be mutually overlapped and fastened by said first and second fastening members (108,109).
9. The device according to one or more of the preceding claims, characterized in that said flexible element (21) is made of an elastic material.



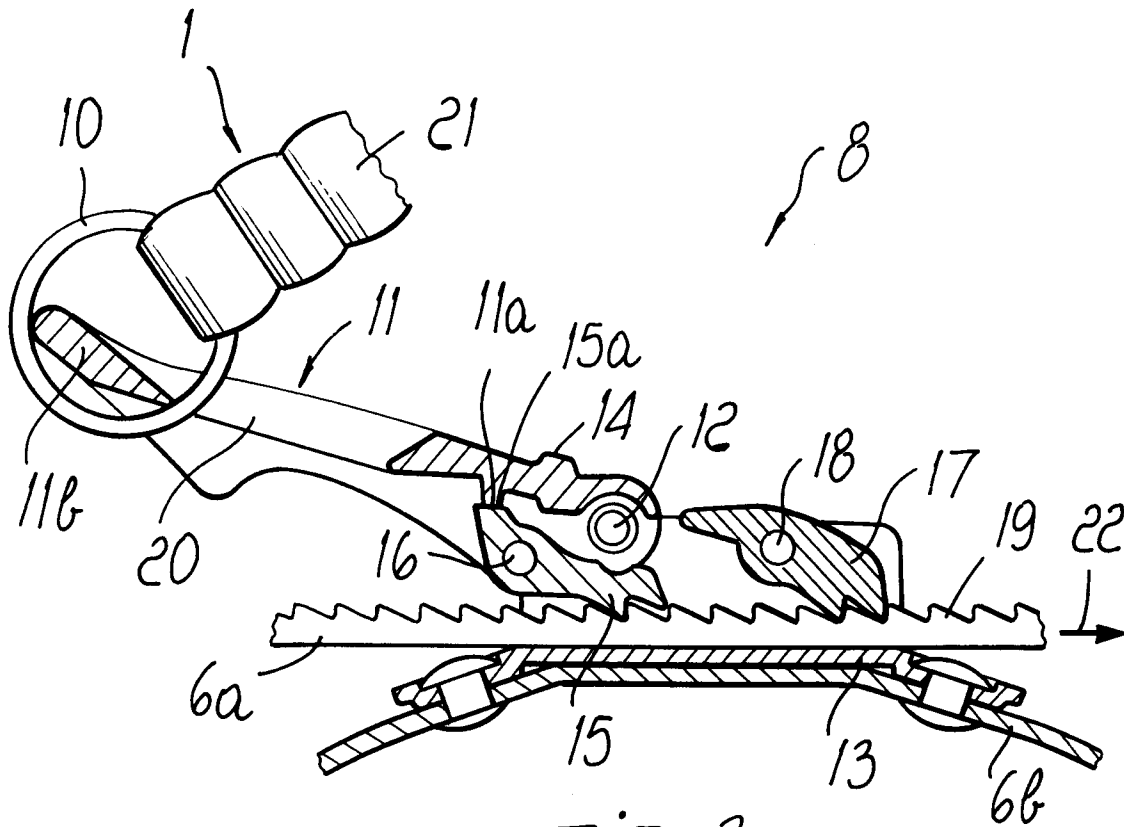


Fig. 3

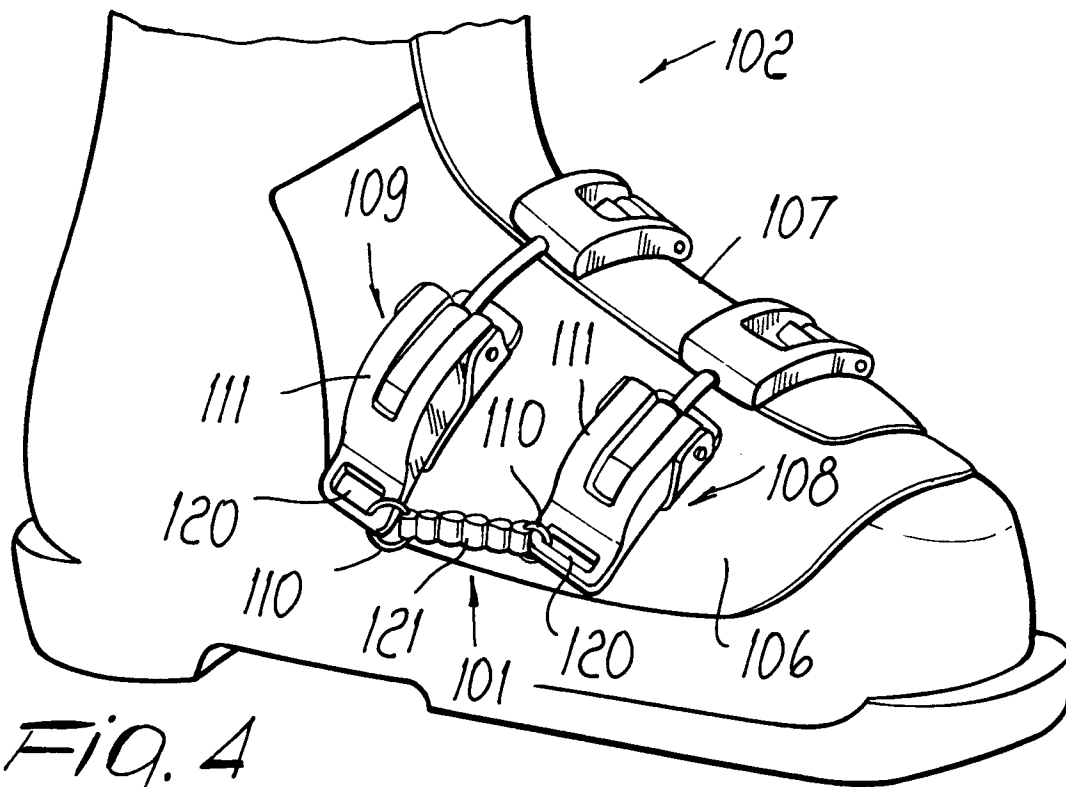


Fig. 4



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EUROPEAN SEARCH REPORT

Application Number
EP 96 11 6854

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	US 4 081 916 A (T. SALISBURY) * the whole document * ---	1	A43C11/00 A43B11/00 A43C11/14
A	US 4 414 761 A (D. MAHOOD) * the whole document * ---	1	
A	US 5 353 483 A (D. LOUVIERE) * the whole document * -----	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			A43C A43B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 4 February 1997	Examiner 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			

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