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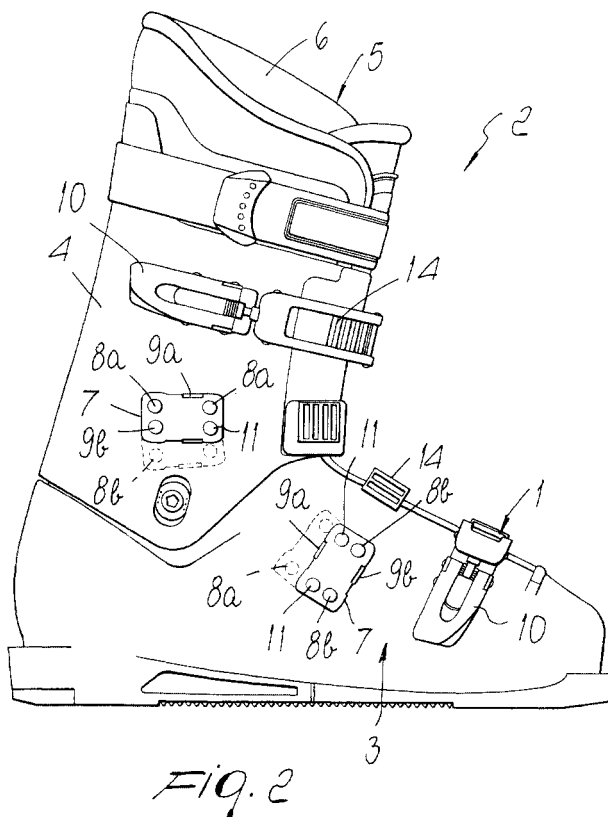
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(54) **Lever particularly for sports shoes**

(57) A fastening lever (1) for sports shoes (2) comprising at least two adjustable parts to be fastened, characterized in that it comprises at least one plate (7) having at least one hole (8d,8b) adapted to receive a fastening member (11) fastened to a seat (12) provided in

a first part (13d,13b) of said adjustable parts of the shoe, a lever arm (10) being pivoted to said plate and cooperating selectively with a toothed rack (14) which is pivoted to a second part (15a,15b) of said adjustable parts of the shoe.



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Description

[0001] The present invention relates to a fastening lever, particularly for sports shoes, such as ski boots, roller skates, ice skates, or ice-climbing boots.

[0002] A problem, currently felt for those sports shoes, is to achieve optimum fastening of the flaps of the shoe and at the same time maintain good comfort.

[0003] US-5,983,531 provides a partial solution to such problem and discloses a tightening device adjustable on the adjustable parts of a boot in a direction transverse to that of the tightening force that it is capable of exerting by means of a tension lever. The device has, on an adjustable part, a tension lever whose baseplate is adjustable in position in a transverse direction by a fastening means and a cutout which cooperate, respectively, with a succession of fastening points and a boss. On the other adjustable part, a retaining element is guided in translation in a slot which extends parallel to the transverse direction of adjustment of the baseplate, located on the other adjustable part of the boot. The direction of the tightening force is thus allowed to be modified.

[0004] Such tightening device has the drawback that the combined motions of the fastening point of the plate and of the rack still maintain the direction of the fastening force transversely to the shoe and therefore only move it along mutually parallel axes and the best comfort is not achieved.

[0005] Moreover, such tightening device is complicated from the point of view of manufacture, because it is composed of several parts and requires the provision of a longitudinal seat for the rack on one flap and of a protruding member on the other flap.

[0006] The aim of the present invention is to overcome the above cited problems of the prior art by providing a lever in which the user can achieve optimum comfort.

[0007] An object of the invention is to provide a fastening lever in which it is possible to vary the direction of the fastening force along an axis which is not only at right angles to the longitudinal axis of the shoe but rather also oblique with respect to the longitudinal axis of the shoe.

[0008] Another object is to provide a fastening lever which is structurally simple and has low manufacturing costs.

[0009] This aim, these objects and others which will become better apparent hereinafter are achieved by a fastening lever, particularly for sports shoes comprising at least two adjustable parts to be fastened, characterized in that it comprises at least one plate having at least one hole adapted to receive a fastening member fastened to a seat provided in a first part of said adjustable parts of the shoe, a lever arm being pivoted to said plate and cooperating selectively with a toothed rack which is pivoted to a second part of said adjustable parts of the shoe.

[0010] Further characteristics and advantages of the invention will become better apparent from the detailed description of a particular embodiment thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a side view of a ski boot provided with fastening levers according to the invention, wherein two of the levers are shown in a partially assembled condition;

Figure 2 is a view similar to the preceding one wherein the two levers are shown in a further assembled condition with two perforated plates associated with the pairs of second seats;

Figure 3 is a view similar to the preceding ones wherein the fastening levers are shown in a fully assembled condition;

Figure 4 is a side view of a ski boot provided with fastening levers according to a varied aspect of the invention.

[0011] With reference to the figures, the numeral 1 designates a lever, particularly for a sports shoe, for example a ski boot 2 constituted by a shell 3 having a quarter 4 rotatably associated thereto.

[0012] The shell 3 and the quarter 4 are internally provided with a soft innerboot 6.

[0013] The boot has four fastening levers: two at the shell 3 and two at the quarter 4.

[0014] Each lever 1 includes a plate 7, which is flat and rectangular and has two pairs of holes 8a and 8b. The holes in each pair are arranged along an axis which is approximately parallel to the longitudinal axis of the plate 7. The plate is also provided with two wings, 9a and 9b, protruding approximately at right angles with respect to the plate 7 and supporting a respective lever arm 10.

[0015] The shell 3 and the quarter 4 are provided each with a pair of seats 12 adapted to receive screws 11 for fastening the plates 7. Each plate 7 can be fastened to the shell/quarter by inserting the screws 11 in either the pair of holes 8a or 8b.

[0016] The seats 12 in each pair are arranged along an axis which is approximately complementary to a first flap, designated by the reference numerals 13a and 13b, which belongs respectively to the shell 3 and the quarter 4.

[0017] The lever arm 10, which is pivoted to the plate 7, selectively cooperates, in a per se known manner, with a toothed rack 14, pivoted to the second flap 15a or 15b, respectively, of the shell 3 and the quarter 4. It is thus possible to fasten the respective first and second flaps 13a and 15a of the shell 3 and the first and second flaps 13b and 15b of the quarter 4.

[0018] According to the invention, the user may associate the plates 7 with the shell 3 and with the quarter 4 in two positions having different angles by selecting the pair of holes 8a or 8b used for fastening the plates.

[0019] Since the lever arm 10 is articulated to the plate 7 by virtue of the two wings 9a and 9b, it is therefore possible to change the direction of the fastening force adapting it to the particular shape of the foot of the user.

[0020] It has thus been observed that the invention has achieved the intended aim and objects, a lever having been provided in which the user can achieve optimum comfort by varying the direction of the fastening force.

[0021] The fastening lever according to the invention is susceptible of numerous modifications and variations, within the scope of the appended claims.

[0022] Thus, for example, Figure 4 illustrates a lever 101 to be applied to a ski boot 102 by means of flat plates 107.

[0023] Each plate 107 has two slots 120, which are arranged along two axes which are parallel to each other and to the transverse axis of the plate. Each plate has a pair of wings 109a and 109b, protruding approximately at right angles to the plate 107 for connection to a respective lever arm 110.

[0024] The shell 103 and the quarter 104 are provided each with a pair of seats, as in the above described embodiment, adapted to receive screws 111 for fastening the plates 107. Each plate 107 can be fastened to the shell/quarter by inserting the screws 111 in either the pair of slots 120. This embodiment allows to continuously and precisely adjust the direction of the fastening force.

[0025] The materials used and the dimensions that constitute the individual components of the invention may of course be more pertinent according to specific requirements.

Claims

1. A fastening lever, particularly for sports shoes comprising at least two adjustable parts to be fastened, **characterized in that** it comprises at least one plate having at least one hole adapted to receive a fastening member fastened to a seat provided in a first part of said adjustable parts of the shoe, a lever arm being pivoted to said plate and cooperating selectively with a toothed rack which is pivoted to a second part of said adjustable parts of the shoe.
2. The lever according to claim 1, **characterized in that** said plate has two wings protruding approximately at right angles and adapted to support said lever arm.
3. The lever according to claim 1, **characterized in that** each plate is provided with two pairs of holes, the holes in each pair being arranged along an axis which is approximately parallel to the longitudinal axis of said plate but converges with respect to the pivoting point of said toothed rack, which is an-

chored to said second part.

4. The lever according to claim 3, **characterized in that** said first part comprises a pair of seats adapted to receive screws passing to a selected pair of holes of said plate for adjusting the orientation of said plate with respect of said first part.
5. The lever according to one or more of the preceding claims, **characterized in that** said plate has two holes each in the form of a slot.
6. The lever according to one or more of the preceding claims, **characterized in that** said two slots are arranged along two axes which are parallel to each other and to the transverse axis of said plate.

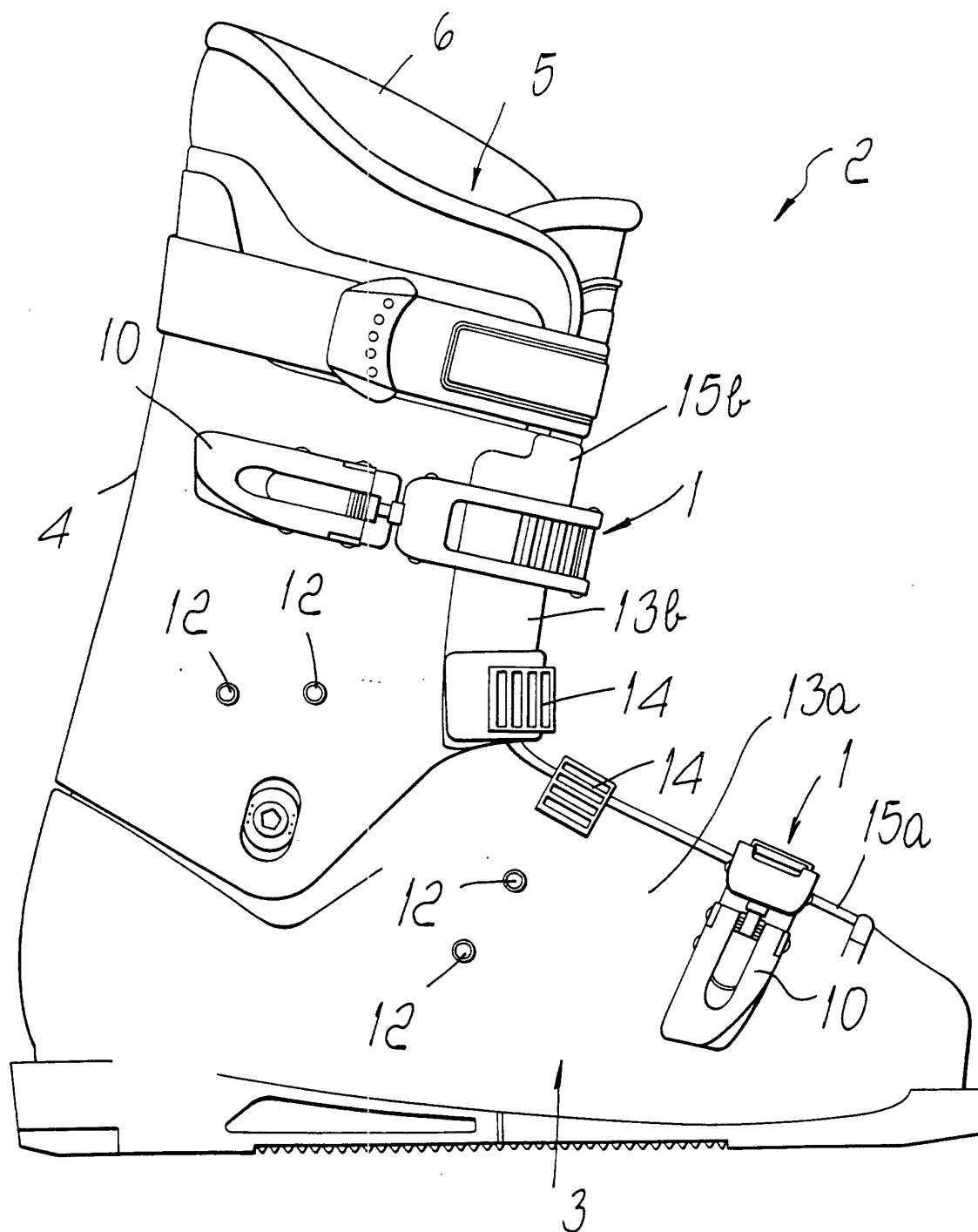


Fig. 1

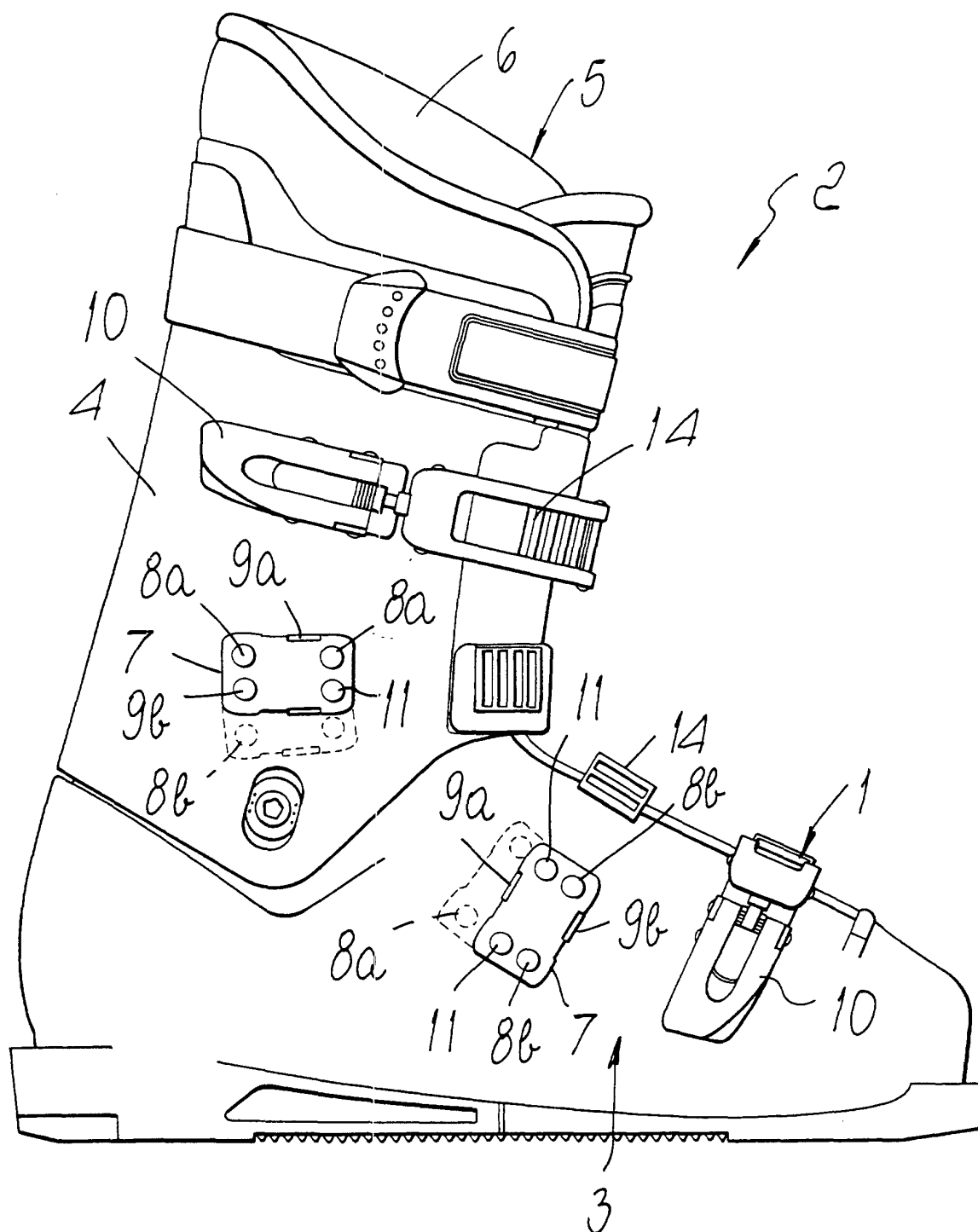


Fig. 2

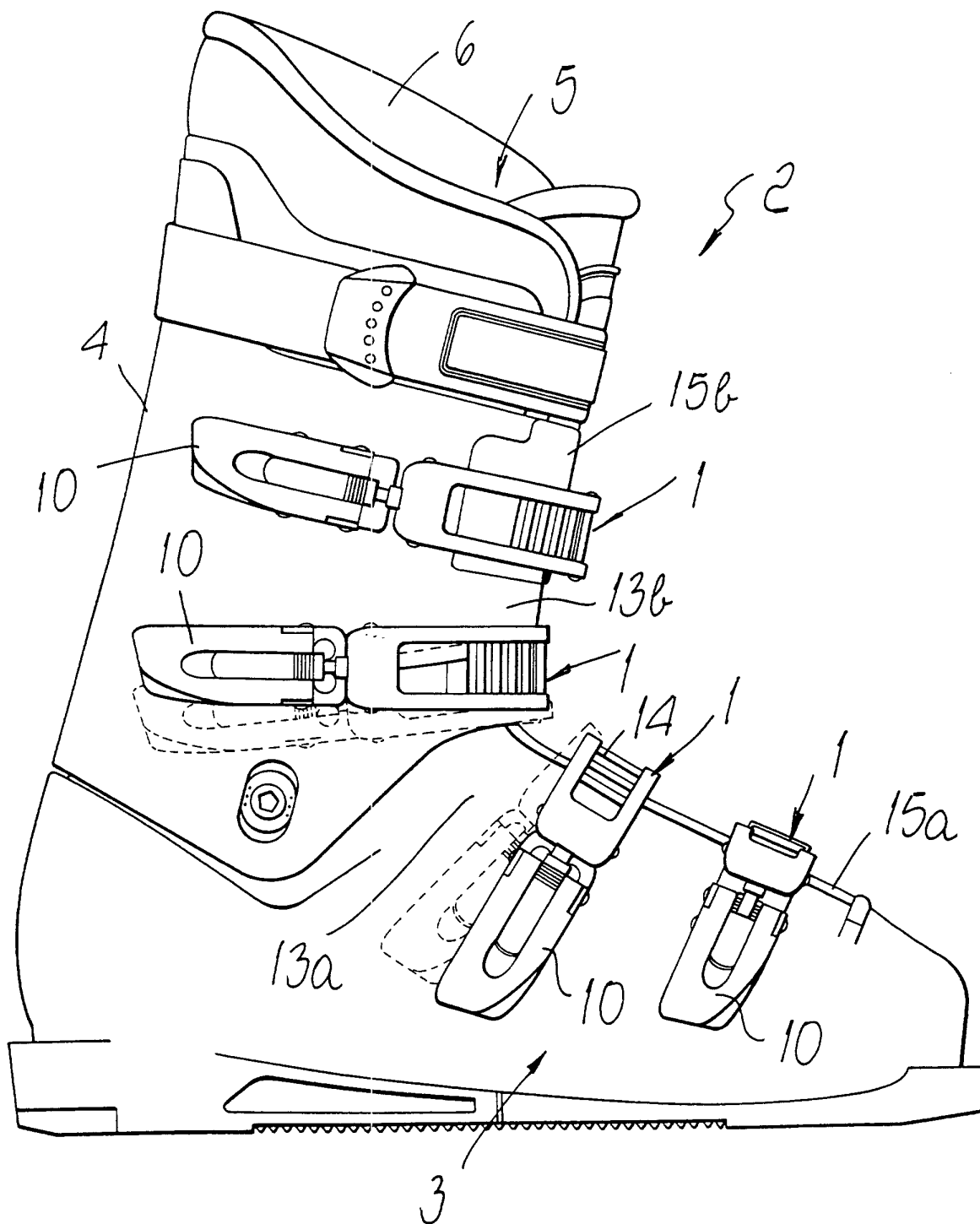


Fig. 3

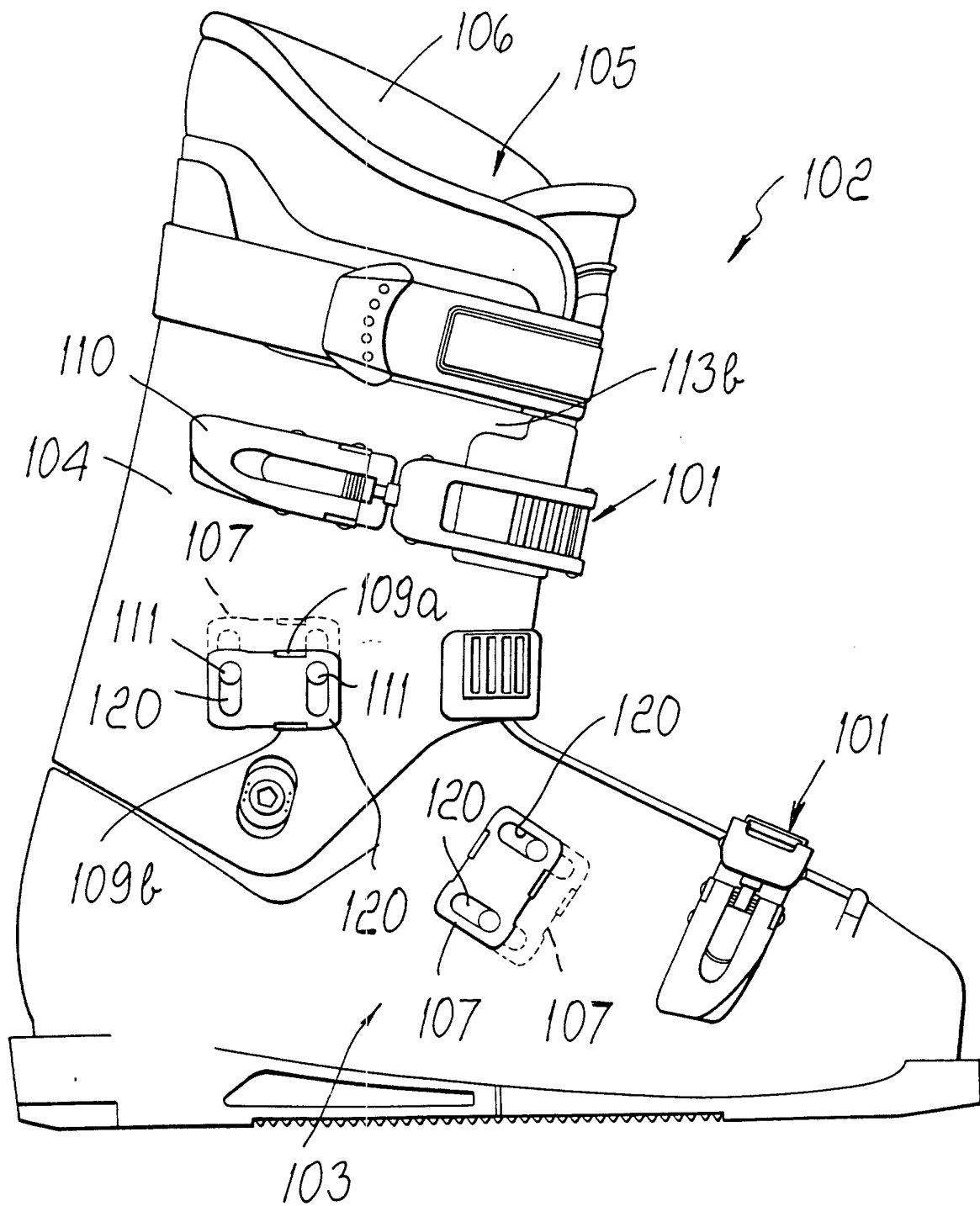


Fig. 4



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EUROPEAN SEARCH REPORT

Application Number
EP 01 10 8370

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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		19 June 2001	Claude1, B
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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