

(19)



(11)

EP 2 229 831 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

22.09.2010 Bulletin 2010/38

(51) Int Cl.:

A43B 11/00 (2006.01)

A43B 5/04 (2006.01)

(21) Application number: **09180186.0**

(22) Date of filing: **21.12.2009**

(84) Designated Contracting States:

**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL
PT RO SE SI SK SM TR**

Designated Extension States:

AL BA RS

(30) Priority: **17.03.2009 IT TV20090043**

(71) Applicants:

- **Premec S.P.A.**
31010 Godega di Sant'Urbano (TV) (IT)
- **Baggio, Giorgio**
35018 San Martino di Lupari (PD) (IT)

(72) Inventors:

- **Baggio, Giorgio**
35018, SAN MARTINO DI LUPARI PD (IT)
- **Salatin, Nicola**
31010, GODEGA DI SANT'URBANO,
Frazione PIANZANO TV (IT)

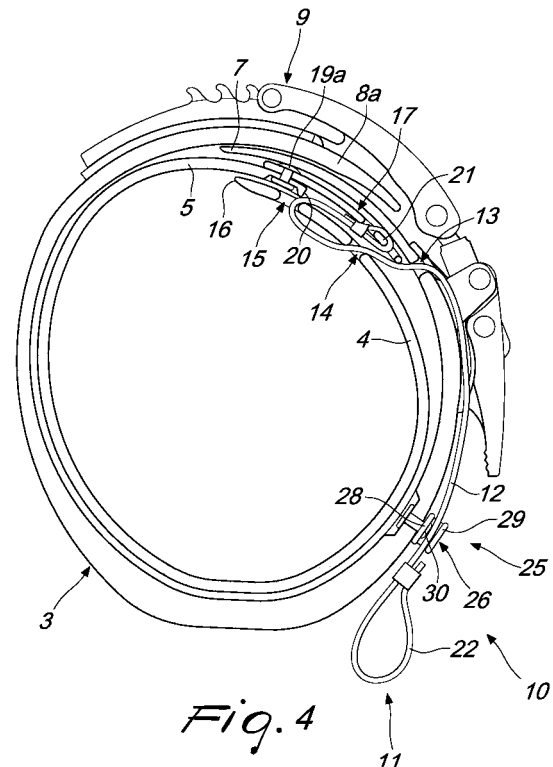
(74) Representative: **Modiano, Micaela Nadia**

Modiano & Partners
Via Meravigli, 16
20123 Milano (IT)

(54) **Device for facilitating foot insertion, particularly for sports shoes**

(57) A device for facilitating foot insertion, particularly for sports shoes, comprising a first flap (4) and a second flap (5) to be joined and being constituted by a means (11) for temporary tensioning of a traction element that passes through and is guided on the first flap (4). The traction element is in turn connected to a support that is coupled to, and protrudes from, the second flap (5) toward the first flap (4).

The activation of the device allows to divaricate temporarily the two flaps, facilitating foot insertion.



EP 2 229 831 A1

Description

[0001] The present invention relates to a device for facilitating foot insertion, particularly for sports shoes.

[0002] Today, sports shoes, for example ski boots, roller skates or ice skates, are usually constituted by a shell that is articulated to at least one quarter; the shell is provided with a first and a second flap that can be divaricated to allow the user's foot to be inserted inside a soft shoe previously inserted inside the shell.

[0003] The shoe is provided with a tongue or front flap that can be moved towards the toe of the shell to allow the insertion of the foot thanks to the divarication that can be imposed to the first and second flaps.

[0004] Such a shape implies that, in order to achieve the optimal transmission of force from the user's leg/foot to the sports piece of equipment or to the wheels or to the blade, the first and second flaps, as well as the quarter, are mutually fastened to limit the play of the leg and the foot inside the boot.

[0005] For this purpose, it is known to use levers that, hugging both the flaps of the quarter and those of the shell, keep them fastened during sporting activities.

[0006] Further, it should not be forgotten that such sports shoes are usually made of plastics that, especially at low temperatures, shows a lack of deformability that objectively makes it difficult for the skier to grasp the flaps with gloves on, to divaricate the flaps, to move the tongue of the internal shoe forward and thus to insert the foot, all while in a bent over position.

[0007] A partial solution for this drawback could be the use of sports shoes, for example ski boots, made of materials that are soft even at low temperatures, in particular regarding the shell and the flaps that must be mutually overlapped; such a solution however would seriously penalize the reactivity of the sports shoe as well as the sensitivity for the user when transmitting force from the leg/foot to the sports piece of equipment and therefore would seriously penalize the sporting performance.

[0008] Shells could also be made having internal shapes that are ample enough in proximity to the instep, allowing the user to impose a smaller divarication of the flaps while still allowing the insertion of the foot inside the shoe; however even such a solution would have drawbacks, since a more ample space inside the shell would reduce how much the instep would rest on the shell, penalizing the transmission of force to the sports piece of equipment and thus the user's general sporting performance.

[0009] It would also be possible to make boots with an internal shoe which is, for example, less padded in the instep region, in the heel and tongue regions; such a solution however would still suffer considerable drawbacks since the lack of padding and also the lack of support owing to their excessive softness would allow neither optimal comfort for the user nor a good grip on the foot inside the boot, again to the detriment of the obtainable sporting performance.

[0010] Even making the internal shoe with a slippery material for example of the type known with the "LYCRA" trademark would not solve the problem, since these materials, besides being expensive, would not grip the foot in a satisfactory way as the foot is able to slip on the inside of the shoe at every movement.

[0011] It is also known to use internal shoes having a heating system inside: even if such heating, besides improving the comfort of the user, confers a slight softening to the materials, it is to be noted that such softening usually takes place at the sole of the shoe, so that the temperature of the instep region of the foot remains effectively unchanged and equal to the outside temperature.

[0012] The aim of the present invention is to solve the above-mentioned technical problems, eliminating the drawbacks of the known background art, by providing a device that allows the user to quickly and easily insert the foot in the shoe, and at the same time allows optimal comfort for the user and a fastener that allows an optimal transmission of force from the leg and foot to a ski or to the wheels or to a blade of an ice-skate.

[0013] Within this aim, an object of the present invention is to provide a device which is easy and prompt to apply, so that when the device is not applied, it does not inhibit the user in any way during the sporting practice. Another object is to provide a device whose aesthetic impact on the shoe is limited.

[0014] Another object is to provide a device which can be used on conventional shoes, and has a simple structure that can be quickly applied.

[0015] Another object is to provide a device that, along with the characteristics described above, has low manufacturing costs and can be used also with sports shoes made of plastic material with a desired rigidity while still allowing easy application for the user.

[0016] This aim and these and other objects that will become better apparent hereinafter, are achieved by a device for facilitating foot insertion, particularly for sports shoes comprising a first flap and a second flap to be joined, **characterized in that** it is constituted by a means for temporary tensioning of at least one traction element that is adapted to divaricate said first flap and second flap.

[0017] Further characteristics and advantages of the present invention will become better apparent from the following detailed description of a preferred but not exclusive embodiment thereof, illustrated by way of a non-limitative example in the accompanying drawings, wherein:

Figure 1 is a side view of a ski boot;

Figure 2 is a front view of the ski boot with the quarter open and the first and second flaps joined together; Figure 3 is a view similar to Figure 2, where the first and second flaps are divaricated;

Figure 4 is a view taken along the line IV-IV of Figure 1;

Figure 5 is a view similar to Figure 1 in a second embodiment;

Figure 6 is a view similar to Figure 5 in a third embodiment;

Figure 7 is a view taken along the line VII-VII of Figure 6;

Figures 8, 9 and 10 are different views of another embodiment of the device.

[0018] In the exemplary embodiments that follow, individual characteristics, given to specific examples, may actually be interchanged with other different characteristics that exist in other exemplary embodiments.

[0019] Moreover, it is noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0020] With reference to the figures, the reference numeral 1 designates a sports shoe, for example a ski boot, constituted by a shell 2 to which a quarter 3 is articulated at the malleolar region.

[0021] The shell 2 comprises, in the foot instep region, a first flap 4 and a second flap 5, which can be mutually partially overlapped and divaricated to allow the insertion of a soft shoe 6 inside the shell and the quarter and thus the insertion of the user's foot.

[0022] In the illustrated embodiment, the first and second flaps 4, 5 are mutually superimposed both at the upper metatarsal region and at the instep region.

[0023] Again in the illustrated embodiment, the quarter 3 is provided with a third flap 7 and a couple of fourth flaps 8a, 8b, which can be mutually superimposed in the foot instep region and fastened by means of appropriately provided levers 9.

[0024] Such levers are also used to fasten the first flap 4 and the second flap 5 at the upper metatarsal region of the foot.

[0025] The device 10 for facilitating foot insertion is constituted by a means 11 for temporary tensioning of at least one traction element 12, such as a cord or band or cable, arranged externally and laterally to the quarter 3, preferably on the outer side of the foot, and made to pass slidably inside the quarter 3 through one of first holes 13 provided in the quarter, preferably in a region that is intermediate between two adjacent levers 9; as an alternative the first holes 13 can be provided in a different position, for example in proximity to the upper perimetric edge 27 of the quarter 3.

[0026] The cable is then made to pass slidably from the outside of the first flap 4 to the inside through a second hole 14 that is provided preferably in a region that is not affected by the overlap with the second flap 5.

[0027] The cable is then guided slidably on the first flap, thus making it pass from the inside to the outside of the first flap, through a third hole 15 that is provided preferably in a region that is adjacent to the first free edge 16 of the first flap 4.

[0028] The cable is then connected, at its free end, to a support 17, constituted by a plate or a wirelike element shaped, in the particular embodiment illustrated, as an

open loop and is substantially M-shaped, coupled at its ends 18a, 18b, by means of screws or studs 19a, 19b, externally to the second flap 5 in a region that is adjacent to a second free edge 20.

[0029] The connection of the cable occurs at the ends of the support 17 or, as in the case of the open loop, at the vertex 21 of the support directed towards the second flap 5.

[0030] The dimension of the support 17, and therefore the extent of its overlap on the underlying first flap 4, is such that its free end or its vertex 21 is arranged advantageously, in the condition in which the device is not activated, at such a distance from the second free edge 20 of the second flap 5 as to allow, upon traction applied to the cable, an approach toward the third hole 15 that allows the desired divarication of the first and second flaps 4, 5 to be obtained.

[0031] The means 11 for temporary tensioning of the traction element 12 can for example be constituted by an electric or mechanical winder or by a handle 22 that can be gripped by the user even when wearing gloves; or it can be constituted, as shown in Figure 6, by a lever 23 that is associated externally with the quarter 3 in a region that is comprised between two adjacent levers 9.

[0032] Either by gripping the handle 22 or the lever 23 the user can apply tension to the traction element 12 that forces the divarication between the first and the second flap 4, 5, the dimension of the lever arm 24 being naturally suitable for the extent of the divarication that one desires to obtain between the first and second flaps.

[0033] In the closed condition of the lever, shown in Figure 6, the traction element 12 is not tensioned and is anyway such to allow the overlapping and reciprocal fastening of the first and second flaps 4, 5 as well as the third and fourth flaps 7, 8a, 8b of the quarter 3.

[0034] When a handle 22 is used it could be, as shown in Figures 1-4, obtained directly at one end of the traction element 12.

[0035] In this case, though it could be omitted, a means 25 for locking the position of the traction element 12 is provided, which is constituted by a rope clamp or cable clamp 26 that is associated with the lateral surface of the quarter 3 in a region that lies approximately above the malleolar region.

[0036] The cable clamp 26 is of the type constituted by a blade that is substantially L-shaped so as to form a first wing 28, which is coupled externally to the quarter 3, and a second wing 29, that is elastically deformable.

[0037] The traction element 12 is interposable between the first and second wing, and is temporarily locked in its position, a protrusion 30 protruding from the first wing 28, in the direction of the second wing 29.

[0038] Alternatively, as shown in Figure 5, the handle 22 can be associated with a distinct cable 31 which interacts with the cable clamp 26 and is guided at an appropriately provided ring 32 with which the end of the traction element 12 that is external to the quarter 3 is associated.

[0039] The cable 31 is thus coupled at its free end to the quarter 3 again for example at the cable clamp 26.

[0040] In this case the length of the cable 31 is such to allow the tensioning of the traction element 12 to the desired extent and anyway such to allow both the divarication of the first and the second flaps 4, 5 and their usual overlapping and fastening by way of the levers 9.

[0041] The cable clamp is specifically used when the user has tensioned the traction element 12 to divaricate the first and second flaps: in this condition it is sufficient to lock the traction element 12 making it temporarily interact with the protrusion 30 of the blade.

[0042] Figures 8, 9 and 10 illustrate a simplified embodiment of the device provided with a means 111 constituted by an electric or mechanical winder or by a handle 122 for the temporary tensioning of at least one traction element 112, such as a cord or strap or cable, which is arranged externally and laterally with respect to the quarter 103, preferably on the outer side of the foot and in proximity to the upper perimetric edge 127 of the quarter 103 in a region that lies above the upper perimetric edge 133 of the first flap 104.

[0043] The traction element 112 is then made to pass slidingly and internally to the quarter 103 through one among the first holes 113 provided on the quarter.

[0044] The cable is then positioned within the first flap 104 and made to pass slidingly outside it through a second hole 114 that is provided preferably in a region that is not affected by the overlap with the second flap 105 and in a region that is adjacent to the first free edge 116 of the first flap 104.

[0045] The cable is then connected, at its free end, to a support 117, such as a plate or a tab that protrudes from the first flap 104 or a wirelike element that is shaped, in the particular embodiment shown, like an open loop and is substantially M-shaped, and is coupled at its free ends, by means of screws or studs 119a, 119b, externally to the second flap 105 in a region that is adjacent to the second free edge 120 of the second flap 105.

[0046] The connection of the cable occurs at the end of the support 117 or, in the case of the open loop, at the vertex 121 of the open loop that is directed toward the second flap 105.

[0047] In this case the user obtains the divarication of the first and second flaps by simply pulling the handle 122 upwards.

[0048] It has thus been found that the invention thus described achieves the intended aim and objects, a device being provided that allows the user to quickly and easily wear the shoe, and at the same time allows optimal comfort in use and a fastener that allows an optimal transmission of force from the leg and foot to a ski or to the wheels or to a blade of an ice-skate.

[0049] Moreover the device has an easy and immediate application, so that when the device is not applied, it does not inhibit the user in any way during the sporting practice, given that in such condition the cable has a reduced length on the outside of the boot and it hardly af-

fects the aesthetic impact on the shoe.

[0050] The device can even be used with known types of shoes, as it is provided with a simple structure that can be quickly applied to them, and with low manufacturing costs and can also be used with sports shoes made of plastic material with a desired rigidity while still allowing easy application for the user.

[0051] Naturally the materials used as well as the dimensions constituting single components of the invention could be more pertinent according to specific requirements.

[0052] The different means for performing certain different functions need not certainly coexist only in the illustrated embodiment, but can be present per se in many embodiments that are not illustrated.

[0053] The characteristics indicated as advantageous, convenient or the like may also be omitted or replaced with other equivalent characteristics.

[0054] For example, the device could also be constituted by a means for the temporary tensioning of at least one traction element guided slidingly by a cable guide, preferably of the pulley or ball type, arranged externally to one of said first or second flaps; this cable guide allows to reduce the friction when the traction element is activated and to position said traction element externally to said first and second flaps and thus without creating holes in the flaps and/or the quarter.

[0055] The disclosures in Italian Patent Application No. TV2009A000043 from which this application claims priority are incorporated herein by reference.

[0056] 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 facilitating foot insertion, particularly for sports shoes comprising a first flap (4) and a second flap (5) to be joined, **characterized in that** it is constituted by a means (11) for temporary tensioning of at least one traction element that is adapted to divaricate said first flap (4) and said second flap (5).
2. The device according to claim 1, **characterized in that** said traction element passes through slidingly and is guided on said first flap (4) and connected to a support that is coupled to, and protrudes from, said second flap (5) toward said first flap (4).
3. The device according to claim 1 or 2, particularly for a shoe constituted by a shell (2) to which a quarter (3) is articulated at the malleolar region, said shell (2) comprising, in the foot instep region, a first flap

- (4) and a second flap (5), which can be mutually superimposed both at the upper metatarsal region and at the foot instep region, said quarter (3) having a third flap (7) and a pair of fourth flaps (8a, 8b), which can be mutually superimposed in the foot instep region and can be fastened by means of levers (9) that are also used to fasten said first flap (4) and said second flap (5) at the upper metatarsal region, **characterized in that** said means (11) for temporary tensioning of at least one traction element (12) is constituted by a cord or band or cable that is arranged externally and laterally with respect to said quarter (3), on the outer side of the foot, said cable being made to pass inside said quarter (3) through one among first holes (13) provided in said quarter, in a region that is intermediate between two of said levers (9) that are adjacent or proximate to the upper perimetric edge (27) of said quarter (3).
4. The device according to claims 1 and 3, **characterized in that** said cable is then made to pass from the outside of said first flap (4) to its inside through a second hole (14) that is provided preferably in a region that is not affected by the overlap with said second flap (5) and is then guided on said first flap, thus making it pass from the inside to the outside of said first flap, through a third hole (15) that is formed in a region that is adjacent to the first free edge (16) of said first flap (4), said cable being then connected, at its free end, to a support (17).
5. The device according to claims 1 and 4, **characterized in that** said support (17) is constituted by a plate or tab that protrudes from said second free edge (20) or by a wirelike element that is shaped like an open loop and is substantially M-shaped, and is coupled at its ends (18a, 18b), by means of screws or studs (19a, 19b), externally to said second flap (5) in a region that is adjacent to said second free edge (20), the connection of said cable to said support (17) occurring at the end or at the vertex (21) of said support that is directed toward said second flap (5).
6. The device according to one or more of the preceding claims, **characterized in that** the dimension of said support (17) and therefore the extent of its overlap on said underlying first flap (4) is such that its vertex (21) arranges itself advantageously, in the condition in which the device is not activated, at such a distance from the second free edge (20) of said second flap (5) as to allow, upon traction applied to said cable, an approach toward said third hole (15) that allows to obtain the desired divarication of said first and second flaps (4, 5).
7. The device according to one or more of the preceding claims, **characterized in that** said means (11) for temporary tensioning of said traction element (12) is constituted by an electric or mechanical winder or by a handle (22), which can be gripped by the user, or by a lever (23) that is associated rotatably and externally with said quarter (3) in a region that is comprised between two of said levers (9) that are mutually adjacent, said handle being obtained directly at one end of said traction element (12).
8. The device according to one or more of the preceding claims, **characterized in that** it comprises a means (25) for locking the position of said traction element (12), which is constituted by a cable clamp (26), which is associated with the lateral surface of said quarter (3) in a region that lies approximately above the malleolar region or in a region that lies above said levers (9), said cable clamp (26) being constituted by a blade that is substantially L-shaped so as to form a first wing (28), which is coupled externally to said quarter (3), and a second wing (29), which is elastically deformable, said traction element (12) being selectively interposable between said first and second wings (28, 29) and being temporarily locked in its position, a protrusion (30) protruding from said first wing (28).
9. The device according to one or more of the preceding claims, **characterized in that** the dimension of the lever arm (24) of said lever (23) is determined by the extent of the divarication that one wishes to obtain for said first and second flaps (4, 5), in the closed condition of the lever said traction element (12) not being tensioned and in any case such as to allow overlap and mutual fastening between said first and second flaps (4, 5) and said third and fourth flaps (7, 8a, 8b) of said quarter (3).
10. The device according to one or more of the preceding claims, **characterized in that** said handle (22) is associated with a separate cable (31), which interacts with said cable clamp (26) and is guided at a ring (32) with which the end of said traction element (12) that is external to said quarter (3) is associated, said cable (31) being coupled at its free end to said quarter (3) at said cable clamp (26), the length of said cable (31) being such as to allow the tensioning of the traction element (12) by the desired extent and being in any case such as to allow both the divarication of the first and second flaps (4, 5) and their usual overlap and fastening by means of the levers (9).
11. The device according to one or more of the preceding claims, **characterized in that** said locking means (25) is associated externally with said shoe and allows to lock temporarily said traction element in a fixed position with respect to said shoe.

12. The device according to one or more of the preceding claims, **characterized in that** said means (11) for temporary tensioning of said traction element (12) is constituted by a lever that is used for the fastening of said shoe. 5
13. The device according to one or more of the preceding claims, **characterized in that** said at least one traction element (12, 112), such as a cord or strap or cable, is arranged externally and laterally with respect to said quarter (3, 103), on the outer side of the foot and proximate to the upper perimetric edge (27, 127) of said quarter (3, 103), in a region that lies above the upper perimetric edge (133) of said first flap (104), said traction element (12, 112) being then made to pass slidingly and internally to said quarter (3, 103) through one among first holes (13, 113) provided in said quarter. 10 15
14. The device according to one or more of the preceding claims, **characterized in that** said cable is then positioned within said first flap (4, 104) and made to pass slidingly outside it through a second hole (14, 114) that is provided in a region that is not affected by the overlap with said second flap (5, 105) and in a region that is adjacent to the first free edge (16, 116) of said first flap (4, 104). 20 25
15. The device according to one or more of the preceding claims, **characterized in that** said cable is then connected, at its free end, to a support (17, 117), such as a plate or tab that protrudes from said first flap (4, 104), or a wirelike element that is shaped like an open loop and is substantially M-shaped and is coupled at its ends, by means of screws or studs (19a, 119a, 19b, 119b), externally to said second flap (5, 105) in a region that is adjacent to the second free edge (20, 120) of said second flap (5, 105), the connection of said cable occurring at the end of said support (17, 117) or at the vertex (21, 121) of said open loop that is directed toward said second flap (5, 105). 30 35 40
16. The device according to one or more of the preceding claims, **characterized in that** said at least one traction element is slidingly guided by a cable guide, of the pulley or ball type, which is arranged outside one of said first or second flaps, in order to reduce friction and allow the positioning of said traction element outside said first and second flaps. 45 50

55

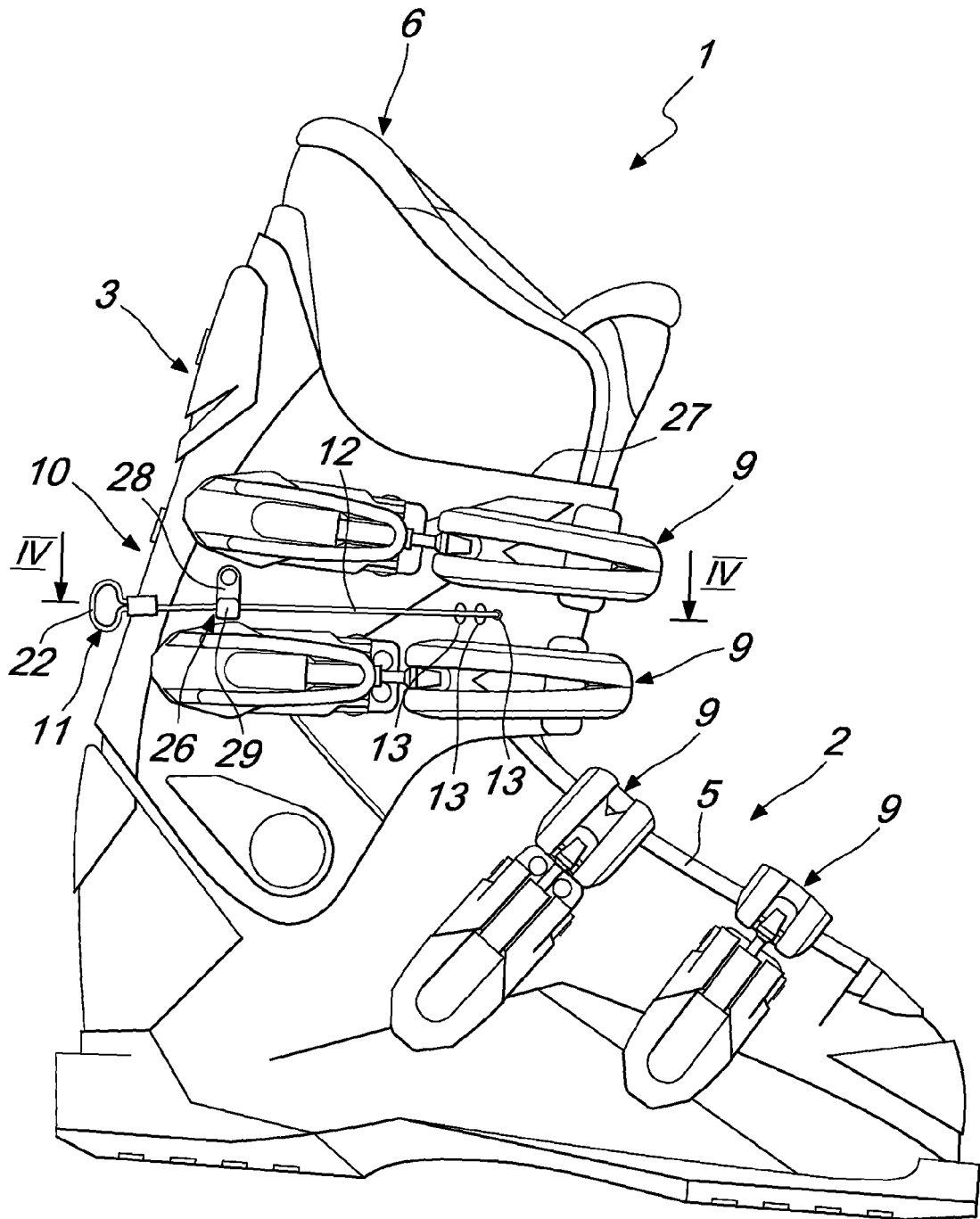


Fig. 1

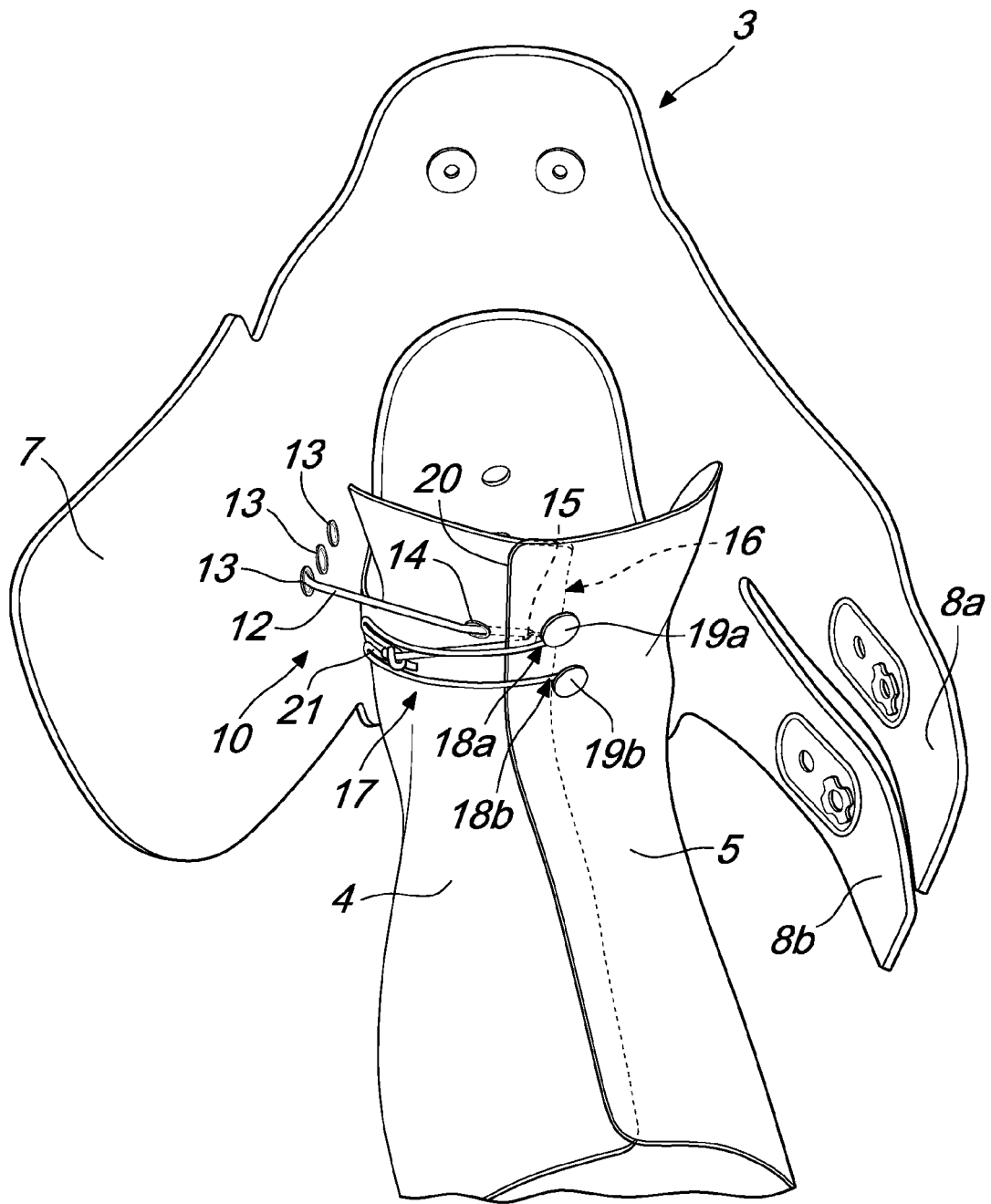
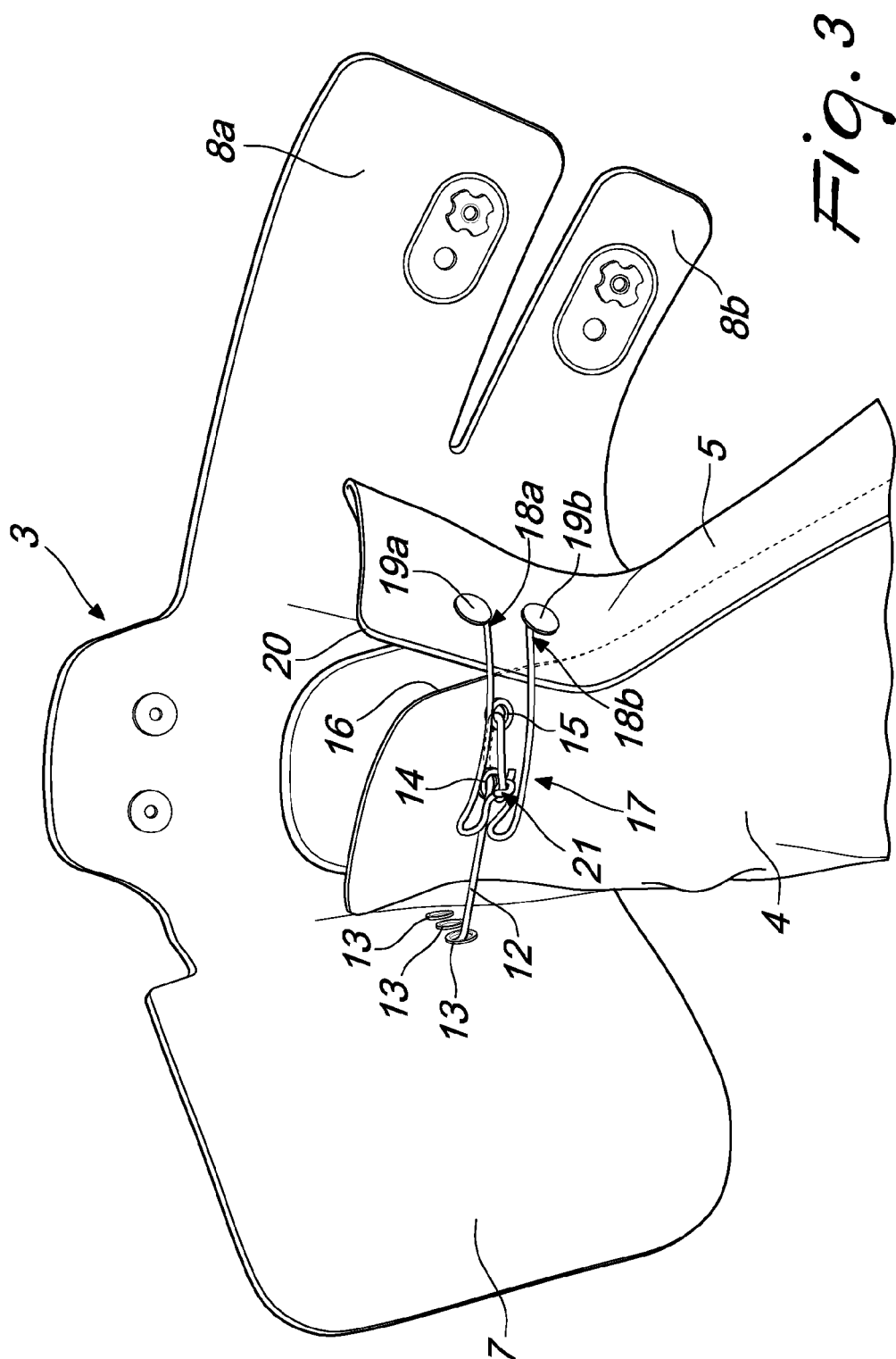
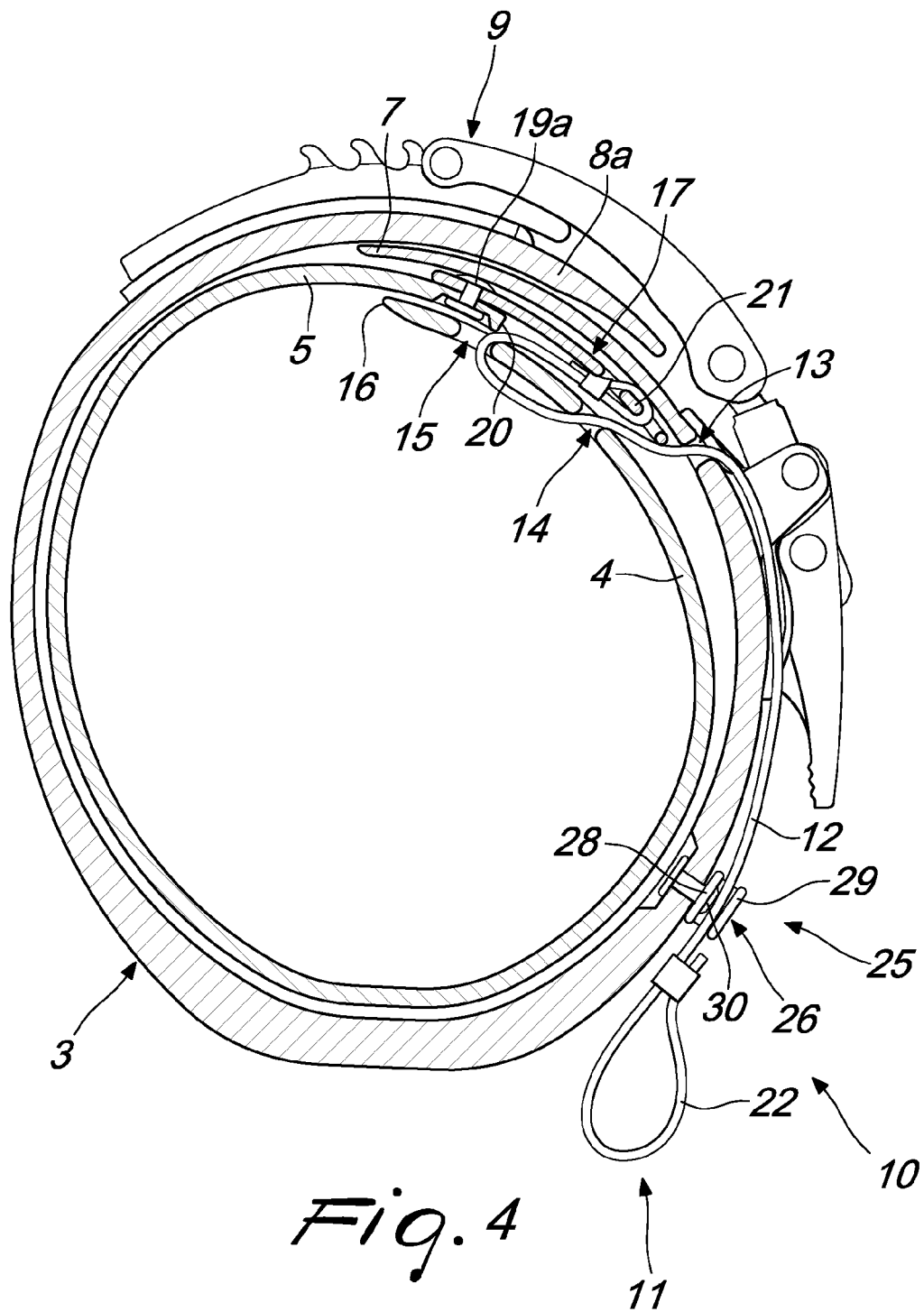


Fig. 2





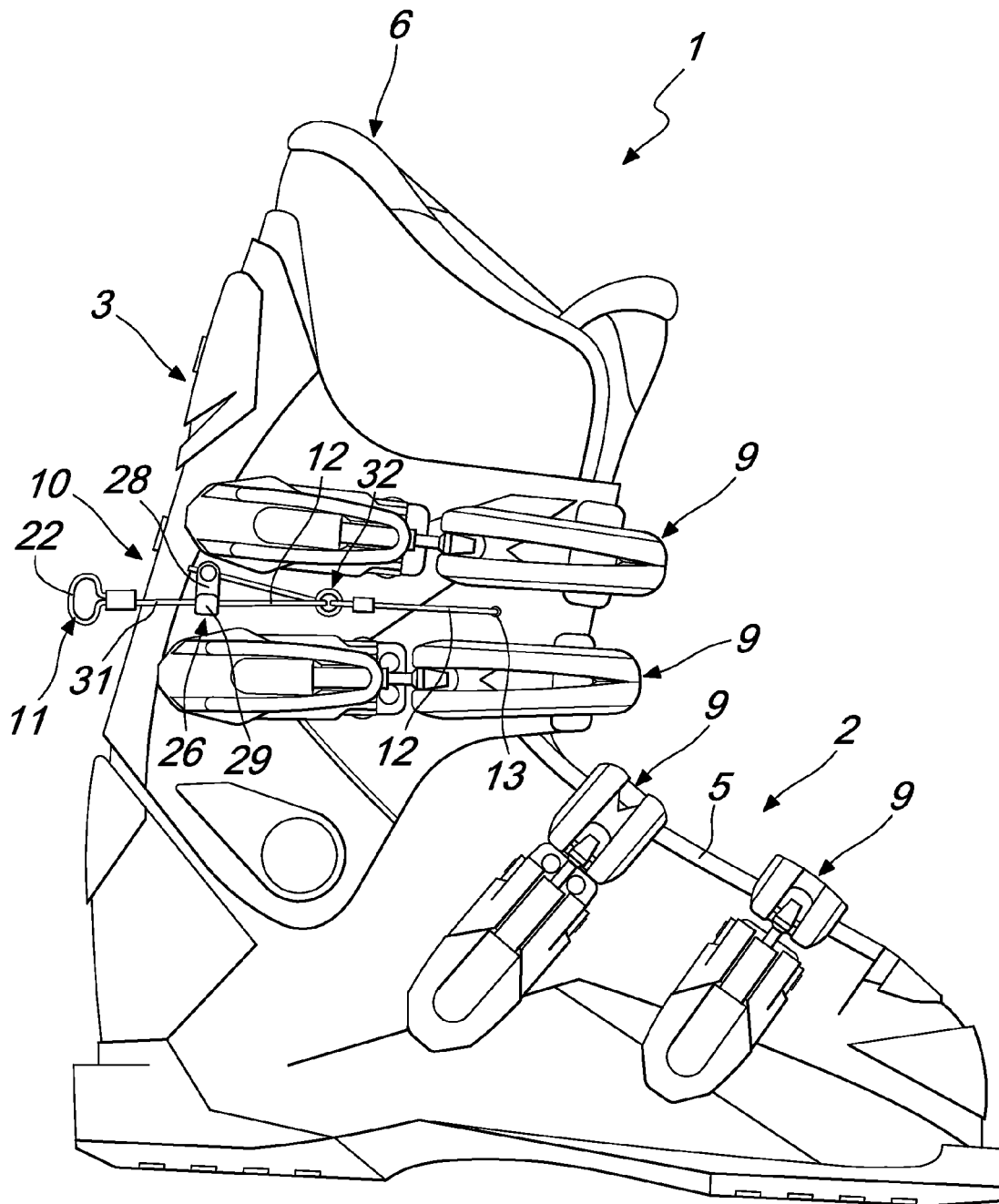


Fig. 5

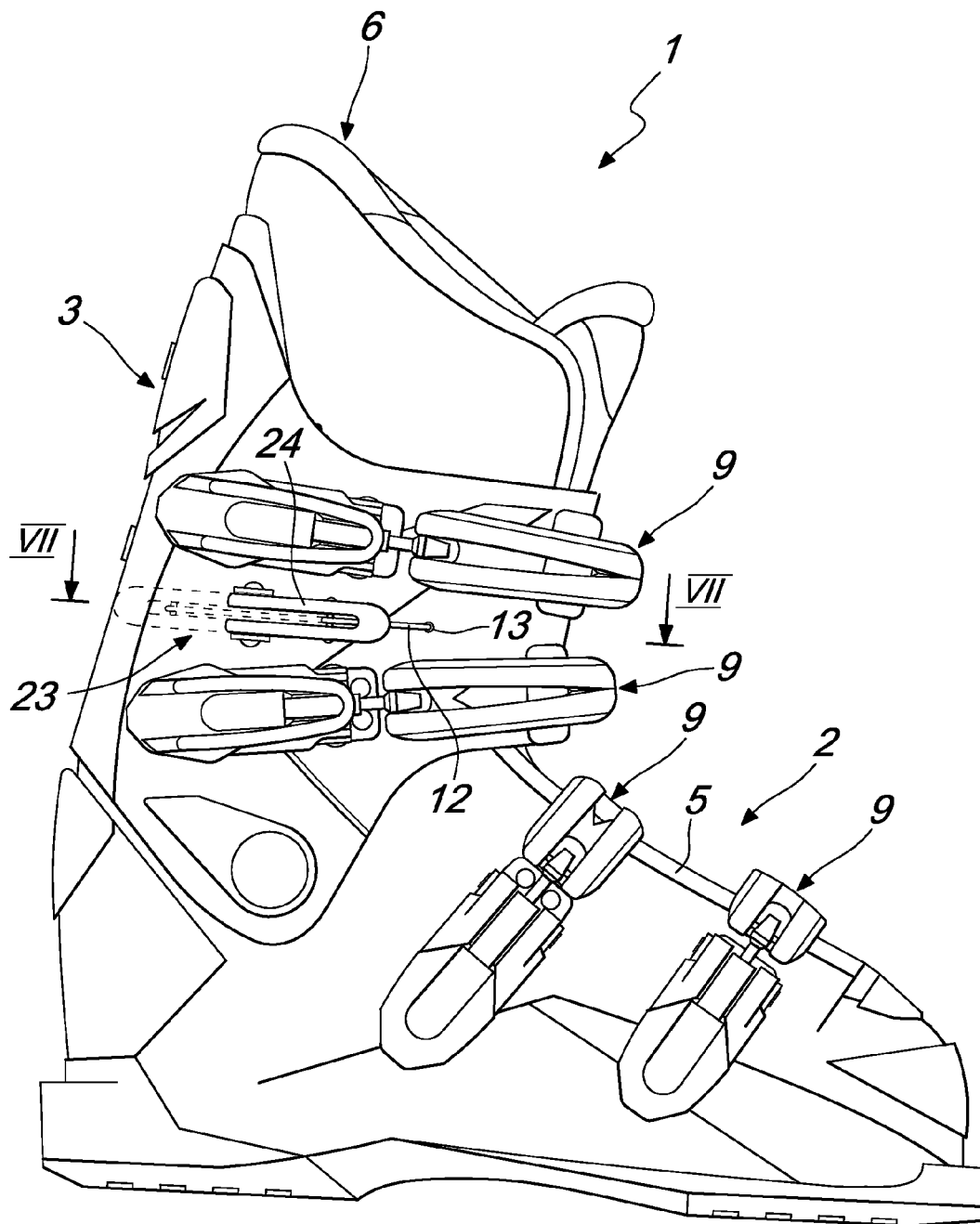


Fig. 6

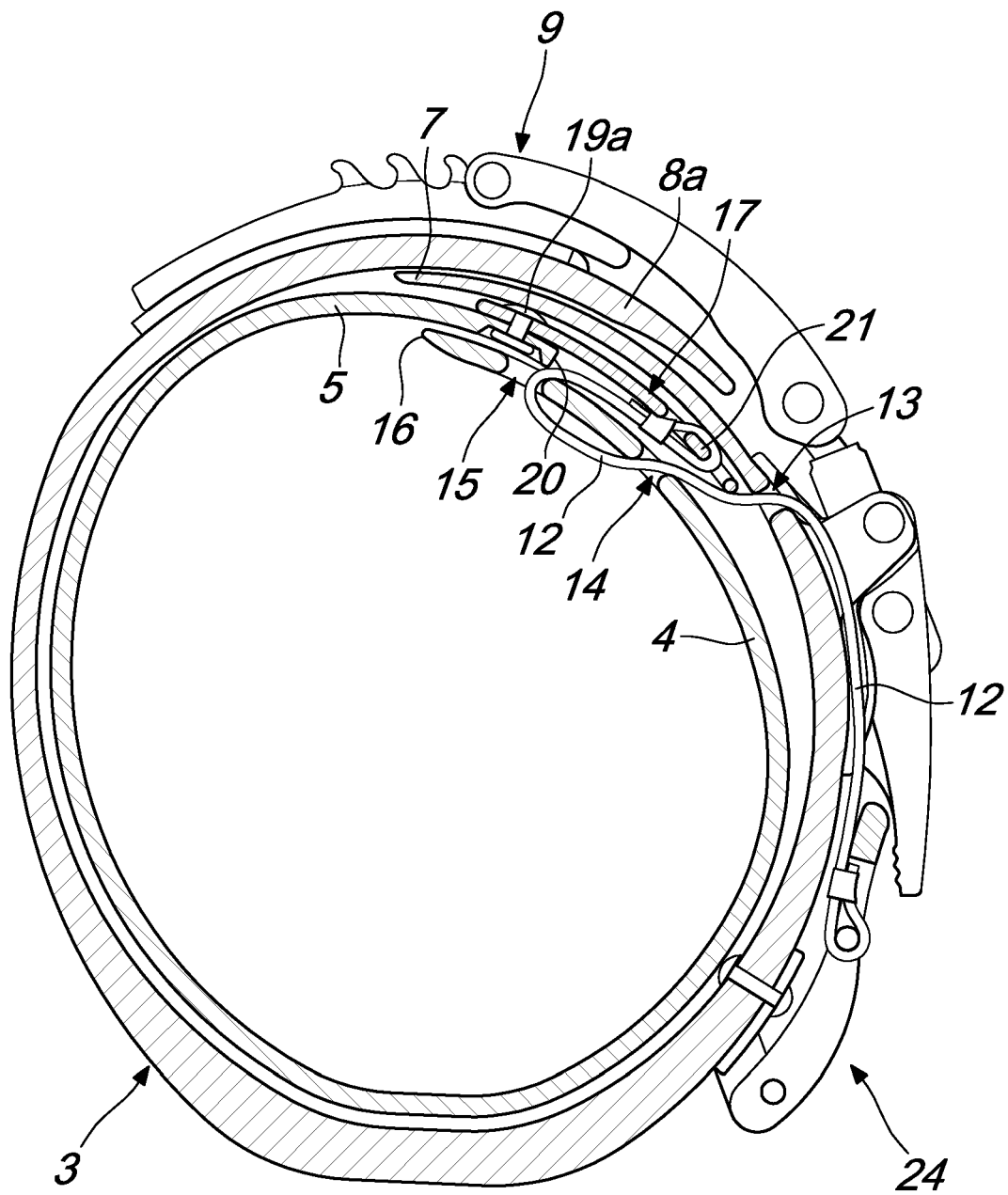


Fig. 7

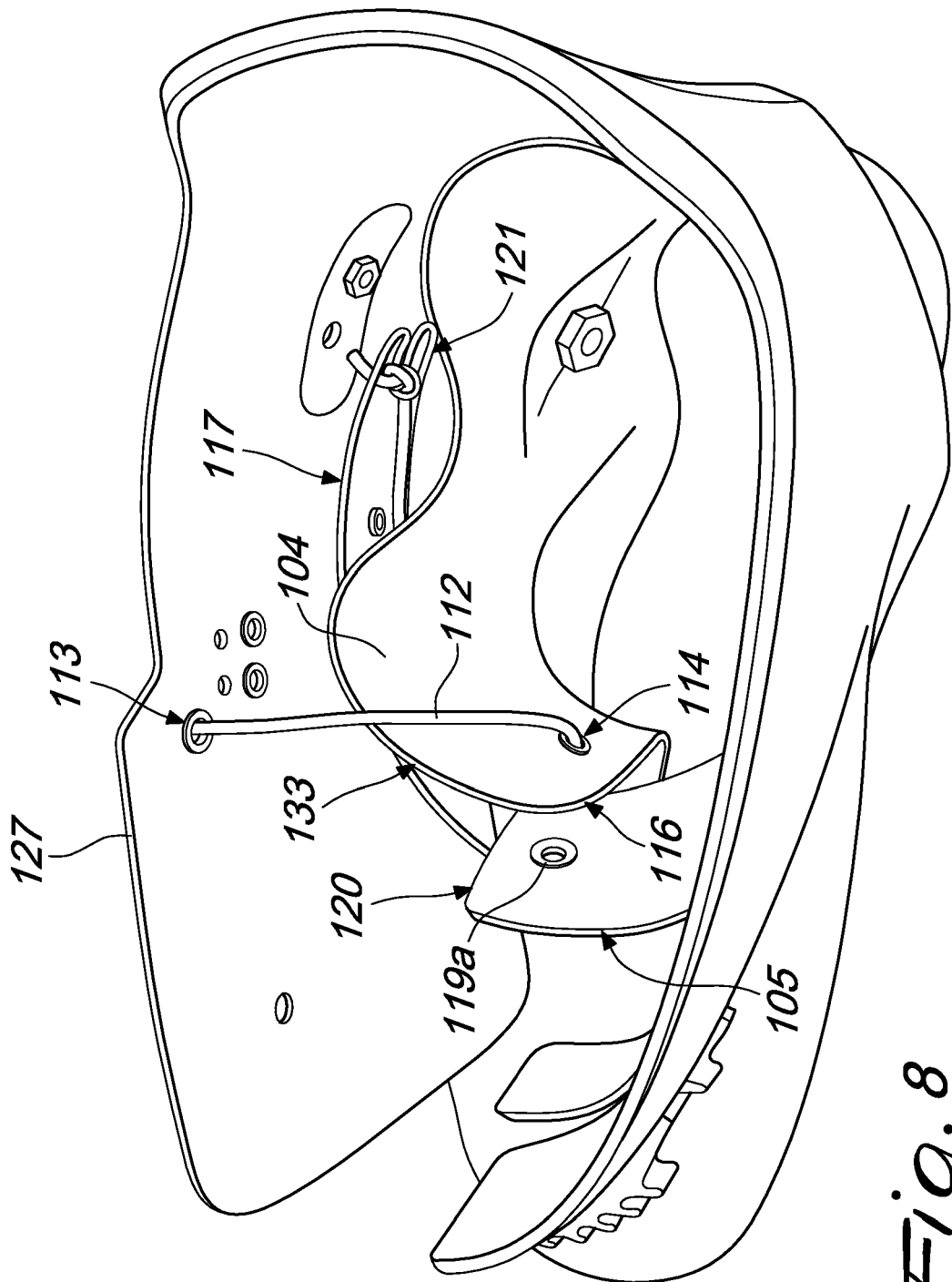
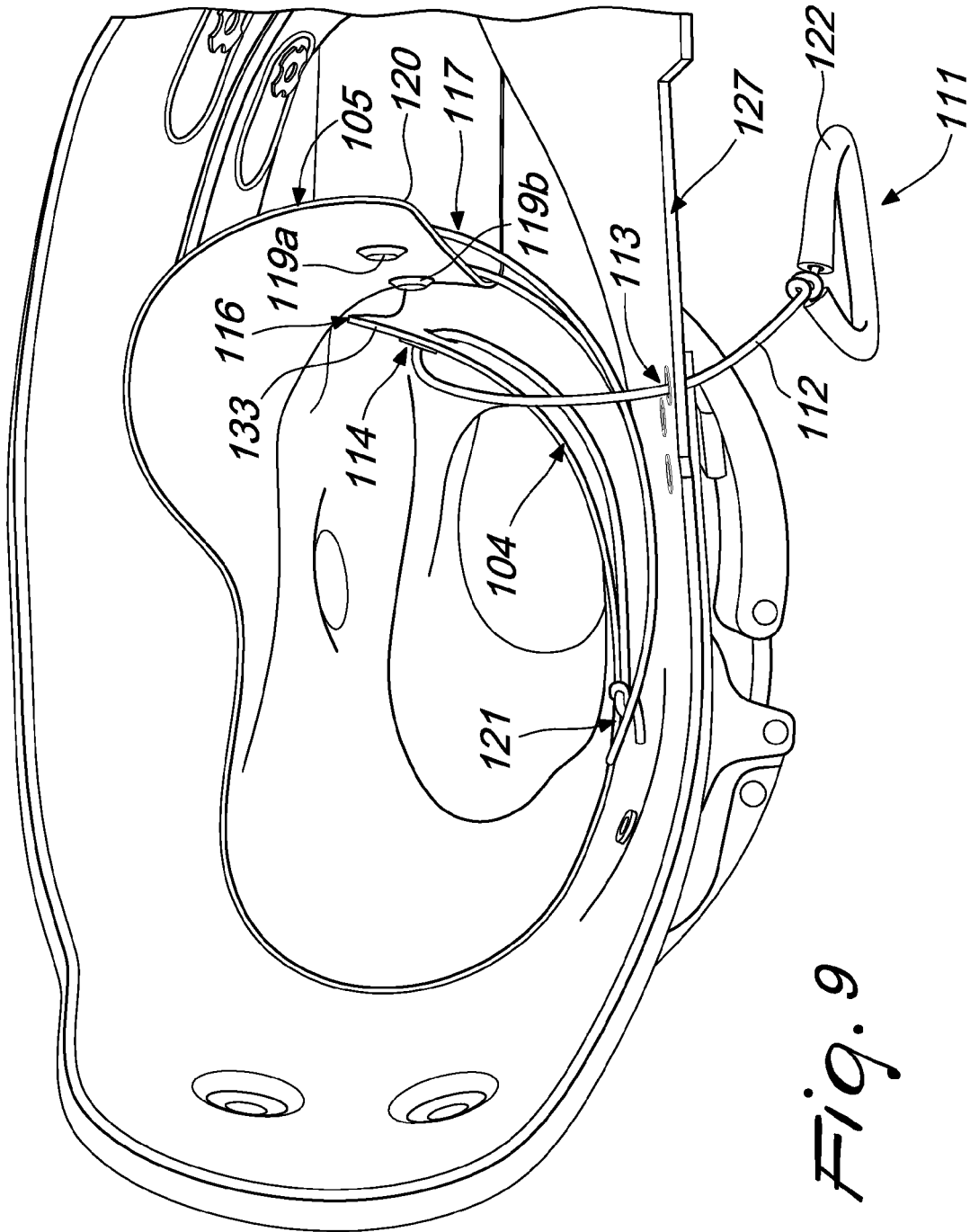
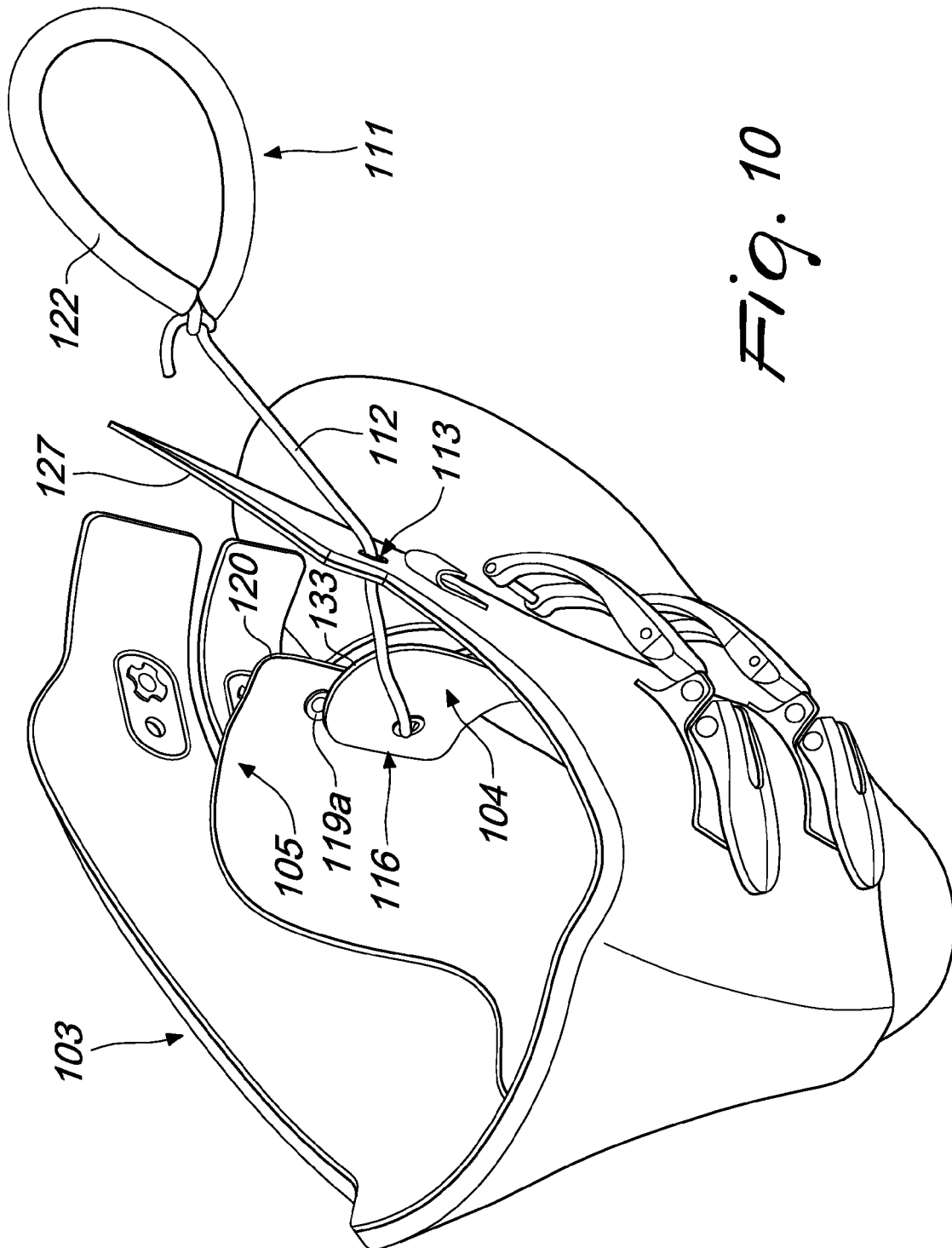


Fig. 8







EUROPEAN SEARCH REPORT

Application Number
EP 09 18 0186

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 A	EP 1 690 462 A1 (SALOMON SA [FR]) 16 August 2006 (2006-08-16) * paragraph [0018] - paragraph [0019]; figure 6 *	1,7,11, 12 2-6, 8-10, 13-16	INV. A43B11/00 A43B5/04
X A	EP 1 495 691 A1 (SALOMON SA [FR]) 12 January 2005 (2005-01-12) * paragraph [0060] - paragraph [0082]; figures *	1,7,11, 12 2-6, 8-10, 13-16	
X A	US 2004/250388 A1 (MARTIN JOHN DIETRICH [US]) 16 December 2004 (2004-12-16) * paragraphs [0023], [0 27], [0 29]; figures *	1,7,11, 12 2-6, 8-10, 13-16	
X A	US 5 230 171 A (CARDAROPOLI PAUL R [US]) 27 July 1993 (1993-07-27) * column 2 - column 3; figures *	1 2-16	TECHNICAL FIELDS SEARCHED (IPC) A43B A43C
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 7 July 2010	Examiner Herry, Manuel
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			

 2
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 09 18 0186

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

07-07-2010

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1690462	A1	16-08-2006	CN 1817260 A	16-08-2006
			FR 2881930 A1	18-08-2006
			US 2006179685 A1	17-08-2006

EP 1495691	A1	12-01-2005	AT 379982 T	15-12-2007
			CN 1575683 A	09-02-2005
			DE 602004010462 T2	27-11-2008
			FR 2857234 A1	14-01-2005
			US 2005005477 A1	13-01-2005

US 2004250388	A1	16-12-2004	AT 355477 T	15-03-2006
			CN 1802523 A	12-07-2006
			DE 602004005038 T2	09-08-2007
			EP 1631754 A1	08-03-2006
			JP 2007500835 T	18-01-2007
			WO 2005003591 A1	13-01-2005

US 5230171	A	27-07-1993	NONE	

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- IT TV20090043 A [0055]