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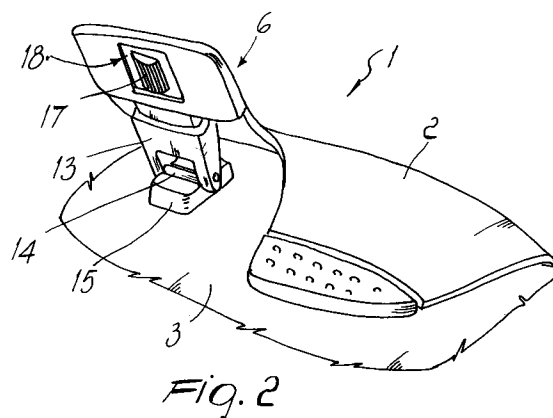
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I-20123 Milan (IT)(54) **Securing lever particularly for sports footgear.**

(57) A securing lever, particularly usable for sports footgear, comprising at least one flap (2) which can be closed onto a main body (3) of the footgear. The peculiarity of this lever resides in the fact that the flap has at least one wing (4) which can be associated with a containment element (6) for at least one lever arm (11) which has a pin (14) for temporary coupling with a rack (15) which is associated with the main body.

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The present invention relates to a lever, particularly usable for sports footgear and particularly for ski boots.

Several types of lever for ski boots are currently known. This same Applicant filed, on July 17, 1975, an Italian patent, granted as no. 1039897, which discloses a lever constituted by an arm which is pivoted at one end to a pair of shoulders which are rigidly coupled to a flap of the boot; the arm has a toothed region for interaction with the end of a hook which can be associated, at its other end, with the other flap of the boot to be closed.

This known type of lever requires a surface finish of good aesthetic quality, because it is visible on the boot. Accordingly, materials, such as aluminum or plastics must be used which have a pleasant external appearance for the skier but at the same time do not have high mechanical characteristics, which are required in order to withstand the stresses and shocks to which they are subject during sports practice.

In any case, the protrusion of the levers on the lateral surface of the boot does not give said boot a neat aesthetic appearance, and said levers are subject to accidental opening or breakage in case of impact with the snow.

As a partial solution to this problem, the same Applicant filed, on January 21, 1976, an Italian patent, granted as no. 1054289, which discloses a closure assembly for ski boots having a simplified structure. However it has been found to be difficult to close, because of the small size of the hand resting surface on which the effort is applied.

Italian utility model no. 185645 filed on January 20, 1981, discloses a lever closure, particularly for motorcycle boots, wherein the arm of the lever, which is again pivoted, at one end, at an adapted support which is rigidly coupled to a flap, is inserted within adapted notches defined on another flap to be closed.

Also this lever, despite having a low number of components, has some problems, such as the direct interaction of the lever arm with the flap to be closed, which entails breakages or deformations due to the different strength of the materials in mutual contact.

A French patent, published as no. 2432280 and filed on August 3, 1978, discloses a closure device which is again composed of a U-shaped lever arm whose wings are again pivoted, at their ends, at an adapted support which is rigidly coupled to a flap. A pin is interposed between the wings and interacts with an adapted rack which protrudes from the other flap to be joined.

Also this device has problems, because the engagement between the lever arm and the rack is not always reliable. The rack must be made of plastic material together with the boot flap and

therefore does not withstand the high stresses imparted while skiing.

Among the various situations described, the same applicant of said French patent indeed provides for the use of a single lever arm which has a tooth region interacting with an adapted pin which is transversely associated with the wings of a U-shaped bar which is pivoted about one edge, at one end, to the other flap to be joined.

Thus, this solution too has the previously mentioned problems and moreover the closure operation is difficult for the skier, who must practically rotate the lever arm through 180°.

As a partial solution to this problem, this same Applicant filed on September 8, 1980 an Italian application, No. 22716 B/80, concerning a closure device, particularly for ski boots, wherein a lever arm is pivoted at one of the flaps to be secured. The end of a traction element is articulated to a median portion of the lever element and the traction element is provided, on the opposite side, with a hook member which can be coupled in an engagement seat provided at the other flap to be secured. The traction element is provided with means for adjusting its useful length and with a substantially flexible portion.

However, this device too comprises a large number of components and protrudes beyond the contour of the boot; the closure device also has a considerable longitudinal size which affects a very wide area of the boot.

As a partial solution to these problems, this same Applicant filed, on November 4, 1991, a European patent application no. 91118755.7, which discloses a lever for sports footgear, particularly for securing two flaps of a ski boot, whose peculiarity resides in the fact that it comprises a lever arm which is associated at an adapted seat formed on one of the flaps. A grip element for engagement means provided on the lever arm is associated on the other one of the flaps.

Although it is undoubtedly valid, this device too has problems, because the mutual connection between the lever arm and the seat defined on the flaps has been found to be less than optimum; furthermore it is also necessary to change the adjustment of the degree of tension which can be applied by the lever.

One aim of the present invention is to eliminate the problems described above in known types, by providing a lever which is optimally associable with a flap of a boot and allows to ensure an optimum adjustment of the mutual securing of two flaps to be joined although it does not, at the same time, protrude from the outer contour of the boot.

Within the scope of the above aim, an object of the invention is to provide a lever which is structurally simple and can be produced with a low num-

ber of components.

Another object is to provide a lever which can be easily interchanged even by the user himself, without requiring particular tools.

Another object is to provide a lever having a small size and thus occupying a minimal surface of the boot.

Another object is to provide a lever which is reliable and safe in use.

This aim, these objects and others which will become apparent hereinafter are achieved by a securing lever, particularly for sports footgear comprising a main body and at least one flap which can be closed onto said main body, characterized in that said at least one flap has at least one wing which can be removably associated with a containment element for at least one lever arm which has means for temporary coupling with engagement means associated with said main body.

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

figure 1 is a sectional view of a boot, taken transversely to the shell at the lever;

figure 2 is a partially discontinued perspective view of the coupling between a flap and a lever;

figure 3 is an exploded view of an end of the flap which can be coupled at the containment element and of the lever;

figure 4 is a partially sectional top view of the lever associated with the containment element, together with the wing of the flap;

figure 5 is a sectional view, taken along the plane V-V of figure 4;

figure 6 is a sectional view, taken along the plane VI-VI of figure 4;

figure 7 is a partially sectional view of the securing device in the condition of minimum lever extension;

figure 8 is a view, similar to the preceding one, of the condition of maximum lever extension;

figure 9 is a view, similar to that of figure 3, of a second embodiment of the invention;

figure 10 is an exploded view of the components of a third embodiment of the invention;

figure 11 is a view, similar to the preceding one, of the device shown in figure 10, in partially assembled condition.

With reference to the above figures, the securing lever, generally designated by the reference numeral 1, is particularly usable for sports footgear, such as a ski boot, which comprises at least one flap 2 which can be closed onto a main body of the footgear, such as an upper or a quarter or a shell, generally designated by the reference numeral 3.

At least one wing 4 is provided at said at least one flap 2 and, in the particular embodiment shown in figure 3, is substantially C-shaped. A means for temporary connection to a containment element, constituted by a shell 6, is provided on the tabs 5a and 5b of the wing 4, which are directed toward the main body.

The means is constituted by a plurality of lugs 7a and 7b which protrude transversely to the respective tabs 5a and 5b, have a preferably cylindrical transverse cross-section and protrude outside the tabs 5a and 5b.

Preferably, the ends of the lugs 7a and 7b which do not face each other are chamfered along an inclined plane.

The tabs 5a and 5b can be moved mutually closer in an elastic manner and can be inserted within an adapted cavity 8 defined axially inside the shell 6. The cavity 8 is connected, at both sides, with adapted first seats 9a and 9b which are shaped complementarily to said lugs 7a and 7b and to second seats 10a and 10b which are shaped complementarily to the remaining parts of the tabs 5a and 5b which can be positioned within the shell 6.

Once compression on the tabs 5a and 5b, which can be performed beforehand by the skier, has been reduced, the lugs 7a and 7b enter the respective first seats 9a and 9b and the remaining parts of the tabs 5a and 5b arrange themselves at the second seats 10a and 10b: the shell 6 is thus temporarily rigidly coupled to the flap 2.

At least one lever arm 11 is insertable at the cavity after the placement of the wing 4.

The lever arm in fact has a pair of coupling elements 12 which can be slidingly arranged at the cavity 8 and are connected to a block 13 whose free end is substantially C-shaped and comprises a temporary engagement means, such as a transversely arranged pin 14, suitable to interact with an engagement means such as a rack 15 which is associated with said upper and/or said quarter and/or said shell 3.

The axial movement of the block 13 with respect to the shell 6 is allowed by virtue of the presence of a threaded stem 16 which protrudes axially with respect to the block 13 and interacts with a complementarily threaded and externally knurled pawl 17 which can be activated by the user and can be arranged at the adapted opening 18 defined on the shell 6.

The pawl also has the task of retaining the lever arm 11 inside the shell 6.

Use of the invention is thus as follows: initially, the tabs 5a and 5b of the wing 4 must be compressed elastically, placing the lugs 7a and 7b within the shell 6 and then within the respective first seats 9a and 9b and second seats 10a and

10b.

The lever arm 11 is then inserted, placing the pair of coupling elements 12 thereof within the cavity 8 and inserting the pawl 17 in the opening 18, screwing it onto the threaded stem 16.

The user then engages the pin 14 at the required point of the rack 15 and then imparts a rotation to the lever arm 11 which moves it adjacent to the upper and/or quarter and/or shell 3.

Tension is thus applied to the flap 2.

The user may of course operate the pawl 17 to increase or decrease the degree of securing, as shown in figures 7 and 8.

It has thus been observed that the invention has achieved the intended aim and objects, a lever having been provided which is rapidly and optimally associable with a flap of a boot and allows to ensure an optimum adjustment of the mutual securing of said flap and of the upper and/or a quarter and/or the shell.

Furthermore the lever is contained within the flap to be secured, so that it does not protrude from the outer contour of the boot, thus improving the aesthetic characteristics thereof.

In case of breakage the lever arm can be replaced very rapidly and easily even by the skier himself, without the aid of special tools.

The lever is constituted by a low number of components, and this allows to reduce the manufacturing costs.

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

Thus, for example, figure 9 illustrates a second embodiment, wherein a securing lever comprises at least one flap 102 which has a substantially C-shaped wing 104. Preferably cylindrical lugs 107a and 107b are transversely associated with the free ends of the tabs 105a and 105b of said wing.

Tabs 105a and 105b can be compressed elastically so that they are temporarily accommodated at first seats 109 and second seats 110 formed laterally with respect to a cavity formed axially to a shell 106.

In this case, too, the securing lever comprises a lever arm 111 having a pair of coupling elements 112 which can be slidingly positioned at the cavity 108 and are connected to a block 113 which has, at one end, a pin 114 which interacts with the adapted rack.

The lever arm 111 can be adjusted by means of an adapted pawl 117 which interacts with a threaded stem 116 which protrudes axially with respect to the block 113. The pawl can be operated by the skier through an adapted opening 118 formed on the shell 106.

A third embodiment of the invention is illustrated in figures 10 and 11, wherein the flap 202

has at least one wing 204 on which adapted engagement means, such as a plurality of first holes 220a and 220b formed laterally with respect to a longitudinal through slot 221, are provided.

The lever also comprises a shell 206 which is constituted by two half-bodies 222a and 222b which can be mutually coupled. The first half-body has a plurality of protrusions 223a and 223b which constitute means for gripping said first holes and second holes 224a and 224b formed on the second half-body 222b.

The removable connection between the wing 204 and the shell 206 thus occurs by opening the two half-bodies 222a and 222b, arranging the first holes 220a and 220b at the protrusions 223a and 223b and then closing the half-bodies 222a and 222b on one another.

A lever arm 211 can be arranged beforehand between the wing 204 and the half-body 222a. The lever arm has a block 213 provided with a pin 214 which can be associated at the adapted rack 215 which can be coupled to the upper and/or to the quarter and/or to the shell 203.

The lever arm 211 also has means suitable to adjust its longitudinal extension, such as an externally knurled pawl 217 which has a threaded seat for a complementarily threaded stem 216 which is associable at the pair of coupling elements 212 of said lever arm 211.

Openings 219a and 219b, approximately equal in size to said slot 221 and suitable to allow the skier to access the pawl 217, are furthermore provided on the first half-body and on the second half-body.

This solution too allows to achieve the intended aim and objects.

The lever can also be applied at sports footgear such as roller skates, ice skates, snowboard boots, trekking and mountain footgear, motorcycle boots, etc.

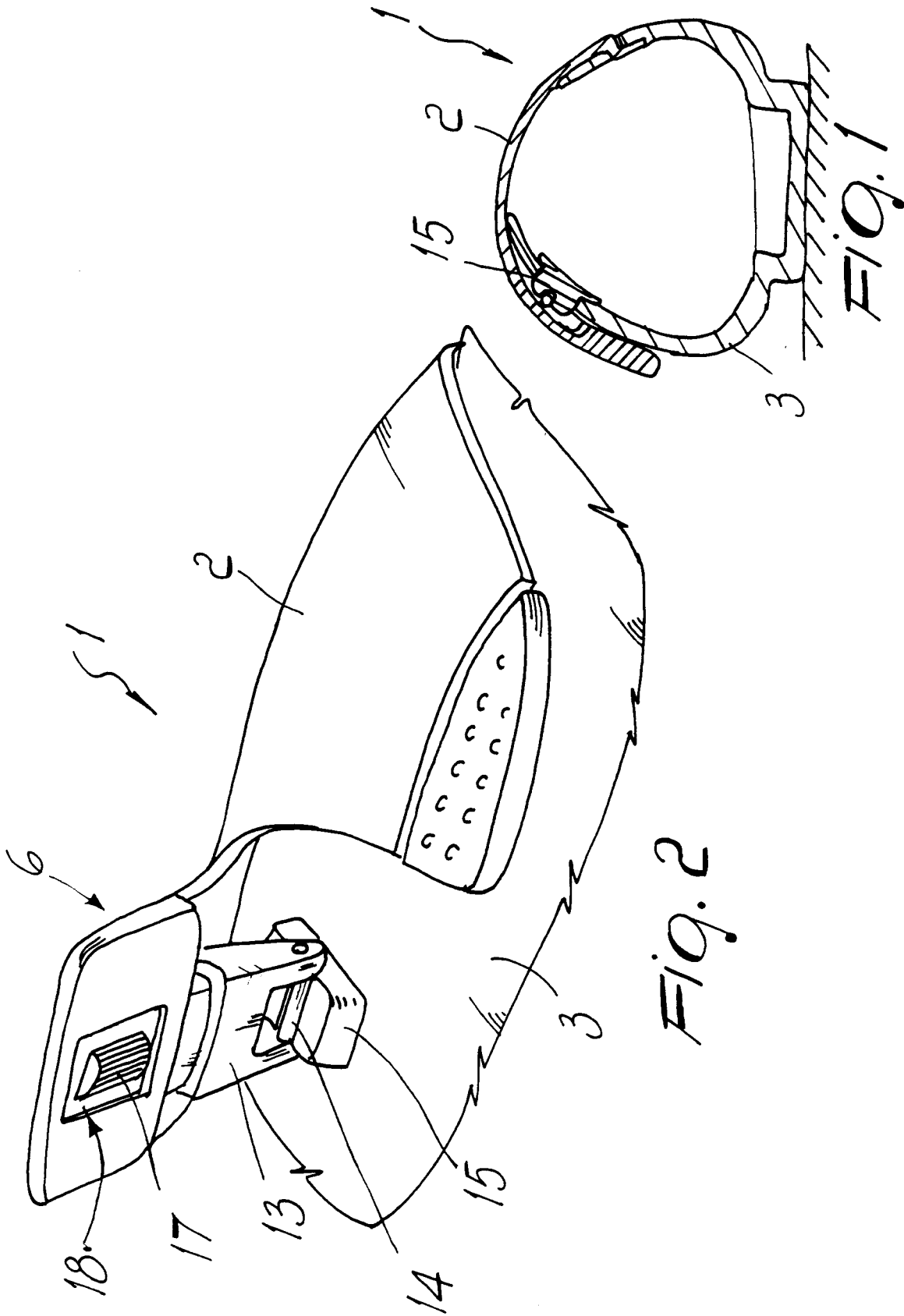
The materials and the dimensions which constitute the individual components of the lever may naturally be the most pertinent according to the specific requirements.

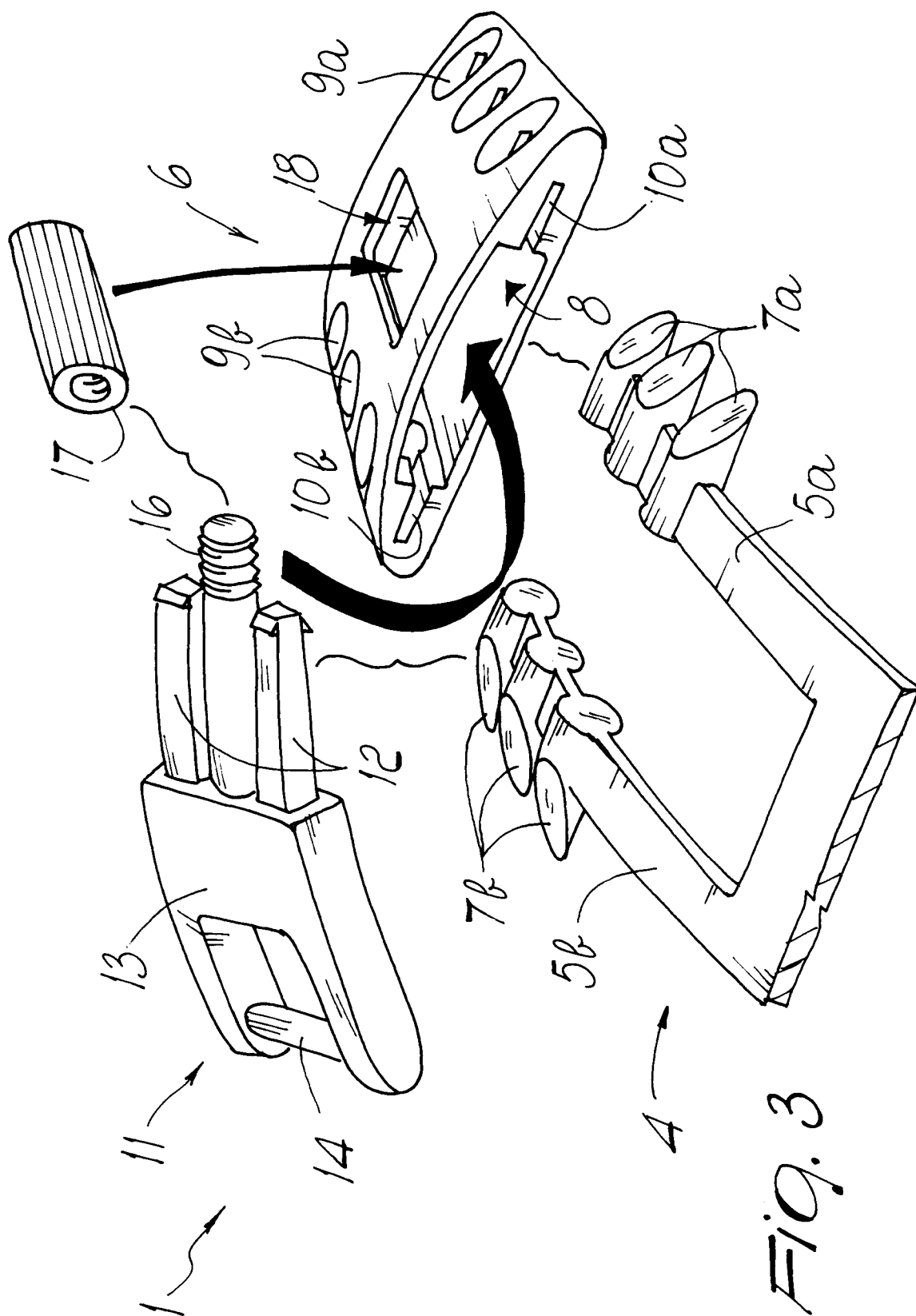
Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

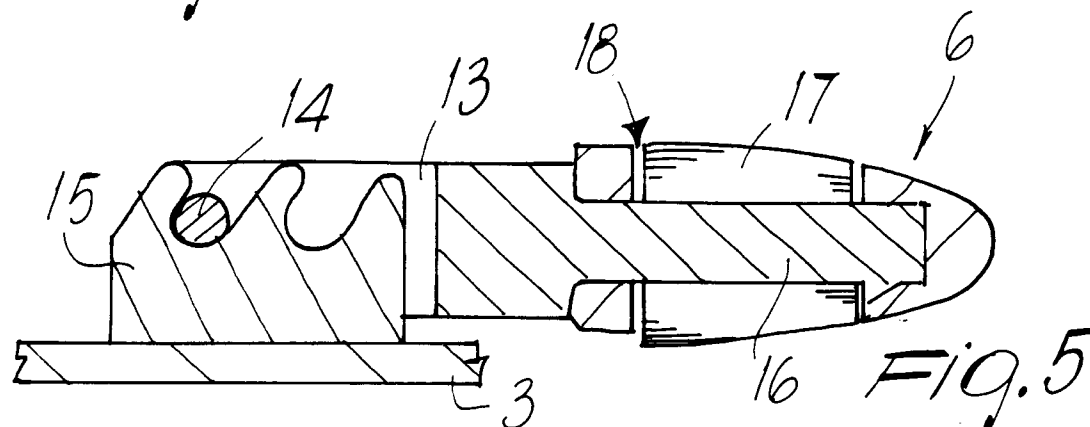
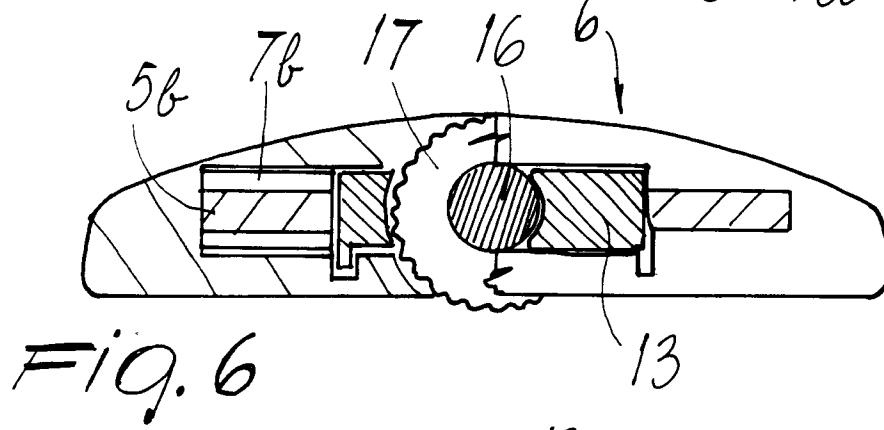
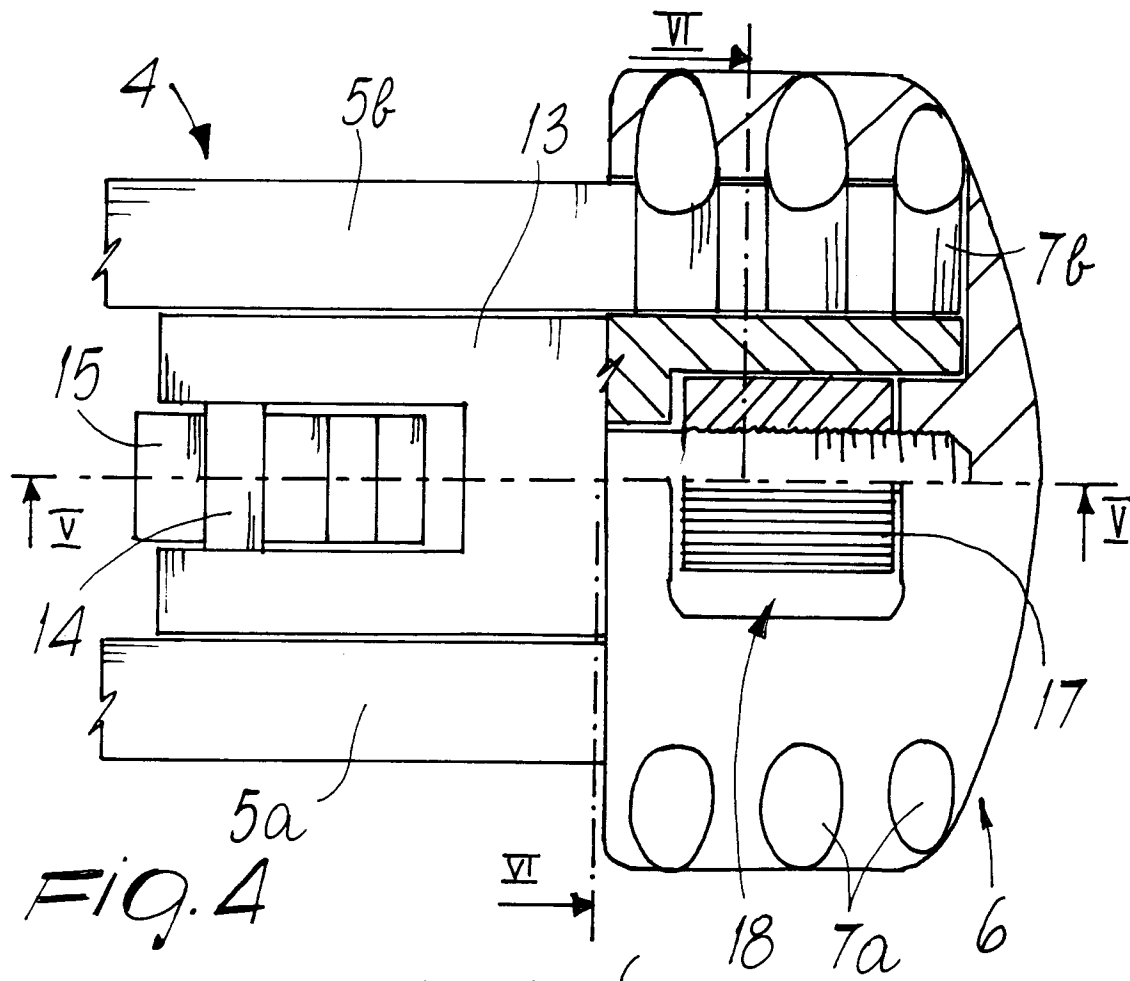
Claims

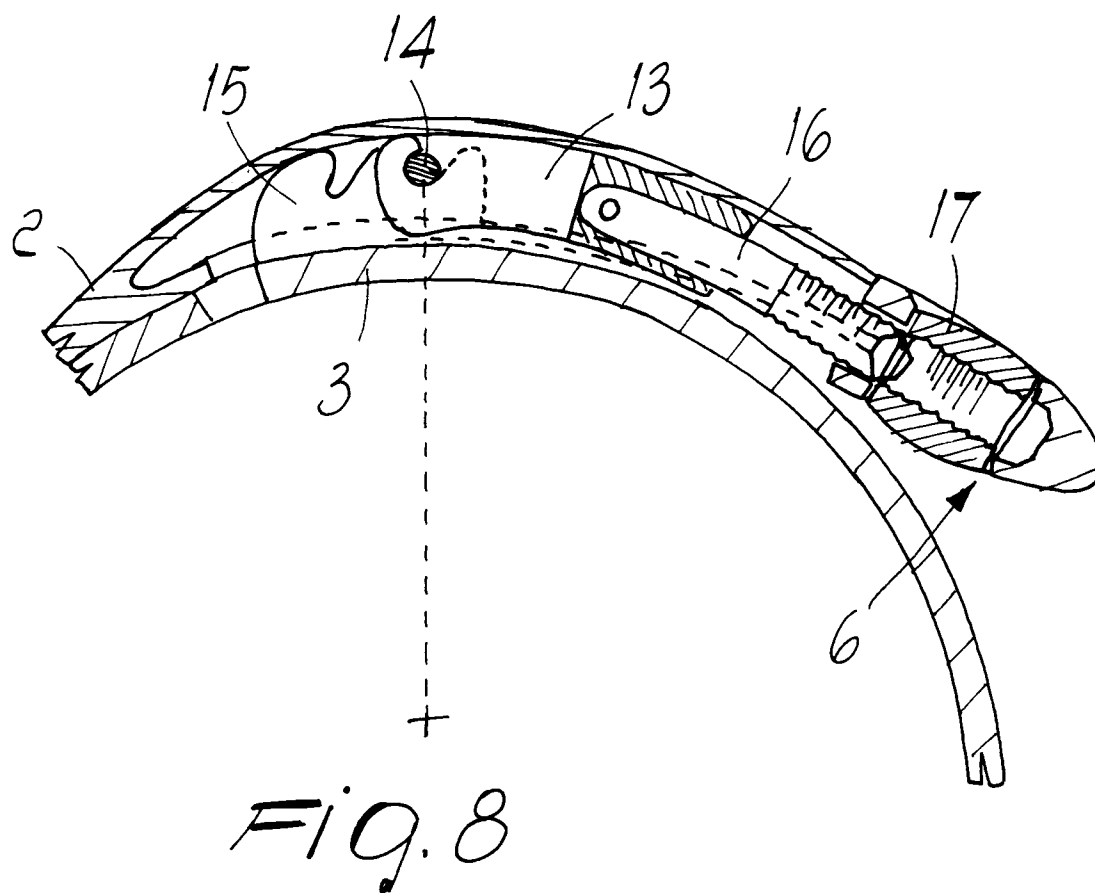
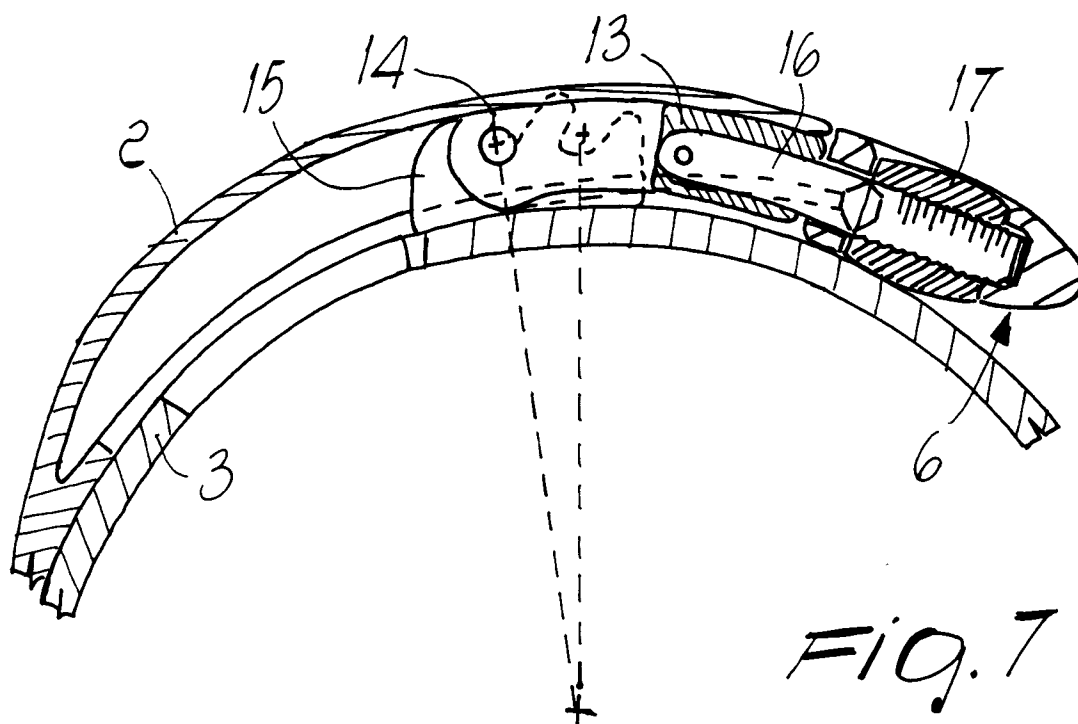
1. Securing lever, particularly for sports footgear comprising a main body (3) and at least one flap (2,202) which can be closed onto said

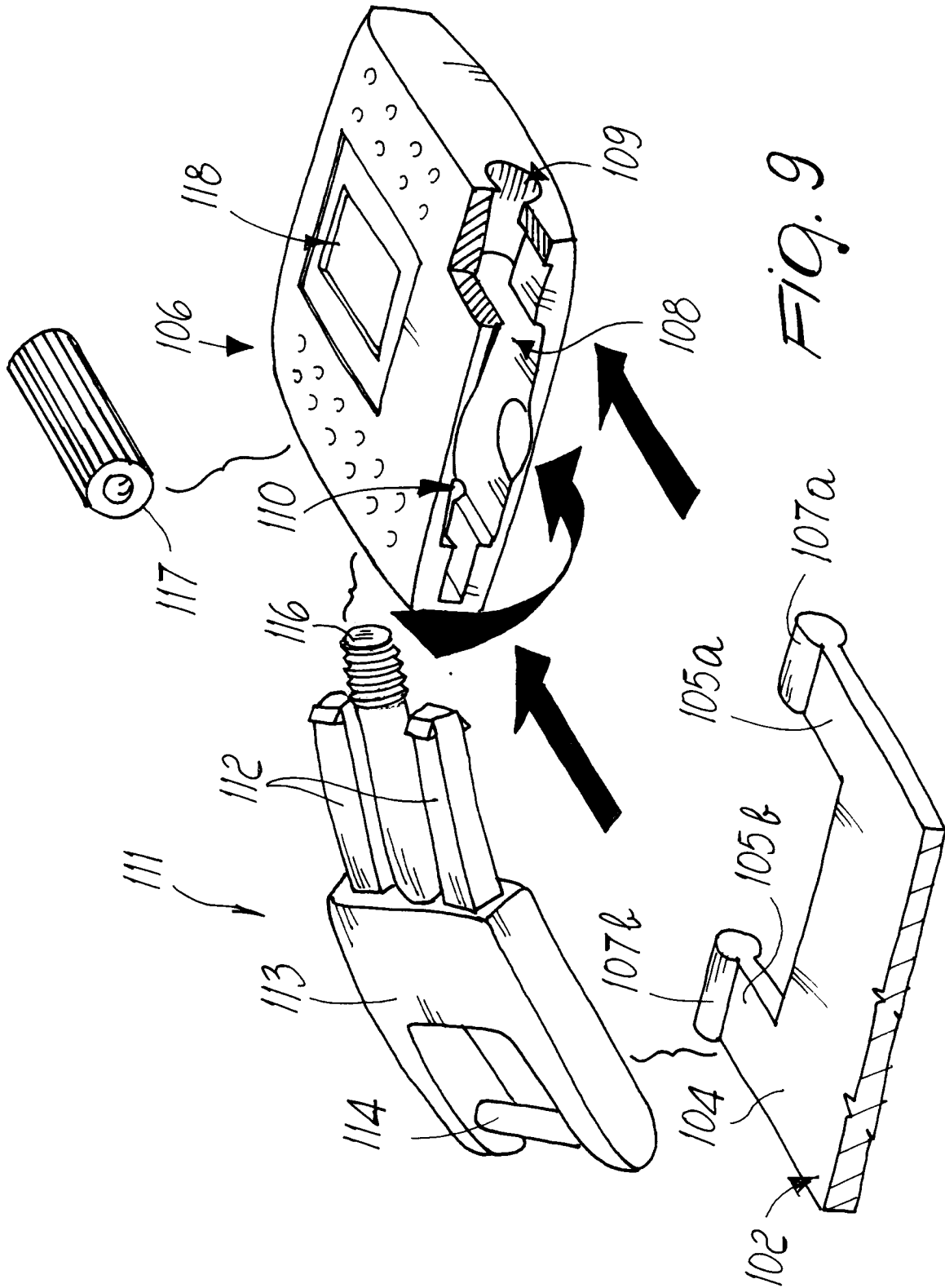
- main body (3), characterized in that said at least one flap has at least one wing (4,104,204) which can be removably associated with a containment element (6,106,206) for at least one lever arm (11,111,211) which has means (14,114,214) for temporary coupling with engagement means (15,215) associated with said main body.
2. Lever according to claim 1, characterized in that said at least one wing (4,104) is C-shaped, means (7a,7b,107a,107b) for temporary connection to a containment element constituted by a shell (6,106) being provided on tabs (5a,5b,105a,105b) of said wing which are directed toward said main body.
 3. Lever according to claim 2, characterized in that said temporary connection means are constituted by lugs (7a,7b,107a,107b) which protrude transversely to each one of said tabs.
 4. Lever according to claim 3, characterized in that said tabs can be moved elastically toward each other.
 5. Lever according to claim 4, characterized in that said tabs can be removably inserted in, and extracted from, an adapted cavity (8,108) defined internally and axially to said shell, said cavity being connected, at both sides, to adapted first (9a,9b) and second seats (10a, 10b) which are shaped complementarily to said lugs and to said tabs.
 6. Lever according to claim 5, characterized in that said lever arm (11) can be arranged within said cavity, said arm having a pair of coupling elements (12) which can be slidingly positioned within said cavity and are connected to a block (13) which comprises a temporary coupling means, such as a pin (14), for engagement means, such as a rack (15), which are associated with said main body.
 7. Lever according to claim 6, characterized in that said block can move axially with respect to said shell by means of a threaded stem which protrudes axially with respect to said block and interacts with a complementarily threaded pawl (17) which can be activated by the user and is positioned at an adapted opening (18) defined on said shell.
 8. Lever according to claim 3, characterized in that said lugs have a cylindrical shape.
 9. Lever according to claim 1, characterized in that said wing (204) has coupling means for a containment element, said means being constituted by a plurality of first holes (220a,220b) formed laterally with respect to a longitudinal through slot (221).
 10. Lever according to claim 9, characterized in that said containment element is constituted by a shell (206) which is formed by a first half-body (222a) and by a second half-body (222b) which can be mutually temporarily coupled; said first half-shell having a plurality of protrusions (223a,223b) which constitute grip means for said first holes and for said second holes (224a,224b) formed on said second half-body.
 11. Lever according to claim 10, characterized in that said first half-body and said second half-body are each provided with an opening (219a,219b) approximately equal in size to said slot (221) which acts as seat for a pawl (217) which is suitable to adjust the mutual position of a pair of coupling elements (212) and of a block of a lever arm which is selectively associable with a rack at one end.

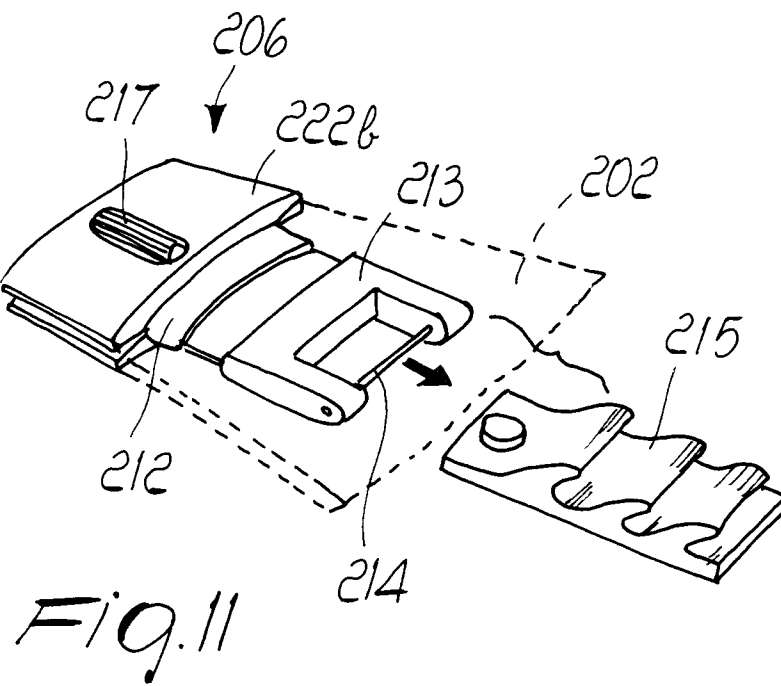
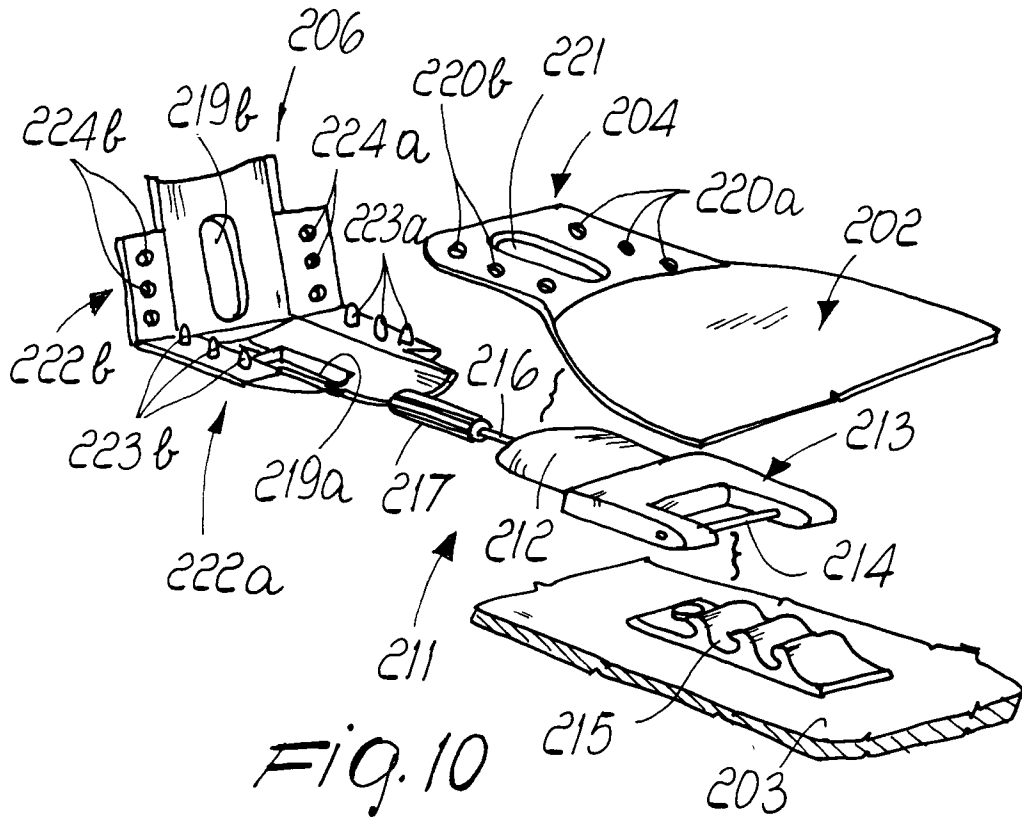














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EUROPEAN SEARCH REPORT

Application Number

EP 93 10 0412

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.5)
X	FR-A-1 426 740 (BRÜCKL) * figures * ---	1, 2	A43C11/14
X A	CH-A-504 850 (RAICHLE SPORTSCHUH A.G.) * the whole document * ---	1 2	
P,D, A	EP-A-0 484 846 (NORDICA S.P.A.) 13 May 1992 * the whole document * ---	1-11	
A	GB-A-1 269 858 (CARR FASTENER COMPANY LIMITED) * figures * ---	2-5, 8	
A	FR-A-2 625 079 (SALOMON S.A.) * figures * ---	2-5	
A	DE-A-2 712 737 (HOHLOCH) * the whole document * ---	1, 7, 11	
D,A	FR-A-2 664 176 (SALOMON S.A.) * figures * ---	1	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
A	EP-A-0 401 202 (KOFACH SPORT GESELLSCHAFT M.B.H & CO K.G.) * figures * -----	1	A43C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 06 MAY 1993	Examiner SCHOLVINCK T.S.
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			