(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 201 855 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
30.06.2010 Bulletin 2010/26

(51) Int Cl.:
A43C 11/14 *(2006.01)*

(21) Application number: **09180469.0**

(22) Date of filing: **22.12.2009**

(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: **23.12.2008 IT TV20080166**

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

(54) Closure device, particularly for sports shoes

(57) A closure device (1), particularly for sports shoes, comprising a lever arm (2), which is coupled to a first flap (7a) of the shoe and articulated to an interconnection element (10) for a means for engagement with a second flap (7b) of the shoe, with which an extension (19) is slidingly associated in contrast with elastically compressible means. The extension (19) interacts selectively, in the fully extracted condition, with a temporary stop means, so as to provide an easy grip for the user.

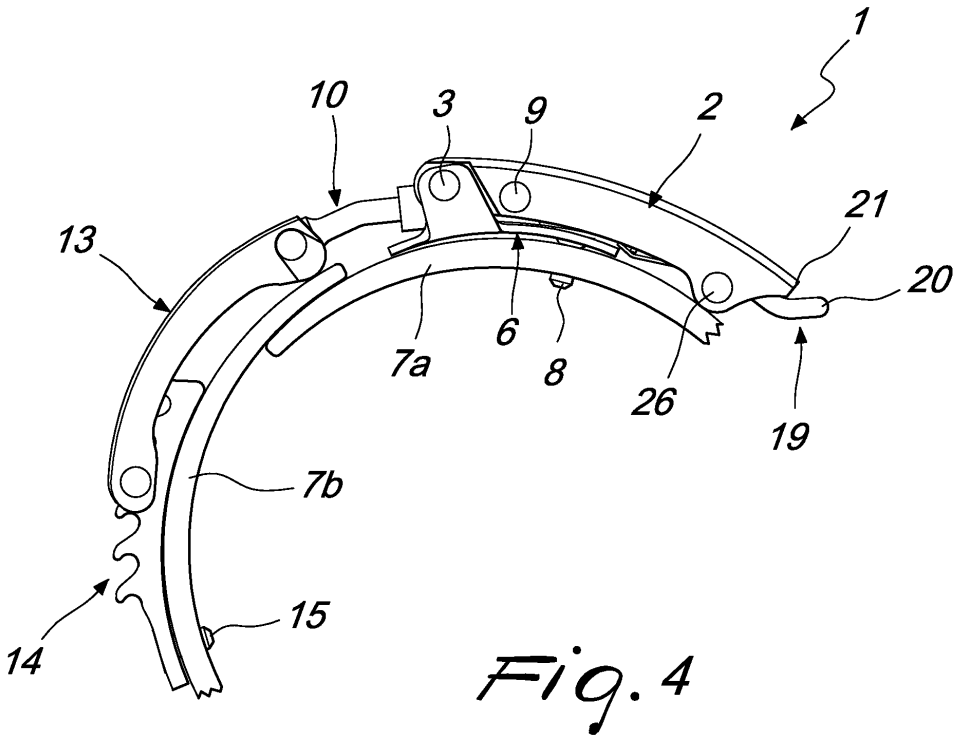

Fig. 4

EP 2 201 855 A1

Description

[0001] The present invention relates to a closure device particularly for sports shoes.

[0002] In the field of sports shoes it is known to use closure devices which comprise levers adapted to allow the fastening of a first flap and a second flap, which constitute the shoe.

[0003] Levers are known which comprise a lever arm, which can be gripped by the user and is associated with a first flap to be joined, which is connected, by means of an interconnection element, to a ring or hook which interacts for example with the teeth of a rack or a strap or band with teeth, which can be associated with the second flap to be joined of the shoe.

[0004] The problem due to difficulty in opening and closing the lever owing to the limited length of the lever arm, to the fact that the user usually wears gloves and to the fact that sports activity occurs in low-temperature atmospheric conditions, which make it more difficult to handle the lever arm, is observed.

[0005] Italian patent No. 0000232825 is known which discloses a buckle for a shoe, particularly for ski boots, which comprises a base designed to be fixed on a boot part, a tensioning lever with two arms, which is articulated on this base by means of the ends of its arms, a first engagement element, which is designed to be fastened to a second engagement element which is fixed to another part of the shoe, and means for joining the first engagement element and the tensioning lever, such buckle being constituted by two telescopic parts.

[0006] In this solution, one of the two telescopic parts has adapted holes which provide two distinct mutual arrangement positions.

[0007] This solution has several drawbacks: extraction of one of the two telescopic parts is not easy, since it has to be performed by gripping it laterally by means of the thumb and index, so as to apply a vise-like pressure; moreover, the protrusion of one part with respect to the other is limited, thus making it awkward for the user to grip so as to open the lever.

[0008] Further, if the user grips the extracted part, trying to impart thereto a rotation in order to open the lever, the applied force tends to reposition the extracted part within the other part, so that the two telescopic parts tend to return to the initial position, thus voiding any practical usefulness.

[0009] This is observed both during opening and during closure of the lever.

[0010] Italian patent No. 1298824 is also known which is constituted by a lever, particularly for sports shoes, which comprises a lever arm which is rotatably associated, at a first end, with a support which is coupled to a flap of the shoe, an auxiliary grip lever for the user being associated or associable with the lever arm and being adapted to increase temporarily the useful length of the lever arm.

[0011] In this solution, the auxiliary lever, if it is not distinct and therefore not associated with the lever arm, must be stored necessarily by the user, for example in a pocket, during sports practice, with the consequent possibility of losing it; in any case, interconnection with the lever arm is not easy, since sports activity usually occurs while wearing gloves and the seat for insertion in the lever arm is usually filled with snow or ice.

[0012] If the auxiliary lever is articulated to one end of the lever arm, a drawback is observed due to the fact that in order to perform closure, the user must lift the auxiliary lever, gripping it in a vise-like manner between the thumb and index finger until he can insert the palm of his hand under the auxiliary lever and then turn it in the closing direction.

[0013] This operation is awkward due to difficulty in gripping and due to the fact that sports activity is usually performed in atmospheric conditions that have very low temperatures, which make it even more difficult for the user to achieve grip.

[0014] Moreover, during use the auxiliary lever, rotated with respect to the lever arm, increases considerably the vertical space occupation during rotation steps.

[0015] Finally, this solution is applied during closure of the lever but not in the opening step as well.

[0016] The aim of the present invention is to solve the above mentioned technical problems, eliminating the drawbacks of the cited background art, by providing a closure device that allows to achieve both opening and closure of a lever rapidly and easily and with an effort containment that can be applied in both cases.

[0017] Within this aim, an object of the invention is to provide a closure device for sports shoes that can be activated easily even in the presence of snow on the lever arm.

[0018] Another object is to obtain a closure device for sports shoes that does not modify the vertical dimensions of the lever arm.

[0019] Another object is to obtain a closure device for sports shoes in which its activation and deactivation are easy for the user even if he is wearing gloves and even in low-temperature conditions.

[0020] Another object is to obtain a device which combines the above cited characteristics with those of being structurally simple and of having low production costs.

[0021] This aim and these objects, as well as others which will become better apparent hereinafter, are achieved by a closure device, particularly for sports shoes, which comprises a lever arm, which is coupled to a first flap of said shoe and articulated to an interconnection element for a means for engagement with a second flap of said shoe, **characterized in that** an extension is slidingly associated with said lever arm, in contrast with elastically compressible means, and interacts selectively, in the fully extracted condition, with a temporary stop means.

[0022] Further characteristics and advantages of the invention will become better apparent from the following detailed description of a particular but not exclusive em-

bodiment thereof, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a view of the mutually assembled components present at the lever arm;
Figure 2 is an exploded view of the components, with reference to Figure 1;
Figure 3 is a top view of the device according to the invention, in which the extension is not extracted;
Figure 4 is a side view of the device according to the invention;
Figure 5 is a sectional view, taken along the line V-V of Figure 3;
Figure 6 is a sectional view, taken along the line VI-VI of Figure 3;
Figure 7 is a sectional view, taken along the line VII-VII of Figure 6;
Figure 8 is a sectional view, taken along the line VIII-VIII of Figure 6;
Figure 9 is a sectional view, taken along the line IX-IX of Figure 6;
Figure 10 is a sectional view, taken along the line X-X of Figure 6;
Figure 11 is a bottom view of the components of the lever arm, in which a base has been omitted;
Figure 12 is a top view of the device according to the invention in which the extension is extracted;
Figure 13 is a sectional view, taken along the line XIII-XIII of Figure 12;
Figure 14 is a sectional view, taken along the line XIV-XIV of Figure 12;
Figure 15 is a sectional view, taken along the line XV-XV of Figure 14;
Figure 16 is a sectional view, taken along the line XVI-XVI of Figure 14;
Figure 17 is a sectional view, taken along the line XVII-XVII of Figure 14;
Figure 18 is a sectional view, taken along the line XVIII-XVIII of Figure 14;
Figures 19 to 22 are schematic views of the steps for opening and closing the lever.

[0023] In the exemplary embodiments that follow, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other exemplary embodiments.

[0024] 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.

[0025] With reference to the figures, the reference numeral 1 designates a closure device, particularly for sports shoes, which comprises a lever arm 2, which is associated rotatably, by means of a pair of first pivots 3 and 4, with a pair of first shoulders 5a, 5b, which protrude from a base 6 which is coupled to a first flap 7a of the shoe by means of a first rivet or screw 8.

[0026] The lever arm 2 is articulated, by means of a second pivot 9, to an end of an interconnection element 10, which at the other end is rotatably associated, for example by means of a pivot 11, with a first end 12 of a hook 13, which interacts selectively with the teeth of a rack 14 which can be associated, by means of a second rivet or screw 15, with a second flap 7b of the shoe.

[0027] The lever arm 2 has, in a lower region, a first central longitudinal seat 16, which is interposed between a pair of second longitudinal seats 17a, 17b, which accordingly are provided at the sides of the lever arm 2.

[0028] The arms 18a, 18b of an extension 19 are associated slidingly within the pair of second longitudinal seats 17a, 17b, and the extension 19 is U-shaped so as to form a first base 20, which is slightly inclined away from the first flap 7a and protrudes beyond the front perimetric edge 21 of the lever arm 2.

[0029] The extension 19 is preferably made of steel wire and interacts with elastically compressible means constituted by a pair of first springs 22a, 22b which are arranged coaxially to the arms 18a, 18b.

[0030] The pair of first springs 22a, 22b abuts at it ends at adapted protrusions 23a, 23b, which protrude proximate to one end of the pair of arms 18a, 18b and a wall 24 of a pair of tabs 25a, 25b which protrude downward along the sides of the lever arm 2 proximate to the front perimetric edge 21.

[0031] The protrusions 23a, 23b are also designed to trap the extension 19 with respect to the lever arm 2 and at the same time leave the extension 19 free to move in the two directions which are longitudinal with respect to the lever arm 2.

[0032] Each one of the pair of tabs 25a, 25b is provided with holes to allow the arrangement of a third pivot 26, which is arranged transversely to the lever arm 2 in a region that lies below the pair of arms 18a, 18b.

[0033] A second substantially V-shaped spring 27 is arranged coaxially to the third pivot 26 and has an end which interacts with the lower surface of the lever arm 2 in the region of the first longitudinal seat 16 and the other end which interacts with a temporary stop means for the extension 19.

[0034] Such means is constituted by a pawl 28, which is U-shaped in plan view so as to form a second base 29, which is flat and tapers slightly at the tip in the direction of the base 6, and from which two wings 30a, 30b protrude which have a tip 31a, 31b shaped like a slider, which is slightly arc-like with the concavity directed toward the base 6.

[0035] Two second shoulders 32a, 32b protrude at right angles laterally and externally to the pair of wings 30a, 30b and are conveniently provided with holes for rotary interconnection with the second pivot 9.

[0036] The slider-shaped tips 31a, 31b lie in a region located above adapted openings 33a, 33b formed on the underlying base 6.

[0037] The operation of the closure device of the invention therefore entails that the user extracts the exten-

sion 19 by simply placing a finger at the first base 20, which is slightly inclined away from the first flap 7a; once the extension 19 has been extracted, even if it is drawn back continuously by the compression of the pair of first springs 22a, 22b, it remains firmly extended, since its retraction is contrasted by the pawl 28, the second base 29 of which is drawn counterclockwise by the second spring 27 toward the inside of the lever arm 2, arranging itself against the end of the arms 18a, 18b.

[0038] The extension 19 can be retracted manually by compressing the tips 31a, 31b of the pawl 28 on the opposite side with respect to the base 6.

[0039] The extension 19 is retracted automatically whenever the lever is closed, in view of the interaction of the tips 31a, 31b with the base 6.

[0040] In the step shown in Figure 19, existing friction, due to the force imparted by the user, keeps the extension extracted, overcoming the force of the first springs 22a, 22b up to the arrangement shown in Figure 21, in which locking with the pawl 28 occurs again.

[0041] It has thus been found that the invention has achieved the intended aim and objects, a device having been devised which allows to obtain both the opening and the closure of a lever rapidly and easily and with a containment of the effort that can be applied in both cases, the device being activatable even in the presence of snow on the lever arm.

[0042] The lever arm can thus be extended functionally by extraction of the extension at will on the part of the user both during closure and during the opening of the lever, reducing the effort both during opening and during closure.

[0043] Once the extension has been extracted, it is retained firmly externally with respect to the lever arm by the pawl, which hinders its retraction, while once it is extracted the extension requires no further maneuvers and is therefore immediately ready to be gripped with the palm of the hand in order to facilitate closure of the lever or to be gripped with the index finger in order to facilitate the opening of the lever.

[0044] The overall thickness of the lever is low, because the extension is arranged in a central space of the lever arm that is normally unused.

[0045] Since the extension can be made for example of steel wire, it is possible to achieve a scarcely visible aesthetic impact.

[0046] The materials and the dimensions that constitute the individual components of the invention may of course be more pertinent according to specific requirements.

[0047] The various means for performing certain different functions need not certainly coexist only in the illustrated embodiment but can be present per se in many embodiments, including ones that are not illustrated.

[0048] The characteristics indicated as advantageous, convenient or the like may also be omitted or be replaced with equivalents.

[0049] The disclosures in Italian Patent Application No. TV2008A000166 from which this application claims priority are incorporated herein by reference.

[0050] 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 closure device (1), particularly for sports shoes, comprising a lever arm (2), which is coupled to a first flap (7a) of said shoe and articulated to an interconnection element (10) for a means for engagement with a second flap (7b) of said shoe, **characterized in that** an extension (19) is slidingly associated with said lever arm (2), in contrast with elastically compressible means, and interacts selectively, in the fully extracted condition, with a temporary stop means.

2. The device according to claim 1, **characterized in that** said lever arm (2) is provided, in a lower region, with a first central longitudinal seat (16), which is interposed between a pair of second longitudinal seats (17a, 17b), arms (18a, 18b) of the extension (19) being associated slidingly within said pair of second longitudinal seats (17a, 17b), said extension (19) being U-shaped so as to form a first base (20), which is slightly inclined away from the first flap (7a) and protrudes beyond the front perimetric edge (21) of said lever arm (2), said extension (19) being preferably made of steel wire.

3. The device according to claims 1 and 2, **characterized in that** said extension (19) interacts with elastically compressible means, which are constituted by a pair of first springs (22a, 22b), which are arranged coaxially to the arms (18a, 18b), said pair of first springs (22a, 22b) abutting at its ends at adapted protrusions (23a, 23b), which protrude proximate to one end of said pair of arms (18a, 18b) and at a wall (24) of a pair of tabs (25a, 25b), which protrude downward along the sides of said lever arm (2) proximate to the front perimetric edge (21), said protrusions (23a, 23b) trapping said extension (19) with respect to said lever arm (2) and at the same time leaving said extension (19) free to move in both longitudinal directions with respect to said lever arm (2).

4. The device according to claims 1 and 3, **characterized in that** each one of said pair of tabs (25a, 25b) is provided with holes so as to allow the arrangement of a third pivot (26), which is arranged transversely to said lever arm (2) in a region that lies below said pair of arms (18a, 18b), a second substantially V-

shaped spring (27) being arranged coaxially to said third pivot (26) and having an end which interacts with the lower surface of said lever arm (2) in the region of said first longitudinal seat (16) and another end which interacts with a means for temporarily stopping said extension (19).

5. The device according to claims 1 and 4, **characterized in that** said temporary stop means for said extension (19) is constituted by a pawl (28), which is U-shaped in plan view so as to form a second base (29), which is flat and tapers slightly at the tip in the direction of the base (6) and from which two wings (30a, 30b) protrude which have a slider-shaped tip (31a, 31b), and is slightly arc-like, with the concavity directed toward the base (6).

6. The device according to claims 1 and 5, **characterized in that** two second shoulders (32a, 32b) protrude at right angles laterally and externally to said pair of wings (30a, 30b) and are conveniently provided with holes for rotary interconnection to the second pivot (9), said slider-shaped tips (31a, 31b) being arranged in a region that lies above adapted openings (33a, 33b) provided in said underlying base (6).

7. The device according to one or more of the preceding claims, **characterized in that** once said extension (19) has been extracted from said lever arm (2), it is drawn back continuously by the compression of said pair of first springs (22a, 22b) but remains extended because its retraction is contrasted by said pawl (28), whose second base (29) is drawn back so as to rotate counterclockwise by said second spring (27) toward the inside of said lever arm (2), arranging itself against the end of said arms (18a, 18b).

8. The device according to claims 1 and 7, **characterized in that** said extension (19) can be retracted manually by compressing said tips (31a, 31b) of said pawl (28) on the opposite side with respect to said base (6).

9. The device according to claims 1 and 8, **characterized in that** said extension (19) is retracted automatically whenever said tips (31a, 31b) interact with said base (6).

10. The device according to one or more of the preceding claims, **characterized in that** during the step for opening said lever arm the friction that exists, due to the force imparted by the user, between said extension (19) and said second longitudinal seats (17a, 17b) keeps said extension extracted, overcoming the force of said first pair of springs (22a, 22b).

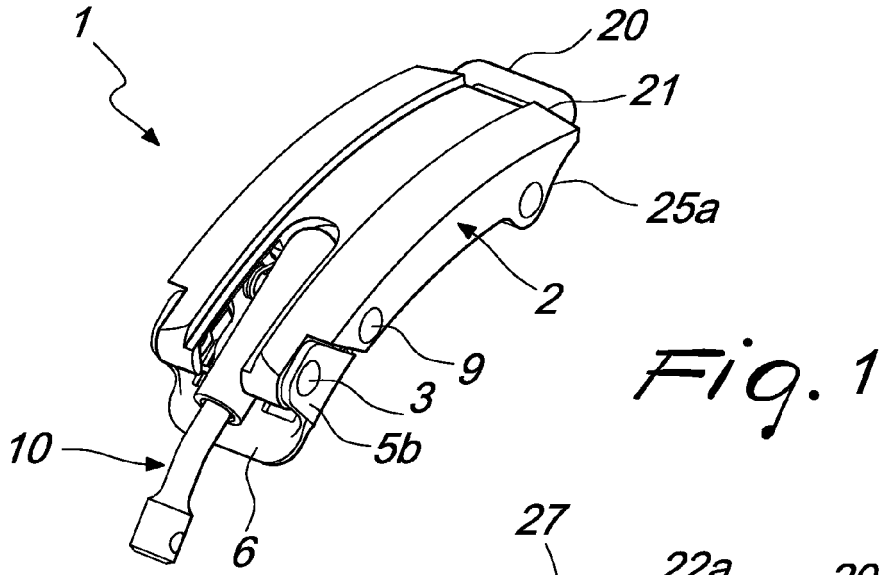
1
20
21
25a
2
9
3
5b
10
6

Fig. 1

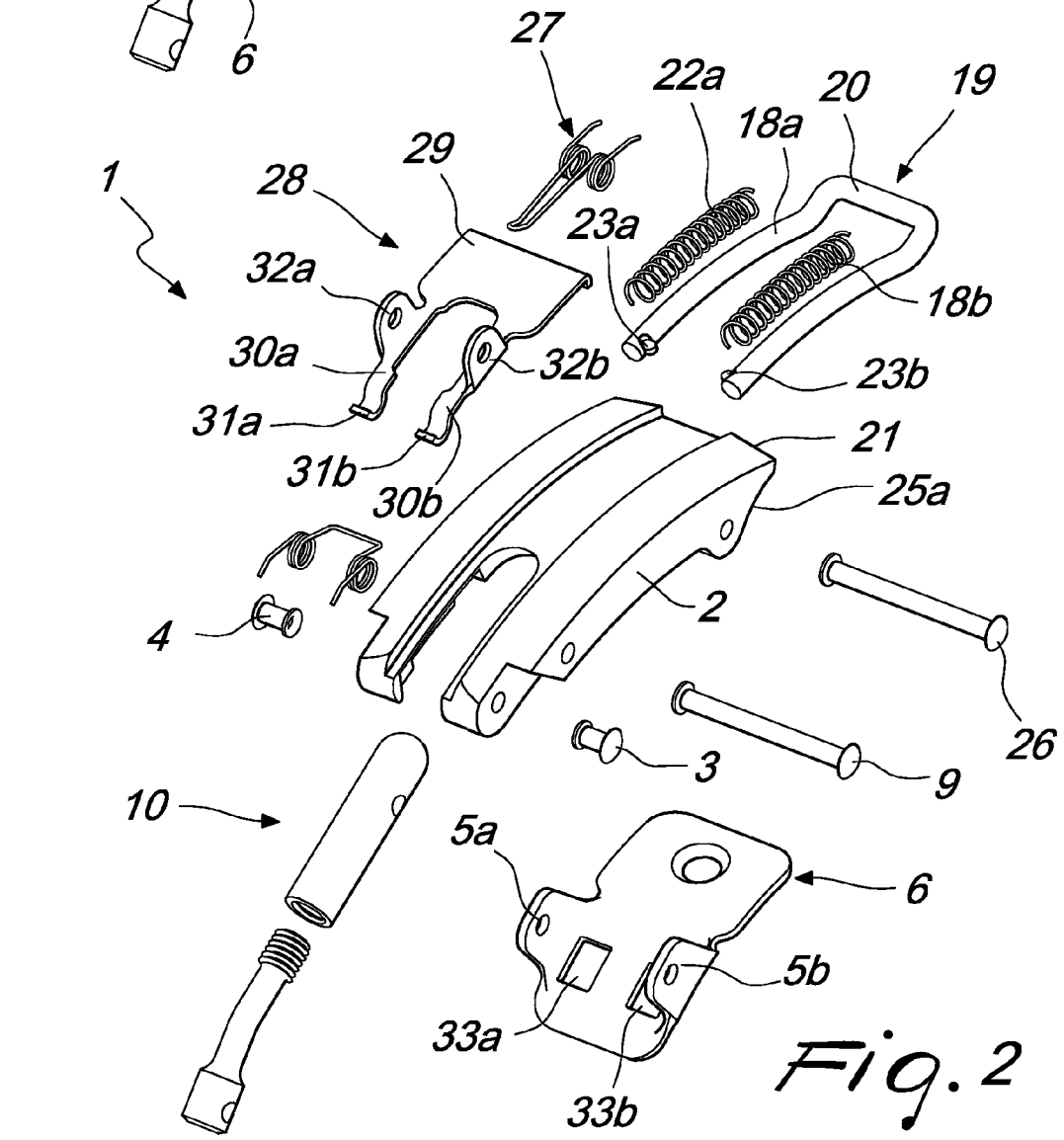
27
22a
20
19
18a
29
28
1
23a
32a
18b
30a
32b
23b
31a
21
31b
30b
25a
4
2
26
3
9
10
5a
6
5b
33a
33b

Fig. 2

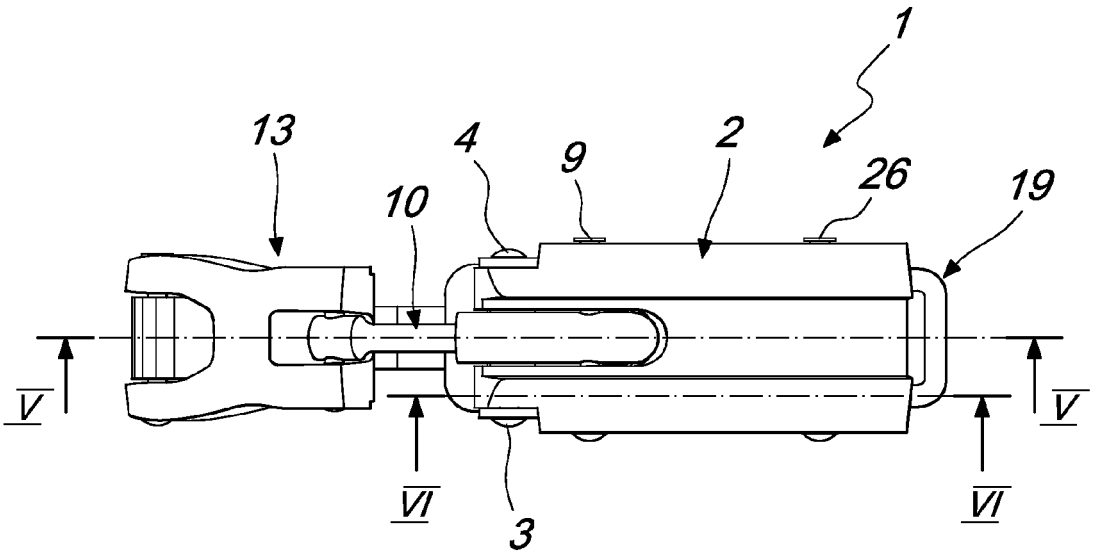

Fig. 3

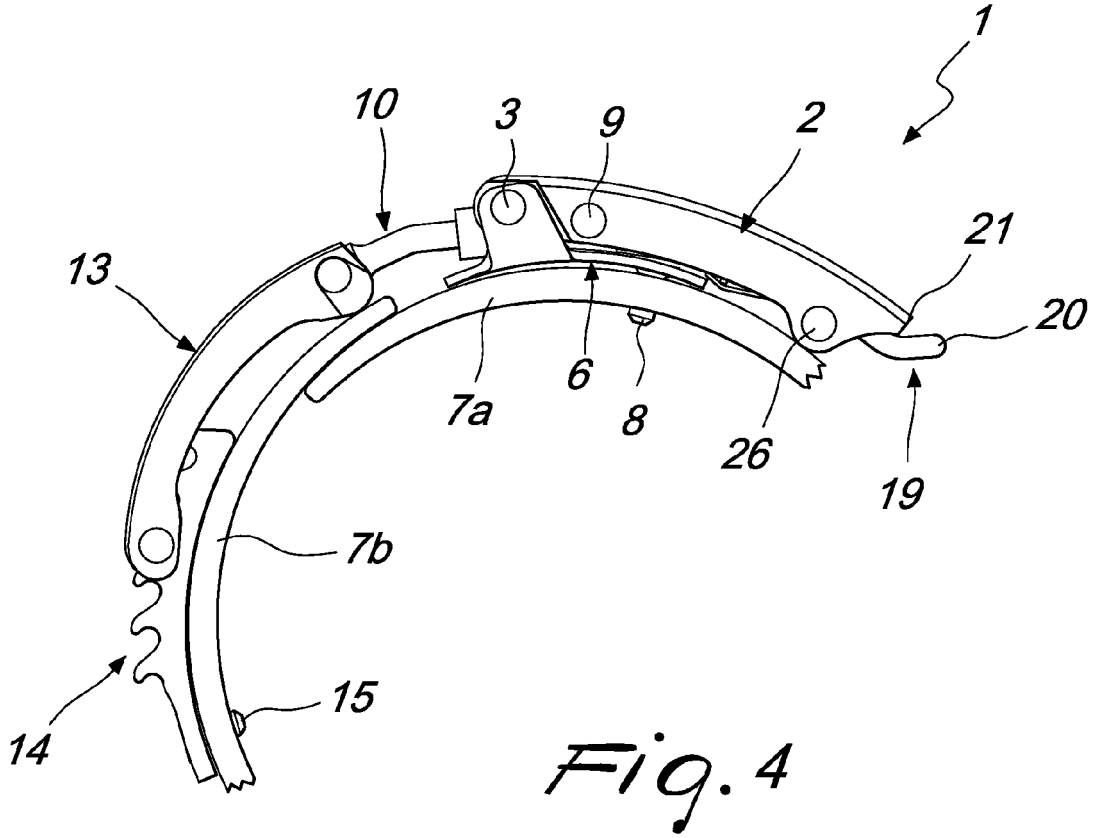

Fig. 4

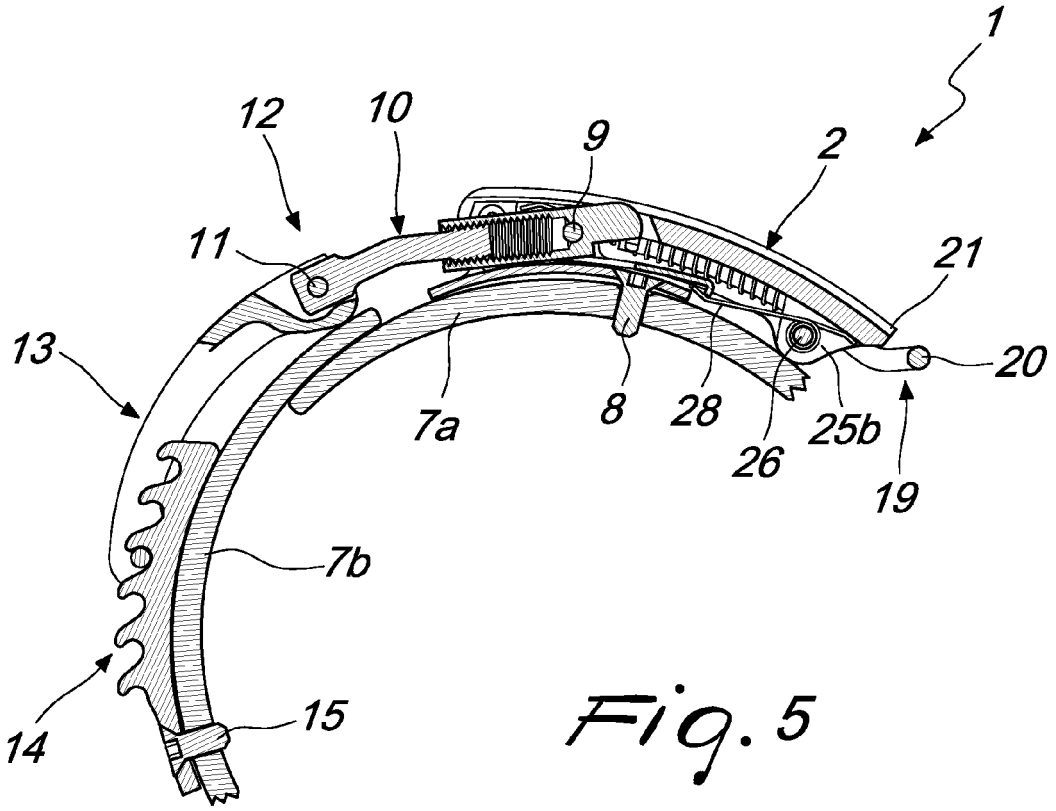
1
12
10
9
2
11
21
13
20
7a
8
28
25b
26
19
7b
14
15

Fig. 5

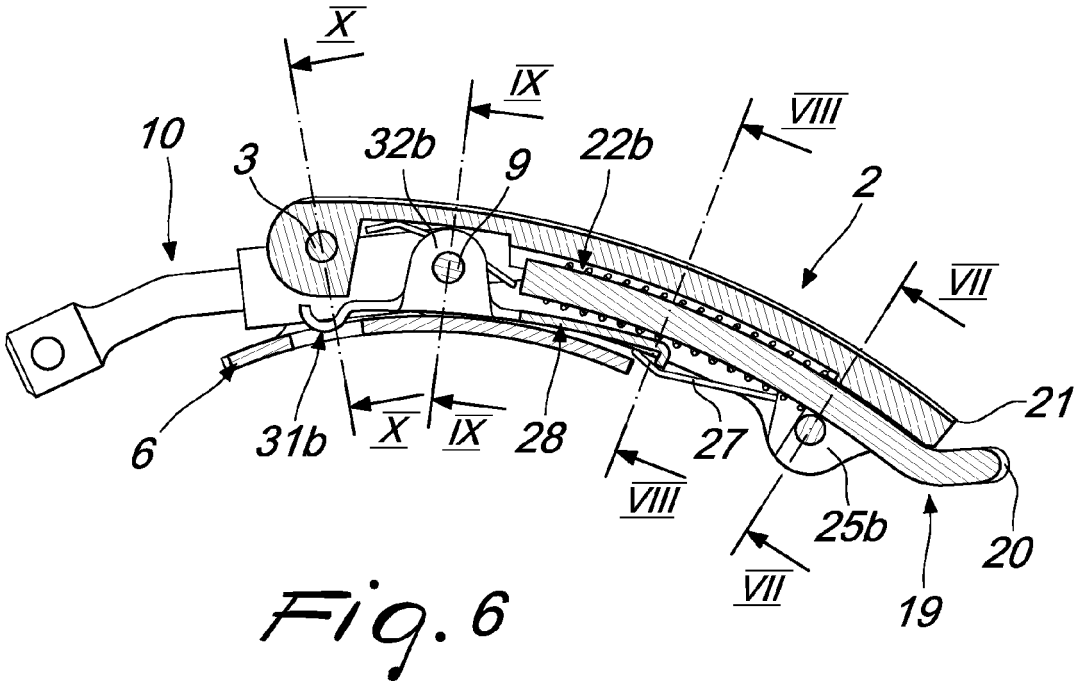
X
IX
VIII
10
3
32b
9
22b
2
VII
21
6
31b
X
IX
28
27
VIII
25b
20
VII
19

Fig. 6

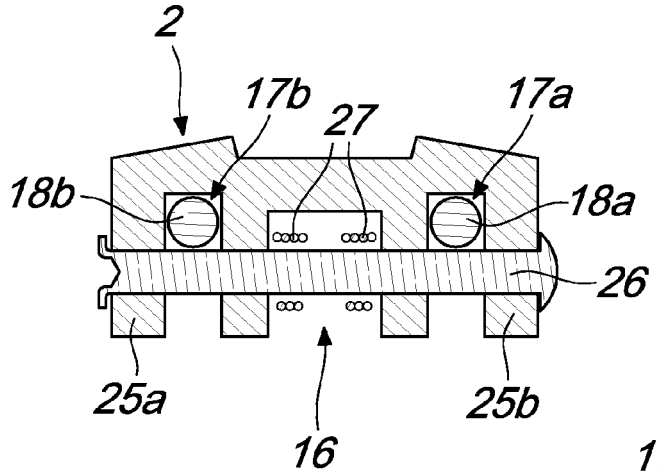

Fig. 7

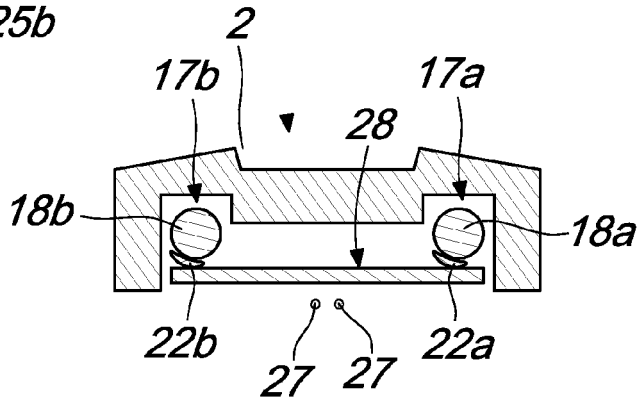

Fig. 8

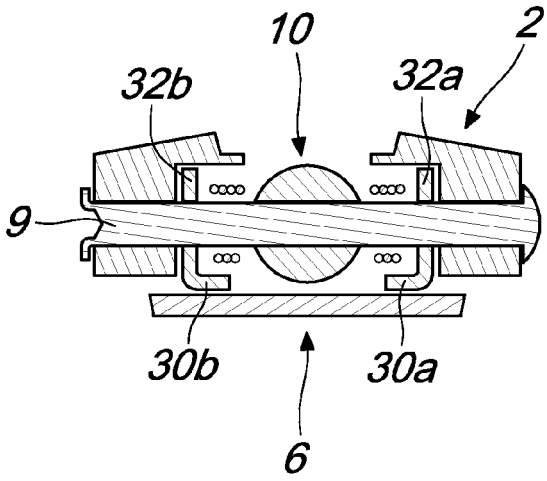

Fig. 9

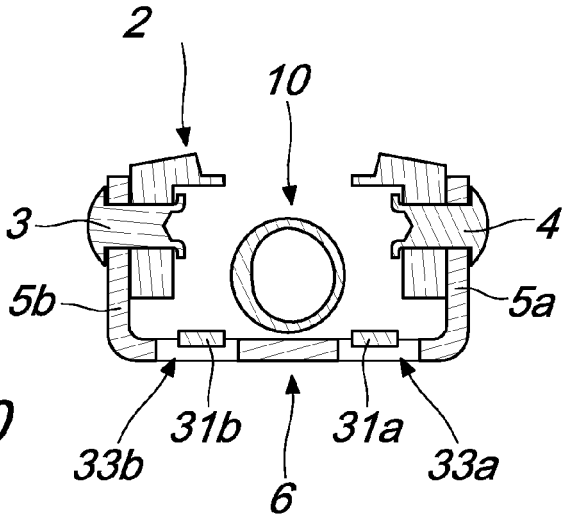

Fig. 10

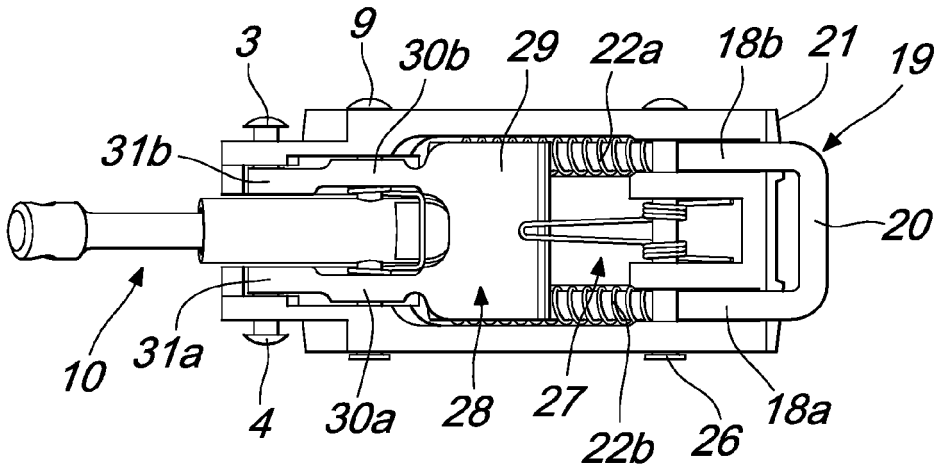
3
9
30b
29
22a
18b
21
19
31b
20
10
31a
4
30a
28
27
22b
26
18a

Fig. 11

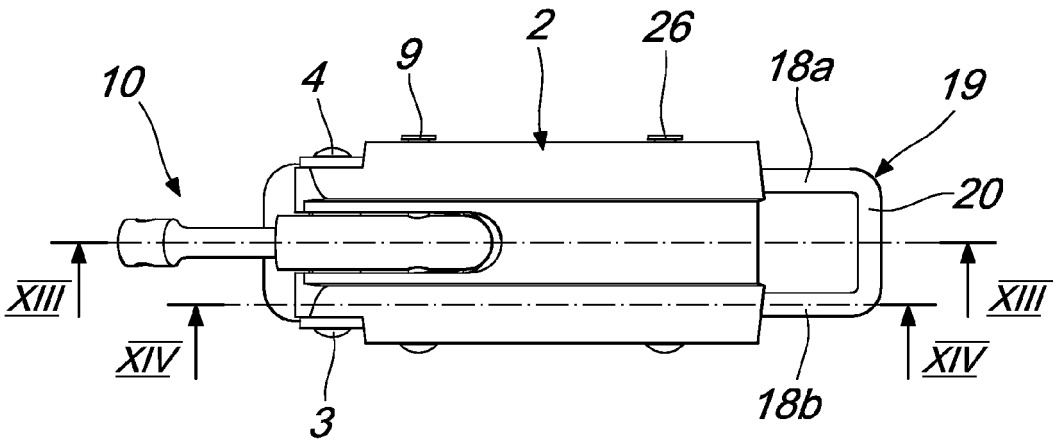
10
4
9
2
26
18a
19
20
XIII
XIV
XIII
XIV
3
18b

Fig. 12

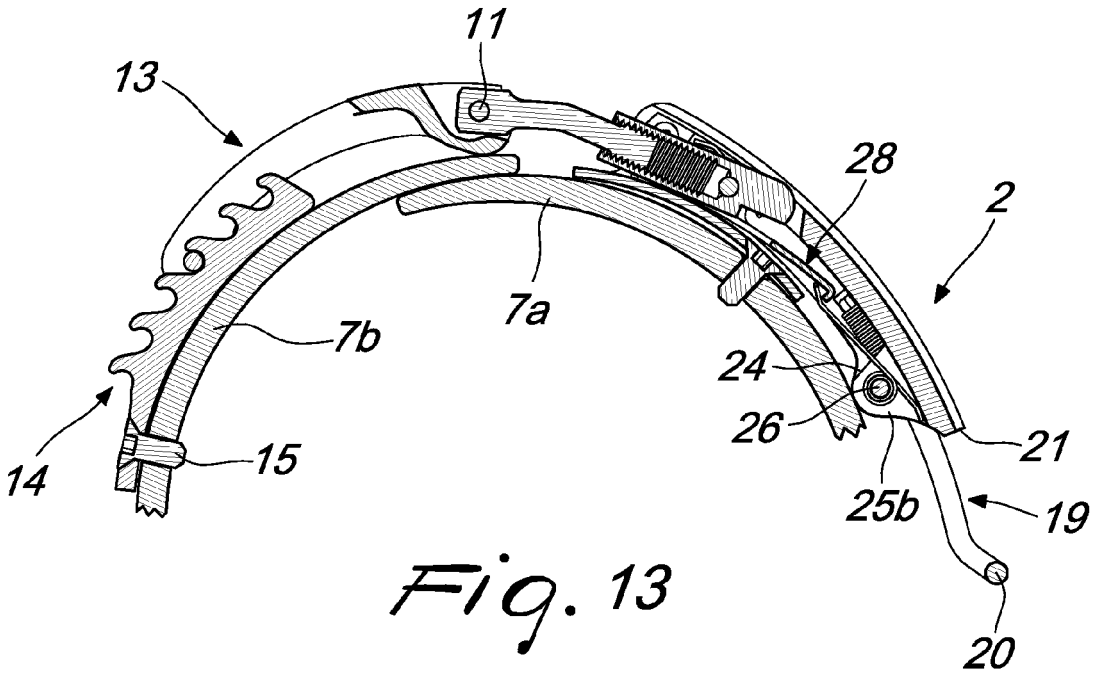
11
13
28
2
7a
7b
24
26
21
14
15
25b
19
20

Fig. 13

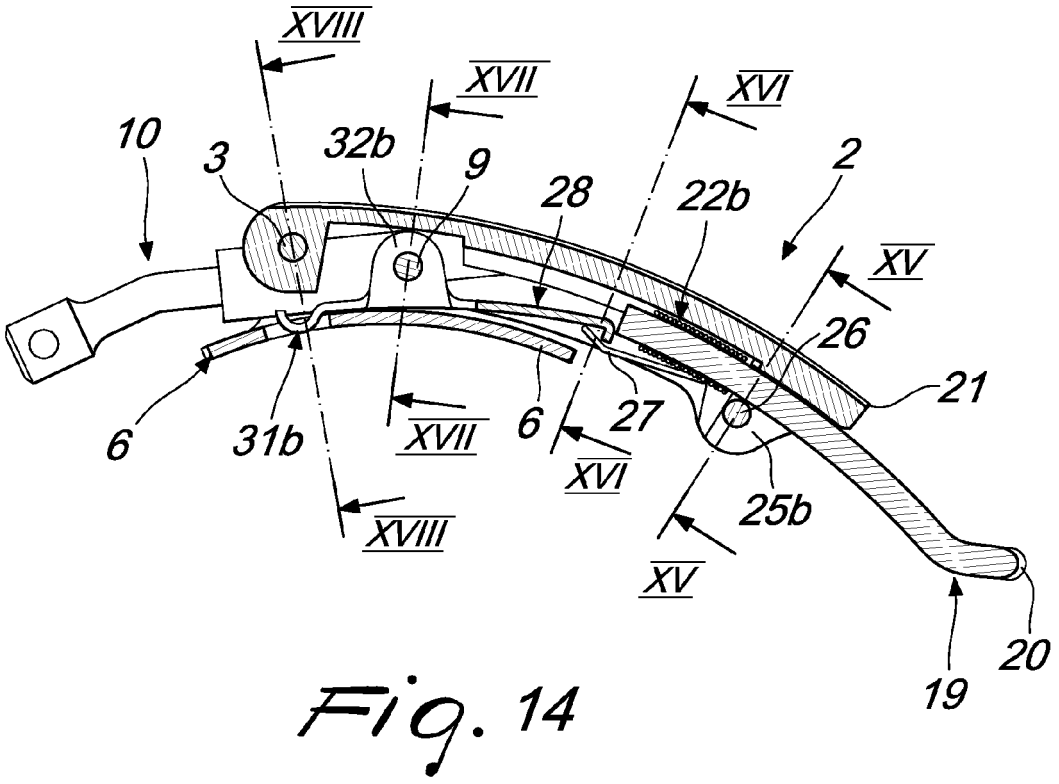
XVIII
XVII
XVI
10
3
32b
9
28
22b
2
XV
26
21
6
31b
XVII
6
27
XVI
25b
XVIII
XV
19
20

Fig. 14

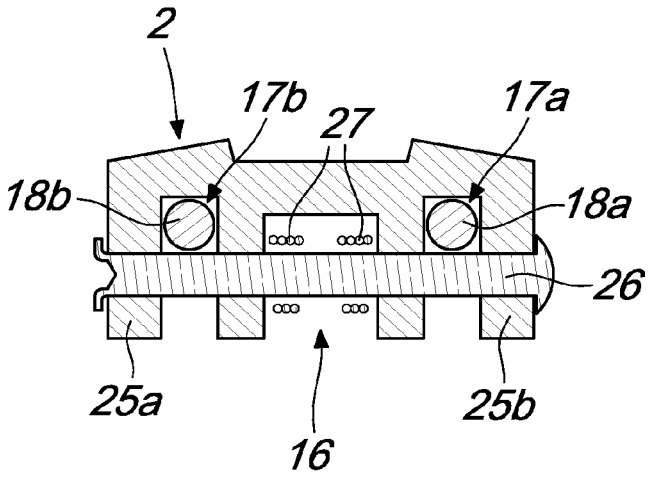

Fig. 15

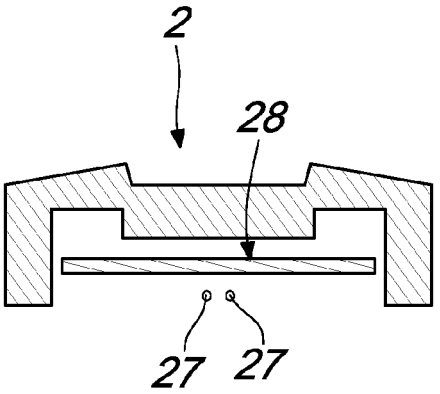

Fig. 16

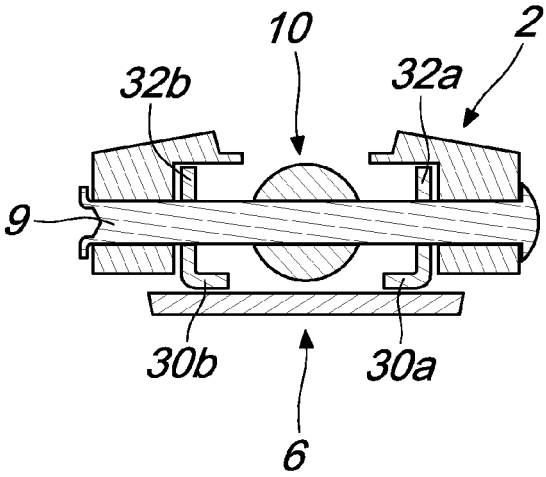

Fig. 17

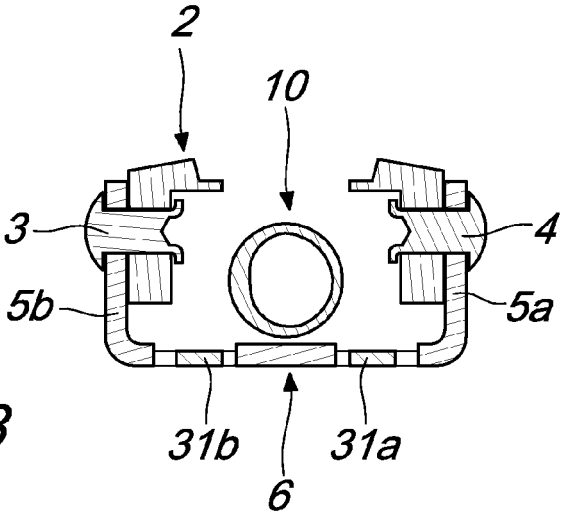

Fig. 18

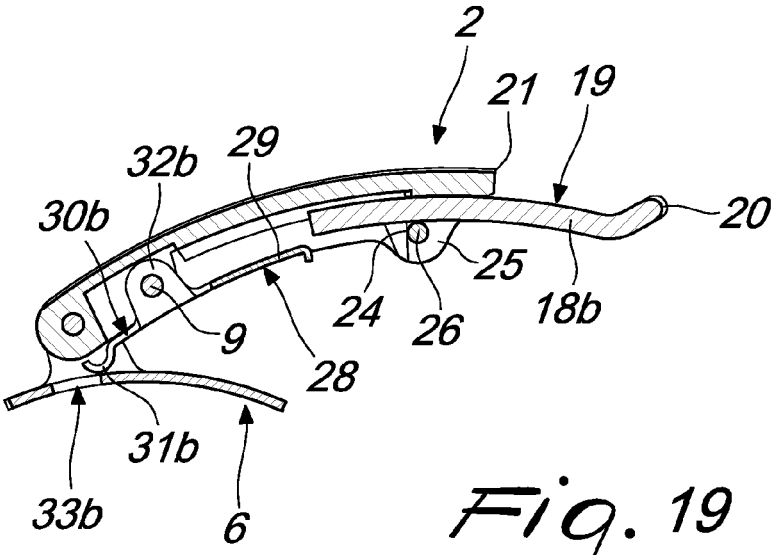
2
21
19
32b
29
30b
20
25
24
26
18b
9
28
31b
33b
6

Fig. 19

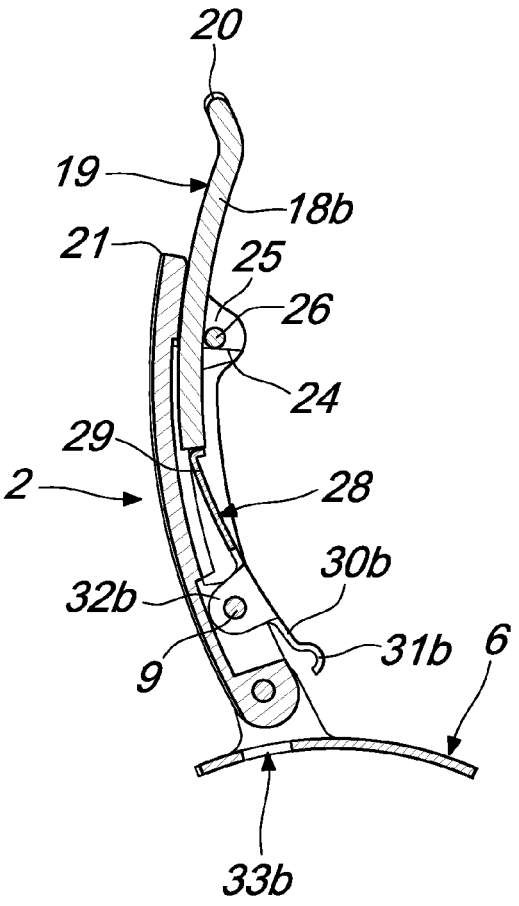
20
19
18b
21
25
26
24
29
2
28
30b
32b
31b
6
9
33b

Fig. 20

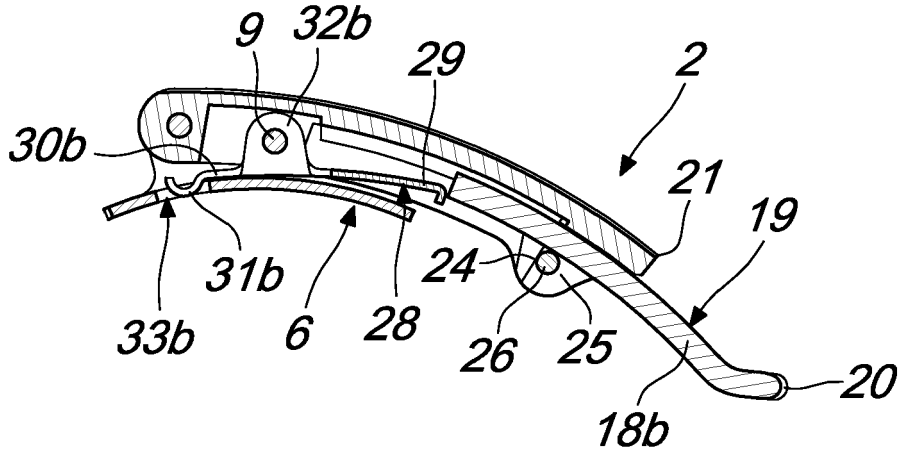
9
32b
29
2
30b
21
19
31b
24
33b
6
28
26
25
20
18b

Fig. 21

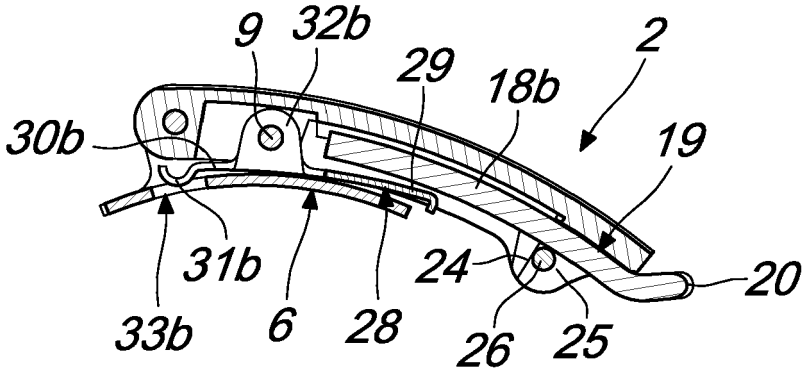
9
32b
29
18b
2
30b
19
31b
24
20
33b
6
28
26
25

Fig. 22

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 09 18 0469

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,D	EP 0 945 080 A1 (HTM SPORT SPA [IT]) 29 September 1999 (1999-09-29) * figures *	1-10	INV. A43C11/14
A	US 4 587 870 A (COLBURN KENNETH [US]) 13 May 1986 (1986-05-13) * figure 4 *	1-10	
A	EP 1 205 122 A2 (HTM SPORT SPA [IT]) 15 May 2002 (2002-05-15) * paragraphs [0043] - [0046]; figures 1-8 *	1-10	
A	EP 1 470 762 A1 (LUIGI S A [LU]) 27 October 2004 (2004-10-27) * paragraph [0015]; figure 2 *	1-10	

TECHNICAL FIELDS SEARCHED (IPC)

A43C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	26 April 2010	Vesin, Stéphane

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

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 09 18 0469

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.

26-04-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0945080 A1	29-09-1999	AT 254411 T	15-12-2003
		DE 69912872 D1	24-12-2003
		DE 69912872 T2	11-11-2004
		IT MI980646 A1	27-09-1999
		US 6145168 A	14-11-2000
US 4587870 A	13-05-1986	NONE	
EP 1205122 A2	15-05-2002	NONE	
EP 1470762 A1	27-10-2004	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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 0000232825 **[0005]**
- IT 1298824 **[0010]**
- IT TV20080166 A **[0049]**