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INVENTION S.r.l.

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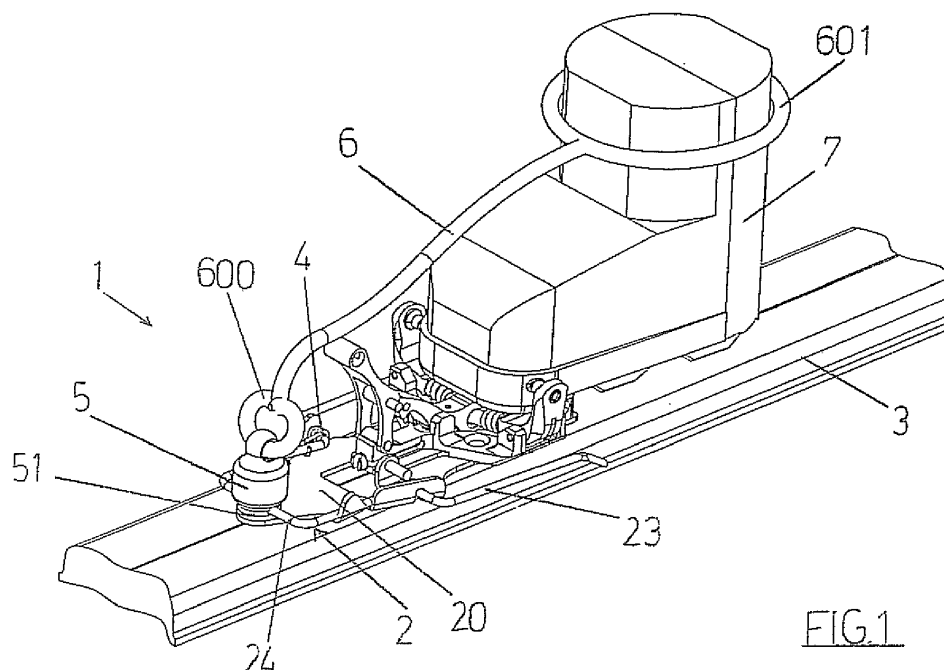
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(54) **Braking system fort a ski**

(57) A braking system (1) for a ski, comprising: a friction element (2) couplable to a ski (3) and mobile between two positions, a first non-operative position and a second braking position in which second braking position the friction element (2) interferes with a ground surface, causing braking of the ski (3); elastic means (4) for moving the friction element (2) into the braking position; a blocking element (5) which is removable and fixable to the ski (3) such as to block the friction element (2) in the non-oper-

ative position; connecting means (6) for connecting the blocking element (5) to a ski boot (7) when the ski boot (7) is engaged to or is in proximity of the ski (3) or for connecting the blocking element (5) to a skier using the ski (3); the connecting means (6) being conformed such that when the ski boot (7) or the skier using the ski (3) distances from the ski (3) the blocking element (5) is removed from the ski (3) and the friction element (2) moves into the braking position.



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Description

[0001] The present invention relates to the technical sector of skis. In particular, the present invention relates to a braking system of a ski.

[0002] Modern skis, as is known, exhibit safety attachments, i.e. attachments which enable engaging the ski boot to the skis and also the relative disengagement when, in use, the attachment is subject to anomalous stresses, for example following a fall by the skier.

[0003] In these cases it can occur that the ski, disengaged from the boot, slides down the slope the skier was using, with the risk of being dangerous for the safety of the other skiers transiting along the slope.

[0004] To obviate this problem, known ski braking systems are known, which comprise a leather or fabric strap of which a first end is fixed to an attachment element of the ski and a second end is fixable to the ski boot.

[0005] In this way, once the second end of the strap is fixed to the ski boot, if the ski boot disengages from the ski (for example due to the fall of the skier), the ski does not slide along the slope, but remains connected to the boot.

[0006] However this known-type system exhibits a drawback: in fact there is the risk that once the boot disengages from the ski, the ski might interfere with the skier's body, causing even serious contusions and/or injury.

[0007] To obviate the above drawback, devices known as ski-stoppers are widely known, constituted by a sort of fork comprising two tines, subject to the action of springs and mobile between a non-operative position and an operating position of braking. In the non-operative position, following the engagement of the ski boot to the ski attachment, the fork is arranged in a substantially parallel position to the ski, in contact with the sole of the boot, by which it is maintained pressed.

[0008] If for some reason the sole of the boot raises from the ski, the fork is brought into the corresponding braking position, pushed by the springs; in this position it penetrates with the relative tines into the snowy surface, thus preventing the sliding of the ski downhill.

[0009] This known-type system, however, also exhibits some drawbacks.

[0010] In fact this system is not applicable to all types of ski, such as for example those used in Alpine skiing.

[0011] As is known, in the discipline of Alpine skiing, the skier, after having descended along a slope using conventional methods, returns, with the skis fitted to his or her boots, from downhill up to the required height.

[0012] To enable this technique, ski attachments for Alpine skiing enable the skier to free his or her boot heel from the ski during the return uphill, in order to enable the skier to move freely. During the descent, however, the boot is completely fixed to the heel part of the ski attachment.

[0013] Thus, during ascent the ski-stopper has to be blocked in the relative non-operative position, as otherwise the detachment of the heel from the ski boot from

the ski during ascent would lead to the activation of the ski stopper.

[0014] Blocking the ski stopper in the relative non-operative position, however, is entirely ineffective if during the ascent the boot detaches from the ski.

[0015] Further braking systems are known.

[0016] DE 2 504 922 discloses a ski braking system, comprising a component, blocked to the ski, which supports a shaft at ends of which two friction elements are blocked, arranged bilaterally of the ski plane; a spring, enveloping the shaft, acts on the two friction elements such as to bring them into the braking position.

[0017] In the non-operative position, these elements are situated above the ski; this position is imposed by a plug, inserted in a seating realised in the component, which intercepts a wing to which the two friction elements are solidly constrained.

[0018] A cord, connected on a side thereof to the plug, and on the other to the leg or the boot of the skier, causes, when the skier becomes distanced from the ski, a disengagement of the pin from the seating thereof, which leads to the engagement of the braking position.

[0019] This braking system is not functional, as in order to achieve the disengagement of the plug from the relative seating a stress has to be exerted acting along the axis of the plug, or in any case with an axial component such as to enable disengagement thereof; these stresses are angularly orientated with respect to the axis of the pin and can thus jam the plug in the seating thereof.

[0020] A further drawback of the above system is the complexity of the activation thereof; in fact, with one hand the spring is loaded, i.e. the friction elements are brought into the operative position, and with the other hand, following the achieving of the position, the pin is inserted into the seating thereof.

[0021] FR 2 660 568 discloses a ski braking device, associated to the downstream end of the ski plane.

[0022] This device comprises a support, fixed to the ski plane, which bears a shaft to which a braking element is constrained; a spring acts on the element in such a ways as to force it into the braking position.

[0023] The support bears a vertical pin which inserted in a hole made in the braking element when the element is in the non-operative position; an elastically-deformable cap (in the radial direction) couples with the pin and stabilises the non-operative position of the braking element.

[0024] The cap is connected by a cord to the leg or boot of the skier.

[0025] The device of the above French document exhibits the same drawbacks as the preceding document of the prior art considered above.

[0026] The aim of the present invention is to obviate the above drawbacks.

[0027] This aim is obviated by providing a braking system for a ski in accordance with claim 1.

[0028] In accordance with claim 1, the disclosed system comprises:

a friction element hinged to a support element couplable to a ski and mobile between two positions, a first non-operative position and a second braking position in which second braking position the friction element interferes with a ground surface, causing braking of the ski;

elastic means for moving the friction element into the braking position;

a blocking element which is removable and fixable to the ski such as to block the friction element in the non-operative position;

connecting means for connecting the blocking element to a ski boot or to a skier when using the ski; the blocking means being conformed such that when the boot or the skier using the ski distances from the ski the blocking element is removed from the ski and the friction element is consequently moved into the braking position thereof; **characterised in that** it comprises a base, solidly constrained to the support element from which at least two coupling elements originate, of which at least one is elastically deformable, which two elements face upwards and define there-between a housing conformed such as to receive a portion of the friction element when the friction element is in the relative non-operative position, the coupling elements removably coupling with the blocking element such as to removably block the friction element in the non-operative position.

[0029] For reasons of clarity, by the term "ground" is meant any treadable surface; for example, considering a ski piste, the ground is constituted by the snowy surface.

[0030] In the system of the invention, the friction element moves into the braking position thereof when the boot is distanced from the ski (for example following the skier's fall).

[0031] This advantageously enables the system of the invention to be associated to any type of ski, for example those used in Alpine skiing. In this way an Alpine skier can advance uphill by raising the boot from the ski, without the friction element being moved into the relative braking position, unless the boot is distanced from the ski (or the skier using the ski in the case that the connecting means are connected thereto) during the ascent (for example due to anomalous stresses).

[0032] Further, the system is such that when the ski boot (or the skier using the ski) distances from the ski, for example following the fall of the skier, the ski does not remain connected to the boot (or the skier).

[0033] In fact, when the boot (or the skier using the ski) distances from the ski, the blocking element is removed from the ski; this detail advantageously prevents, once the boot (or the skier using the ski) distances from the ski, the ski from interfering with the body of the skier,

causing even serious contusions and/or injuries.

[0034] Specific embodiments of the invention, and advantageous technical-functional characteristics correlated to two embodiments only in part derivable from the above description, will be described in the following part of the description, according to what is reported in the claims and with the aid of the figures of the drawings, in which:

figure 1 is a perspective view of a braking system of a ski associated to a ski (partly illustrated) and connected to a ski boot, according to a first embodiment of the invention;

figure 2 is a plan view of the system of figure 1, in which some parts have been removed better to evidence others;

figure 3 is a lateral view of figure 1, in a different operative situation;

figure 4 is a perspective view of the system of figure 3, in which some parts have been removed better to evidence others;

figure 5 is a plan view illustration of a second embodiment of the disclosed system;

figure 6 is a section view along line VI-VI of figure 5;

figure 7 illustrates, in plan view, the illustration of figure 5 in a different operative configuration;

figure 8 illustrates the section view along line VIII-VIII of figure 7;

figures 9A, 9B illustrate a component of the disclosed system of the second embodiment in two perspective views.

[0035] With reference to the figures, 1 denotes a braking system of a ski according to the present invention.

[0036] The system 1 comprises a friction element 2 couplable to a ski 3 (partly illustrated) and mobile between two positions, a first non-operative position (see figures 1 and 2) and a second braking position (see figures 3 and 4) in which the friction element 2 interferes with the ground, causing the ski 3 to brake.

[0037] In the first embodiment (figures 1 to 4) the system 1 further comprises elastic means 4 for moving the friction element 2 into the braking position and a blocking element 5 that is removable and fixable to the ski 3 such as to block the friction element 2 in the non-operative position; and connecting means 6 for connecting the blocking element 5 to a ski boot 7 when the ski boot 7 is engaged to or in proximity of the ski 3 or in order to connect the blocking element 5 to a skier who is using the ski 3. In particular, the connecting means 6 are con-

formed such that when the ski boot 7 or the skier using the ski 3 distances from the ski 3 the blocking element 5 is removed from the ski 3 and the friction element 2 is consequently moved into the braking position.

[0038] For example, the connecting means 6 can be connected to the blocking element 5 and a leg of a skier using the ski 3 (not illustrated).

[0039] By way of example, in figures 1 to 3 the system 1 of the invention has been represented coupled to a ski suitable for using in Alpine skiing, but can also be coupled to any type of ski.

[0040] The distancing of the ski boot 7 from the ski 3 (i.e. the skier using the ski 3) can occur in a case of anomalous stresses, accidental (for example when the skier falls over) or voluntary.

[0041] In the embodiment of figures 1 to 4, the system 1 comprises a support element 20 (for example a plate) coupled to the ski 3 at least at a relative surface; the friction element 2 is hinged to the support element 20 in such a way as to be rotatably mobile with respect to a transversal axis of the support element 20 between the non-operative position and the braking position.

[0042] Further, and still with reference to figures 1-4, the friction element 2 comprises a fork 21, i.e. it comprises a first and a second side 23, 23 opposite one another and a third side 24 which conjoins the first and second side 22, 23, determining a substantially U-shaped form (see figures 2, 4).

[0043] The fork 21 advantageously acts at the opposite sides of the ski 3, such that both the first and the second side 22, 23 interfere at the same time with the ground when moved into the relative position of braking, for example penetrating into the snowy surface, guaranteeing the braking of the ski 3 rapidly.

[0044] The elastic means 4 comprise for example springs (see figures 1, 2, 4) interposed between the support element 20 and the friction element 2, such as to push the friction element into the relative braking position. In the case represented two springs 4 are present, respectively at the first side 22 and the second side 23 of the fork 21.

[0045] The connecting means 6 can comprise at least a belt or cord (see figures 1, 3) fixable to the ski boot 7 or the skier who is using the ski 3 (for example to a leg of the skier) and at the same time to the blocking element 5, for example by means of two relative looped portions 600, 601 (visible in figure 3).

[0046] In particular, the tape of the connecting means 6 can be constituted by elastic or non-elastic means and exhibits a length such as not to interfere with the ground when it is fixed to the boot 7 or to the skier using the ski 3 and to the blocking element 5. In this way, the belt 6 does not constitute an obstacle or a risk of danger for the skier while it transits along a slope.

[0047] In the embodiment of figures 1-4, the system 1 further comprises a base 51 solidly constrained to the plate 20, from which two coupling elements 40, 41 originate, of which at least one is elastically deformable, fac-

ing upwards and defining there-between a housing 50 conformed such as to receive a portion of the friction element 2 when the element is in the non-operative position thereof. In detail, in the illustrated embodiment the housing 50 is conformed such as to receive the third side 25 of the fork 21.

[0048] The elements 40, 41 have a semicircular transversal profile and are externally interested by relative semicircular gullies 40A, 41A destined to receive, in a snap connection, the lower edge 5A of the blocking element 5, the element 5 being conformed as an upturned beaker.

[0049] The operator grips the element 5 and with the edge 5A thereof intercepts the third side 24 of the friction element 2 (figure 4); this causes the passage of the friction element 2 from the braking position (figure 4) to the non-operative position and at the same time nears, by elastic deformation, the two coupling elements 40, 41 which insert internally of the blocking element 5 up to snap-inserting the edge thereof in the gullies 40A, 41 A (figure 3).

[0050] The coupling of the edge 5A with the gullies 40A, 41A is such as to oppose the action of the elastic means 4 with a consequent stabilisation of the non-operative position of the friction element 2.

[0051] When for any reason the boot 7 or the skier using the ski 3 distances from the ski, the blocking element 5 is removed by the elements 40, 41, more precisely the edge 5A disengages from the gullies 40A, 41A, and consequently the friction element 2 disengages the housing 50, moved into the braking position by the elastic means 4.

[0052] Figures 5-9 illustrate the second embodiment of the disclosed system, for which the same numerical references as those used for the first embodiment will be used, with the exception of the coupling elements originating from the base 21, denoted by reference numbers 70A, 70B, and for the blocking element denoted by 80; an abutment 90 is also provided (figure 6) solidly constrained to the plate 20, intercepted by the internal portion of the side 23 of the friction element 2 such as to define the braking position.

[0053] The action of the elastic means 4 tends to stabilise the braking position.

[0054] The blocking element 80, starting from the external head 80A thereof with which it anchors a looped end of the connecting means 6, forms, in order:

a plate 81;

a spherical portion 82, with a first part 83 originating from the plate 81 such as to identify, in the internal surface thereof, an annular abutment 81A, and exhibits a growing diameter up to a maximum value, and with the remaining second part 84, which from the maximum value exhibits a decreasing diameter at the internal head 80B.

[0055] The head 80B is interested by opposite pairs of recesses 86A, 86B: in the example of figure 9B two of the pairs are evidenced.

[0056] The internal surfaces of the coupling element 70A, 70B are conformed complementarily to the central-
upper part of the spherical portion 82 (see figure 8).

[0057] By way of example, both the coupling elements 70A, 70B can be elastically deformable.

[0058] The dimensions of the surfaces are such that the insertion of the blocking element 80 between the elements 70A, 70B first causes the elastic spreading thereof up to the snap-coupling of the element 80 between the elements 70A, 70B.

[0059] The operator grips the element 80, and by means of one of the two pairs of recesses 86A, 86B intercepts the third side 24 of the friction element such as to draw it into the housing 50 internally of which there is the snap-coupling of the blocking element 80 between the coupling elements 70A, 70B; the coupling opposes the action of the elastic means 4 with consequent stabilising of the non-operative position of the friction element 2.

[0060] In this case too when for any reason the boot 7 or the skier using the ski 3 distances from the ski, the blocking element 80 disengages from the elements 70A, 70B and consequently, by the action of the elastic means 4, the friction element is brought into the braking position.

[0061] In both considered embodiments, the conformation of the blocking element 5, 80 and the corresponding coupling elements with which it functionally cooperates, respectively 40, 41 and 70A and 70B is such as to make the unblocking certain, independently of the direction with which the connecting means 6, subjected to traction, exert the action thereof on the blocking element.

[0062] In other terms, the stress can be directed either along the axis of the blocking element or angled with respect to the axis, up to beyond perpendicularity therewith.

[0063] Further, the conformation of the blocking element and the relative elements it couples with, is such as to enable the operator, with a single hand, to simply and rapidly perform the coupling, which is extremely advantageous in consideration also of the awkward and precarious situations in which the skier is operating.

[0064] The above has been described by way of non-limiting example, and any constructional variants are understood to fall within the scope of the following claims.

Claims

1. A braking system for a ski, comprising:

a friction element (2) hinged to a support element couplable to a ski (3) and mobile between two positions, a first non-operative position and a second braking position in which second braking position the friction element (2) interferes

with a ground surface, causing braking of the ski (3);

elastic means (4) for moving the friction element (2) into the braking position;

a blocking element (5, 80) which is removable and fixable to the ski (3) such as to block the friction element (2) in the non-operative position; connecting means (6) for connecting the blocking element (5) to a ski boot (7) when the ski boot (7) is engaged to the ski (3), or for connecting the blocking element to a skier who is using the ski (3); the blocking means being conformed such that when the boot (7) or the skier using the ski (3) distances from the ski the blocking element (5, 80) is removed from the ski and the friction element (2) is consequently moved into the braking position thereof;

characterised in that it comprises a base (51), solidly constrained to the support element from which at least two coupling elements originate, of which at least one is elastically deformable, which two elements face upwards and define there-between a housing (50) conformed such as to receive a portion (24) of the friction element (2) when the friction element (2) is in the relative non-operative position, the coupling elements removably coupling with the blocking element (5, 80) such as to removably block the friction element (2) in the non-operative position.

2. The system (1) of claim 1, **characterised in that** the blocking element (80) has a rounded shape with a diameter, starting from the head 80A constrained to the connecting means 6, first increasing and then decreasing, and **in that** the internal surfaces of the coupling elements (70A, 70B), are complementary to the rounded shape and of such dimensions as to couplingly receive, in a snap coupling, the blocking element (80).

3. The system of claim 2, **characterised in that** the head (80B) of the blocking element (80) not interested by the connecting means (6) forms engaging means of the side (24) of the friction element (2) for inserting the side (24) in the housing (50), in a switching of the friction element (2) from the braking position to the non-operative position.

4. The system of claim 3, **characterised in that** the engaging means of the side (24) of the friction element comprise at least a recess (86A, 86B) realised in the relative head (80B) of the blocking element.

5. The system of claim 2 or 3 or 4, **characterised in that** the rounded shape of the blocking element (80) is a portion of a sphere.

6. The system of any one of claims 2 or 3 or 4 or 5,

characterised in that the head (80A) of the blocking element (80) interested by the connecting means (6) comprises a plate (81).

7. The system of claim 1, **characterised in that** the blocking element (5) is conformed as an upturned beaker, and in the coupling elements (40, 41) exhibit such dimensions as to insert, by elastic deformation of at least one thereof, internally of the blocking element 5. 5 10
8. The system of claim 7, **characterised in that** the coupling elements (40, 41) are externally interested by relative gullies (40A, 41A) destined to receive, in a snapfitting, the edge (5A) of the blocking element (5) on coupling of the blocking element (5) with the elements (40, 41). 15
9. The system of any one of the preceding claims, **characterised in that** it comprises an abutment (90) intercepted by the friction element (2) following the disengagement of the friction element (2) from the housing (50), with a consequent definition of the braking position. 20 25

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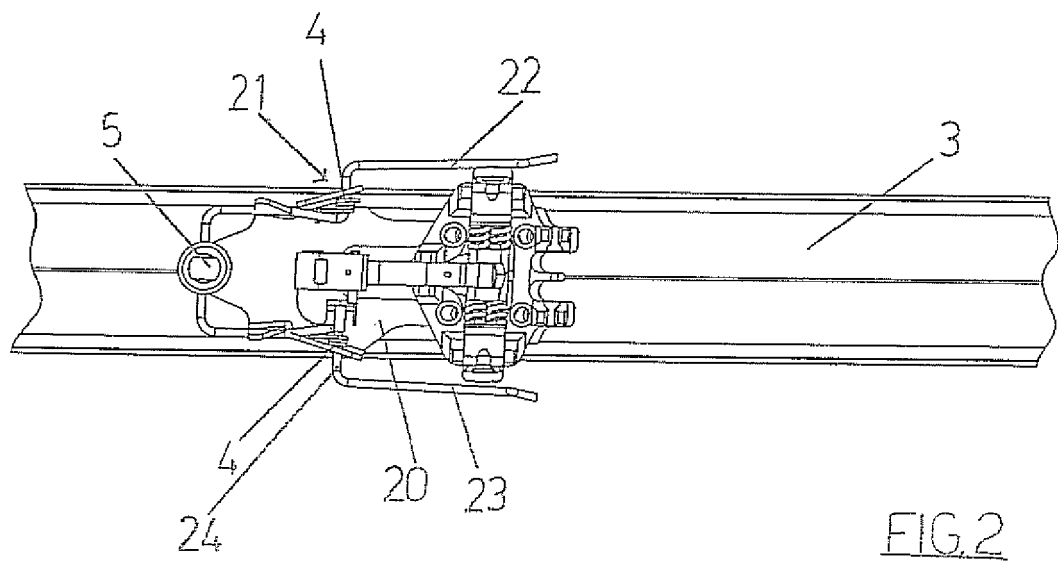
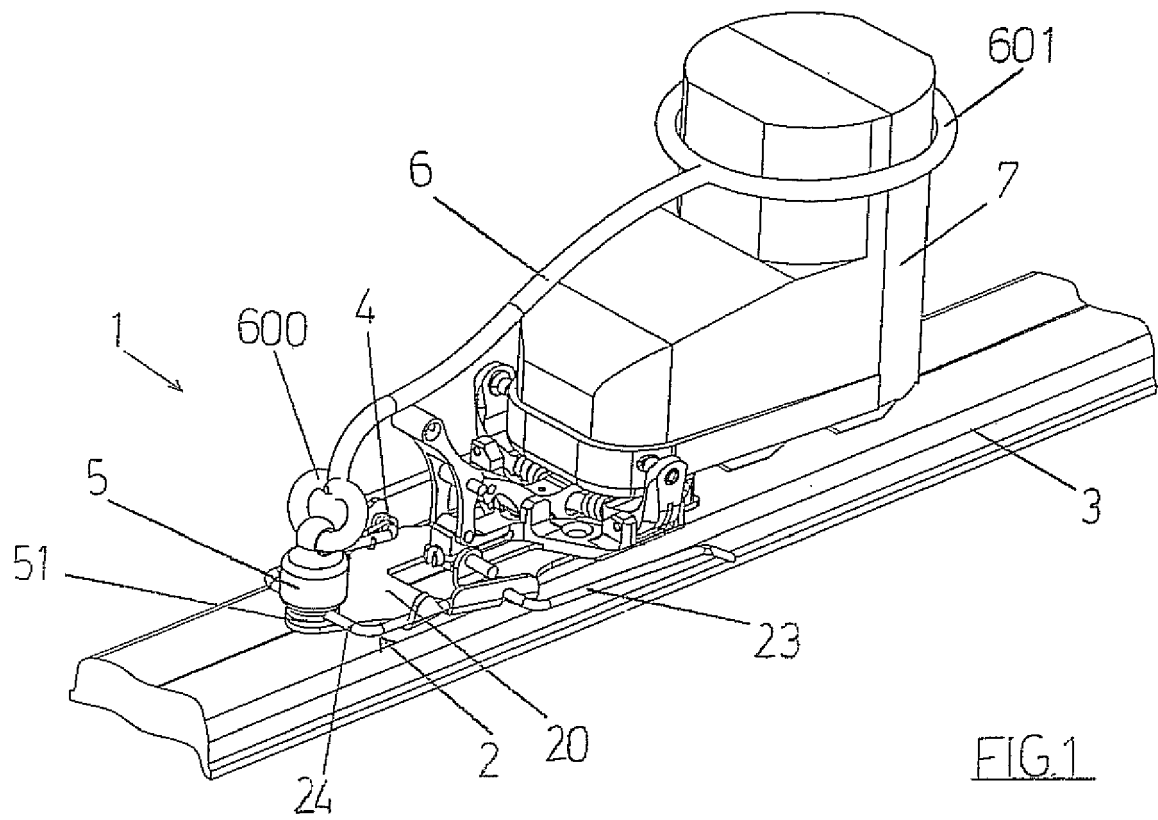
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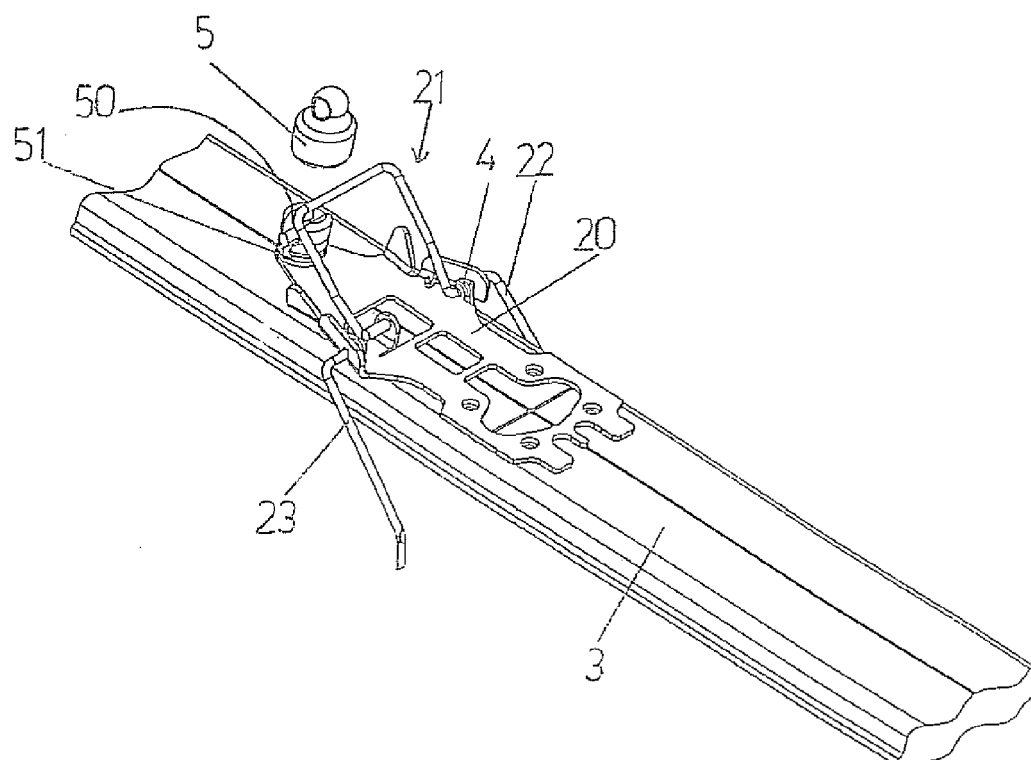
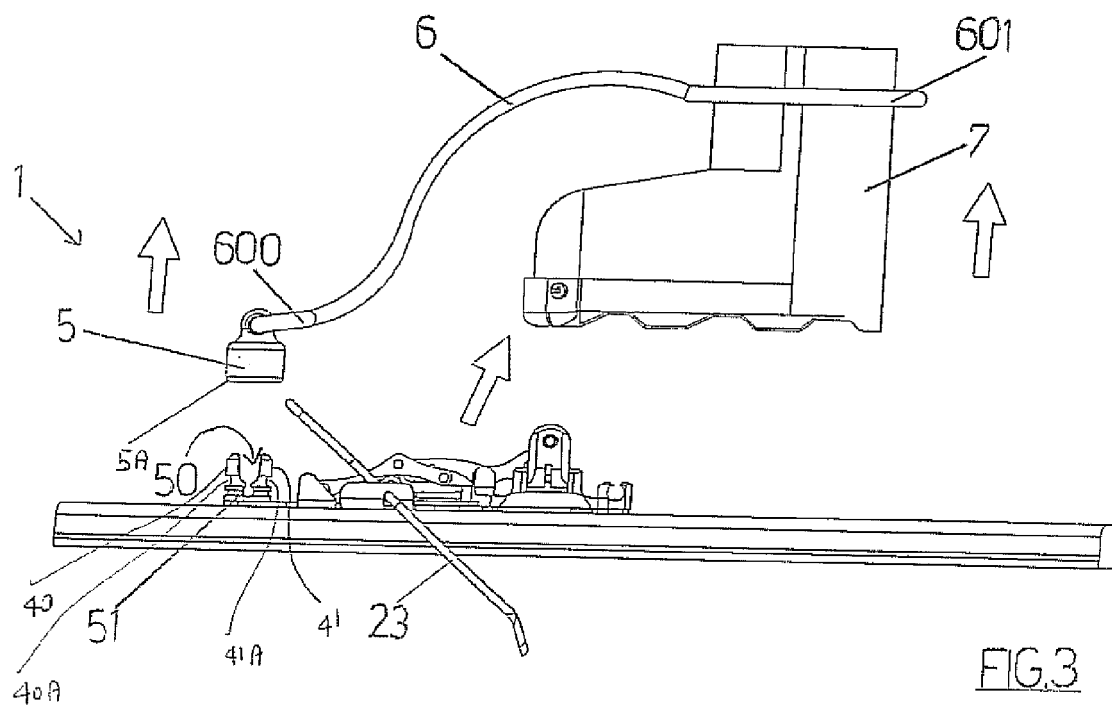
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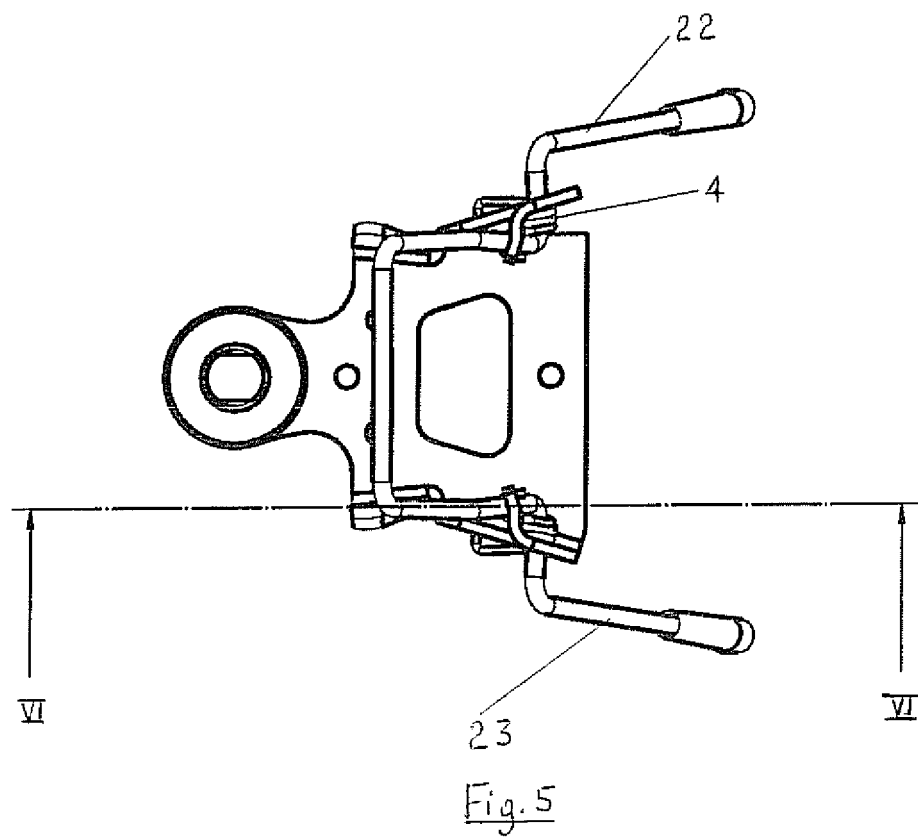
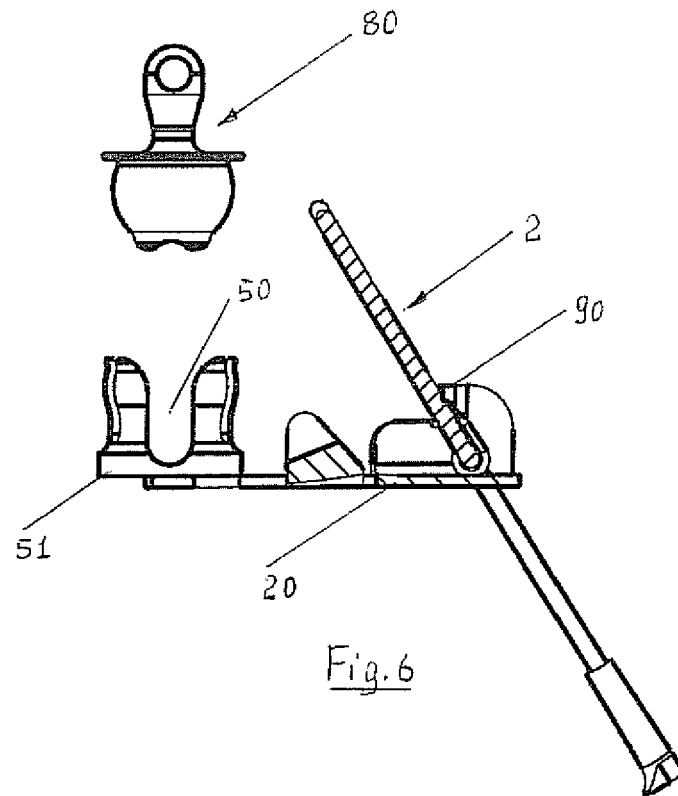
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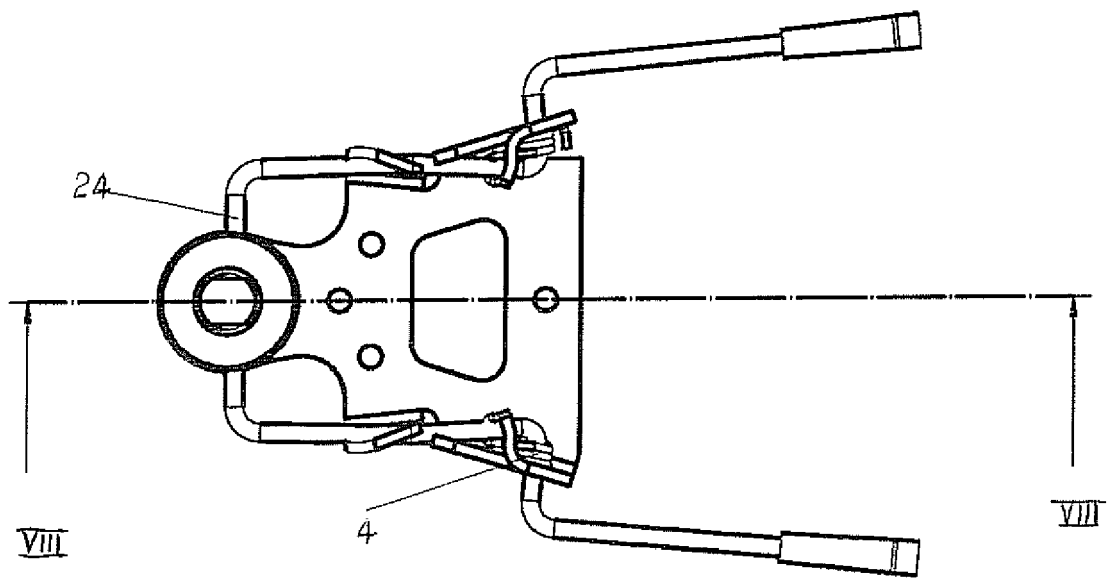
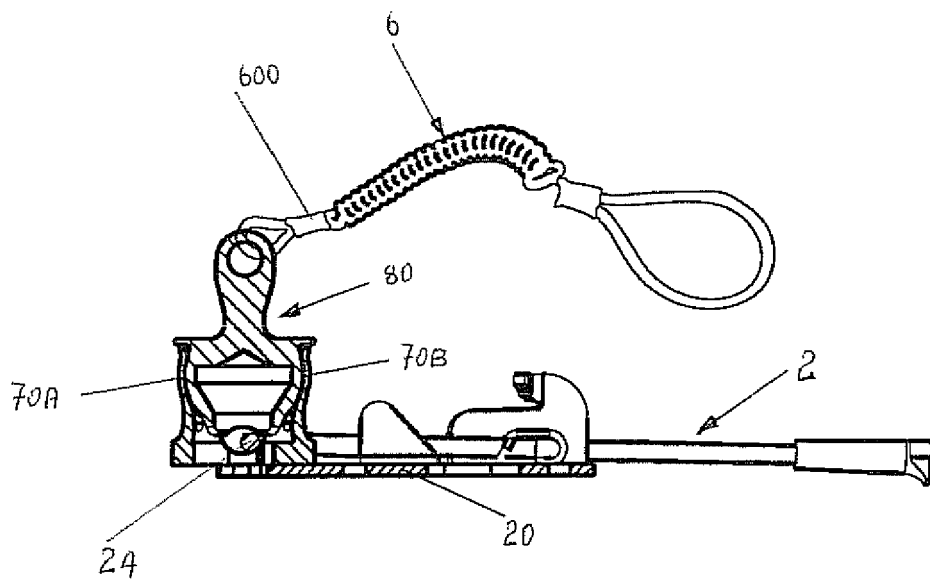
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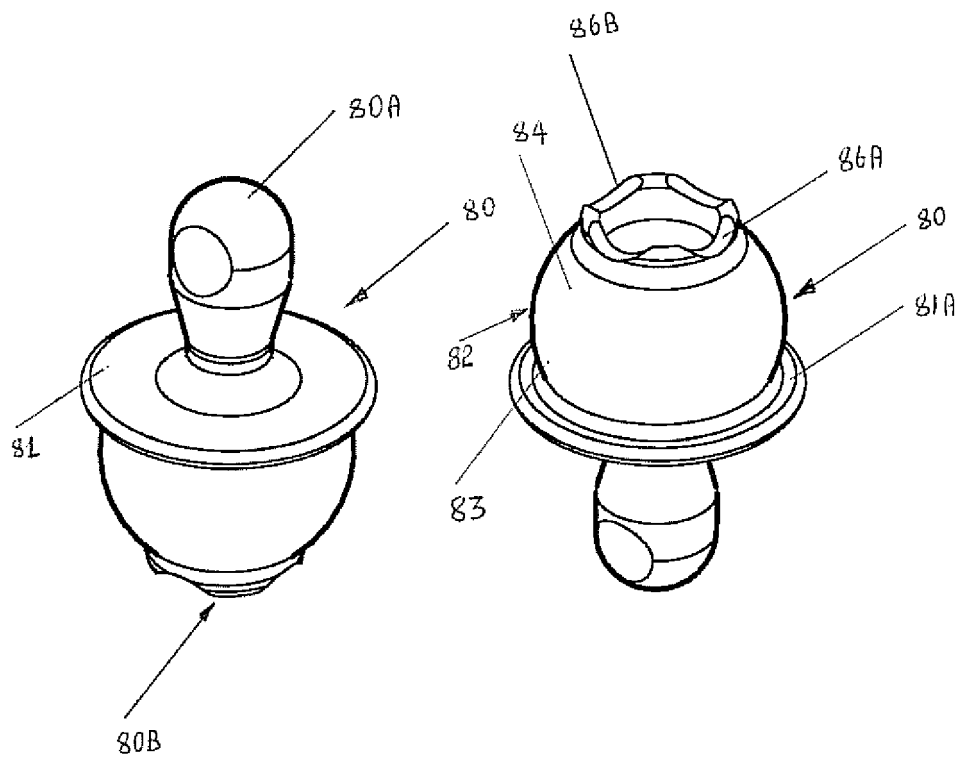


Fig. 9A

Fig. 9B



EUROPEAN SEARCH REPORT

Application Number
EP 12 17 2014

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	DE 25 04 922 A1 (MAIER) 19 August 1976 (1976-08-19) * pages 7-13; figures 1-10 *	1	INV. A63C7/10
A	US 4 171 827 A (GLEYS PAUL [US]) 23 October 1979 (1979-10-23) * figures 1-12 *	1	
A	FR 2 660 568 A1 (LOOK SA [FR]) 11 October 1991 (1991-10-11) * page 4, line 20 - page 6, line 37; figures 1-6 *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			A63C
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 24 October 2012	Examiner Brunie, Franck
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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

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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
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24-10-2012

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 2504922	A1	19-08-1976	NONE
US 4171827	A	23-10-1979	NONE
FR 2660568	A1	11-10-1991	DE 9002865 U1 17-05-1990 FR 2660568 A1 11-10-1991

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- DE 2504922 [0016]
- FR 2660568 [0021]