



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
23.05.2012 Bulletin 2012/21

(51) Int Cl.:
A63C 9/00 (2006.01)

(21) Application number: **10192055.1**

(22) Date of filing: **22.11.2010**

(84) Designated Contracting States:
AL 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 RS SE SI SK SM TR
Designated Extension States:
BA ME

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(54) **Snowboard binding assembly**

(57) A snowboard binding assembly (3) comprises a base plate (4) having a bottom surface (5) adapted to be attached to an upper surface of the snowboard (2) and a binding mounting plate (8) positioned above the base plate (4) and attached thereto in a manner allowing a relative rotation between the base plate (4) and binding mounting plate (8) around an axis (10) substantially perpendicular to the bottom surface (5) of the base plate (4), and further comprising locking means for selectively preventing said relative rotation. The locking means comprise facing engagement means (14, 15) provided on the base plate (4) and binding mounting plate (8). The binding

mounting plate (8) additionally is attached to the base plate (4) in a manner allowing a pivotal motion with respect to the base plate (4) between a rest position in which the facing engagement means (14, 15) of the base plate (4) and binding mounting plate (8) are disengaged and a pivoted position in which the facing engagement means (14, 15) of the base plate (4) and binding mounting plate (8) engage each other frictionally for preventing said relative rotation between the base plate (4) and binding mounting plate (8). Further spring means (16) are provided for biasing the binding mounting plate (8) towards its rest position.

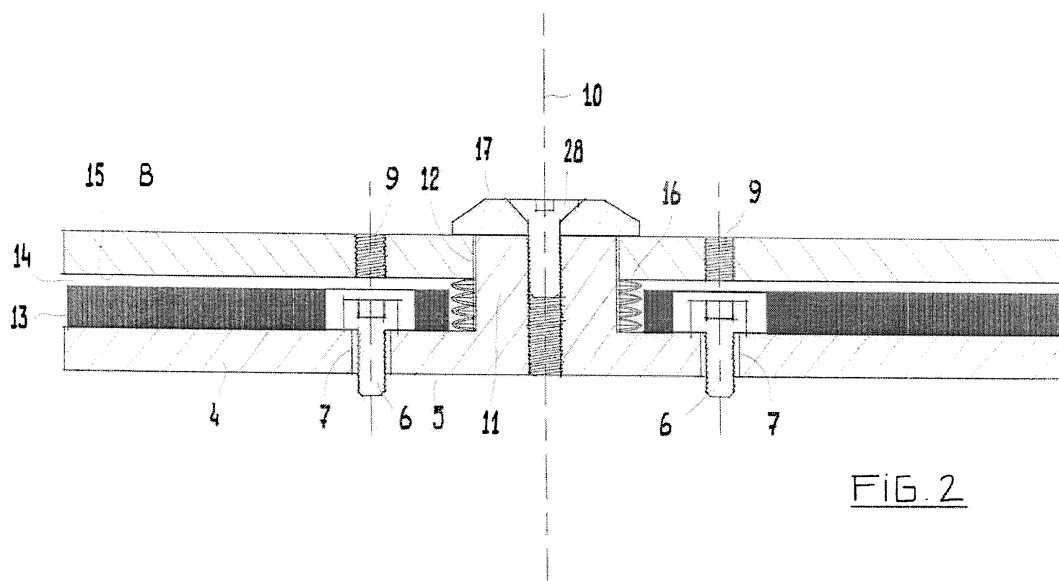


FIG. 2

Description

[0001] The invention relates to a snowboard binding assembly with a base plate having a bottom surface adapted to be attached to an upper surface of the snowboard and with a binding mounting plate positioned above the base plate and attached thereto in a manner allowing a relative rotation between the base plate and binding mounting plate around an axis substantially perpendicular to the bottom surface of the base plate, and further comprising locking means for selectively preventing said relative rotation.

[0002] In such a snowboard binding assembly the ski boot or boot of a snowboarder will be locked to the binding mounting plate in any convenient and conventional manner, for example using a soft boot binding or a step-in binding attached to the binding mounting plate. The relative rotation allows the snowboarder to choose a position of at least one of his feet relative to snowboard which is most convenient in a specific situation, such as during snowboarding or for example when propelling himself towards a lift by an action known as skating (releasing the rear foot binding and propelling oneself with the rear foot while the front foot remains attached to the snowboard), or when sitting in a chair lift with the snowboard still attached to at least one of the feet (and rotating the snowboard to a position in which it points forward in parallel to the feet). The prior art comprises numerous examples of snowboard binding assemblies of the above type. For allowing the relative rotation between the base plate and binding mounting plate these prior art snowboard binding assemblies comprise locking means that first have to be unlocked manually for changing the rotational position between the base plate and binding mounting plate and then have to be locked again manually to maintain this position while snowboarding or using the snowboard otherwise.

[0003] It is an object of the present invention to provide an improved snowboard binding assembly of the above type.

[0004] Thus, in accordance with the present invention such an assembly is characterized in that the locking means comprise facing engagement means provided on the base plate and binding mounting plate and wherein the binding mounting plate additionally is attached to the base plate in a manner allowing a pivotal motion with respect to the base plate between a rest position in which the facing engagement means of the base plate and binding mounting means are disengaged and a pivoted position in which the facing engagement means of the base plate and binding mounting means engage each other frictionally for preventing said relative rotation between the base plate and binding mounting plate, and wherein spring means are provided for biasing the binding mounting plate towards its rest position.

[0005] In the rest position a desired relative rotation is possible. This rest position occurs when the snowboarder is not leaning forward or backward but is in a central

position in which the spring means are capable of maintaining this rest position. This rest position also occurs when the snowboarder is in the air without contact between the snowboard and the ground surface. When, however, the snowboarder is leaning forward or backward (shifting his weight to his toes or heels) for making a turn, a moment is created which causes the binding mounting plate to pivot while overcoming the bias of the spring means, and the engagement means will engage each other and a relative rotation between the base plate (or snowboard) and the binding mounting plate (or feet of the snowboarder) is prevented, as required for successfully maneuvering through a turn with total control.

[0006] In an embodiment of the snowboard binding assembly the base plate comprises a central upwardly extending stem carrying the binding mounting plate in a manner for allowing said rotation and said pivotal motion. This embodiment combines a simple and sturdy construction with a very reliable operation.

[0007] Preferably, then, the stem has a circular cross section with a first diameter and the binding mounting plate has a central hole with a second diameter which is sufficiently larger than the first diameter to allow the binding mounting plate to be received with its hole around the stem in a manner allowing the required pivotal motion of the binding mounting plate. Because of its circular cross section the stem also defines the location (or axis) around which the binding mounting plate rotates.

[0008] In another embodiment a locking member is attached to the top of the stem having a third diameter larger than the second diameter for keeping the binding mounting plate on the stem. When, further, said locking member is releasable, the binding mounting plate may be removed, e.g. for servicing.

[0009] There are also other possibilities to achieve the pivotal motion of the binding mounting plate. For example the top of the stem and the binding mounting plate may define a ball and socket joint.

[0010] As an alternative the top of the stem and the binding mounting plate may define a hinge wherein the stem can rotate with respect to the base plate.

[0011] Another possibility is that the stem is made of a flexible and resilient material. This offers the additional advantage that the stem also may function as the spring means and that separate spring means are not required, lowering the number of parts of the assembly.

[0012] When separate spring means are applied, these may comprise a spring member surrounding the stem and having a first end engaging the base plate and an opposite second end engaging the binding mounting plate. For example such spring means may comprise a cupped spring washer.

[0013] In a preferred embodiment the engagement means may comprise a friction lining attached to at least one of the base plate and binding mounting plate. The characteristics of such a lining may be selected in correspondence with the desired dynamic behaviour of the binding assembly. For example the friction lining may

comprise a flexible plate with high friction, for example made of neoprene. Such a lining may be replaceable when worn out, especially in an embodiment in which, as mentioned before, the binding mounting plate may be removed.

[0014] In an alternative embodiment of the snowboard binding assembly according to the present invention the engagement means comprise cooperating toothings on facing sides of the base plate and binding mounting plate, wherein at least one of said facing sides (for example the upper side of the base plate) is cone-shaped. When the binding mounting plate pivots, said toothings will cooperate for preventing a relative rotation between the base plate and binding mounting plate.

[0015] Finally an embodiment of the snowboard binding assembly according to the present invention is mentioned in which the locking means further comprise a manually operable locking pin attached to the binding mounting plate which can cooperate with locking recesses provided in the base plate and which locking pin can assume at least a stable locking position preventing said relative rotation in any pivotal position of the binding mounting plate and at least a stable unlocking position allowing said relative rotation in the rest position of the binding mounting plate. Using this locking pin the snowboard binding assembly may be locked, converting it into a conventional snowboard binding assembly without the possibility of said relative rotation.

[0016] Hereinafter the invention will be elucidated while referring to the drawings, in which:

Figure 1 illustrates a snowboarder on a snowboard; Figure 2 shows a cross section through a first embodiment of the snowboard binding assembly according to the present invention; Figure 3 shows a cross section through a second embodiment of the snowboard binding assembly according to the present invention; Figure 4 shows a cross section through a third embodiment of the snowboard binding assembly according to the present invention; Figure 5 shows a cross section through a fourth embodiment of the snowboard binding assembly according to the present invention; Figure 6 shows a cross section through a fifth embodiment of the snowboard binding assembly according to the present invention, and Figure 7 shows a cross section through a sixth embodiment of the snowboard binding assembly according to the present invention.

[0017] As illustrated schematically in figure 1, a snowboarder 1 with its feet is attached to a snowboard 2 using two binding assemblies 3. The present invention allows the snowboarder 1 to adjust the angle of the feet with respect to the snowboard 2 by a rotation R around axes (not illustrated) extending substantially perpendicularly to the main plane of the snowboard 2 without the need

for (manually) operating any kind of locking mechanism.

[0018] Referring to figure 2, a first embodiment of the snowboard binding assembly comprises a base plate 4 having a bottom surface 5 adapted to be attached to an upper surface of the snowboard 2, for example by using bolts 6 which extend through holes 7 in the base plate and which have to be screwed in respective threaded holes (not shown) in the upper surface of the snowboard 2. A binding mounting plate 8 is positioned above the base plate 4 and comprises threaded holes 9 for receiving bolts of a binding assembly not illustrated (e.g. for a soft boot binding or a step-in binding).

[0019] The binding mounting plate 8 is attached to the base plate 4 in a manner allowing a relative rotation between the base plate and binding mounting plate around an axis 10 substantially perpendicular to the bottom surface 5 of the base plate (corresponding with the axes around which rotation R occurs in figure 1).

[0020] The base plate 4 comprises a central upwardly extending stem 11 carrying the binding mounting plate 8 in a manner for allowing said relative rotation. The stem 11 has a circular cross section with a first outer diameter and the binding mounting plate 8 has a central hole 12 with a second inner diameter which is larger than the first diameter to allow the binding mounting plate to be received with its hole 12 around the stem 11 in a manner allowing said rotation. However, not only said relative rotation will be allowed but also a pivotal motion of the binding mounting plate 8 with respect to the base plate 4, as will appear below.

[0021] A flexible plate 13 with high friction, for example made of neoprene, is attached in any convenient manner (permanently or detachably) to the upper surface of the base plate 4. The upper surface 14 of said plate 13 and the lower surface 15 of the binding mounting plate 8 define facing engagement means. Because the binding mounting plate 8 is attached to the base plate 4 in a manner allowing a pivotal motion with respect thereto the binding mounting plate 8 can pivot between a rest position (illustrated in figure 2) in which the facing engagement means 14 and 15 of the base plate and binding mounting means are disengaged, and a pivoted position in which the facing engagement means of the base plate and binding mounting means engage each other frictionally for preventing the relative rotation between the base plate and binding mounting plate. Surface 15 may be provided with an appropriate texture to obtain the desired friction when engaged with surface 14.

[0022] Further figure 2 shows spring means 16 having a first end engaging the base plate and an opposite second end engaging the binding mounting plate which are provided for biasing the binding mounting plate 8 upwardly towards its rest position. Said spring means 16 may comprises one or a number of cupped spring washers.

[0023] A locking member 17 (which may be provided with means for preventing an undesired detachment thereof) is attached to the top of the stem 11 having a third diameter larger than the second diameter of the hole

12 of the binding mounting plate 8 for locking the binding mounting plate on the stem. When said locking member 17 is releasable (for example by being bolted to the stem 11 by a bolt 28), the binding mounting plate 8 may be removed (and the friction plate 13 becomes accessible too).

[0024] In the rest position of figure 1 a desired relative rotation between the base plate 4 (or snowboard 2) and the binding mounting plate 8 (or feet of the snowboarder 1) is possible. This rest position occurs when the snowboarder 1 is not leaning forward or backward but is in a central position in which the spring means 16 are capable of maintaining the binding mounting plate 8 in this rest position. This rest position also occurs when the snowboarder 1 is in the air without contact between the snowboard and the ground surface. When, however, the snowboarder is leaning forward or backward (shifting his weight to his toes or heels) for making a turn, a moment is created which causes the binding mounting plate 8 to pivot while overcoming the bias of the spring means 16, and the engagement means 14 and 15 will engage each other and a relative rotation between the base plate 4 (or snowboard 2) and the binding mounting plate 8 (or feet of the snowboarder 1) is prevented, as required for successfully maneuvering through a turn with total control.

[0025] Figure 3 shows an alternative embodiment in which the top of the stem 11 and the binding mounting plate 8 define a hinge 30,31 and wherein the stem can rotate with respect to the base plate 4.

[0026] Figure 4 also shows an alternative embodiment in which the top of the stem 11 and the binding mounting plate 8 define a ball and socket joint; specifically, now, a socket 20 is defined in the top part of the stem 11 and a ball 21 downwardly protrudes from the centre of the binding mounting plate 8.

[0027] In the embodiment illustrated in figure 5 the stem 11 is made of a flexible and resilient material (e.g. rubber). This offers the advantage that the stem 11 also may function as the spring means and that separate spring means are not required (yet still possible), lowering the number of parts of the assembly.

[0028] Figure 6 illustrates an embodiment which resembles the embodiment according to figure 2, but in which the friction plate 13 is omitted. In this embodiment the engagement means comprise cooperating toothings 22 and 23 on facing sides of the base plate 4 and binding mounting plate 8, wherein the toothing 22 of the base plate defines a cone-shaped surface corresponding with the inclined orientation of the upper toothing 23 when the binding mounting plate 8 has pivoted to the engagement position.

[0029] Finally figure 7 shows an embodiment closely resembling the embodiment of figure 2, but additionally provided with a manually operable locking pin 24 attached to the binding mounting plate 8 which can cooperate with locking recesses 25 provided in the base plate 4. Said locking pin 24 can assume at least a stable locking position (extending with its lower end in a locking recess

25) preventing said relative rotation in any pivotal position of the binding mounting plate 8 and at least a stable unlocking position (illustrated in figure 7) allowing said relative rotation in the rest position of the binding mounting plate 8. In the illustrated embodiment said stable positions are defined through the cooperation between a spring loaded ball 26 and grooves 27 in the locking pin 24.

[0030] The invention is not limited to the embodiments described before which may be varied widely within the scope of the invention as defined by the appending claims.

Claims

1. Snowboard binding assembly with a base plate having a bottom surface adapted to be attached to an upper surface of the snowboard and with a binding mounting plate positioned above the base plate and attached thereto in a manner allowing a relative rotation between the base plate and binding mounting plate around an axis substantially perpendicular to the bottom surface of the base plate, and further comprising locking means for selectively preventing said relative rotation, **characterized in that** the locking means comprise facing engagement means provided on the base plate and binding mounting plate and wherein the binding mounting plate additionally is attached to the base plate in a manner allowing a pivotal motion with respect to the base plate between a rest position in which the facing engagement means of the base plate and binding mounting means are disengaged and a pivoted position in which the facing engagement means of the base plate and binding mounting means engage each other frictionally for preventing said relative rotation between the base plate and binding mounting plate, and wherein spring means are provided for biasing the binding mounting plate towards its rest position.
2. Snowboard binding assembly according to claim 1, wherein the base plate comprises a central upwardly extending stem carrying the binding mounting plate in a manner for allowing said rotation and said pivotal motion.
3. Snowboard binding assembly according to claim 2, wherein the stem has a circular cross section with a first diameter and the binding mounting plate has a central hole with a second diameter which is sufficiently larger than the first diameter to allow the binding mounting plate to be received with its hole around the stem in a manner allowing the required pivotal motion of the binding mounting plate.
4. Snowboard binding assembly according to claim 3, wherein a locking member is attached to the top of the stem having a third diameter larger than the sec-

ond diameter for keeping the binding mounting plate on the stem.

said relative rotation in the rest position of the binding mounting plate.

5. Snowboard binding assembly according to claim 4, wherein the locking member is releasable. 5
6. Snowboard binding assembly according to claim 2, wherein the top of the stem and the binding mounting plate define a ball and socket joint. 10
7. Snowboard binding assembly according to claim 6, wherein the socket is defined in the top part of the stem and the ball downwardly protrudes from the centre of the binding mounting plate. 15
8. Snowboard binding assembly according to claim 2, wherein the top of the stem and the binding mounting plate define a hinge and wherein the stem can rotate with respect to the base plate. 20
9. Snowboard binding assembly according to claim 2, wherein the stem is made of a flexible and resilient material.
10. Snowboard binding assembly according to any of the claims 2-9, wherein the spring means comprise a spring member surrounding the stem and having a first end engaging the base plate and an opposite second end engaging the binding mounting plate. 25 30
11. Snowboard binding assembly according to claim 10, wherein the spring means comprises a cupped spring washer.
12. Snowboard binding assembly according to any of the previous claims, wherein the engagement means comprise a friction lining attached to at least one of the base plate and binding mounting plate. 35
13. Snowboard binding assembly according to claim 12, wherein the friction lining comprises a flexible plate with high friction, for example made of neoprene. 40
14. Snowboard binding assembly according to claim 1, wherein the engagement means comprise cooperating toothings on facing sides of the base plate and binding mounting plate, wherein at least one of said facing sides is cone-shaped. 45
15. Snowboard binding assembly according to any of the previous claims, wherein the locking means further comprise a manually operable locking pin attached to the binding mounting plate which can cooperate with locking recesses provided in the base plate and which locking pin can assume at least a stable locking position preventing said relative rotation in any pivotal position of the binding mounting plate and at least a stable unlocking position allowing 50 55

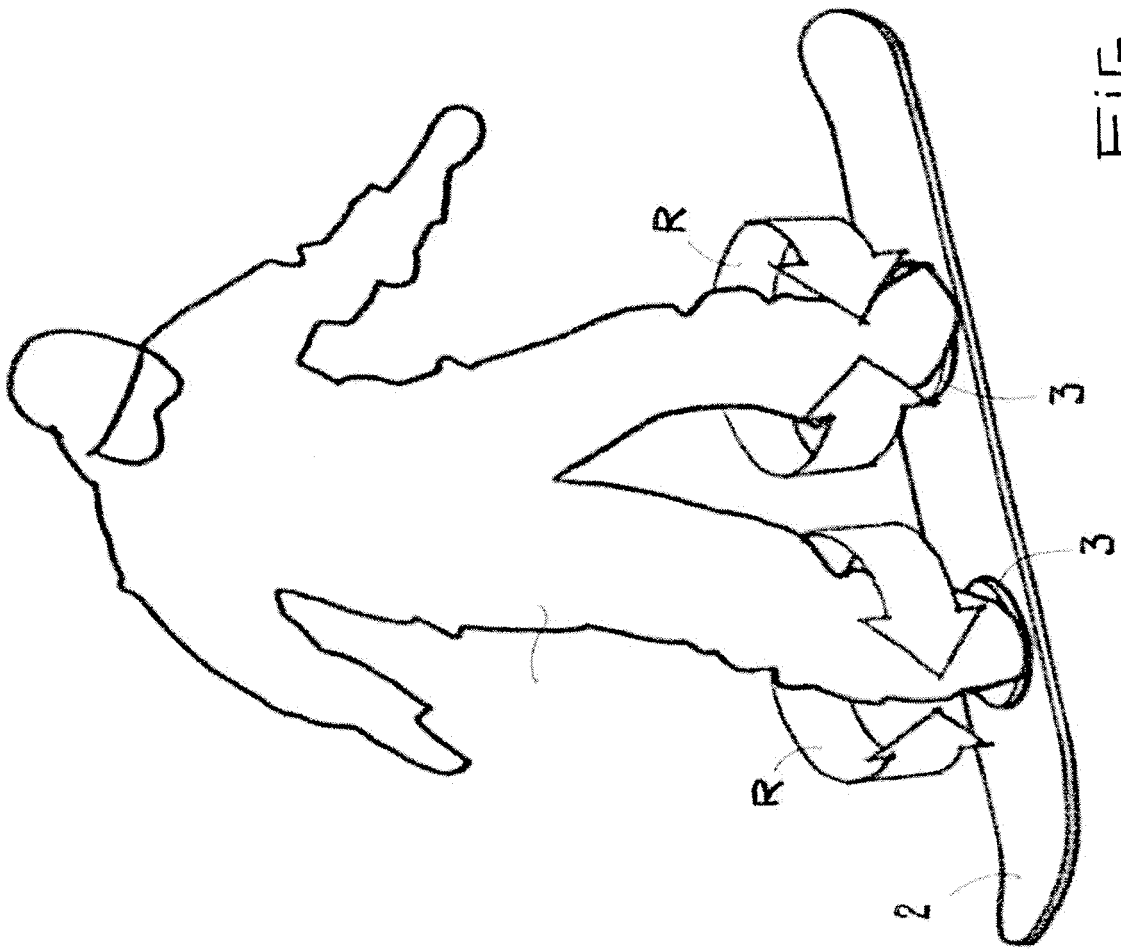


FIG. 1

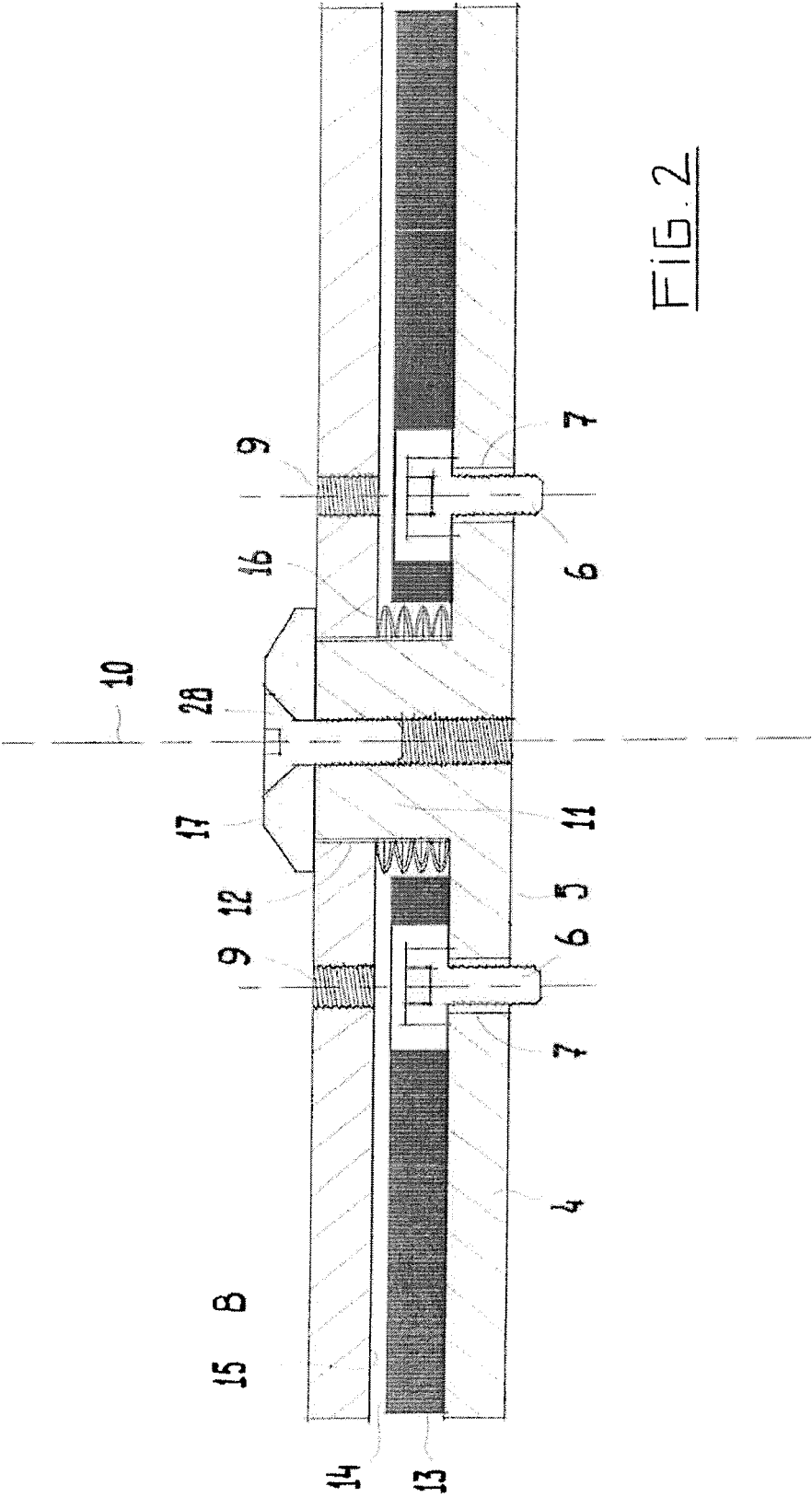


FIG. 2

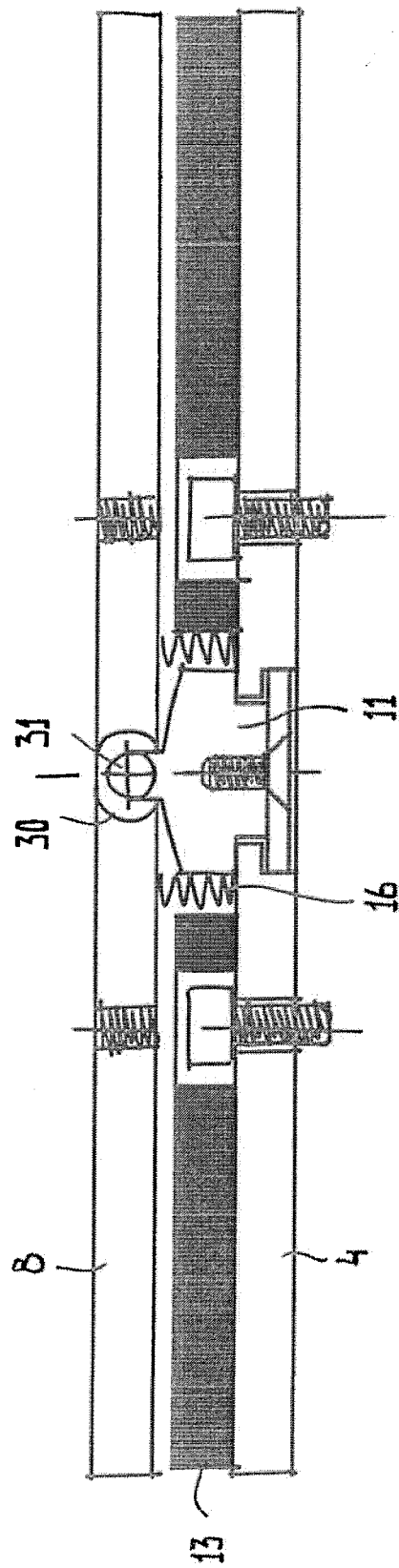
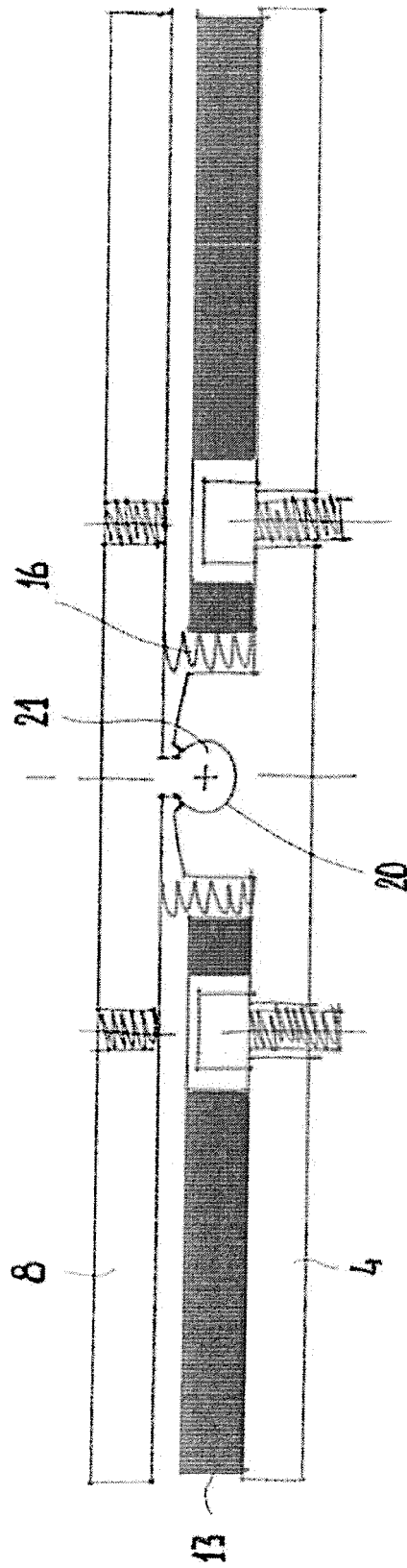
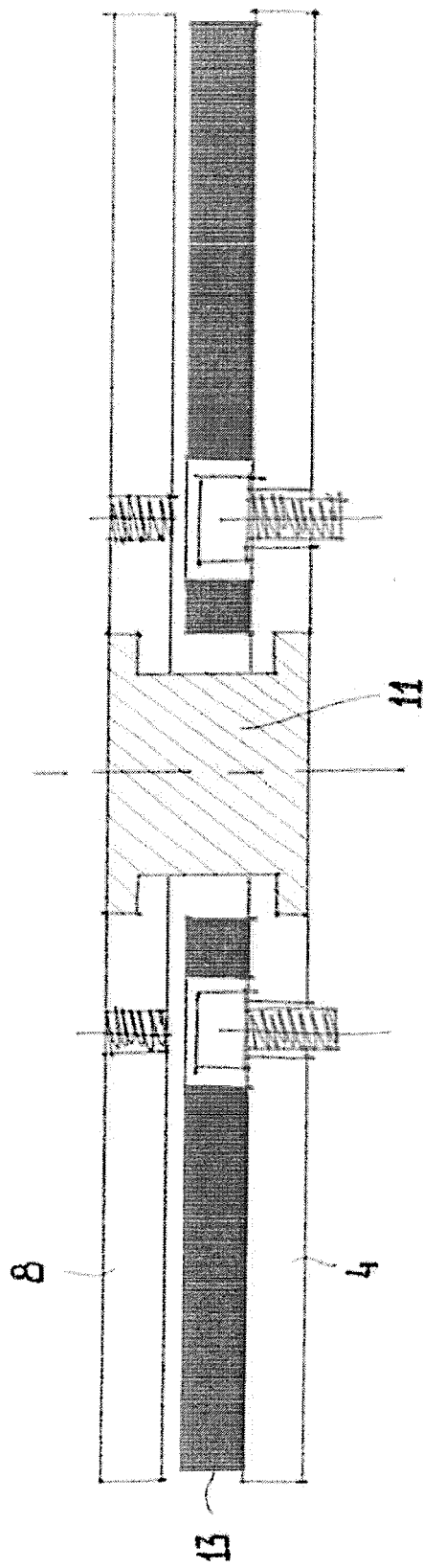


FIG. 3



49.4

Fig. 5.

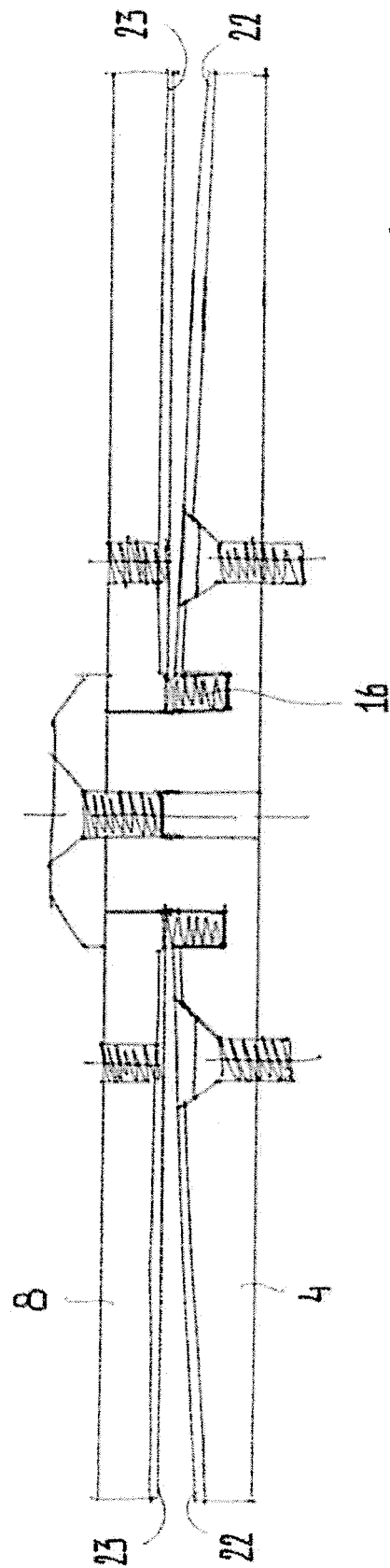
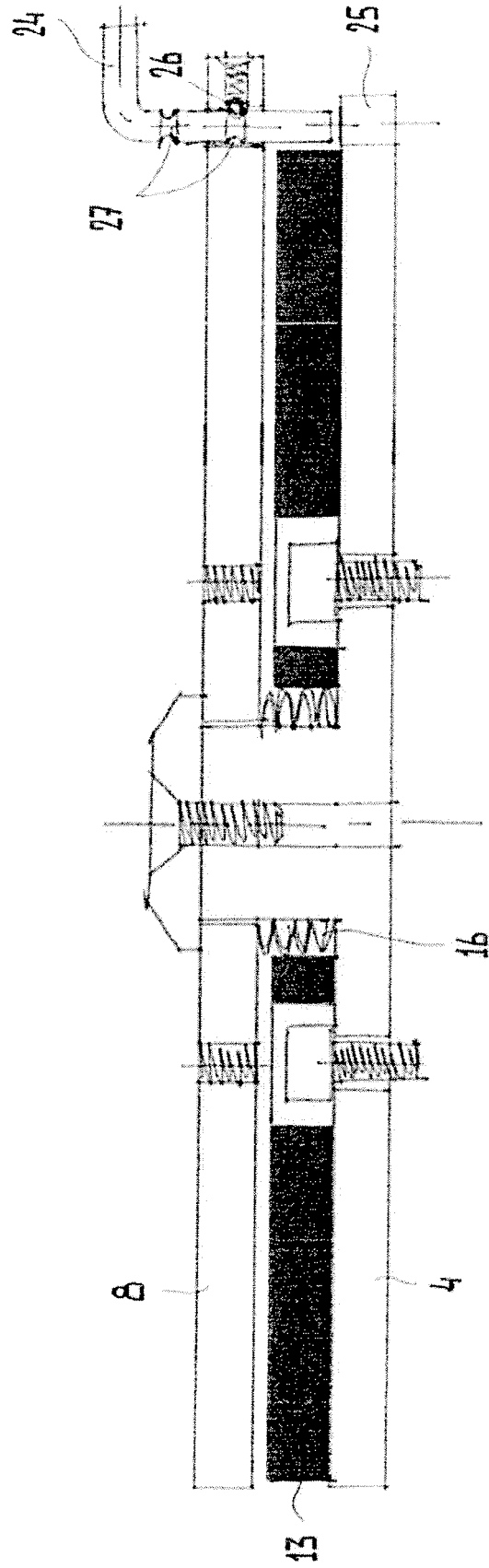


FIG. 6



7.917



EUROPEAN SEARCH REPORT

Application Number
EP 10 19 2055

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 11 April 2011	Examiner Haller, E
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EPO FORM 1503 03.82 (P04C01)

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

EP 10 19 2055

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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