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(54) **Pressure button**

Berger-Button

Bouton pression

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Description

[0001] The present invention relates to a bow pressure button.

[0002] Bow and arrows have characterized the history of mankind since its earliest phases, and as a weapon have accompanied man throughout the centuries.

[0003] Over time, bow and arrows have gradually lost their original function to find with increasing frequency a place in sport and recreation. Appearing for the first time in the Olympic Games of 1900 in Paris, archery was in fact firmly inserted in the Olympic program after the Olympics in Munich in 1972.

[0004] Parallel to this transformation of their most typical intended use, bows and arrows have undergone a considerable evolution in technology, and more increasingly sophisticated instruments where imposed on the market to meet the need to shoot arrows with increasing power and precision.

[0005] In a way, the very structure of the bow evolved. Typically, a modern bow comprises a central body, also called "riser", two limbs, and the string. The riser constitutes the central portion of the body of the bow which, in use, is gripped. The limbs may be separate parts to be mounted on the riser, or constituting extensions thereof (in the case of monolithic bows).

[0006] Hand in hand with the structure evolution of the bows several accessories have been developed, many of which typically mounted on the riser, such as the rest, i.e. the support for the arrow, the viewfinder, the stabilizer, etc..

[0007] When an arrow is released and accelerated under the thrust action of the string, the nock side portion of the arrow initially bends away from the bow. Subsequently, the same arrow portion bends towards the bow and then moves away again. In consequence of this oscillatory phenomenon, to which is typically given the name of "paradox of the archer", in order to hit the center of the target, an arrow must be pointed in a direction slightly lateral to the theoretical trajectory.

[0008] In order to compensate for this oscillatory phenomenon, the modern bows are typically provided with an additional accessory, named pressure button or Berger button, after its creator.

[0009] The pressure button is an adjusting device comprising an elastically loaded element, for example by a spring, and movable within a housing body. The housing body is typically screwed to the riser so that the tip of the elastically loaded element protrudes and comes into contact with the arrow when this is located on the rest.

[0010] The spring or other resilient means can be adjusted so as to enable the arrow to move by a predetermined amount to the riser at the instant when it is shot.

[0011] In practice, when the arrow is shot and undergoes the action of thrust and acceleration by the string, the arrow shaft cooperates with the movable element of the elastic button causing the retraction within the housing body and, therefore, the compression of the spring.

Following the distension of the spring, the movable element applies a straightening spring force on the arrow shaft.

[0012] Pressure buttons are known, for example, from U.S. 5375584, U.S. 5385135 and U.S. 5251606.

[0013] In the pressure buttons of the known type, especially those that use stiff springs, it may happen that the repeated stress of the movable element by the arrows shot determines a surface wear of the tip of the movable element which, in use, comes in contact with the arrow shaft. In particular, in the case wherein the bow is used to release a high number of arrows, as usually happens during a competition, the phenomenon of surface wear may cause the formation of a groove.

[0014] As a result of displacements and/or rotations, even of a very small amount, of the pressure button with respect to the riser to which is fixed in a releasable manner, the corresponding displacement of a groove formed on the tip of the movable element can impair, at least partially, the corrective effect for which the pressure button is designed, leading to shot errors that the archer is not easily able to correct during use.

[0015] Furthermore, if the pressure button is dismounted and re-fixed to the riser of the same bow or to another bow, finding the ideal position wherein the groove on the tip of the movable element is perfectly aligned with the ideal orientation of the arrow shaft being released, is practically impossible.

[0016] Reusing a pressure button already repeatedly stressed by arrows, especially in combination with a particularly rigid spring, therefore becomes particularly disadvantageous. There is, therefore in the field, the need to provide a bow pressure button which allows to overcome the drawbacks described above.

[0017] More in particular, being requested in the field is the need to provide a bow pressure button which allows overcoming the undesirable effects arising from surface wear of the movable element of the pressure button, so that it may be used for an extended time and/or on subsequent occasions without substantial reductions in shooting accuracy.

[0018] U.S. 4697323 discloses a bow pressure button as defined in the preamble of claim 1.

[0019] The purpose of the present invention is therefore to provide a bow pressure button which allows to satisfy at least one of the above requirements in a simple and economical way.

[0020] The above object is achieved by the present invention, as relating to a bow pressure button as defined in claim 1.

[0021] For a better understanding of the present invention, in the following will be described a preferred embodiment, purely by way of non limiting example and with reference to the accompanying drawings, wherein:

- Figure 1 illustrates a perspective view of a detail of a bow riser to which a pressure button is fixed in a releasable manner according to the invention;

- Figure 2 illustrates a perspective view of a pressure button according to the invention with some parts removed for ease of understanding, and
- Figure 3 illustrates an exploded perspective view of pressure button of Figure 2.

[0022] In Figures 1, 2 and 3 is indicated as a whole with 1 a pressure button according to the invention.

[0023] In particular, in Figure 1 is shown a detail of a riser 50 of a bow (not shown in its entirety) to which a pressure button 1 is fixed in a releasable manner.

[0024] The pressure button 1 is screw mounted into a threaded opening 51 formed in the riser 50, and is fixed axially with respect to the latter by means of an adjustable collar 52.

[0025] The pressure button 1 is, for its construction, adapted to be used in combination with any bow. In particular, the pressure button 1 is adapted to absorb the lateral thrust of an arrow 53 and to guide the arrow 53 before and during the step of releasing the arrow from the riser 50, that is when, in use, the arrow itself is subjected to thrust and acceleration by the string (not shown) of the bow.

[0026] As shown more clearly with reference to Figures 2 and 3, the pressure button 1 comprises a housing body 2 defining a substantially cylindrical cavity 3 therein.

[0027] More particularly, the housing body 2 comprises a cup-shaped base body 4 defining a first half-cavity 3A and a tubular body 5 internally defining a second half-cavity 3B. The first and second cavity 3A and 3B together define the cavity 3 of the housing body 2.

[0028] The tubular body 5 is adapted to engage at least partially the first half-cavity 3A and is fixable in an adjustable and releasable manner to the base body 4.

[0029] For example, in the example shown, the outer surface of the tubular body 5 and the surface defining the first half-cavity 3A are threaded. In this way, the tubular body 5 can be screwed inside the first half-cavity 3A.

[0030] Preferably, the base body 4 comprises adjustable fixing means 20 in the mutual position of the tubular body 5 and the base body 4. In the example shown, the fixing means 20 comprise a threaded seat 21 directed radially to receive a fixing screw 22. In this way, the screw 22 is adapted to axially fix the mutual position of the tubular body 5 and the base body 4.

[0031] More particularly, the tubular body 5 comprises a first and a second portion 5A and 5B. The first portion 5A is fixable in an adjustable and releasable manner to the base body 4 and has an outer diameter D1 and an inner diameter d1, respectively greater than the corresponding outer and inner diameter D2 and d2 of the second portion.

[0032] The second half-cavity 3B is internally defined by the first portion 5A, while the second portion 5B internally defines a third cavity 6 communicating with the second half-cavity 3B. In addition, the tubular body 5 internally defines a shoulder 7 between the first and the second portion 5A and 5B.

[0033] Preferably, the outer surface of the first portion 5A is threaded and provided with a plurality of longitudinally directed grooves 23. Even more preferably, these grooves are angularly at the same distance one from the other. The fixing screw 22 is adapted to engage with its end a groove 23. In this way, the screw 22 is adapted to fix in the radial direction the mutual position of the tubular body 5 and the base body 4.

[0034] The pressure button 1 comprises, moreover, an element 8 slidable within the cavity 3 of the housing body 2 and having a first end 8A and a second end 8B. The first end 8A extends outside the housing body 2 so as to cooperate with the arrow 53 before and during the step of releasing the same from the bow.

[0035] More particularly, the sliding element 8 comprises a stem 9 and an abutment portion 10 respectively by the part of said first and second ends 8A and 8B. The abutment portion 10 has a larger diameter of the stem 10 and of the internal diameter d2 of the second portion 5B of the tubular body 5.

[0036] The sliding element 8 is elastically loaded by elastic means 11 housed within the cavity 3 of the housing body 2.

[0037] For example, the elastic means 11 may include a compression spring 11a housed between the sliding element 8 and a bottom wall of the housing body 2. In the example shown, in a configuration wherein is not stressed by an arrow 53, the sliding member 8 is pushed by elastic means 11 in abutment against the shoulder 7. Depending on the conditions of use, for example depending on the greater or lesser flexibility of the arrow shaft 53, a compression spring 11a having a different stiffness value will be selected. Furthermore, increasing the degree of tightness of the tubular body 5 in the base body 4 it is possible to determine a pre-compression of the spring 11a.

[0038] In both ways described, the pressure button 1 can be conveniently adapted to the needs of the user.

[0039] Advantageously, the sliding member 8 is free to rotate about a relative axis A inside the cavity 3 of the housing body 2.

[0040] Preferably, the pressure button 1 comprises, for this purpose, support means 12 of the sliding element 8 housed within the cavity 3 of the housing body 2 to allow the free rotation of the sliding element 8 about the axis A.

[0041] For example, the support means 12 may comprise a bearing 12a, in the example shown being of a shielded roller type.

[0042] Preferably, the pressure button 1 comprises an abutment element 13 housed within said cavity 3 of the housing body 2, which cooperates in the axial direction with the sliding element 8 from the part of the second end 8B and, on the opposite side, with the housing body 2, and the support means 12 are radially interposed between the abutment element 13 and the housing body 2.

[0043] More particularly, in the example shown, the abutment element 13 cooperates with the bottom wall of the base body 4 and carries the bearing 12a to one end

thereof. In addition, the wall of the half-cavity 3B comprises an unthreaded portion 14 on the side of the bottom wall of the base body. Conveniently, the unthreaded portion 14 extends axially for a length substantially equal to the height of the bearing 12a.

[0044] From an examination of the characteristics of the pressure button 1 according to the present invention the advantages that it allows to obtain are evident.

[0045] In particular, it appears clear that, when it is subjected to the stress communicated by an arrow 53, in particular in the step of releasing the arrow itself by the bow, the sliding element 8 is able to absorb more effectively the bending action of the arrow 53, compared with known solutions, since it has one more degree of kinematic freedom.

[0046] As the sliding element 8 is free to rotate about its own axis A, the stress is distributed over time in a uniform manner over the entire surface of the first end 8A of the sliding element 8 itself. Consequently, said surface is not subject to the formation of a groove, but is at most worn in a uniform way and therefore its effectiveness remains substantially unaltered over time, both in the course of a prolonged shooting session - during which the position of the pressure button 1 with respect to the riser 50 is intentionally changed or inadvertently altered - and when the pressure button 1 has to be disassembled, for example to replace the compression spring 11a with a new one or with one having a different degree of stiffness.

[0047] It should also be noted that, even in conditions of maximum compression of the spring 11a, the bearing 12a always allows the free rotation of the sliding element 8 relative to the housing body 2; in addition, the presence of the bearing 12a always allows to keep the coaxiality between the sliding element 8, the abutment element 13 and the elastic means 11.

Claims

1. A pressure button (1) releasably fixable to a bow (51) and adapted to cooperate with an arrow (53) before and during the step of releasing the arrow (53) from said bow (51), the pressure button (1) comprising:

a housing body (2) defining a substantially cylindrical cavity (3) therein;
a sliding element (8) sliding within said cavity (3) and having a first end (8A) and a second end (8B), the first end (8A) extending outside said housing body (2) so as to cooperate with said arrow (53) before and during the step of releasing said bow (51);
said sliding element (8) being elastically loaded by elastic means (11) housed within said cavity (3) of the housing body (2) and being free to rotate about a relative axis (A) within said cavity (3) of the housing body (2);

characterized by comprising support means (12) of said sliding element (8) housed within said cavity (3) of the housing body (2) to allow the free rotation of said sliding element (8) about said axis (A), said support means (12) comprising a bearing (12a).

2. The button according to claim 1, wherein said housing body (2) comprises a cup-shaped base body (4) defining a first half-cavity (3A) and a tubular body (5) internally defining a second half-cavity (3B), adapted to engage at least partially said first half-cavity (3A) and fixable in an adjustable and releasable manner to said base body (4), said first and second half-cavity (3A, 3B) defining said cavity (3) of the housing body (2).
3. The button according to claim 2, wherein said tubular body (5) comprises a first and a second portion (5A, 5B), the first portion (5A) being fixable in an adjustable and releasable manner to said base body (4), the first portion (5A) having an outer diameter (D1) and an inner diameter (d1) greater than a respective outer diameter (D2) and inner diameter (d2) of said second portion (5B), said second half-cavity (3B) being internally defined by said first portion (5A), said second portion (5B) defining internally a third cavity (6) communicating with said second half-cavity (3B), said tubular body (5) defining internally a shoulder (7) between said first and second portions (5A, 5B).
4. The button according to claim 3, wherein said sliding element (8) comprises a stem (9) and an abutment portion (10) respectively on the side of said first and second ends (8A, 8B), the abutment portion (10) having a diameter greater than said stem (9) and said inner diameter (d2) of said second portion (5B) of said tubular body (5).

5. The button according to any of claims 1 to 4, wherein said elastic means (11) comprise a compression spring (11a) housed between said sliding element (8) and a bottom wall of said housing body (2).

6. The button according to any one of claims 1 to 5, comprising an abutment element (13) housed within said cavity (3) of the housing body (2), cooperating in an axial direction with said sliding element (8) on the side of said second end (8B) and, on the opposite side, with said housing body (2), said support means (12) being radially interposed between said abutment element (13) and said housing body (2).

Patentansprüche

1. Berger-Button (1), welcher freigebbar an einem Bogen (51) festlegbar und geeignet ist, mit einem Pfeil

(53) vor und während des Schritts des Lösens des Pfeils (53) von dem Bogen (51) zusammenzuwirken, wobei der Berger-Button aufweist:

- ein Gehäuse (2), in dessen Innerem eine im Wesentlichen zylindrische Kavität (3) definiert wird, ein Gleitelement (8), welches innerhalb der Kavität (3) gleitet und ein erstes Ende (8A) und ein zweites Ende (8B) aufweist, wobei das erste Ende (8A) sich nach außerhalb des Gehäuses (2) erstreckt, so dass es vor und während des Schritts der Freigabe des Bogens (51) mit dem Pfeil (53) zusammenwirkt, wobei das Gleitelement (8) durch elastische Mittel (11), die in der Kavität (3) des Gehäuses (2) angeordnet sind, elastisch belastet ist und frei um eine relative Achse (A) innerhalb der Kavität (3) des Gehäuses (2) drehen kann, **dadurch gekennzeichnet, dass** er Unterstützungsmittel (12) des Gleitelements (8), die innerhalb der Kavität (3) des Gehäuses (2) untergebracht sind, um das freie Drehen des Gleitelements (8) um die Achse (A) zu ermöglichen, aufweist, wobei die Unterstützungsmittel (12) ein Lager (12a) umfassen.
2. Button gemäß Anspruch 1, wobei das Gehäuse (2) ein becherförmiges Grundgehäuse (4), welches eine erste Halbkavität (3A) definiert, und ein röhrenförmiges Gehäuse (5), welches innen eine zweite Halbkavität (3B) definiert, umfasst, welche geeignet ist, wenigstens teilweise in die erste Halbkavität (3A) einzugreifen und in einstellbarer und freigebbarer Weise an dem Grundgehäuse (4) festlegbar ist, wobei die erste und zweite Halbkavität (3A, 3B) die Kavität (3) des Gehäuses (2) definieren.
3. Button gemäß Anspruch 2, wobei das röhrenförmige Gehäuse (5) einen ersten und einen zweiten Abschnitt (5A, 5B) umfasst, wobei der erste Abschnitt (5A) in einstellbarer und lösbarer Weise an dem Grundgehäuse (4) festlegbar ist, wobei der erste Abschnitt (5A) einen äußeren Durchmesser (D1) und einen inneren Durchmesser (d1) aufweist, die größer sind als der äußere Durchmesser (D2) bzw. der innere Durchmesser (d2) des zweiten Abschnitts (5B), wobei die zweite Halbkavität (3B) innen durch den ersten Abschnitt (5A) definiert wird, wobei der zweite Abschnitt (5B) innen eine dritte Kavität (6) definiert, die mit der zweiten Halbkavität (3B) in Verbindung steht, wobei das röhrenförmige Gehäuse (5) innen einen Absatz (7) zwischen dem ersten und zweiten Abschnitt (5A, 5B) definiert.
4. Button gemäß Anspruch 3, wobei das Gleitelement (8) einen Schaft (9) und einen Widerlagerabschnitt (10) an der Seite des ersten bzw. zweiten Endes (8A, 8B) umfasst, wobei der Widerlagerabschnitt

(10) einen Durchmesser aufweist, der größer als der Schaft (9) und der innere Durchmesser (d2) des zweiten Abschnitts (5B) des röhrenförmigen Gehäuses (5) ist.

5. Button gemäß irgendeinem der Ansprüche 1 bis 4, wobei die elastischen Mittel (11) eine Druckfeder (11a) umfassen, die zwischen dem Gleitelement (8) und einer Bodenwand des Gehäuses (2) untergebracht ist.
6. Button gemäß irgendeinem der Ansprüche 1 bis 5, umfassend ein Widerlagerelement (13), welches innerhalb der Kavität (3) des Gehäuses (2) untergebracht ist, in einer axialen Richtung mit dem Gleitelement (8) auf der Seite des zweiten Endes (8B) zusammenwirkt und, auf der entgegen gesetzten Seite mit dem Gehäuse (2) zusammenwirkt, wobei das Unterstüzungsmittel (12) radial zwischen dem Widerlagerelement (13) und dem Gehäuse (2) angeordnet ist.

Revendications

1. Un bouton de pression (1) pouvant être fixé de manière amovible à un arc (51) et adapté pour coopérer avec une flèche (53) avant et pendant l'étape de libération de la flèche (53) depuis l'arc (51), le bouton de pression (1) comprenant:

un corps de boîtier (2) définissant une cavité sensiblement cylindrique (3) dans celui-ci; un élément coulissant (8) coulissant à l'intérieur de la cavité (3) et ayant une première extrémité (8A) et une seconde extrémité (8B), la première extrémité (8A) s'étendant à l'extérieur du corps de boîtier (2) de manière à coopérer avec la flèche (53) avant et pendant l'étape de libération de l'arc (51); cet élément coulissant (8) étant chargé élastiquement par des moyens élastiques (11) logés à l'intérieur de la cavité (3) du corps de boîtier (2) et étant libre de tourner autour d'un axe relatif (A) à l'intérieur de ladite cavité (3) du corps de boîtier (2),

caractérisé en ce qu'il comprend des moyens de support (12) de l'élément coulissant (8) logés à l'intérieur de ladite cavité (3) du corps de boîtier (2) afin de permettre la libre rotation de l'élément coulissant (8) autour de l'axe (A), ces moyens de support (12) comprenant un palier (12a).

2. Le bouton selon la revendication 1, dans lequel le corps de boîtier (2) comprend un corps de base en forme de coupelle (4) définissant une première demi-cavité (3A) et un corps tubulaire (5) définissant intérieurement une seconde demi-cavité (3B), adapté

pour s'emboîter au moins partiellement avec ladite première demi-cavité (3A) et pouvant être fixé de manière ajustable et amovible au corps de base (4), les première et seconde demi-cavités (3A, 3B) définissant la cavité (3) du corps de boîtier (2).

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3. Le bouton selon la revendication 2, dans lequel le corps tubulaire (5) comprend une première et une seconde parties (5A, 5B), la première partie (5A) pouvant être fixée de manière ajustable et amovible au corps de base (4), la première partie (5A) ayant un diamètre extérieur (D1) et un diamètre intérieur (d1) respectivement supérieurs à un diamètre extérieur (D2) et à un diamètre intérieur (d2) de la seconde partie (5B), la seconde demi-cavité (3B) étant définie intérieurement par la première partie (5A), la seconde partie (5B) définissant intérieurement une troisième cavité (6) communiquant avec la seconde demi-cavité (3B), le corps tubulaire (5) définissant intérieurement un épaulement (7) entre les première et seconde parties (5A, 5B).
4. Le bouton selon la revendication 3, dans lequel l'élément coulissant (8) comprend une tige (9) et une partie de mise en butée (10) respectivement sur le côté des première et seconde extrémités (8A, 8B), la partie de mise en butée (10) ayant un diamètre supérieur à celui de la tige (9) et au diamètre intérieur (d2) de la seconde portion (5B) du corps tubulaire (5).
5. Le bouton selon l'une quelconque des revendications 1 à 4, dans lequel les moyens élastiques (11) comprennent un ressort de compression (11a) logé entre l'élément coulissant (8) et une paroi arrière du corps de boîtier (2).
6. Le bouton selon l'une quelconque des revendications 1 à 5, comprenant un élément de mise en butée (13) logé à l'intérieur de la cavité (3) du corps de boîtier (2), coopérant dans une direction axiale avec l'élément coulissant (8) sur le côté de la seconde extrémité (8B) et, sur le côté opposé, avec le corps de boîtier (2), les moyens de support (12) étant interposés radialement entre l'élément de mise en butée (13) et le corps de boîtier (2).

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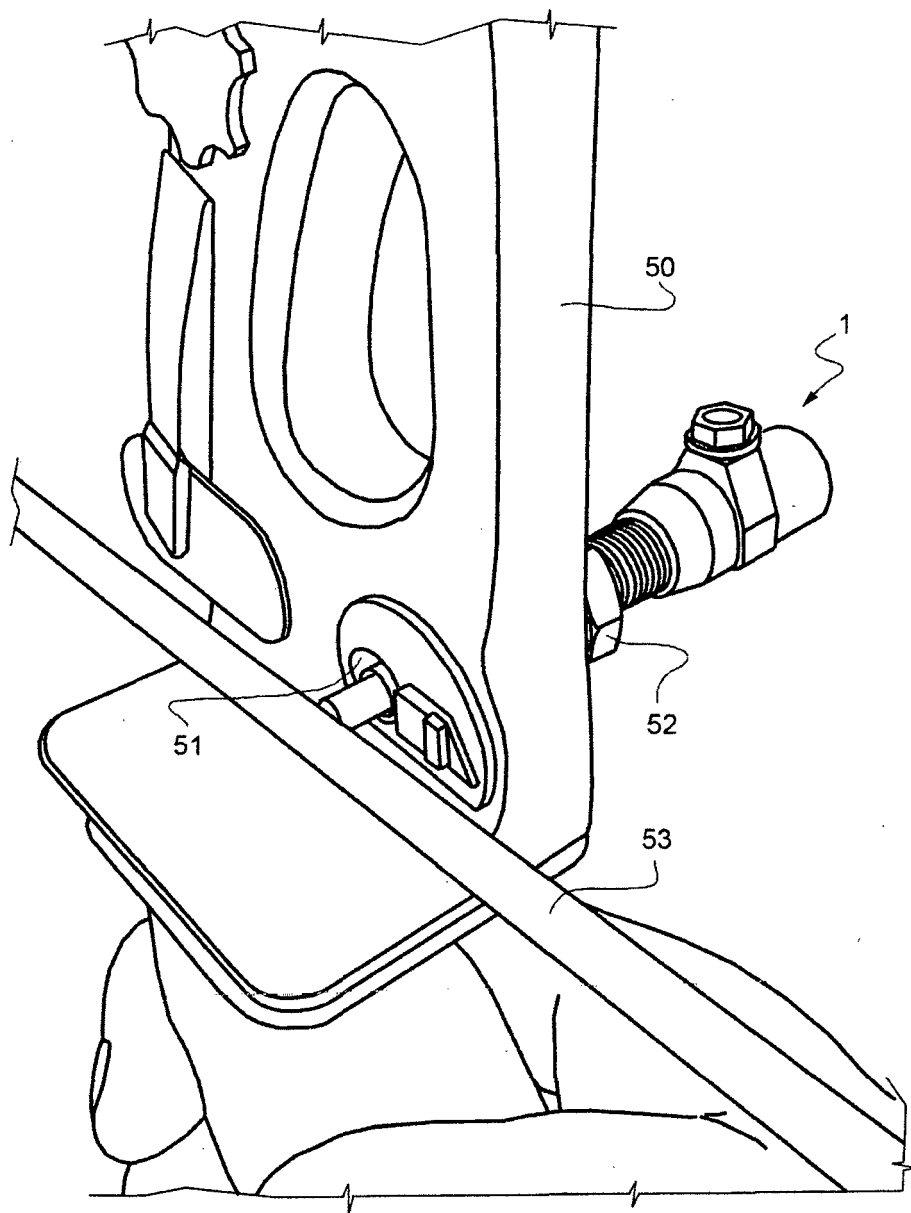
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FIG. 1



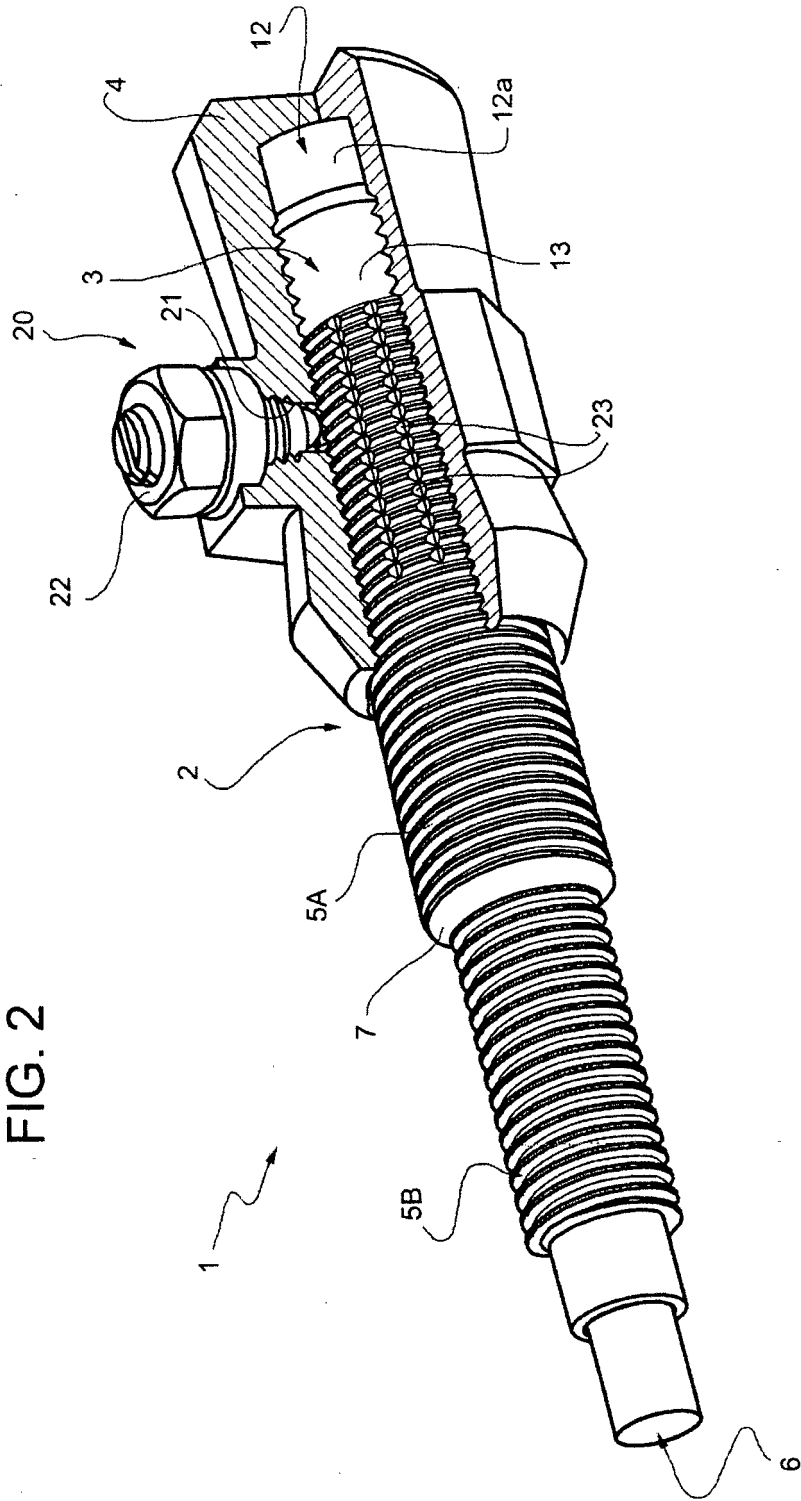
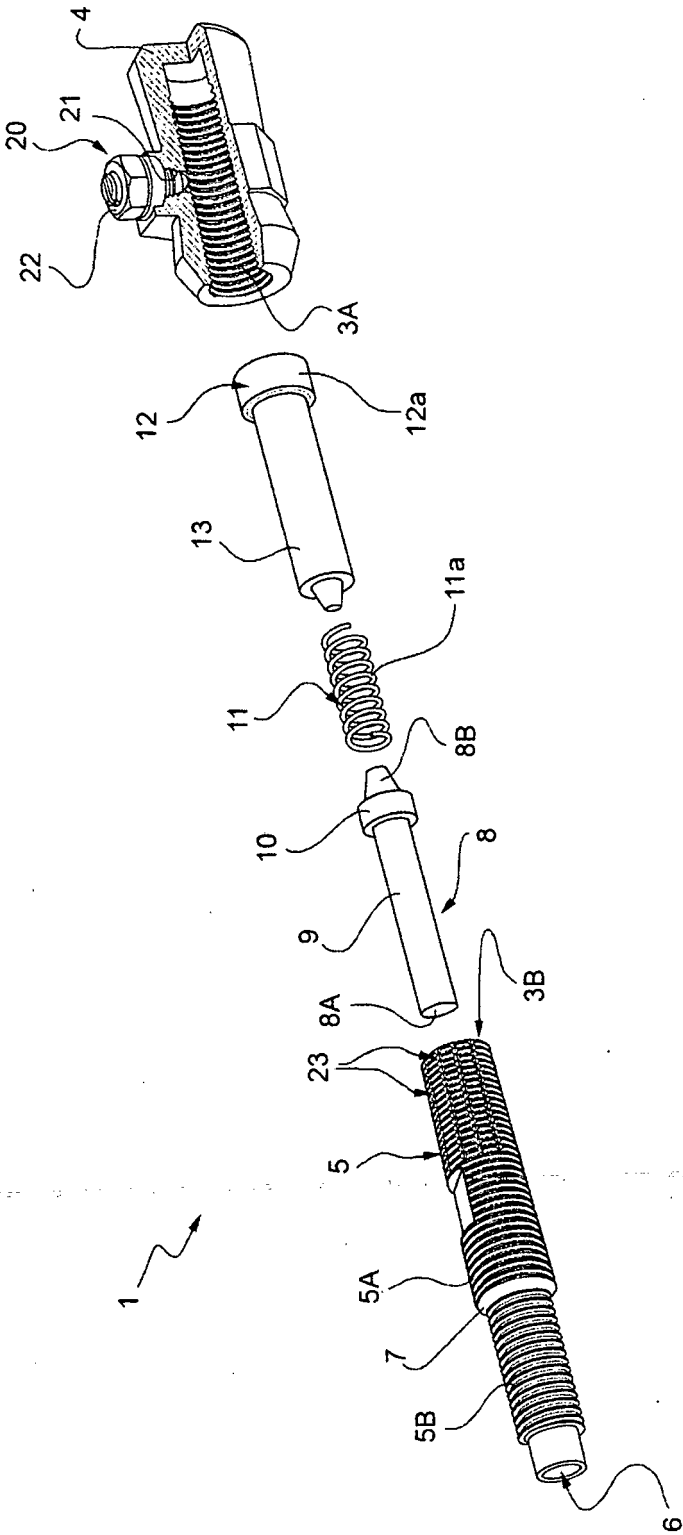


FIG. 3



REFERENCES CITED IN THE DESCRIPTION

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