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(54) Device for adjusting the position of a quarter with respect to the shell of a sports shoe

(57) A device for adjusting the position of a quarter with respect to the shell of a sports shoe comprises a base element (4) with which at least one slider (7) is slidingly associated and to which a tilting element (12), provided with an axial seat for a pawl (15), is pivoted. The tilting element is actuated by an eccentric element (36) which can in turn be activated by means of a knob (39) which can be operated by the user. There are also means for activating the eccentric element and for the selective interaction of the pawl with the shell.

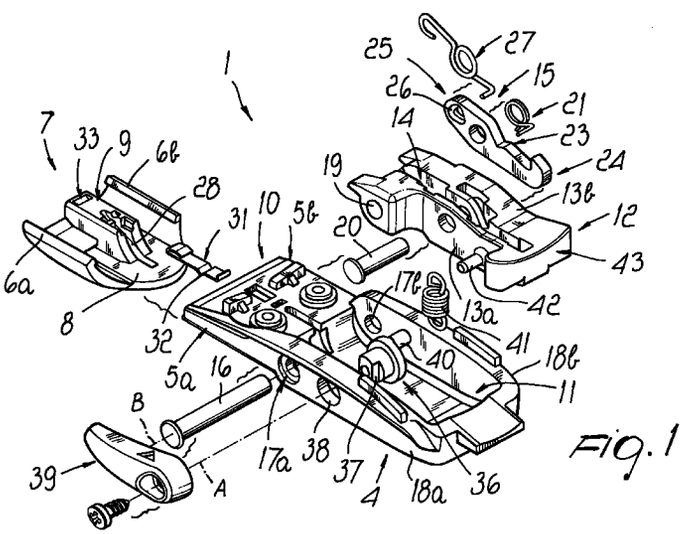

Fig. 1

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Description

[0001] The present invention relates to a device for adjusting the position of a quarter with respect to the shell of a sports shoe.

[0002] Conventional ski boots, for example, are provided with a shell to which at least one quarter is articulated approximately at the malleolar region. The quarter is allowed to oscillate forwards and backwards during sports practice.

[0003] A problem that is currently dealt with in the manufacture of ski boots is the possibility to control the oscillation of the quarter according to the specific sport or to any walking that the skier may have to do after disconnecting the boots from the skis.

[0004] In this regard, FR-A-2,647,649 discloses a ski boot constituted by a shell to which a quarter is articulated which comprises a tilting element which co-operates with a locator which is rigidly coupled to the shell in order to arrange the quarter in a chosen inclined position with respect to the shell.

[0005] The shoe also comprises adjustable means which co-operate with the locator in order to modify the static inclination of the quarter of the shoe. The adjustable means is constituted by a locator which can be moved by means of a screw and can be accessed by the user.

[0006] The actuation of the screw allows to vary the point where backward rotation is blocked for the quarter and therefore to vary its forward inclination.

[0007] The tilting element can be activated manually by the user so that it does not interact with the locator, thus allowing optimum free backward movement of the quarter in the walking mode.

[0008] This mode, however, is not very easy for the user, because achieving it entails simultaneously imparting a manual movement to the tilting element in order to move it away from the locator and a backward movement of the leg in order to prevent interaction with the locator.

[0009] Furthermore, in the walking mode the free movement of the quarter is limited by the tilting element, which can catch on or encounter obstacles between the support and the shell.

[0010] The above-described boot also allows only one single position during sports practice, namely one allowing free forward movement, the boot however is not adapted for all sports, such as for example slalom, downhill racing or mountain skiing.

[0011] E-P-A 0582803 discloses a mountain-skiing boot which comprises a shell to which a quarter is articulated so as to be able to oscillate. An eccentric element is rotatably associated with the quarter and interacts with a lever which is transversely articulated to the quarter and oscillates in contrast with a spring the other end whereof interacts with the quarter.

[0012] The end of the lever that interacts with the spring can be arranged in abutment at an adapted recess provided in the shell.

[0013] The articulation axis of the lever can be shifted vertically; this allows greater freedom of movement of the quarter and easier actuation of the device with respect to the previous solution, but still has the drawback that it allows free forward movement of the quarter and therefore does not allow to lock said quarter. As in the previously described boot, this is not ideal for the various kinds of skiing that can be performed.

[0014] EPA No. 95108268.4 discloses a device for adjusting the position of a quarter with respect to the shell of a sports shoe, which comprises a lever which can be actuated by the user. The position of the lever with respect to adapted tabs, springs and a toothed ring allows to block the oscillation of the quarter or to achieve its free oscillation when the quarter is flexed forwards and the free backward oscillation of the quarter for walking.

[0015] However, this boot is constructively very complicated, because it requires interaction among many components in order to achieve the chosen setting. Furthermore, if the user has preset a skiing position, thus either allowing the quarter to flex forwards or locking it, said position could not be kept "memorized" after selecting the condition for walking, making it necessary to set again either the locking of the quarter or the free forward flexing thereof.

[0016] EPA No. 95108268.4 discloses a device for adjusting the position of a quarter with respect to the shell of a sports shoe which comprises a knob, rotation of which entails an equal rotation of a plate and of an eccentric element which loads a spring which actuates the positioning of a tilting element, moving it closer or further away from the shell.

[0017] This boot allows to choose between the walking position and the skiing position, as required, at any time during sports practice, since the energy applied by the user to the eccentric element is accumulated by the spring, which forces the tilting element until it reaches a stable condition, allowing the quarter to assume an inclined skiing position and oscillate freely forwards, or a walking position, allowing free forward and backward oscillation.

[0018] As in the boot disclosed in patent EP-A-0582803, this device allows to achieve a single position for skiing which is preset by the manufacturer and therefore cannot be customized by the user in any way, at the same time allowing free oscillation of the quarter in a backward direction.

[0019] Accordingly, this boot does not allow complete forward and backward locking of the quarter with respect to the shell.

[0020] The aim of the present invention is therefore to solve the problems described above, eliminating the drawbacks of the prior art by providing a device which allows to achieve an adjustment of the position of a quarter with respect to the shell of a sports shoe while storing the positions selected by the user.

[0021] An important object is to provide a device which is compact with respect to conventional devices.

[0022] A further important object is to provide a device which is structurally more simple and therefore has low manufacturing costs.

[0023] Still a further important object is to provide a device whose actuation and operation are simple and intuitive for the user.

[0024] Still a further object is to provide a device which combines the above characteristics together with that of being reliable and safe in use and of being producible with conventional machines and equipment.

[0025] This aim, these objects and others which will become apparent hereinafter are achieved by a device for adjusting the position of a quarter with respect to the shell of a sports shoe, characterized in that it comprises a base element associated with a first actuation element for selecting either an active position, in which the backward oscillation of said quarter with respect to said shell is blocked, or an inactive position, in which said backward oscillation is free, a second actuation element, being associated with said base element, said second actuation element being distinct and separate from said first element and being adapted to select either a first configuration of said active position, in which the forward oscillation of said quarter with respect to said shell is blocked, and a second configuration of said active position, in which said forward oscillation is free.

[0026] Further characteristics and advantages of the invention will become apparent from the detailed description of a particular but not exclusive embodiment, illustrated only by way of nonlimitative example in the accompanying drawings, wherein:

Fig. 1 is an exploded view of the device;
Fig. 2 is a plan view of the device;
Fig. 3 is a sectional view, taken along the plane III-III of Fig. 2;
Fig. 4 is a sectional view, taken along the plane IV-IV of Fig. 2;
Figs. 5, 6 and 7 are views, similar to Figs. 2, 3 and 4, of a different arrangement of the device;
Figs. 8, 9 and 10 are views, similar to Figs. 2, 3 and 4, of another different arrangement of the device;
Figs. 11, 12 and 13 are views, similar to Figs. 2, 3 and 4, of another different arrangement of the device.

[0027] With reference to the above figures, the reference numeral 1 designates the device for adjusting the position of a quarter 2 with respect to the shell 3 of a sports shoe such as, for example, a ski boot or a skate.

[0028] The device is preferably applied at the rear region of the quarter 2 and is substantially constituted by a base element 4 which, at the surface that faces the quarter 2, has first lateral guides 5a, 5b for complementarily shaped first tabs 6a, 6b which are provided at the ends of a slider 7 whose cross-section is substantially U-shaped with an axial ridge 9 at the first base 8.

[0029] The slider 7 can therefore be slidingly associated at the end 10 of the base element 4 that is directed away from the ground or the snow.

[0030] A first seat 11 for a tilting element 12 is formed in the shell 4. The tilting element can be arranged thereat and is substantially U-shaped, and a second axial seat 14 for a pawl 15 is formed between the wings 13a, 13b of the tilting element.

[0031] The tilting element 12 is pivoted transversely to the base element 4, along a first axis B, by means of a first pivot 16, which passes at first holes 17a and 17b formed on the shoulders 18a and 18b of the base element 4, between which the first seat 11 is formed, and at second holes 19 which are formed proximate to the tips of the wings 13a and 13b of the tilting element 12.

[0032] The pawl 15 is in turn pivoted between the wings 13a and 13b by means of an adapted second pivot 20.

[0033] The pawl 15 is arranged within the second axial seat 14 and is forced into this position by a first torsion spring 21 which is accommodated at an adapted third seat 22 which is formed on one of said wings 13a, 13b and is arranged coaxially to the second pivot 20. The first spring 21 has an end which interacts with the back 23 of the pawl 15.

[0034] The pawl has a first end 24 which is directed towards the snow and forms a hook directed toward the shell 3.

[0035] The pawl 15 has a second end 25 at the opposite end. Second end 25 has a fourth seat 26 for the end of an elastic means for the selective interaction of said pawl with said shell. The elastic means is constituted by a second torsion spring 27, having a second end interacting in abutment at an inclined cavity 28 formed on the ridge 9 of the slider 7 at the end that is directed toward the tilting element 12. The inclined cavity 28 is blended with the first base 8 of said slider 7.

[0036] As shown for example in Figs. 3 and 6, the movement of the slider 7 forces a downward movement of the end of the second spring 27 accommodated in the inclined cavity 28, which in turn forces the oscillation of the pawl 15 and therefore the approach or arrangement of its first end 24, which is hook-shaped, at an adapted opening 29 formed on a plate 30 which is rigidly coupled to the shell 3 or is formed directly on said shell 3.

[0037] The sliding of the slider 7 with respect to the base element 4 is guided by an adapted third spring 21 which is axially associated with the base element 4 and protrudes from it toward the slider 7. The third spring 31 is a thin plate provided with a transverse ridge 32 for temporary engagement with a complementarily shaped fifth seat 33 formed on the ridge 9 at the opposite end with respect to the one provided with the inclined cavity 28.

[0038] The fifth seat 33 and said transverse ridge 32 allow to arrange the slider 7 in a temporary and stable

position with respect to the base element 4.

[0039] The slider 7 also has at least one second guide 34, at the first base 8 and at the opposite side with respect to the base element 4. A second tab 35 is slidingly arranged in the second guide 34 and is associated with the quarter 2 or with the base element 4.

[0040] The device 1 is also constituted by an eccentric element 36 arranged within the first seat 11 of the base element 4. The eccentric element 36 has a first axial stem 37 which forms a second axis A and protrudes outside the shoulder 18a of the base element 4 through an adapted third hole 38 formed therein. A knob 39 can be keyed to said first stem 36 and 37 and is accordingly arranged laterally to the shoulder 18b and can be easily gripped by the user.

[0041] The eccentric element 36 also has a second stem 40 which is axially offset and faces the wing 13a of the adjacent tilting element 12. The end of an elastic means, such as a fourth traction spring 41, is associated coaxially with the second stem. The spring is associated, at its other end, with a third pivot 42 which protrudes from the wing 13a of the tilting element 12.

[0042] A thinner region is formed in said wing 13a in order to allow to accommodate the eccentric element 36 and the fourth spring 41.

[0043] Before describing the operation, it should be noted that the terms "WALK" or "inactive position" designate a condition of the device which allows the user to walk, while the expression "active position" designates the state of the device that allows to ski.

[0044] Furthermore, within the active position, the term "SLALOM" or "first configuration" designates a condition of the device which blocks any forward and backward movement of the quarter, while the term "CARVE" or "second configuration" designates a condition for the device in which the quarter can oscillate freely forwards.

[0045] Assuming that the initial position allowed by the device is the one designated as WALK or inactive, and therefore the position for walking, the skier can select one of two distinct configurations of the active position in order to ski; this is done by moving the slider 7 vertically and turning the knob 39 through 180°.

[0046] The walking position is illustrated in Figs. 2 to 6: in this position, the tilting element 12 is moved backwards with respect to the shell 3, so as to allow free forward and backward oscillation of the quarter with respect to the shell.

[0047] If the skier wishes to pass to the active skiing condition, he can for example turn the knob 39 through 180°, as shown in Figs. 9 to 13.

[0048] This rotation forces an equal rotation of the eccentric element 36 which is connected to the fourth spring 41, which moves the tilting element 12, forcing it to rotate so that the second base 43 of the tilting element 12 that connects the wings 13a and 13b is arranged adjacent to an abutment 44 formed at the facing surface of the shell 3.

[0049] Any backward oscillation of the quarter is therefore contrasted by the tilting element 12, because the second base 43 thereof rests in abutment against the locator 44.

[0050] It is evident that in passing from the inactive position to the active position the device maintains the configuration of the active position that had been set earlier.

[0051] Figs. 5 to 10 in fact show that the slider 7 is shifted downwards toward the ground with respect to the base element 4, thus determining the first configuration ("SLALOM") of the device. The second spring 27 in fact forces the pawl 15 to oscillate so that its first end 24, which is hook-shaped, tends to protrude from the second axial seat 14 formed on the tilting element 12, thus overcoming the force of the first spring 21.

[0052] If the user turns the knob 39 through 180°, the knob forces the oscillation of the tilting element as mentioned earlier, making the second base 43 abut again against the locator 44 provided on the shell 3 and simultaneously allows to arrange the first hook-shaped end 24 of the pawl 15 at the opening 29 formed in the plate 30 or directly in the shell 3.

[0053] In this way, the pawl 15 prevents any forward oscillation of the quarter and the tilting element 12 prevents any backward rotation of the quarter.

[0054] As in the preceding case, the simple rotation of the knob 39 allows the user to reposition the quarter in the WALK position for walking and vice-versa because the device maintains the configuration for the previously selected type of skiing.

[0055] If one wishes to pass from the first configuration to the second configuration while remaining in the active position, as shown in Figs. 8 to 13, it is sufficient for the user to move the slider 7 upwards, thus obtaining the second configuration ("CARVE"). The upward sliding of the slider 7 in fact produces a counterclockwise rotation of the second spring 27 and in particular lifts its lower end, which is connected to the pawl 15, forcing the oscillation of said pawl in a clockwise direction, making the first end 24 disengage from the opening 29. The quarter is therefore allowed to oscillate freely forwards, while the backward oscillation is still blocked by the tilting element 12.

[0056] In passing from the second configuration of the active position to the inactive position the set configuration is maintained also in this case because the position of the pawl 15 is not altered, as shown in Figs. 11 to 13 and 2 to 4.

[0057] Therefore, the device memorizes the different configurations set in the active position when passing to the "WALK" position or inactive position. As shown in Figs. 2, 3 and 4, the pawl 15 is in fact fully accommodated within the second axial seat 14 formed in the tilting element 12, as shown in Figs. 11, 12 and 13, while as shown in Figs. 5, 6 and 7 the pawl 15 is slightly rotated and therefore its first hook-shaped end 24 protrudes slightly from the second axial seat 14, as shown

in Figs. 8, 9 and 10.

[0058] It has thus been observed that the invention has achieved the intended aim and objects, a device having been provided which makes it easier and more comfortable for the user to position the quarter with respect to the shell, remembering the selected operating positions and decreasing the dimensions, the bulk and the production costs.

[0059] The device in fact allows to achieve multiple configurations in the active skiing position and allows to select at any time the walking position while the preceding skiing configuration used continues to be preset and therefore "memorized" and is automatically restored when the walking position is abandoned.

[0060] Furthermore, the components of the device are all grouped within the base element 4 and accordingly the device is compact.

[0061] Furthermore, the device is intuitive in terms of operation for the user, making it even easier to use.

[0062] The device according to the invention is of course susceptible of numerous modifications and variations, within the scope of the appended claims.

[0063] The materials and the dimensions that constitute the individual components of the device may also be the most pertinent according to the specific requirements.

[0064] The disclosures in Italian Patent Application No. TV97A000162 from which this application claims priority are incorporated herein by reference.

[0065] 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 device for adjusting the position of a quarter (2) with respect to the shell (3) of a sports shoe, characterized in that it comprises a base element (4) associated with a first actuation element (39) for selecting either an active position, in which the backward oscillation of said quarter with respect to said shell is blocked, or an inactive position, in which said backward oscillation is free, a second actuation element, being associated with said base element (4), said second actuation element being distinct and separate from said first element and being adapted to select either a first configuration of said active position, in which the forward oscillation of said quarter with respect to said shell is blocked, and a second configuration of said active position, in which said forward oscillation is free.

2. A device according to claim 1, characterized in that said first actuation element comprises a knob (39) which is associated with said base element (4) so that it can rotate about a second axis (A) and actuates, by means of an actuator, a tilting element (12) which is associated with said base element so that it can rotate about a first axis (B) which is parallel to said second axis (A) and selectively interacts with said shell in order to define said active and inactive positions.

3. A device according to claim 2, characterized in that said second actuation element comprises a slider (7) which is slidingly associated with said base element (4) and actuates a pawl (15) which is supported by said tilting element (12) and selectively interacts with said shell (3) in order to define said first and second configurations of said active position.

4. A device according to claim 3, characterized in that said base element (4) has, at the surface that is directed toward said quarter, first lateral guides (5a, 5b) for complementarily shaped first tabs (6a, 6b) provided at the ends of said slider (7), which has a substantially U-shaped cross-section with an axial ridge (9) at the first base (8).

5. A device according to claim 3, characterized in that said slider (7) is slidingly associated at the end (10) of said base element (4) that is directed away from the ground or snow, a first seat being formed in said base element for said tilting element (12), said tilting element (12) being arrangeable thereat and having a substantially U-shaped configuration between the wings of which there is a second axial seat (14) for accommodating said pawl (15).

6. A device according to claim 3, characterized in that said tilting element (12) is pivoted transversely to said base element (4) along said first axis (B) by means of a first pivot (16) which passes at first holes (17a, 17b) which are formed in the shoulders (18a, 18b) of said base element (4) and between which said first seat (11) is formed, and at adapted second holes (19) which are provided proximate to the tips of said wings (13a, 13b) of said tilting element (12).

7. A device according to claim 5, characterized in that said pawl (15) is pivoted between said wings (13a, 13b) by means of an adapted second pivot (20), said pawl (15) being accommodated within said second axial seat (14) and being forced into said position by a first torsion spring (21) which is accommodated at an adapted third seat (22) formed in one of said wings (13a, 13b) and arranged coaxially to said second pivot (20), said first spring (21) having an end which interacts with the back (23) of said pawl (15).

8. A device according to claim 3, characterized in that said pawl (15) has a first end (24) which is directed toward the snow and has a hook-shaped configuration directed toward said shell (3).

9. A device according to claims 4 and 8, characterized in that said pawl (15) has, in the opposite region with respect to said first end (24), a second end (25) at which there is a fourth seat (26) for the end of an elastic means for the selective interaction of said pawl with said shell, said elastic means being constituted by a second torsion spring (27), the other end of which interacts by abutment at an inclined cavity (28) formed on said ridge (9) of said slider (7) at the end that is directed toward said tilting element (12), said inclined cavity (28) being blended with said first base (8) of said slider (7).

10. A device according to claim 9, characterized in that the downward movement of said slider (7) forces said end of said second spring (27), accommodated in said inclined cavity (28), to move downwards, in turn forcing the oscillation of said pawl (15) and the approach or arrangement of said first hook-shaped end (24) at an opening (29) formed in said shell (3) or in a plate (30) which is rigidly associated with said shell.

11. A device according to claim 9, characterized in that the sliding of said slider (7) with respect to said base element (4) is guided by an adapted third spring (21) which is axially associated with said base element (4) and protrudes from it toward said slider (7), said third spring (21) being in the form of a thin plate provided with a transverse ridge (32) for temporary engagement with a complementarily shaped fifth seat (33) formed on said ridge (32) at the opposite end with respect to the one provided with said inclined cavity.

12. A device according to claim 11, characterized in that said fifth seat (33) and said transverse ridge (32) allow to arrange said slider (7) in a temporary and stable position with respect to said base element (4).

13. A device according to claim 12, characterized in that said slider (7) advantageously has, at said first base (8) and on the opposite side with respect to said base element, at least one second guide (34) in which a second tab (35) is slidingly positioned, said second tab (35) being associated with said quarter (2) or with said base element (4).

14. A device according to one or more of the preceding claims, characterized in that said actuator is constituted by an eccentric element (36) which is rigidly associated with said knob (39) and can rotate with it with respect to said base element (4).

15. A device according to claim 14, characterized in that said eccentric element (36) is arranged in said first seat (11) of said base element (4), said eccentric element (36) having a first axial stem (37) which forms said second axis (A) which protrudes outside one of said shoulders (18a) of said base element (4) through an adapted third hole (38) formed therein, said knob (39), which is arranged laterally to said shoulder (38a) and can be gripped by the user, being associable with said first stem by keying.

16. A device according to claim 15, characterized in that said eccentric element (36) has a second axially offset stem (40) which faces one of said wings (13a) of said adjacent oscillating element (12), the end of an elastic element, such as a fourth traction spring (41), being associated coaxially with said second stem (40), said spring being associated, at its other end, with a third pivot (42) which protrudes from one of said wings (13a) of said tilting element (12).

17. A device according to claim 16, characterized in that a thinner region is formed in one of said wings (13a) and allows to accommodate said eccentric element (36) and said fourth spring (41).

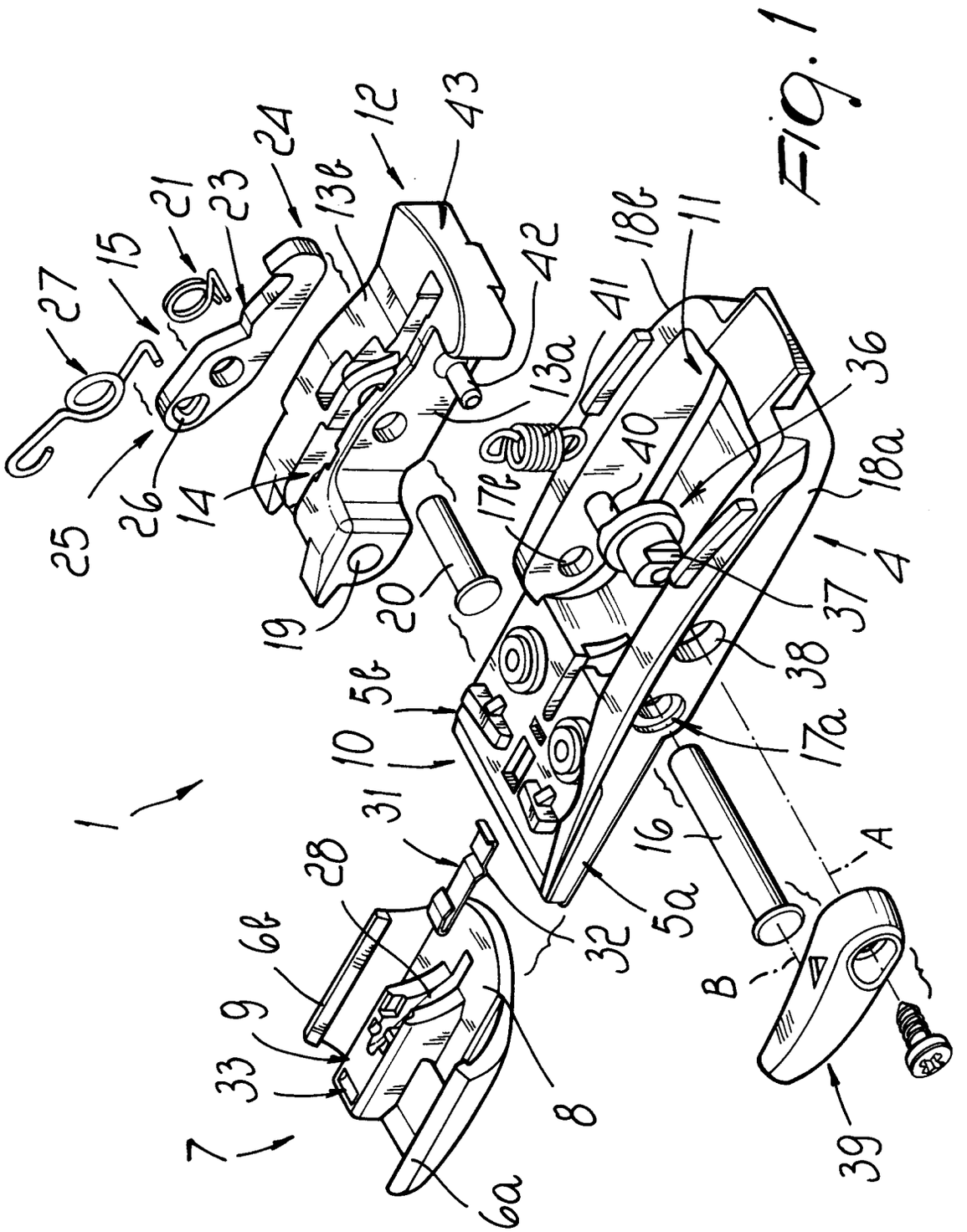
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Fig. 1

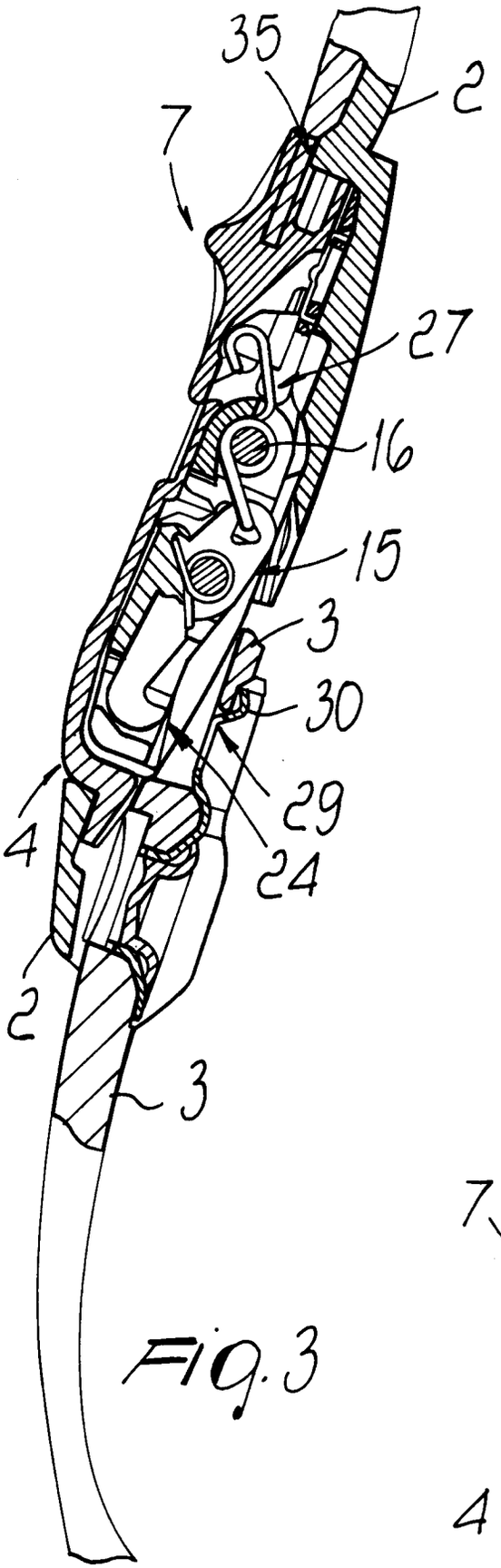

Fig. 3

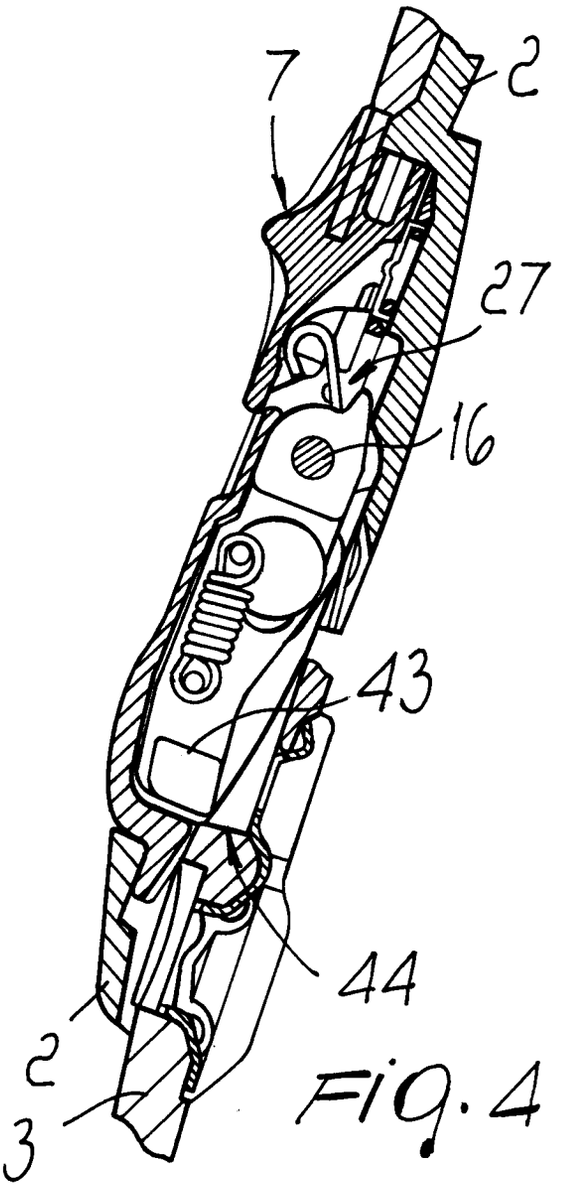

Fig. 4

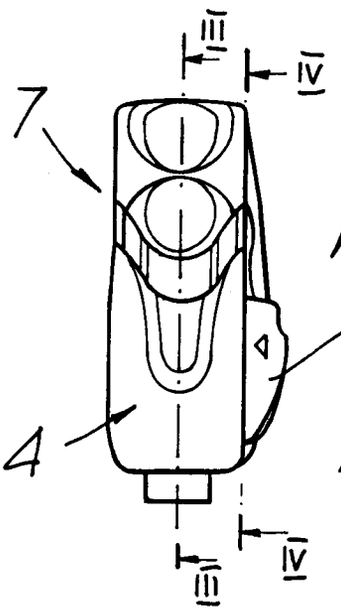

Fig. 2

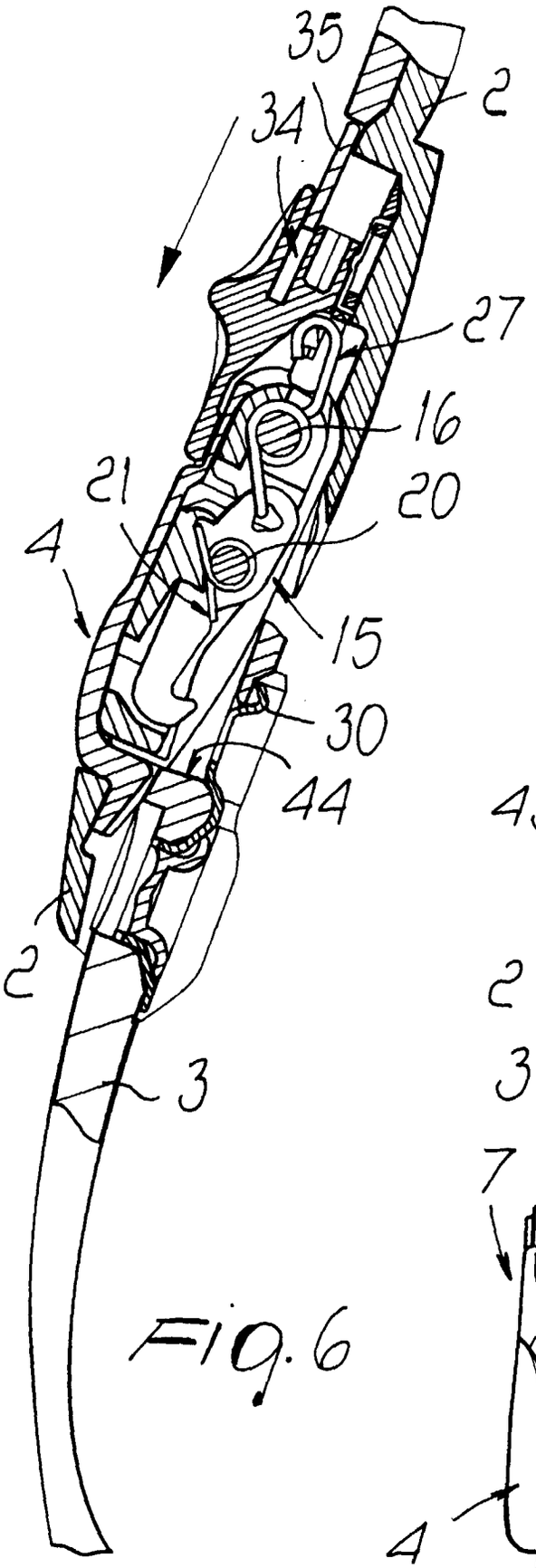

FIG. 6

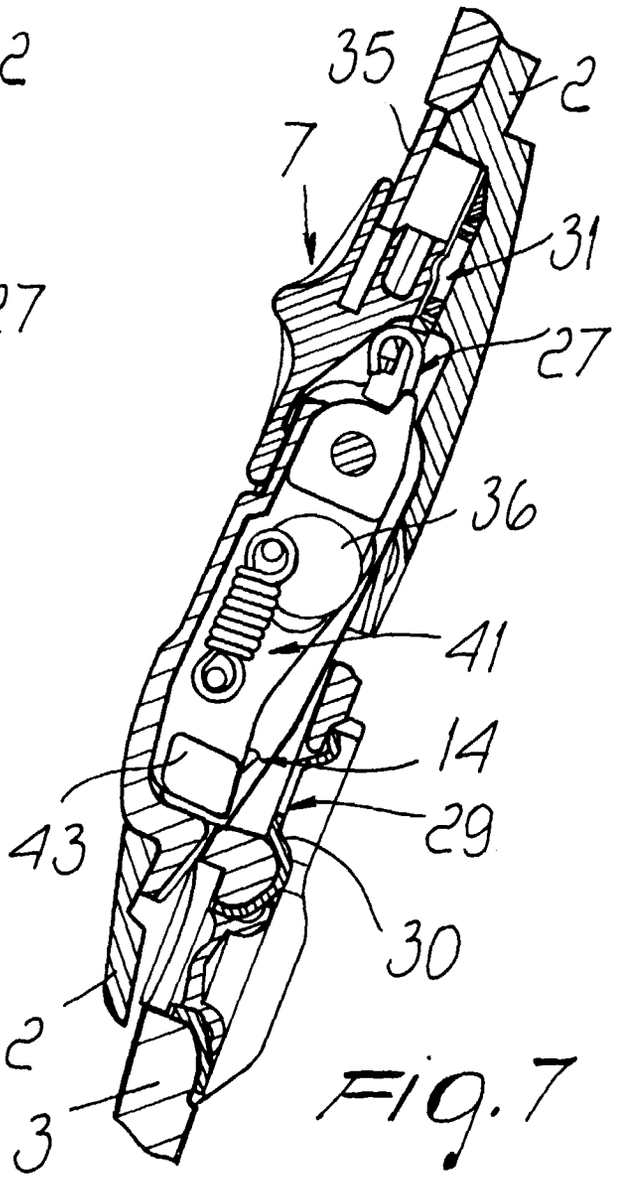

FIG. 7

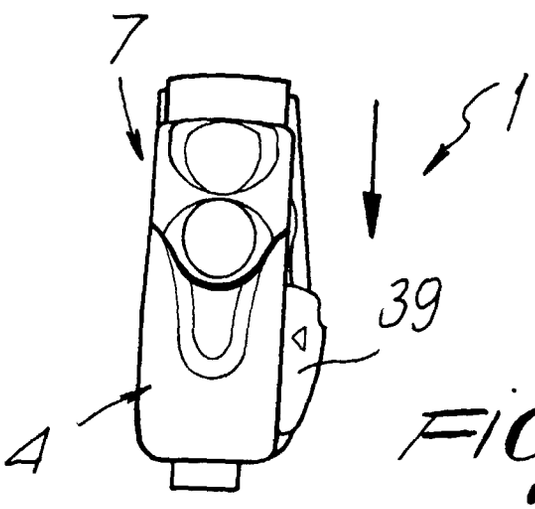

FIG. 5

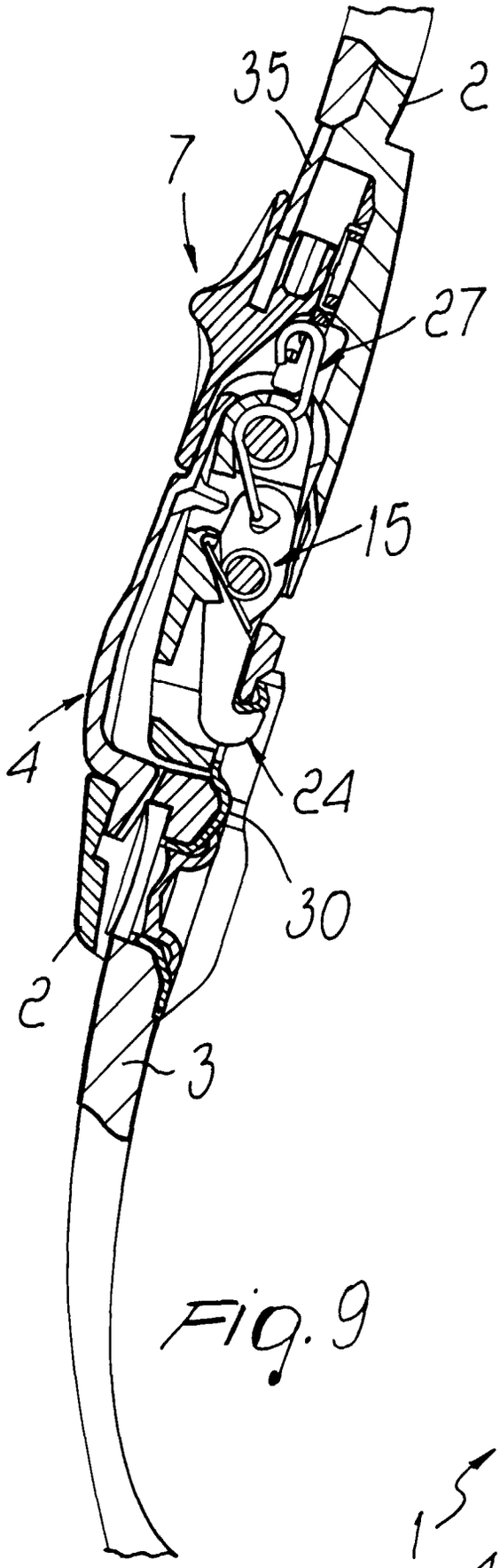

Fig. 9

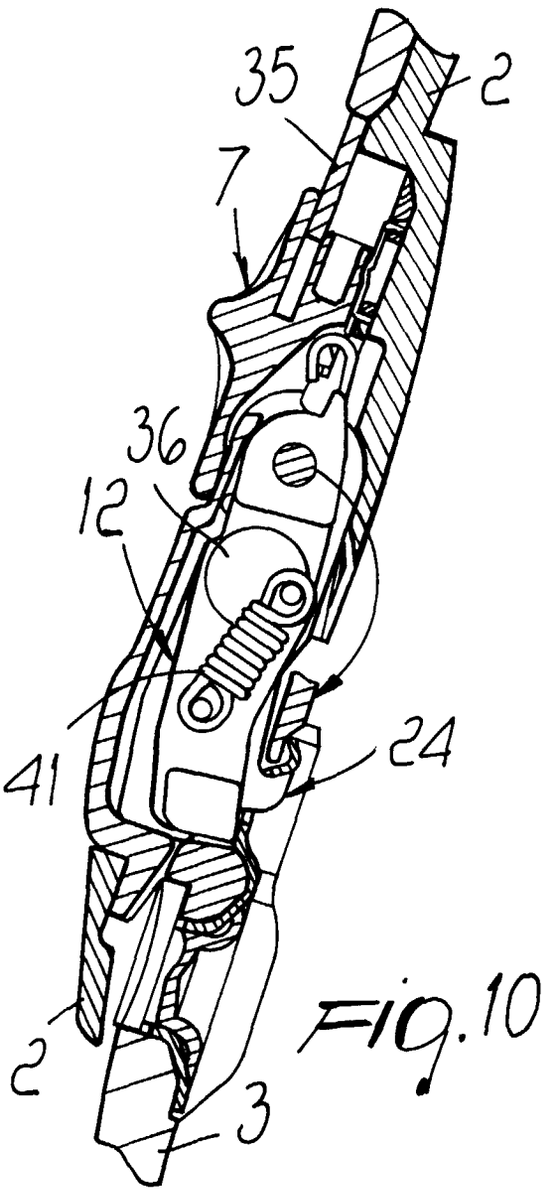

Fig. 10

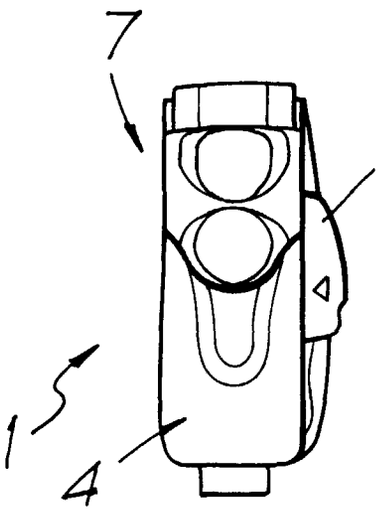

Fig. 8

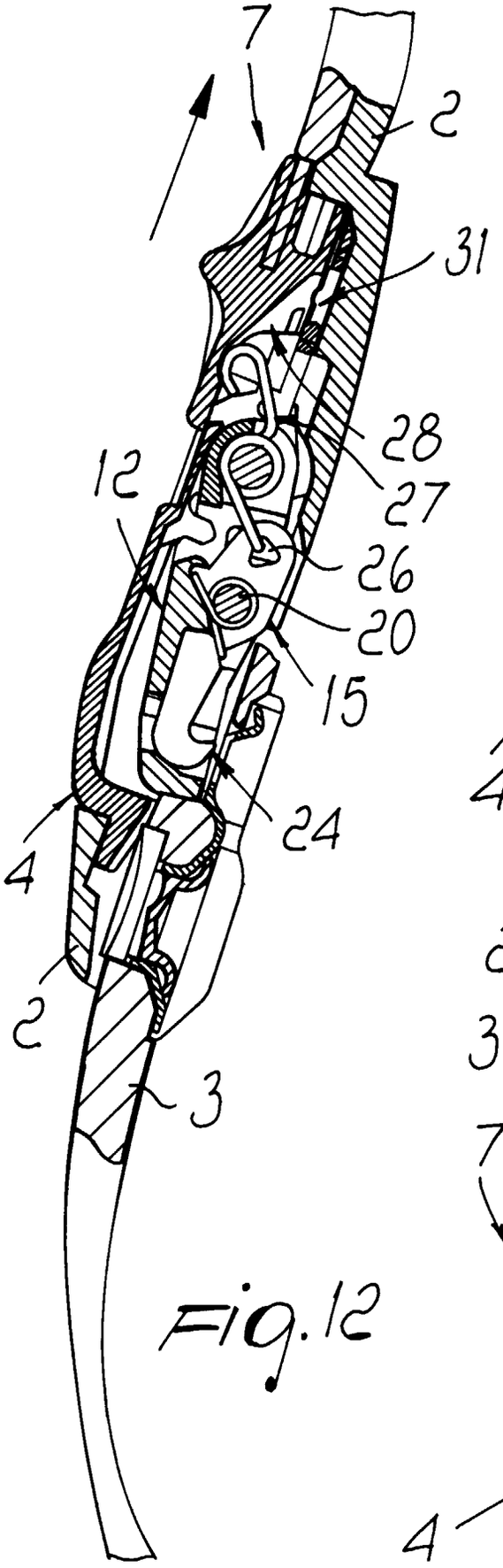

Fig. 12

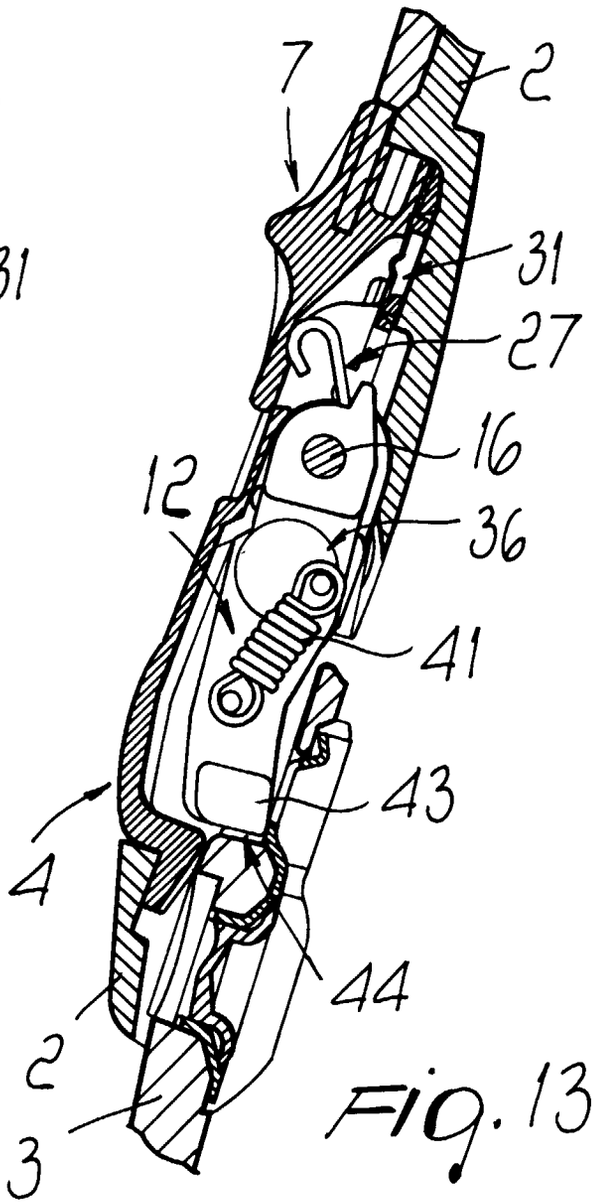

Fig. 13

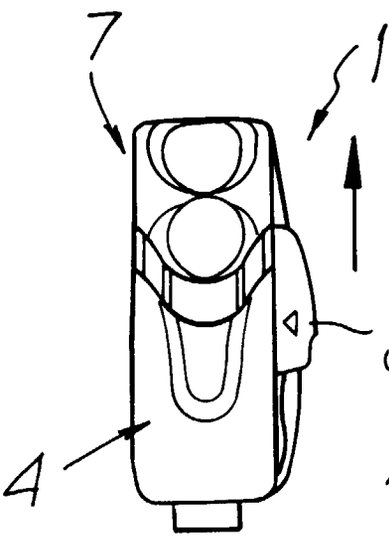

Fig. 11

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EUROPEAN SEARCH REPORT

Application Number
EP 98 12 1528

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	2 February 1999	Declerck, J

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