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

(11) **EP 1 815 762 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
08.08.2007 Bulletin 2007/32

(51) Int Cl.:
A43B 5/14 *(2006.01)*

(21) Application number: **07101215.7**

(22) Date of filing: **26.01.2007**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

(30) Priority: **01.02.2006 IT TV20060009**

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(54) **Flex control device particularly for a motocross boot**

(57) A flex control device (50), particularly for the quarter (4) of a motocross boot, which comprises a soft upper (2) provided at the rear with a semirigid cuff (7) and a semirigid counter (8), which are connected respectively to the upper (2) and to the upper (2) and/or sole (5). The device is constituted by a first rod-like element (19) and a second rod-like element (20), the first rod-like element (19) being rigidly coupled to the counter (4), the second one (20) being selectively associable with the quarter (4), the first and second rod-like elements (19, 20) being slidingly associated in contrast with at least one elastically deformable element (31).

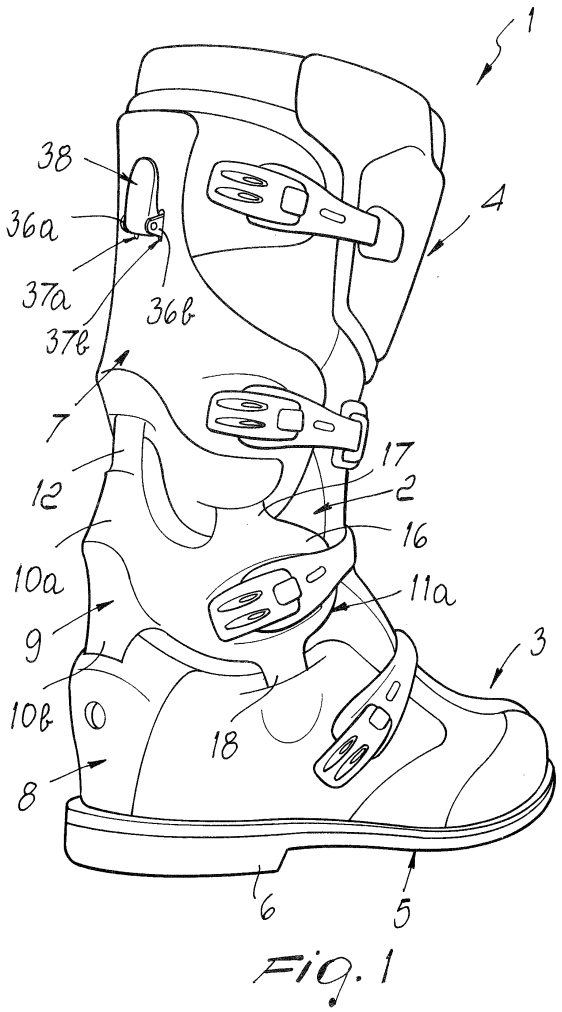

Fig. 1

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Description

[0001] The present invention relates to a flex control device particularly for a motocross boot.

[0002] Boots are currently used, particularly for practicing motocross, which comprise a soft upper with which stiffening and protection elements are associated; such elements are typically made of rigid plastic material, such as for example front plates, a toe cap, a heel counter and a rear cuff.

[0003] In particular, EPA. 03016526.0 of July 23, 2003 discloses a sports shoe, particularly for the practice of motocross, which comprises a soft upper with the rear of which a semirigid cuff, which partially surrounds the lower part of the leg of the user, and a semirigid counter, which wraps around the heel of the user, are separately associated.

[0004] Such sports shoe comprises an additional semirigid element which is approximately cross-shaped so as to form two first wings, which are arranged approximately vertically and to the rear and longitudinally with respect to the upper, and two second wings, which are arranged approximately transversely to the upper so as to wrap laterally around the malleolar region.

[0005] The first two wings form respectively a first tab, which protrudes approximately vertically toward the overlying cuff, and a second tab, which protrudes approximately vertically towards the underlying counter, and engage slidingly respectively in first and second receptacles formed respectively in the cuff and in the counter.

[0006] A reinforcement element adapted to protect the malleoli is provided at the tips of the second wings, and third and fourth tabs protrude from said reinforcement element respectively toward the cuff and toward the counter and engage slidingly respectively third and fourth receptacles formed respectively in the cuff and in the counter.

[0007] The positioning distances between the counter, the semirigid element and the cuff allow the sliding engagement of the various tabs in the respective receptacles, so as to allow the foot of the user to perform both forward or backward flexing and lateral movement to the right or to the left or a combination thereof; said sports shoe allows the user to maintain very good foot insertion, to perform a correct and guided movement of the system formed by the foot and the ankle, and at the same time ensures support and protection of said foot and ankle.

[0008] Currently, in the practice of motocross it is common for the motorcyclist to stand for most of the time, resting on the footrests of the motorcycle with the region of the sole of the boot that corresponds to the forefoot and/or toes.

[0009] This riding position, particularly during landing after a jump, which is frequent during motocross, entails a large and sudden flexing of the tibia toward the toe of the foot, thus imparting considerable stresses to the Achilles tendon, which can lead to inflammation or even rupture thereof.

[0010] The above mentioned known types of boot, while being able to guide the movements of the foot and of the ankle, do not provide optimum protection to the Achilles tendon.

[0011] The aim of the present invention is to solve the above described problems, eliminating the drawbacks of the cited background art, by providing a device which allows to provide, particularly during the practice of motocross, adequate protection to the Achilles tendon of the user.

[0012] Within this aim, an object of the invention is to provide a device which can be adapted quickly and easily to the various riding positions which can be adopted by each user and to the different shapes of the leg and of the foot of the various users.

[0013] Another object is to provide a device which is structurally simple and has low manufacturing costs.

[0014] This aim and these and other objects which will become better apparent hereinafter are achieved by a flex control device, particularly for the quarter of a motocross boot, which comprises a soft upper provided at the rear with a semirigid cuff and a semirigid counter, which are connected respectively to said upper and to said upper and/or sole, characterized in that it is constituted by a first rod-like element and a second rod-like element, the first rod-like element being rigidly coupled to said counter, the second one being selectively associable with said quarter, said first and second rod-like elements being slidingly associated in contrast with at least one elastically deformable element.

[0015] Further characteristics and advantages of the invention will become better apparent from the following detailed description of a particular but not exclusive embodiment thereof, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a perspective view of a motocross boot with a device according to the invention applied thereto;

Figure 2 is a perspective view of the cuff, of the counter and of the semirigid element of the boot of Figure 1, with a device according to the invention applied thereto;

Figures 3 and 4 are front views of a device according to the invention in two different operating conditions;

Figure 5 is a sectional view, taken along a plane which passes through the longitudinal central axis of the device, of the cuff, counter and semirigid element of the boot of Figure 1;

Figure 6 is a view of a detail of Figure 5 in a different operating condition.

[0016] In the exemplary embodiments that follow, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other exemplary embodiments.

[0017] Moreover, it is noted that anything found to be

already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0018] With reference to the figures, the reference numeral 1 designates a motocross boot which comprises a soft upper 2, which is preferably shaped like an ankle-boot so as to form a lower portion 3, which during use covers the foot of the user, and a contiguous quarter 4, which affects the region from the ankle up to part of the tibia.

[0019] A sole 5 is associated in a lower region with the upper 2 and is provided at the rear with a heel 6.

[0020] A semirigid cuff 7 is rigidly associated or provided to the rear of the upper 2, in the region of the quarter 4, and during use wraps around the lower and rear part of the leg of the user.

[0021] A semirigid counter 8 is associated with the lower portion 3 of the upper 2 at the rear, at the region of the heel 6, surrounds the heel of the user during use and is connected to the upper 2 and/or the sole 5.

[0022] Advantageously but not necessarily, in a region which is intermediate between the counter 8 and the overlying cuff 7, a semirigid element 9 is associated or rigidly coupled to the upper 2 and is approximately cross-shaped so as to form two first wings 10a, 10b, which are arranged approximately vertically and to the rear and longitudinally with respect to the upper 2, and two second wings 11a, 11b, which are arranged approximately transversely to the upper 2, so as to wrap around, in a rear region, the adjacent region of the leg and laterally the malleoli.

[0023] The two first wings 10a and 10b form respectively a first upper tab 12, which protrudes approximately vertically toward the overlying cuff 7, and a second lower tab 13, which protrudes approximately vertically toward the underlying counter 8; said tabs engage slidingly respectively in first and second receptacles or seats, designated respectively by the reference numerals 14 and 15 and provided respectively within the cuff 7 and the counter 8.

[0024] Approximately at the tips of the second wings 11a and 11b there is a thicker region or reinforcement element 16, which is adapted to protect the malleoli and from which a third tab and a fourth tab, designated respectively by the reference numerals 17 and 18, protrude respectively toward the cuff 7 and the counter 8 and engage slidingly and respectively third and fourth receptacles or seats, which are not shown in the accompanying figures and are provided respectively inside the cuff 7 and the counter 8.

[0025] The boot 1 comprises at least one device 50 for controlling the flexing of the quarter 4, which is constituted advantageously by a first rod-like element and a second rod-like element, designated respectively by the reference numerals 19 and 20, which are respectively rigidly coupled to the counter 8 and selectively associable with said cuff.

[0026] Advantageously, the first rod-like element 19 and the second rod-like element 20 lie, during use, on planes which are substantially parallel and mutually spaced.

[0027] Advantageously, the first and second rod-like elements can slide freely with respect to the semirigid element 9, if provided, preferably without making direct contact therewith.

[0028] Advantageously, the first rod-like element 19 is constituted by a first strip 21, which is fixed inside the counter 8, for example by means of one or more fixing elements such as screws or rivets 22 associated with an appropriately provided first hole 23 which is formed at the end of the first strip 21, which is adjacent to the sole 5.

[0029] Two first rods, designated respectively by the reference numerals 24a and 24b, protrude axially toward the cuff 7 from the free end of the first strip 21 directed toward said cuff 7, preferably have an approximately circular cross-section, are substantially mutually parallel and lie approximately on the same plane of arrangement as the first strip 21; advantageously, the first free ends, designated respectively by the reference numerals 25a and 25b, of the first rods 24a and 24b are bent approximately at right angles on mutually opposite sides.

[0030] Advantageously, the first rod-like element 19 protrudes upward with respect to the counter 8 and is arranged so that the respective first rods 24a and 24b lie approximately at a central region of the semirigid element 9.

[0031] Advantageously, the first rod-like element 9 cooperates with appropriately provided first guiding means for guiding the sliding motion with respect to the counter 8, said first guiding means being constituted advantageously by a first bridge 26, which protrudes inside the counter 8 and surrounds, during use, the first strip 21, so as to keep it slidingly coupled to the counter 8.

[0032] Advantageously, the second rod-like element 20 comprises a second strip 27, which is slidingly and selectively associable with the cuff 7 by way of adjusting means for adjusting its position.

[0033] Two second rods, designated respectively by the reference numerals 28a and 28b, protrude axially from the end of the second strip 27 which is directed toward the counter 8, have a preferably approximately circular cross-section, are approximately mutually parallel, and lie approximately on the same plane of arrangement as the second strip 27; advantageously, the second free ends, designated respectively by the reference numerals 29a and 29b, of the second rods 28a and 28b are bent approximately at right angles on mutually opposite sides.

[0034] Advantageously, the second rod-like element 20 protrudes below the cuff 7, being arranged so that the respective second rods 28a, 28b lie at an approximately central region of the semirigid element 9, if provided, so that the second rods 28a and 28b are superimposed and spaced with respect to the first rods 24a, 24b of the first rod-like element 19; advantageously, the second free ends 29a, 29b of the second rods 28a, 28b are positioned

at a lower height than the first free ends 25a, 25b of the contiguous first rods 24a, 24b.

[0035] Advantageously, the position of the second strip 27 with respect to the cuff 7 is guided by appropriately provided second guiding means, which are constituted advantageously by a second bridge 30, which protrudes inside the cuff 7 and surrounds, during use, the second strip 27, so as to keep it slidingly coupled to the cuff 7.

[0036] The first and second rod-like elements are mutually slidingly associated in contrast with at least one elastically deformable element, which is constituted advantageously by at least one spring 31 which is arranged coaxially to the first and second rods and is interposed between the first and second free ends of said first and second rods.

[0037] Advantageously, the spring 31 is preloaded, so that it applies constantly a thrust to the first and second free ends of the first and second rods, respectively; the thrust of the spring 31 tends to move the first free ends 25a, 25b away from the second free ends 29a, 29b, so as to move mutually closer, in the longitudinal direction, the first strip 21 and the second strip 27.

[0038] Advantageously, the means for adjusting the position of the second rod-like element 20 with respect to the cuff 7 are constituted by a plate 32, which is approximately U-shaped in plan view so as to form an approximately flat base 33, which during use is arranged approximately parallel to the second strip 27 on the opposite side with respect to the cuff 7.

[0039] A pin 34 protrudes approximately at right angles to the base 33 toward the second strip 27 and can engage selectively, during use, one of one or more second holes 35 which are provided in the second strip 27 and are advantageously aligned approximately along the longitudinal central axis of said strip.

[0040] Two arms, designated respectively by the reference numerals 36a and 36b, protrude at right angles to the base 33 and are arranged during use so as to surround laterally the second strip 27, protruding with their respective free ends through two appropriately provided slots 37a, 37b formed in the cuff 7.

[0041] The mutual distance between the base 33 and the second strip 27 can be adjusted by way of appropriate distance adjustment means, so as to allow insertion or extraction of the pin 34 with respect to the chosen hole among the second holes 35.

[0042] Said adjustment means are constituted advantageously by a lever 38, which is arranged outside the cuff 7 and is supported rotatably between the free ends of the arms 36a and 36b.

[0043] The lever 38 is cam-shaped at its region for pivoting to the arms 36a and 36b; its interaction with the outer surface of the cuff 7 allows to vary the distance of the base 33 from the latter and therefore from the second strip 27.

[0044] By turning the lever 38 alternately clockwise or counterclockwise, the base 33 moves respectively toward or away from the second strip 27 and the pin 34 is consequently inserted in, or extracted from, one of the second holes 35, so as to rigidly couple or disengage the second rod-like element 20 with respect to the cuff 7.

[0045] Operation is therefore as follows: with reference to the accompanying figures, by turning the lever 38 in the appropriate direction (for example counterclockwise in the case of the accompanying figures), it is possible to achieve the escape of the pin 34 from the second hole 35 in which it was accommodated, thus allowing to modify the position of the second rod-like element 20 in an axial direction with respect to the cuff 7.

[0046] By increasing the distance between the second rod-like element 20 and the counter 8, the degree of compression of the spring 31 is increased and the effort required to move mutually apart the first and second strips is therefore increased; vice versa, by reducing the distance between the second rod-like element 20 and the counter 8, the spring 31 reduces its degree of preloading, and a smaller effort is sufficient to move mutually apart the first and second strips.

[0047] By fixing the pin 34, by way of an appropriate rotation of the lever 38, in a chosen second hole 35, it is therefore possible to adjust the position of the second rod-like element 20 with respect to the cuff 7, and therefore with respect to the counter 8, so as to achieve the intended degree of preloading of the spring 31.

[0048] The flexing of the quarter 4, and therefore of the cuff 7 rigidly coupled thereto, so as to reduce the angle formed by the quarter 4 with the sole 5, spaces the second strip 27, which is fixed to the cuff 7, from the first strip 21, which is fixed to the counter 8, consequently compressing the spring 31; said spring tends to return elastically to its non-deformed condition, so as to move mutually closer the first and second strips, thus contrasting the flexing of the quarter 4 and absorbing most of the stresses that might be imparted to the Achilles tendon of the user.

[0049] It has thus been found that the invention has achieved the intended aim and objects, a device having been devised which allows to control the flexing of the quarter of a motocross boot so as to ensure adequate protection both of the foot and of the ankle of the user, and in particular of the Achilles tendon of said user, at the same time allowing the foot and the ankle to perform all the movements required to control the motorcycle.

[0050] Further, the possibility to adjust the degree of preloading of the spring allows to achieve a chosen degree of control of the flexing of the quarter, so as to adapt for example to the various riding positions assumed and to the various body shapes of the users.

[0051] Moreover, the production costs of the device according to the invention remain low, since it is provided by means of components which are easy to manufacture and/or assemble.

[0052] The terms "substantially" and "approximately" as herein used are meant to indicate that the features to which they refer have the characteristics indicated but

for the normal tolerances from shape, arrangement, position or dimensions which are known as usual by those skilled in the pertinent art.

[0053] The invention is of course susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0054] The materials used, as well as the dimensions that constitute the individual components of the invention, may of course be more pertinent according to specific requirements.

[0055] The various means for performing certain different functions need not certainly coexist only in the illustrated embodiment but can be present per se in many embodiments, including ones that are not illustrated.

[0056] The characteristics indicated as advantageous, convenient or the like may also be omitted or be replaced with equivalents.

[0057] The disclosures in Italian Patent Application No. TV2006A000009 from which this application claims priority are incorporated herein by reference.

[0058] 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 flex control device (50), particularly for the quarter (4) of a motocross boot, comprising a soft upper (2) provided at the rear with a semirigid cuff (7) and a semirigid counter (8), which are connected respectively to said upper (2) and to said upper (2) and/or sole (5), **characterized in that** it is constituted by a first rod-like element (19) and a second rod-like element (20), the first rod-like element (19) being rigidly coupled to said counter (8), the second one (20) being selectively associable with said quarter (4), said first and second rod-like elements (19, 20) being slidingly associated in contrast with at least one elastically deformable element (31).

2. The device according to claim 1, **characterized in that** said first and second rod-like elements (19, 20) lie, during use, on substantially mutually parallel planes.

3. The device according to claims 1 and 2, **characterized in that** said first rod-like element (19) comprises a first strip (21) which is fixed to said counter (8) by way of one or more screws or rivets (22) which are associated with a first hole (23) provided at the end of said first strip (21) which is adjacent to said sole (5).

4. The device according to claims 1 and 3, **characterized in that** two first rods (24a, 24b) protrude axially toward said cuff (7) from the free end of said first strip (21), which is directed toward said cuff (7), said rods (24a, 24b) having a preferably approximately circular cross-section, being substantially mutually parallel and being arranged approximately on the same plane of arrangement as said first strip (21), the first free ends (25a, 25b) of said first rods (24a, 24b) being bent approximately at right angles on mutually opposite sides.

5. The device according to claims 1 and 4, **characterized in that** said first rod-like element (19) protrudes above said counter (8) and is arranged preferably so that its first said rods (24a, 24b) lie approximately at an intermediate region between said counter (8) and said cuff (7).

6. The device according to one or more of the preceding claims, **characterized in that** said first rod-like element (19) cooperates with appropriately provided first means (26) for guiding its sliding with respect to said counter (8).

7. The device according to claims 1 and 6, **characterized in that** said first guiding means are constituted by a first bridge (26) which protrudes inside said counter (8) and surrounds, during use, said first strip (21) so as to keep it slidingly rigidly coupled to said counter (8).

8. The device according to one or more of the preceding claims, **characterized in that** said second rod-like element (20) comprises a second strip (27), which can be associated slidingly and selectively with said cuff (7) by way of means for adjusting its position.

9. The device according to claims 1 and 8, **characterized in that** two second rods (28a, 28b), having a preferably approximately circular cross-section, that protrude axially from the end of said second strip (27) which is directed toward said counter (8), said second rods (28a, 28b) being substantially mutually parallel and arranged approximately on the same plane of arrangement as said second strip (27), the second free ends (29a, 29b) of said second rods (28a, 28b) being bent approximately at right angles on mutually opposite sides.

10. The device according to claims 1 and 9, **characterized in that** said second rod-like element (20) protrudes below said cuff (7) and is arranged with its second rods (28a, 28b) preferably at a region which is approximately intermediate between said counter (8) and said cuff (7), so that said second rods (28a, 28b) are superimposed and spaced with respect to said first rods (24a, 24b) of said first rod-like element (19), said second free ends (29a, 29b) of said second

rods (28a, 28b) being arranged at a lower height than said first free ends (25a, 25b) of said contiguous first rods (24a, 24b).

11. The device according to one or more of the preceding claims, **characterized in that** the position of said second strip (27) with respect to said cuff (7) is guided by appropriately provided second guiding means (30).

12. The device according to claims 1 and 11, **characterized in that** said second guiding means are constituted by a second bridge (30), which protrudes inside said cuff (7) and surrounds, during use, said second strip (27), so as to keep it slidingly rigidly coupled to said cuff (7).

13. The device according to one or more of the preceding claims, **characterized in that** said at least one elastically deformable element is constituted by at least one spring (31) which is arranged coaxially to said first and second rods (24a, 24b, 28a, 28b) and is interposed between said first and second free ends (25a, 25b, 29a, 29b) thereof.

14. The device according to claims 1 and 13, **characterized in that** said spring (31) is preloaded so as to constantly push said first and second free ends of said first and second rods respectively, the thrust of said spring (31) tending to space said first free ends (25a, 25b) from said second free ends (29a, 29b), so as to move mutually closer, in the longitudinal direction, said first strip (21) and said second strip (27).

15. The device according to one or more of the preceding claims, **characterized in that** said means for adjusting the position of said second rod-like element (20) with respect to said cuff (7) are constituted by a plate (32) which is approximately U-shaped in plan view so as to form an approximately flat base (33) which during use is arranged approximately parallel to said second strip (27), on the opposite side with respect to said cuff (7).

16. The device according to claims 1 and 15, comprising at least one pin (34) that protrudes approximately at right angles to said base (33) toward said second strip (27) and can engage selectively, during use, at least one of one or more second holes (35) provided in said second strip (27), which are advantageously approximately aligned along the longitudinal central axis of said strip (27).

17. The device according to claims 1 and 16, **characterized in that** two arms (36a, 36b) protrude at right angles to said base (33) and during use are arranged so as to surround laterally said second strip (27) and protrude with their respective free ends through two appropriately provided slots (37a, 37b) formed in said cuff (7).

18. The device according to claims 1 and 17, **characterized in that** the mutual distance between said base (33) and said second strip (27) is adjustable by way of appropriately provided adjustment means (38), so as to allow the insertion or extraction of said at least one pin (34) with respect to at least one of said second holes (35).

19. The device according to claims 1 and 18, **characterized in that** said adjustment means are constituted by a lever (38) which is arranged outside said cuff (7) and is supported rotatably between the free ends of said arms (36a, 36b).

20. The device according to claims 1 and 19, **characterized in that** said lever (38) is cam-shaped at its region for pivoting to said arms (36a, 36b), its interaction with the outer surface of said cuff (7) allowing to vary the distance of said base (33) from said cuff (7) and from said second strip (27).

21. The device according to claims 1 and 20, **characterized in that** by way of the rotation of said lever (38) alternately clockwise or counter clockwise, said base (33) is moved respectively toward or away from said second strip (27) and said at least one pin (34) is consequently inserted or extracted with respect to at least one of said second holes (35), so as to rigidly couple or disengage said second rod-like element (20) with respect to said cuff (7).

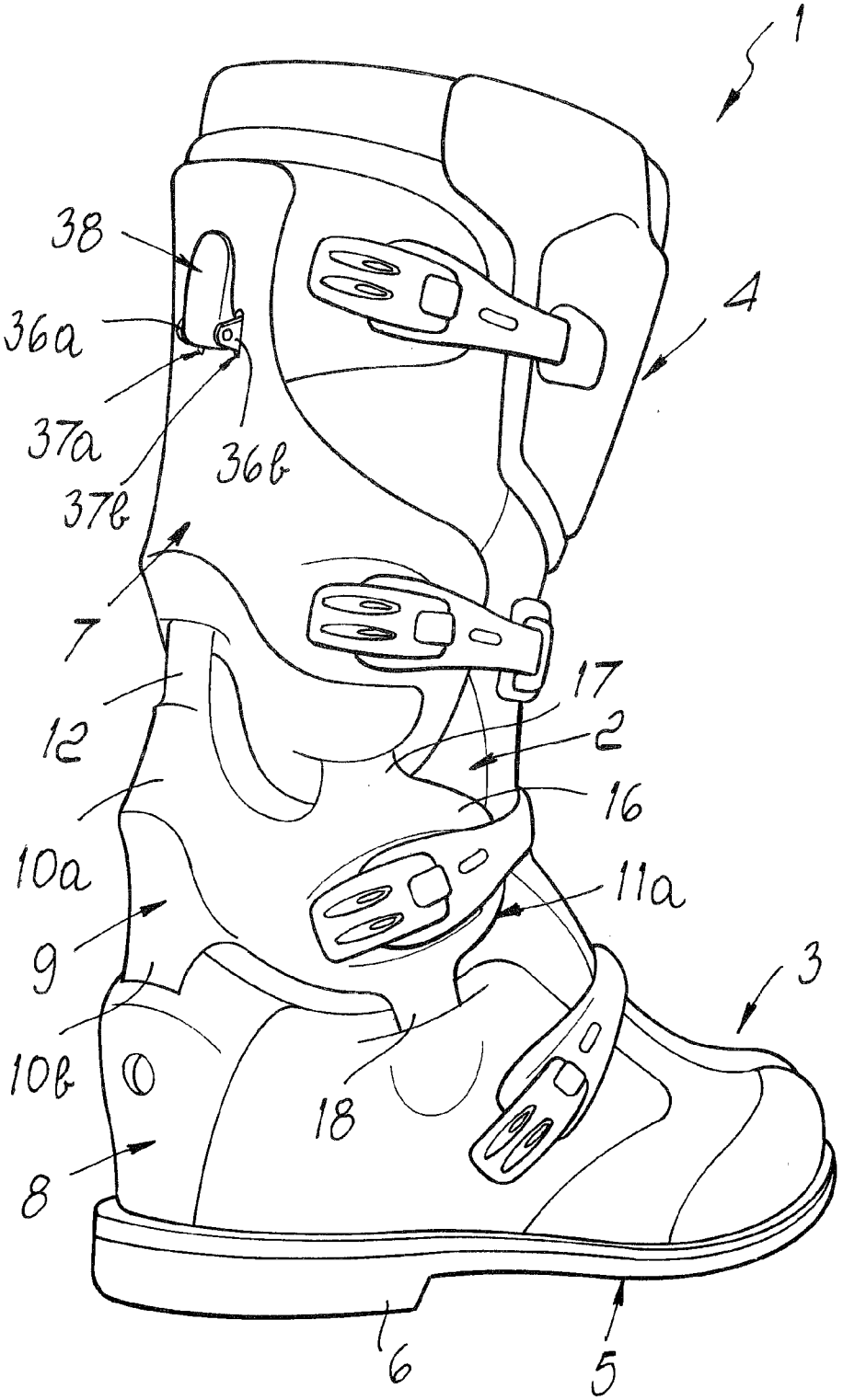

Fig. 1

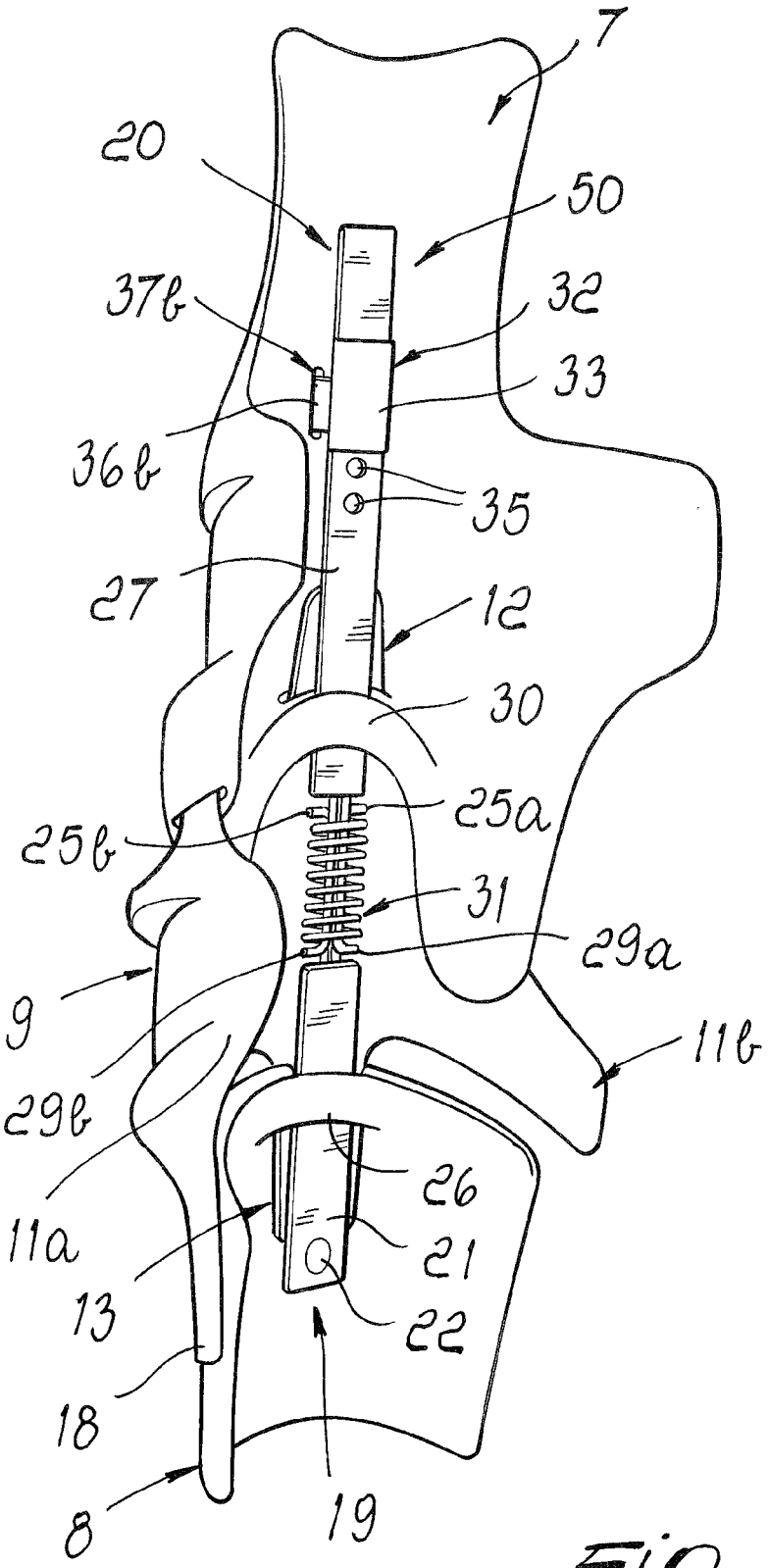
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Fig. 2

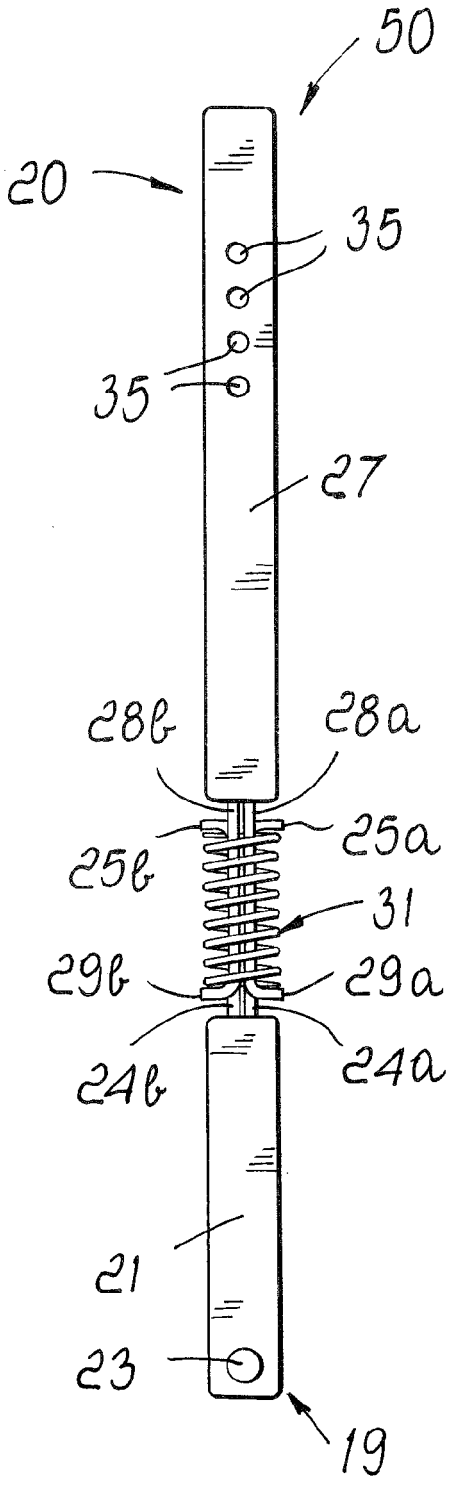
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Fig. 3

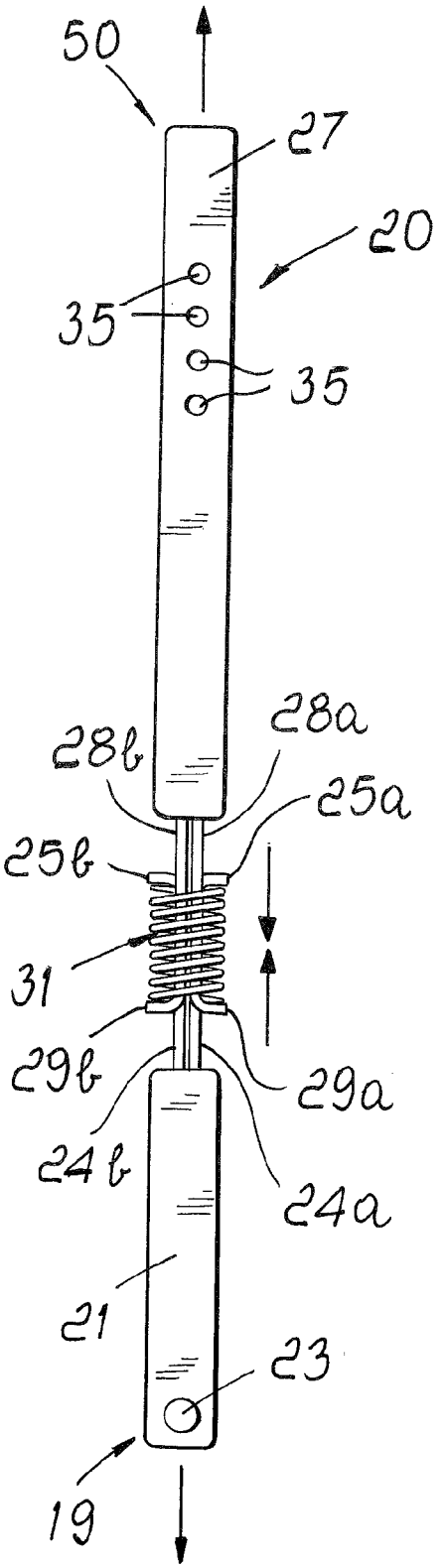
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Fig. 4

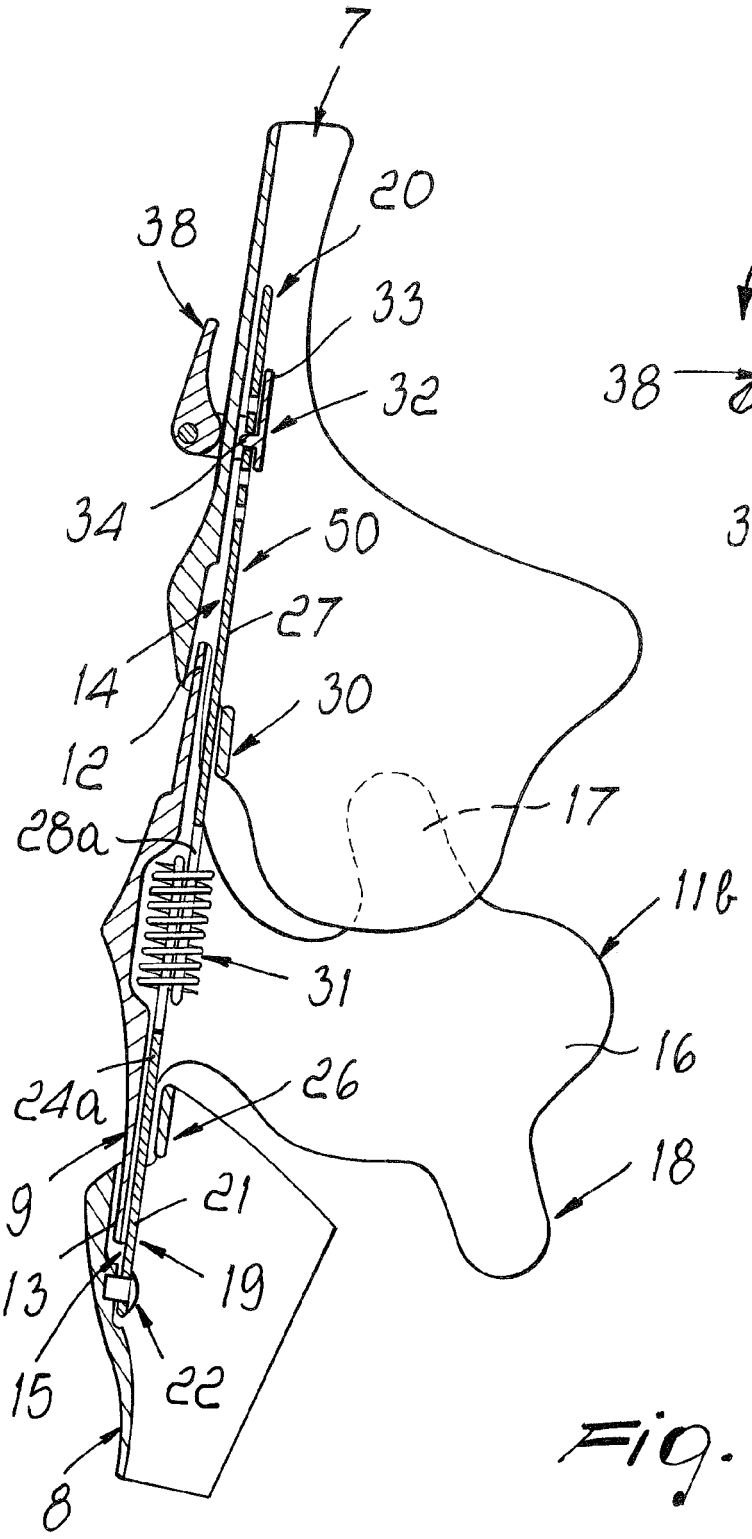
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Fig. 5

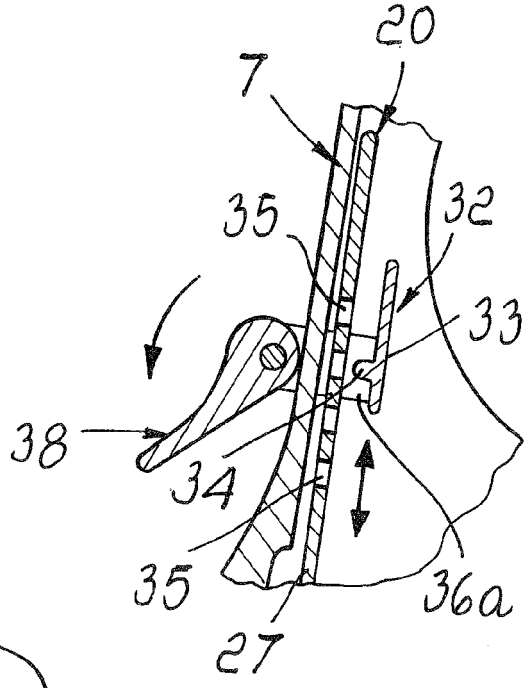
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Fig. 6

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 10 1215

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	FR 2 341 283 A1 (PINET GEORGES [FR]) 16 September 1977 (1977-09-16) * claims; figures *	1-21	INV. A43B5/14
X	DE 20 57 094 A1 (ALTENBURGER KG, 7893 JESTETTEN) 31 May 1972 (1972-05-31) * claims; figures *	1-21	
X	EP 0 073 433 A1 (NORDICA SPA [IT]) 9 March 1983 (1983-03-09) * claims; figures *	1-21	

TECHNICAL FIELDS SEARCHED (IPC)

A43B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	4 May 2007	Claudel, Benoît

CATEGORY OF CITED DOCUMENTS

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D : document cited in the application
L : document cited for other reasons

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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 07 10 1215

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04-05-2007

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