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(71) Applicant: **Calzaturificio S.C.A.R.P.A. S.p.A.**
31011 Asolo (IT)

(72) Inventors:
- **PARISOTTO, Davide**
31011 Asolo (TV) (IT)
- **SOLIGO, Federico**
31011 Asolo (TV) (IT)

(74) Representative: **Studio Torta S.p.A.**
Via Viotti, 9
10121 Torino (IT)

(54) **SKI BOOT**

(57) Ski boot (1) comprising: a rigid foot-case (2), which is adapted to accommodate the user's foot; a rigid cuff (3), which is pivoted on the foot-case (2) so as to be able to swing around a first rotation axis (A) substantially perpendicular to the midplane of the boot; and a manually-operated cuff locking device (15), which is adapted to selectively lock the cuff (3) to the foot-case (2) in a predetermined down-hill position, and which comprises: a supporting plate (16) positioned on the cuff (3), above the heel of the boot (1); a movable arm (17), which is pivoted on the supporting plate (16) so that it can rotate about a second transverse axis (B), to and from a locking position in which the movable arm (17) extends downwards and couples its lower end (17a) in a rigid and releasable manner to an anchoring structure (18) integral with the foot-case (2); and a manually-operated locking member (21) which is fixed to the movable arm (17) with the capability of moving between a first operating position in which it immobilises the movable arm (17) in the locked position, and a second operating position in which it allows the movable arm (17) to move freely on the supporting plate (16).

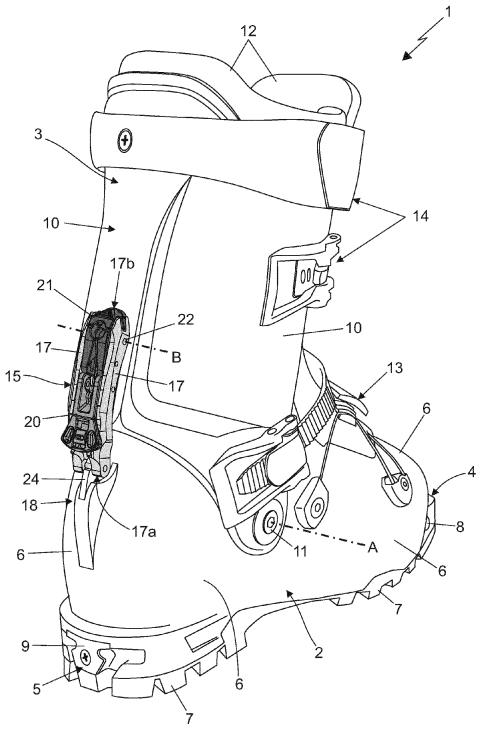

Fig. 1

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Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This patent application claims priority from Italian patent application no. 102023000002667 filed on February 16, 2023, the entire disclosure of which is incorporated herein by reference.

TECHNICAL FIELD

[0002] The present invention relates to a ski boot.

[0003] More in detail, the present invention relates to a mountaineering or Telemark ski boot. Use to which disclosure that follows will make explicit reference without however losing generality.

BACKGROUND ART

[0004] As known, mountaineering ski boots currently on the market basically comprise: a rigid foot-case generally made of plastic material, which is substantially shoe-shaped so as to accommodate/enclose the user's foot, and has the lower part specifically structured so as to be firmly fixed to the back of a down-hill ski or the like by means of a special ski-mountaineering binding device; a rigid cuff generally made of plastic material, which is shaped so as to embrace the lower part of the user's leg from behind, and is hinged to the foot-case so as to be able to swing about a transversal reference axis that is substantially perpendicular to the vertical midplane of the ski boot, and is also locally substantially coincident with the ankle articulation axis; and an inner liner made of a soft, thermal-insulating material, which is removably inserted into the foot-case and the cuff, and is shaped so as to accommodate and protect both the user's foot and leg, approximately up to the calf.

[0005] In addition, the mountaineering ski boots currently on the market are moreover provided with a manually-operated foot-case closing mechanism, which is structured so as to selectively close/tighten the foot-case on the user's foot, in order to immobilise the user's foot inside the thermal-insulating liner; and a manually-operated cuff closing mechanism, which is in turn structured so as to selectively close/tighten the upper part of the cuff on the user's leg, in order to immobilise the user's leg within the thermal-insulating liner.

[0006] Finally, the mountaineering ski boots are provided with a manually-operated cuff locking device, which is traditionally located in the area above the heel of the boot, and is structured so as to, on choice and alternatively, lock the cuff rigidly to the foot-case in a predetermined down-hill position, in which the cuff is tilted forward by a predetermined angle with respect to the vertical; or completely release the cuff from the foot-case so as to allow the cuff to freely swing back and forth with respect to the foot-case.

[0007] In the mountaineering ski boots mostly widespread on the market, the cuff locking device comprises: a supporting plate, which is rigidly fixed to the cuff above the heel of the ski boot and approximately astride the midplane of the boot; a movable arm, which is butt hinged to the supporting plate so as to freely rotate, on the midplane of the boot, to and from a lowered or locking position in which the movable arm extends downwards, substantially flush with the outer surface of the cuff, so as to engage/fit its lower end in a rigid and stable, though easily releasable manner, to/on an anchoring structure fixed on the foot-case, astride the midplane of the boot; and finally an elastic member, which connects the movable arm to the supporting plate and is capable of elastically bringing and maintaining the movable arm, on choice and alternatively, in the above-mentioned lowered or locking position, or in a raised or unlocking position in which the lower end of the movable arm is away from the anchoring structure present on the foot-case.

[0008] Clearly, the cuff locking device only connects the cuff rigidly to the foot-case when the lower end of the movable arm engages the anchoring structure on the foot-case.

[0009] Although working very well, however the above-described locking device has operational limitations that can make its use difficult to less-experienced users.

[0010] In fact, after manually lowering the movable arm, the less-experienced user usually believes to have properly locked the cuff in the down-hill position and immediately starts skiing. However, the snow and/or ice encrustations that very often form on the back of the ski boot can prevent the lower end of the movable arm from properly and completely engaging the anchoring structure of the foot-case.

[0011] If this happens, the lower end of the movable arm can suddenly disengage from the anchoring structure during skiing, leaving the cuff free to move with respect to the foot-case with all the resulting problems for the skier. In fact, the movement of the user's legs while skiing tends to naturally disengage the lower end of the movable arm from the foot-case anchoring structure.

SUMMARY OF THE INVENTION

[0012] Aim of the present invention is to provide a cuff locking device which can overcome the above-described drawbacks and is moreover reliable and cost-effective.

[0013] In accordance with these aims, according to the present invention there is provided a ski boot as defined in Claim 1 and preferably, though not necessarily, in any one of the claims depending on it.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] The present invention will now be described with reference to the attached drawings, which show a non-limiting embodiment thereof, wherein:

- Figure 1 is a perspective view of a ski boot made

according to the teachings of the present invention, with parts removed for clarity's sake;

- Figure 2 is a perspective view of the cuff locking mechanism mounted in the ski boot of Figure 1 with parts removed for clarity's sake;
- Figure 3 is a partially exploded perspective view of the cuff locking mechanism shown in Figure 2, with parts removed for clarity's sake;
- Figure 4 is a side view of the rear part of the ski boot shown in Figure 1 with the cuff locking mechanism in a first operating configuration, with parts sectioned along the midplane of the boot and parts removed for clarity's sake; whereas
- Figure 5 is a side view of the rear part of the ski boot shown in Figure 1 with the cuff locking mechanism in a second operating configuration, with parts sectioned along the midplane of the boot and parts removed for clarity's sake.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0015] With reference to Figure 1, number 1 denotes as a whole a ski boot, which can be advantageously used to practice ski-mountaineering or telemark skiing.

[0016] The ski boot 1 firstly comprises: a substantially rigid foot-case 2, which is substantially shoe-shaped so as to accommodate/enclose the user's foot, and preferably has the lower part specifically structured/shaped to coupled/engaged in a rigid and stable, though easily releasable manner, with a ski binding device of known type (not shown) or similar, which in turn is rigidly fixed to the back of a generic down-hill ski or similar; and a substantially rigid cuff 3, which is shaped so as to embrace the lower part of the user's leg, and is pivotally joined to the foot-case 2 so as to swing about a transversal rotation axis A, which is locally substantially perpendicular to the vertical midplane of the boot, and is preferably also substantially coincident with the articulation axis of the user's ankle.

[0017] In other words, the cuff 3 is pivotally joined to the foot-case 2 so as to freely swing back and forth while remaining on a swinging plane orthogonal to rotation axis A and substantially coincident with the vertical midplane of the boot.

[0018] The lower part of foot-case 2, on the other hand, is preferably provided with a front tip 4 and a rear heel 5.

[0019] The front tip 4 is preferably structured so as to couple/engage in a stable, though easily releasable manner, with the toe-piece (not shown) of a ski binding device, or rather of a mountaineering or telemark ski binding device which, in turn, is stably fixed on the back of a generic down-hill ski or similar. The rear heel 5, on the other hand, is preferably structured so as to couple/engage in a stable, though easily releasable manner with the heel-piece (not shown) of a ski binding device, or rather of a mountaineering or telemark ski binding device which, in turn, is stably fixed on the back of a generic down-hill ski or similar.

[0020] Preferably, the lower part of the foot-case 2 moreover has a threaded profile so as to grip on snow and/or ice, and thus allow the user to walk on snow and ice in relative safety.

[0021] More in detail, with reference to Figures 1, the foot-case 2 preferably comprises: a substantially rigid shell 6, which is preferably made of plastic and/or composite material and is shaped in the form of an substantially oblong basin, so as to accommodate/enclose the user's foot, preferably approximately up to the ankle height; and optionally a sole 7 made of vulcanised rubber or other elastomeric material with a high friction coefficient, which preferably has a threaded profile, and is firmly fixed to the bottom wall of shell 6 preferably by gluing.

[0022] In addition, the foot-case 2 preferably also comprises a front rigid insert 8 and optionally a rear rigid insert 9.

[0023] The front rigid insert 8 is preferably made of metal material, is firmly embedded/incorporated in the bottom wall of shell 6 roughly at the tip 4 of foot-case 2. The front rigid insert 8, in addition, is preferably structured so as to surface/emerge outside of shell 6 from opposite sides of the front tip 4 of the foot-case 2, advantageously in a substantially mirror-like position with respect to the midplane of the boot, so as to couple/engage in known manner with the toe-piece (not shown) of the mountaineering ski binding device.

[0024] The rear rigid insert 9, on the other hand, is preferably made of metal material, is recessed in the shell 6 at the heel 5, and is structured so as to couple/engaged in known manner with the heel-piece (not shown) of the same mountaineering ski-binding device.

[0025] With reference to Figure 1, on the other hand, the cuff 3 preferably comprises a substantially rigid shell 10, preferably made of plastic and/or composite material, which is preferably substantially C-bent so as to cover the rear part of the user's leg, from the ankle substantially up to the calf height, and is moreover provided with two oblong, protruding lateral flaps (not shown in the Figure) that extend forward on opposite sides of the midplane of the boot, so as to embrace the user's leg from behind at approximately the calf height, thus forming a tubular structure that embraces the user's leg at the calf height.

[0026] Furthermore, the cuff 3 is preferably fixed in freely rotatable manner to the foot-case 2, or rather to the shell 6, by means of two connecting hinges 11 preferably made of metal material, which are located on the inner and outer lateral sides of the foot-case 2 and cuff 3, aligned along the transversal axis A.

[0027] With reference to Figure 1, in addition, the ski boot 1 preferably additionally comprises an inner liner 12 with a thermal-insulating structure, which is located inside the foot-case 2 and preferably also inside the cuff 3, and is shaped so as to accommodate and protect the foot and preferably also the lower part of the user's leg. Advantageously, the thermal-insulating liner 12 is moreover inserted within the foot-case 2 and preferably also the cuff 3 in manually removable/extractable manner.

[0028] More in detail, the thermal-insulating liner 12 is preferably shaped substantially in the form of a boot, so as to accommodate and protect the foot and the lower part of the user's leg, advantageously up to the top of the cuff 3.

[0029] The thermal-insulating liner 12 is thus adapted to minimize heat loss to the outside as much and to prevent the user's foot and leg from coming into direct contact with the foot-case 2 and/or the cuff 3.

[0030] With reference to Figures 1, the ski boot 1 is moreover provided with a foot-case closing mechanism 13 and, preferably, also a cuff closing mechanism 14, both manually operated.

[0031] The foot-case closing mechanism 13 is structured so as to selectively close/tighten the upper part of the foot-case 2, or rather of shell 6, against the user's foot, so as to immobilise the user's foot inside the foot-case 2, or rather inside the thermal-insulating liner 12.

[0032] The cuff closing mechanism 14 is structured so as to selectively close/tighten the upper part of cuff 3, or rather of shell 10, against the user's leg, so as to immobilise the user's leg inside the cuff 3, or rather inside the thermal-insulating liner 12.

[0033] The foot-case closing mechanism 13 and the cuff closing mechanism 14 are devices already widely known and used in the ski boot field, and therefore won't be further described.

[0034] In addition, the ski boot 1 is furthermore provided with a manually-operated cuff locking device 15, which is fixed to the rear part of the cuff 3 in the area above the heel 5 of the boot, preferably substantially astride the boot vertical midplane.

[0035] The cuff locking device 15 is structured so as to selectively lock the cuff 3 with respect to the foot-case 2 in a given down-hill position in which the cuff 3 is tilted forward with respect to the vertical by a predetermined angle that advantageously ranges between 5° and 25°.

[0036] More in detail, the cuff locking device 15 is structured so as to, on choice and alternatively: rigidly connect the cuff 3 to the foot-case 2 in the above-mentioned down-hill position; or completely unlock/release the cuff 3 from the foot-case 2 so as to allow the cuff 3 to freely swing back and forth on the foot-case 2 about the transversal axis A, while remaining on the midplane of the boot.

[0037] With reference to Figures 1 to 5, the cuff locking device 15 comprises: a supporting plate 16, which is integral with the cuff 3 and is located on the cuff 3, spaced above the rear heel 5 and preferably also substantially astride the vertical midplane of the boot; and a movable arm 17 with a rigid and oblong structure, which is preferably made of metal material, and is pivotally joined to the supporting plate 16 so as to freely rotate about a transversal rotation axis B, to and from a lowered or locking position (see Figures 1 and 4) in which the movable arm 17 extends cantilevered downwards preferably while remaining substantially flush with the cuff 3, and engages/couples its lower or distal end 17a in a rigid and stable, though easily releasable manner, to an anchoring structure 18 that is rigidly fixed to or is otherwise integral with the foot-case 2 below.

[0038] More in detail, the movable arm 17 is pivotally joined to the supporting plate 16 so as to rotate by a few degrees (less than 90°) about the transversal axis B between said lowered or locking position (see Figures 1 and 4), and a raised or unlocking position (see Figures 2 and 5) in which the lower/distal end 17a of movable arm 17 is spaced/away/ detached from the anchoring structure 18. Preferably, the angular displacement between the lowered or locking position and the raised or unlocking position moreover ranges between 3° and 15°.

[0039] Clearly, when the movable arm 17 is in the lowered or locking position (see Figures 1 and 4), the cuff locking device 15 connects the cuff 3 rigidly to the foot-case 2 so as to immobilize the cuff 3 in said down-hill position. When, on the other hand, the movable arm 17 is in the raised or unlocking position (see Figures 2 and 5), the cuff locking device 15 allows the cuff 3 to freely swing back and forth on the foot-case 2.

[0040] With reference to Figures 3, 4 and 5, in particular, the supporting plate 16 is preferably separate and distinct from the cuff 3, is preferably made of metal material and is preferably firmly fixed/locked to the cuff 3, or rather to the rigid shell 10, by means of one or more anchoring screws (not shown) that cross in pass-through manner the supporting plate 16 before penetrating the rigid shell 10 of cuff 3.

[0041] The supporting plate 16, in addition, is preferably oblong in shape and is preferably located on the cuff 3 substantially astride the vertical midplane of the boot, with its longitudinal axis locally substantially parallel to the outer surface of the cuff 3 and to the same vertical midplane.

[0042] The movable arm 17, on the other hand, is rocker pivoted on the supporting plate 16, so that its lower or distal end 17a and its upper or proximal end 17b are arranged on opposite sides of rotation axis B. Preferably, the distance separating the lower end 17a of movable arm 17 from rotation axis B is greater than the distance separating the upper end 17b of movable arm 17 from the same rotation axis B.

[0043] In other words, the movable arm 17 has a major longitudinal segment that extends from rotation axis B to the lower or distal end 17a of the arm, and a minor longitudinal segment that is complementary and opposite to the major longitudinal segment and extends from rotation axis B to the upper or proximal end 17b of the arm.

[0044] Preferably the minor longitudinal segment of the movable arm 17 has a shorter length than the major longitudinal segment of the same movable arm 17.

[0045] In addition, the movable arm 17 is preferably pivotally joined to the supporting plate 16 so as to rotate/swing while remaining on a lying plane that is locally substantially parallel to, or more conveniently coincident with, the midplane of the boot.

[0046] In other words, the movable arm 17 extends

parallel to the vertical midplane of the boot, and rotation axis B of movable arm 17 is locally substantially perpendicular to the vertical midplane of the boot and/or substantially parallel to the rotation axis A of cuff 3.

[0047] With reference to Figures 1 to 5, the cuff locking device 15 furthermore comprises: an elastic member 19, which is preferably interposed between the supporting plate 16 and the movable arm 17, and which is adapted to elastically bring and maintain the movable arm 17 in said lowered or locking position; and a manually-operated command lever 20, preferably made of a metallic material, which is movably mounted on the movable arm 17 and is adapted to cooperate in contact with the supporting plate 16 so as to selectively shift/move the movable arm 17 from the lowered or locking position by overcoming the thrust of elastic member 19, in order to uncouple and move the lower or distal end 17a of movable arm 17 away from the anchoring structure 18.

[0048] More in detail, the elastic member 19 is preferably adapted to pull the movable arm 17, or rather the major longitudinal segment of the movable arm 17, elastically towards the supporting plate 16.

[0049] The command lever 20, on the other hand, is preferably located on the movable arm 17 between the rotation axis B and the lower or distal end 17a of the arm.

[0050] In other words, the command lever 20 is preferably located on the major longitudinal segment of movable arm 17.

[0051] Preferably, the command lever 20 is also butt-hinged to the movable arm 17 so as to freely rotate between a first operating position in which the command lever 20 arranges the movable arm 17 in the lowered or locking position, and a second operating position in which the command lever 20 arranges the movable arm 17 in the raised or unlocking position.

[0052] In addition, the elastic member 19 is preferably directly connected to the command lever 20, and is moreover adapted to elastically maintain the command lever 20, on choice and alternately, in the first or second operating position.

[0053] In other words, the elastic member 19 is preferably capable of simultaneously both bringing and maintaining the movable arm 17 in the lowered or locking position, and of bringing and maintaining the command lever 20 alternately in the first or second operating position.

[0054] With reference to Figures 2 to 5, in particular, the command lever 20 is preferably butt-hinged to the movable arm 17, or rather to the major longitudinal segment of movable arm 17, so as to freely rotate about a transversal rotation axis C that is substantially parallel to rotation axis B.

[0055] In other words, the command lever 20 is preferably butt hinged to the movable arm 17 so as to rotate while remaining in the lying and rotation plane of movable arm 17, i.e. in the midplane of the boot.

[0056] Preferably, the head 20a of command lever 20 is moreover shaped in the form of a cam and is adapted to rest on the supporting plate 16 so as to selectively move the movable arm 17 away from the supporting plate 16.

[0057] More in detail, the head 20a of command lever 20 is shaped so as to arrange the movable arm 17 in the lowered or locking position when the command lever 20 is in the first operating position, and to arrange the movable arm 17 in the raised or unlocking position when the command lever 20 is in the second operating position.

[0058] Even more specifically, in the second operating position (see Figures 2 and 5), the head 2a of command lever 20 is preferably oriented so as to rest on the supporting plate 16 and move the major longitudinal segment of movable arm 17 away from the underlying supporting plate 16, in order to rotate the movable arm 17 by a few degrees from the lowered or locking position.

[0059] In addition, in the first operating position (see Figures 1 and 4), the command lever 20 is preferably substantially parallel and/or tangential to the movable arm 17. In the second operating position (see Figures 2 and 5), on the other hand, the command lever 20 is preferably substantially perpendicular or at least transversal to the movable arm 17.

[0060] The elastic element 19, on the other hand, is preferably coupled/fixed to the command lever 20 in an eccentric position with respect to the lever rotation axis C, and is adapted to elastically pull the command lever 20 and what is integral with it, i.e. the major longitudinal segment of the movable arm 17, towards the supporting plate 16.

[0061] With reference to Figures 1 to 5, the cuff locking device 15 finally moreover comprises a manually-operated movable locking member 21, separate and distinct from the movable arm 17, which is fixed on the movable arm 17 with the capability of freely moving between a first operating position in which the locking member 21 immobilises the movable arm 17 in the lowered or locking position, and a second operating position in which the locking member 21 allows the movable arm 17 to move freely with respect to the supporting plate 16, or rather allows the movable arm 17 to freely rotate about the transversal axis B.

[0062] More in detail, the locking member 21 is preferably structured so as to contact cooperate, when it is in its first operating position, with the supporting plate 16 to prevent any movement/rotation of the movable arm 17 from its lowered or locking position.

[0063] Preferably, the command lever 20 is moreover adapted to autonomously shift/arrange the locking member 21 into the second operating position when it shifts/moves the movable arm 17 away from the locking position, or rather immediately before moving/shifting the movable arm 17 away from the locking position, so as to allow the movable arm 17 to freely rotate about transversal axis B.

[0064] In other words, the command lever 20 is adapted to autonomously shift/arrange the locking member 21 into the second operating position when it is manually moved from its first to its second operating position.

[0065] With reference to Figures 2, 3, 4 and 5, in particular, the locking member 21 is preferably at least partially located on the minor longitudinal segment of movable arm 17.

[0066] In addition, the locking member 21 is preferably shaped/ structured so as to selectively wedge/fit between the minor longitudinal segment of movable arm 17 and the supporting plate 16, in order to prevent any rotation/tilting of the minor longitudinal segment towards the supporting plate 16.

[0067] More in detail, the locking member 21 is preferably fixed on the movable arm 17 with the capability of freely sliding back and forth between its first and second operating position.

[0068] In other words, the locking member 21 is preferably slidably fixed on the movable arm 17 at the side of command lever 20, clearly on the side opposite the lower or distal end 17a, so as to vary its distance from the rotation axis C of command lever 20.

[0069] The command lever 20, in turn, is preferably adapted to push the locking member 21 into the second operating position when it moves from its first operating position to its second operating position.

[0070] The locking member 21, in addition, extends on the movable arm 17 astride the rotation axis B, so that a first end thereof is located on the major longitudinal segment of the movable arm 17, adjacent to the command lever 20, and that its second end, opposite said first end, is located on the minor longitudinal segment of the movable arm 17.

[0071] The first end of locking member 21 is preferably adapted to contact cooperate with the body of command lever 20. The second end of locking member 21, on the other hand, is preferably adapted to interpose/interlock between the minor longitudinal segment of movable arm 17 and the supporting plate 16 in order to prevent any lowering of the minor longitudinal segment of movable arm 17 towards the underlying supporting plate 16.

[0072] More in detail, when the locking member 21 is in the first operating position (see Figures 1 and 4), the first end of locking member 21 is preferably arranged in abutment on or in any case close to the command lever 20, or rather on/against the head 20a of command lever 20, advantageously at the shortest possible distance from rotation axis C of command lever 20; while the second end of locking member 21 is preferably aligned with the upper or proximal end 17b of movable arm 17 and locally also rests firmly on the underlying supporting plate 16.

[0073] On the other hand, when the locking member 21 is in the second operating position (see Figures 2 and 5), the first end of locking member 21 is arranged in abutment on command lever 20, advantageously at the greatest possible distance from the rotation axis C of command lever 20; while the second end of locking member 21 preferably protrudes cantilevered beyond the upper end 17b of the movable arm 17 and does not rest on the underlying supporting plate 16.

[0074] With reference to Figures 1 to 5, in the example shown, in particular, the major longitudinal segment of movable arm 17 preferably has a length greater than three times the length of the complementary minor longitudinal segment.

[0075] In addition, the movable arm 17 preferably has a forkshaped structure, and is arranged astride the supporting plate 16, so as to embrace the supporting plate 16 on opposite sides thereof.

[0076] The movable arm 17, moreover, is preferably axially rotatably connected to the supporting plate 16 by means of a transversal pin 22, which extends coaxial to the rotation axis B, simultaneously engaging both the supporting plate 16 and the two prongs of movable arm 17, and is advantageously made of metal material.

[0077] Finally, the lower or distal end 17a of movable arm 17 is preferably provided with a transversal pin 23 advantageously made of metal material, which extends parallel to rotation axis B and is adapted to removably interlock in the anchoring structure 18.

[0078] More in detail, with particular reference to Figures 1, 4 and 5, the anchoring structure 18 preferably includes a platelike protruding ridge 24 preferably with an arched profile and advantageously made of metal material, which extends cantilevered from the foot-case 2, or rather from the shell 6, remaining astride the lying and rotation plane of movable arm 17, i.e. astride the midplane of the boot, and is provided with a small transversal notch which is adapted to be engaged by the transversal pin 23 of movable arm 17.

[0079] With reference to Figures 1 to 5, the head 20a of command lever 20, on the other hand, is preferably accommodated between the two prongs of movable arm 17, i.e. inside the fork. Preferably the head 20a of command lever 20 is furthermore formed of a pair of protruding flat wings or appendages, which are pivotally joined each separately to an adjacent prong of movable arm 17 advantageously by means of a corresponding transversal pin 25 preferably made of a metal material, which extends coaxial to rotation axis C engaging in sequence the movable arm 17 and the flat appendage of the head 20a.

[0080] Preferably, the two flat wings or appendages forming the head 20a of command lever 20, in addition, have a loboid-shaped cam profile, and are adapted to rest on the supporting plate 16 so as to vary the tilting of movable arm 17 with respect to the supporting plate 16 according to the angular position assumed with respect to the movable arm 17.

[0081] With reference to Figures 3, 4 and 5, the elastic member 19, in turn, is preferably accommodated between the two prongs of movable arm 17, i.e. inside the fork, and advantageously also between the two protruding flat wings or appendages, which form the forked head 20a of command lever 20.

[0082] Preferably, the elastic member 21 further includes an extensible coil spring, which has its two ends engaged or otherwise fixed, one to the command lever

20 in an eccentric position with respect to rotation axis C, and the other to the supporting plate 16 in an eccentric position with respect to rotation axis B.

[0083] With reference to Figures 1 to 5, the locking member 21 in turn preferably includes an oblong-shaped slider 26, advantageously made of metal material, which is interposed between the two prongs of movable arm 17 substantially at the upper or proximal end 17b of movable arm 17, i.e. it is located within the fork. The oblong slider 26 is preferably slidably fixed to the two prongs of the movable arm 17 by means of a transversal pin 27, which extends parallel to the rotation axis B bridging the prongs of movable arm 17, and engages, in pass-through and freely slidable manner, a longitudinal slot 28 specifically formed in the body of the slider 26.

[0084] Furthermore, the end of the oblong slider 26 facing the command lever 20, i.e. the first end of locking member 21, preferably has a forked shape so that it can rest on the two flat wings or appendages forming the head 20a of command lever 20, while remaining astride the elastic member 19.

[0085] On the other hand, the end of oblong slider 26 facing the opposite side of command lever 20 (i.e. facing the upper or proximal end 17b of movable arm 17), i.e. the first end of locking member 21, preferably has a concave or spoon shape, with the concavity facing the supporting plate 16.

[0086] Preferably, the oblong slider 26 is adapted to place the edge of the concave or substantially spoon-shaped end in abutment against the supporting plate 16.

[0087] Finally, the central part of oblong slider 26 is preferably shaped/structured so as to move flush and tangent to the section of supporting plate 16 that accommodates the transversal pin 22. The oblong slider 26, therefore, is preferably adapted to slide on the part of supporting plate 16 that accommodates the transversal pin 22, when moving from the first operating position to the second operating position and vice versa.

[0088] The friction between the oblong slider 26 and the supporting plate 16 hinders/contrasts/slowdown the movement of the oblong slider 26 from the first operating position to the second operating position and vice versa.

[0089] General operation of ski boot 1 is easily inferable from the foregoing and does not require further explanation.

[0090] As regards the cuff locking device 15, when the user wants to lock the cuff 3 in the down-hill position, he manually arranges the movable arm 17 in the lowered or locking position by acting on the command lever 20, and then manually moves the locking member 21, or rather the oblong slider 26, to the first operating position.

[0091] Even if snow and/or ice encrustations prevent the distal end 17a of movable arm 17 from fully fitting in the anchoring structure 18, the locking member 21, or rather the oblong slider 26, prevents in any case the movable arm 17 from moving during skiing, preventing the distal or lower end 17a of movable arm 17 from disengaging from the anchoring structure 18.

[0092] The advantages associated with the cuff locking device 15 are remarkable.

[0093] The presence of locking member 21 increases the active safety of ski boot 1, as it prevents the movable arm 17 from accidentally detaching from the anchoring structure 18.

[0094] The fact that command lever 20 can autonomously shift the locking member 21 into the second operating position moreover simplifies the use of the cuff locking device 15.

[0095] In addition, the cuff locking device 15 can also be mounted without modifying too much the ski boots currently on the market, with all the advantages that this entails.

[0096] It is finally clear that modifications and variations may be made to the ski boot 1 and to the locking device 15 without however departing from the scope of the present invention.

Claims

1. A ski boot (1) comprising: a substantially rigid foot-case (2), which is adapted to accommodate the user's foot; a substantially rigid cuff (3), which is adapted to embrace the user's lower leg, and is hinged to the foot-case (2) so as to be able to swing around a first rotation axis (A) substantially perpendicular to the midplane of the boot; and a manually-operated cuff locking device (15), which is adapted to selectively lock the cuff (3) rigidly to the foot-case (2) in a predetermined down-hill position;

   the cuff locking device (15) comprising: a supporting plate (16) located on the cuff (3), above the heel of the ski boot (1); and a movable arm (17), which is pivoted on the supporting plate (16) so as to be able to rotate around a second rotation axis (B), to and from a locking position in which the movable arm (17) extends downwards and couples its lower end (17a) in a rigid, though releasable manner to an anchoring structure (18) integral with the foot-case (2);
   the ski boot (1) being **characterized in that** the cuff locking device (15) additionally comprises a manually-operated locking member (21), which is attached to the movable arm (17) with the capability of moving between a first operating position in which the locking member (21) immobilizes the movable arm (17) in the locked position, and a second operating position in which the locking member (21) allows the movable arm (17) to move freely with respect to the supporting plate (16).

2. The ski boot according to Claim 1, wherein the cuff locking device (15) additionally comprises: an elastic member (19), which is adapted to elastically bring

and maintain the movable arm (17) in said locking position; and a manually-operated command lever (20), which is movably mounted on the movable arm (17) and is adapted to contact cooperate with the supporting plate (16) so as to selectively shift/move the movable arm (17) away from the locking position by overcoming the thrust of the elastic member (19), so as to decouple and move the lower end (17a) of the movable arm (17) away from the anchoring structure (18).

3. The ski boot according to Claim 2, wherein the command lever (20) is adapted to autonomously arrange the locking member (21) in the second operating position when the movable arm (17) is shifted/moved away from said locking position.

4. The ski boot according to Claim 1, 2 or 3, wherein the locking member (21) is structured so as to contact cooperate, when in the first operating position, with the supporting plate (16) to prevent any movement of the movable arm (17) from the locking position.

5. The ski boot according to any one of the preceding claims, wherein the movable arm (17) is rocker pivoted on the supporting plate (16) so that its lower end (17a) and its upper end (17b) are arranged on opposite sides of said second rotation axis (B).

6. The ski boot according to Claim 5, wherein the movable arm (17) is provided with a major longitudinal segment extending from said second rotation axis (B) up to the lower end (17a) of the movable arm (17), and with a minor longitudinal segment extending from said second rotation axis (B) up to the upper end (17b) of the movable arm (17); the command lever (20) being located on the major longitudinal segment of the movable arm (17); the locking member (21) being at least partially located on the minor longitudinal segment of the movable arm (17).

7. The ski boot according to claim 6, wherein the locking member (21) is shaped/structured so as to selectively wedge/fit between the minor longitudinal segment of the movable arm (17) and the supporting plate (16), in order to prevent any rotation/tilting of the minor longitudinal segment towards the same supporting plate (16).

8. The ski boot according to any one of the preceding claims, wherein the locking member (21) is fixed on the movable arm (17) with the capability of sliding back and forth between said first and said second operating positions.

9. The ski boot according to any one of Claims 5 to 8, wherein the locking member (21) extends on the movable arm (17) astride the second rotation axis (B), so that its first end is arranged on the major longitudinal segment of the movable arm (17), and its second end is arranged on the minor longitudinal segment of the movable arm (17).

10. The ski boot according to Claim 9, wherein the first end of the locking member (21) is adapted to contact cooperate with said command lever (20) and/or the second end of the locking member (21) is adapted to interpose/ interlock between the minor longitudinal segment of the movable arm (17) and the supporting plate (16).

11. The ski boot according to any one of Claims 2 to 10, wherein the command lever (20) is butt hinged to the movable arm (17) so as to rotate between a first operating position in which the command lever (20) arranges the movable arm (17) in said locking position, and a second operating position in which the command lever (20) arranges the movable arm (17) in an unlocking position in which the lower end (17a) of the movable arm (17) is away/detached from said anchoring structure (18).

12. The ski boot according to claim 11, wherein the command lever (20) is butt hinged to the movable arm (17) so as to be able to rotate about a third rotation axis (C) substantially parallel to said second rotation axis (B).

13. The ski boot according to Claim 12, wherein the head (20a) of the command lever (20) is cam-shaped and is adapted to rest on the supporting plate (16) so as to locally move the movable arm (17) away from the supporting plate (16).

14. The ski boot according to any one of Claims 2 to 13, wherein said elastic member (19) is adapted to pull the movable arm (17) elastically towards the supporting plate (16) .

15. The ski boot according to Claim 14, wherein said elastic member (19) is interposed between the command lever (20) and the supporting plate (16).

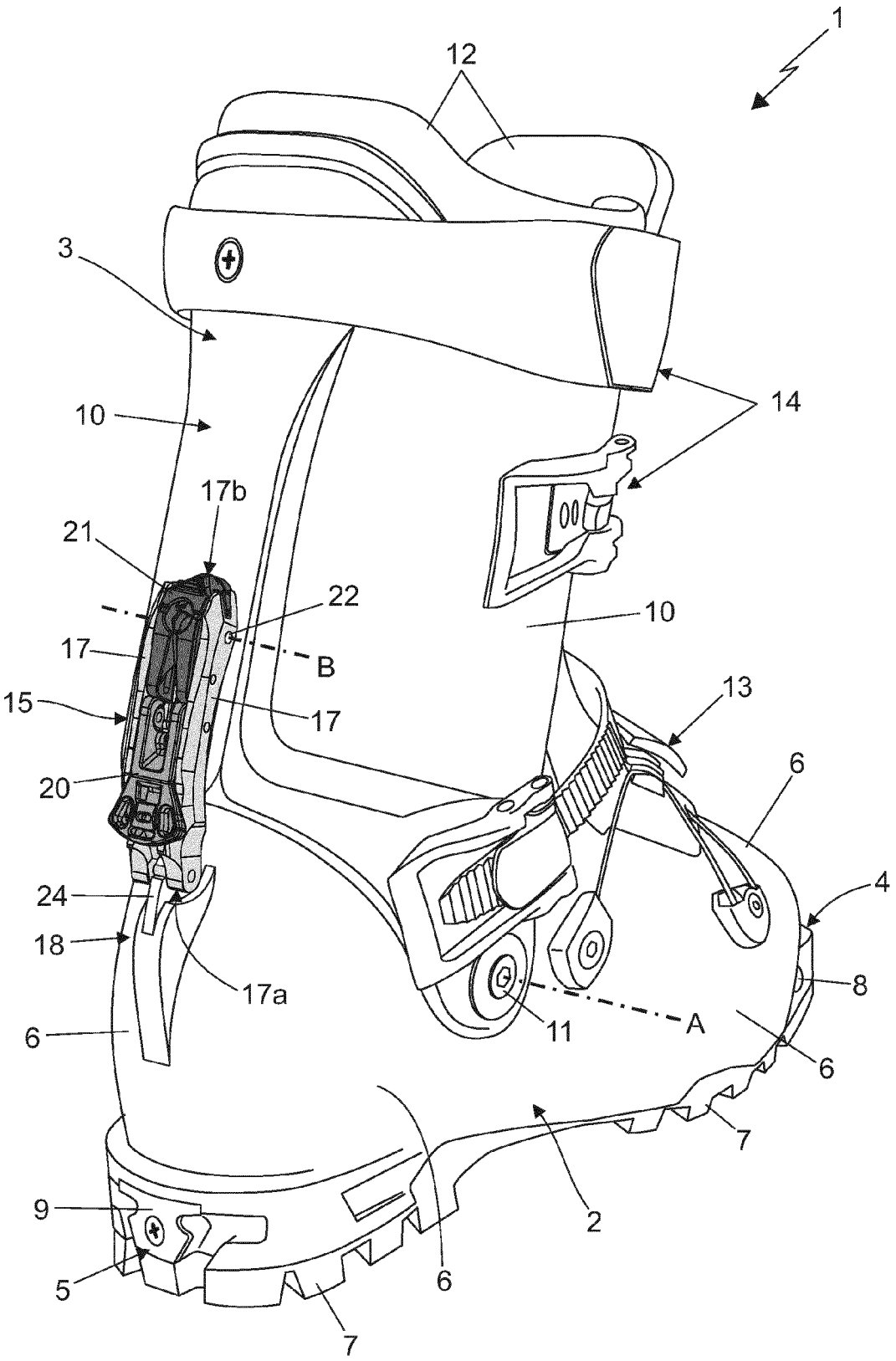

Fig. 1

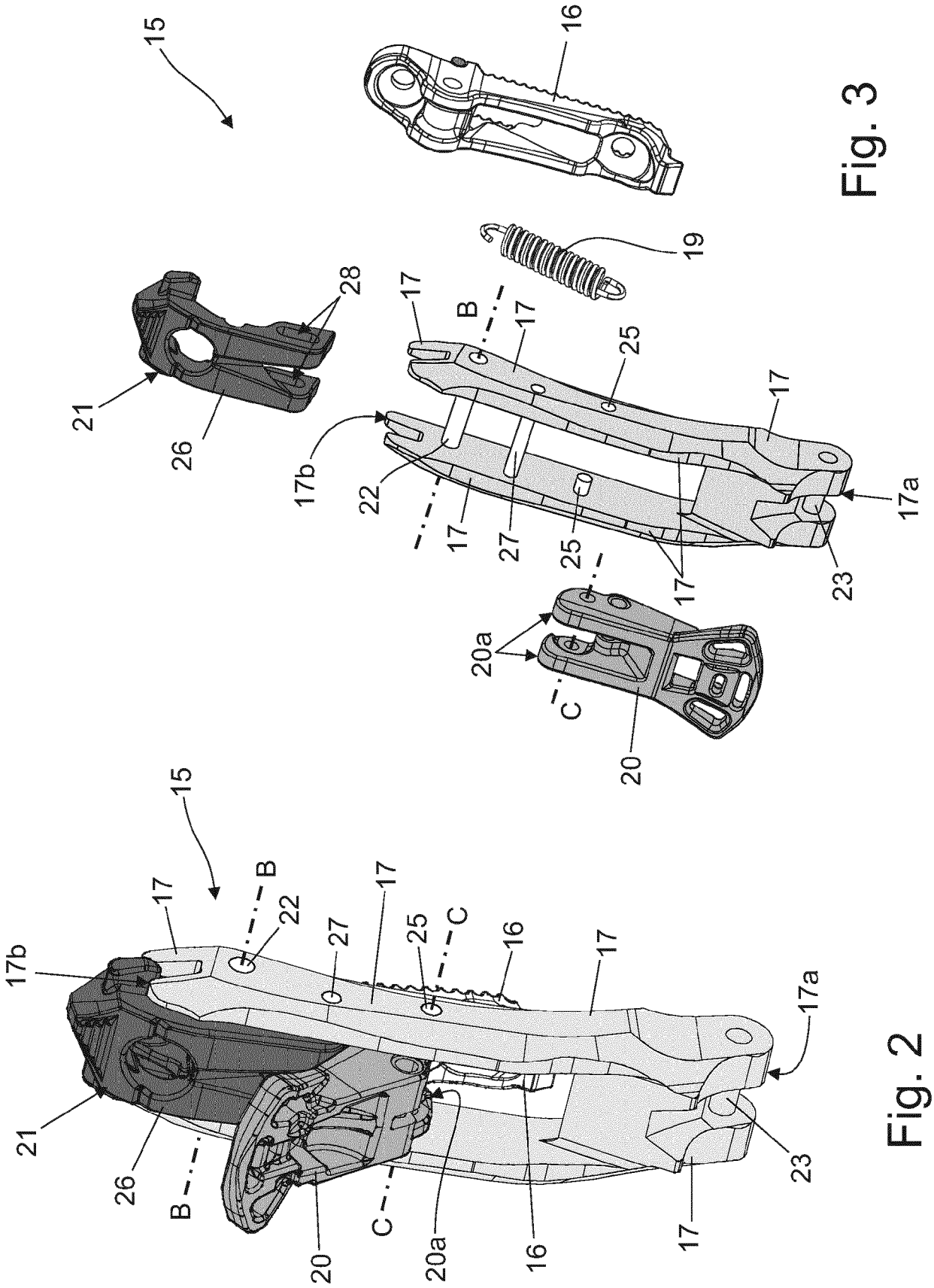
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Fig. 3

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Fig. 2

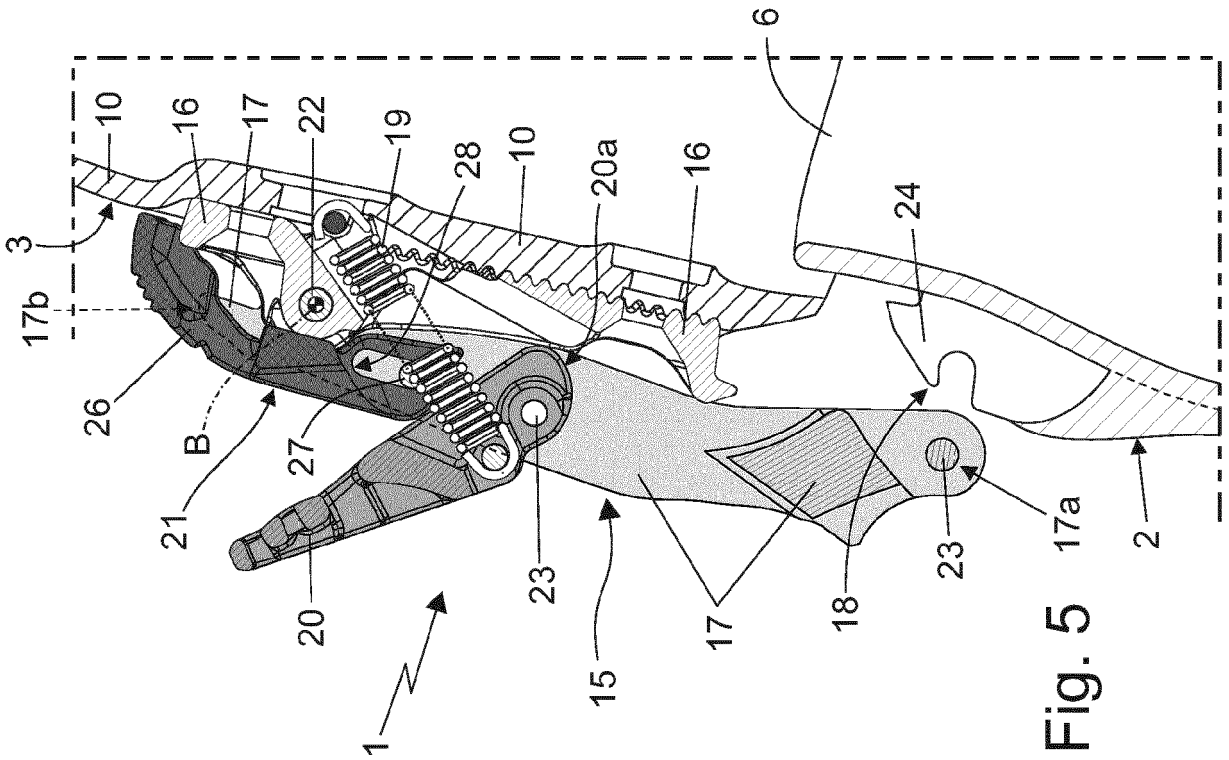
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Fig. 5

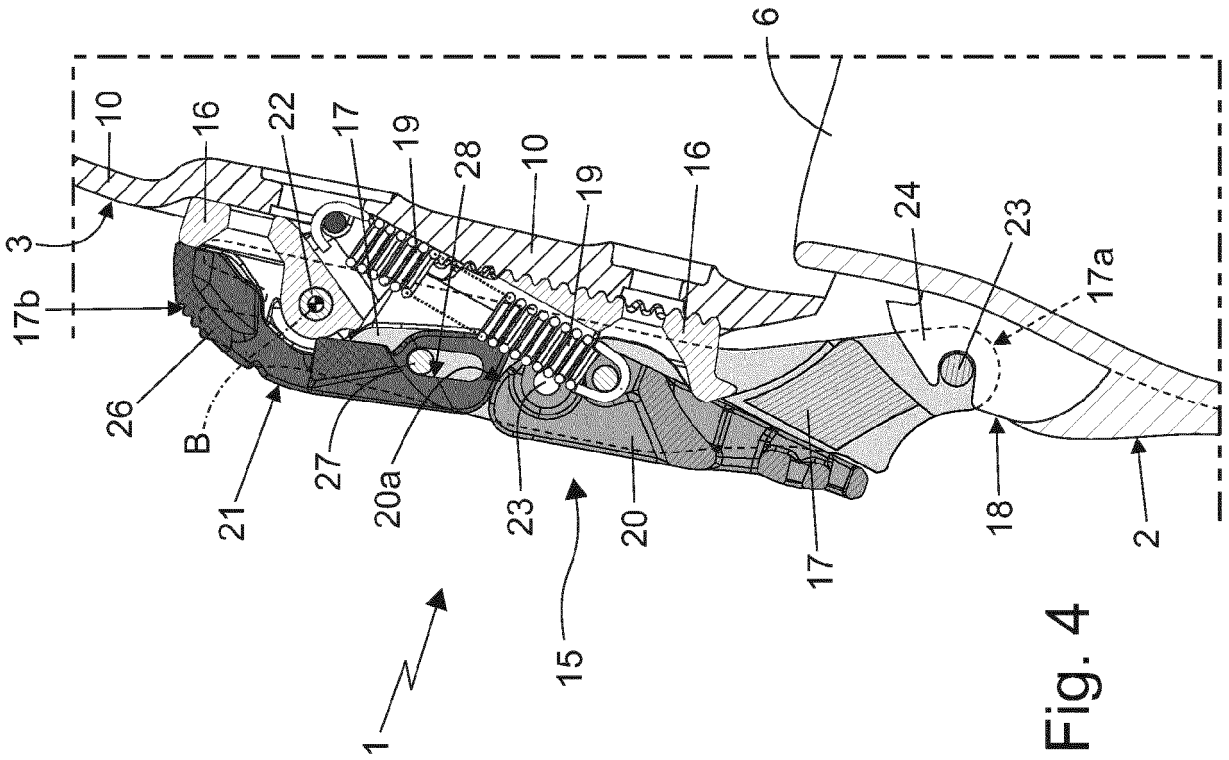
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Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 24 15 7324

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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	11 June 2024	Papatheofrastou, M

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