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(54) **SKI BOOT OR OFF-TRACK SKI BOOT WITH PERFECTED FASTENING MEANS**

(57) A ski boot or off-track ski boot (4) comprising a lower part or foot portion (8), suitable to embrace the foot of the user and an upper portion or leg portion (12), suitable to embrace the lower leg of the skier, the foot portion (8) and/or the leg portion (12) being provided with flaps (24,28) separate and facing each other, provided with fastening means (32) to allow the opening, closing and tightening of said flaps (24, 28), wherein the fastening means (32) comprise a rack (36) provided with teeth (40) and a closing lever (44) kinematically connected to a hook (48) suitable to engage on said teeth (40), the closing lever (44) going from a closed configuration in which it tightens the hook (48) on a tooth (40) of the rack (36) to an open configuration in which it allows the release of the hook (48). Advantageously, the fastening means (32) comprise an anti-release flap (52) superposed on the rack (36) and moveable from a locked position, in which it is fixed to the rack (36) or to the flap (24, 28) equipped with rack (36), to an unlocked configuration, in which the anti-release flap (52) is shaped so that, in the locking configuration, it identifies with the rack (36) a free volume (56) suitable to allow the release of the hook (48) from a tooth (40) and its repositioning in engagement on another tooth (40) of the rack (36).

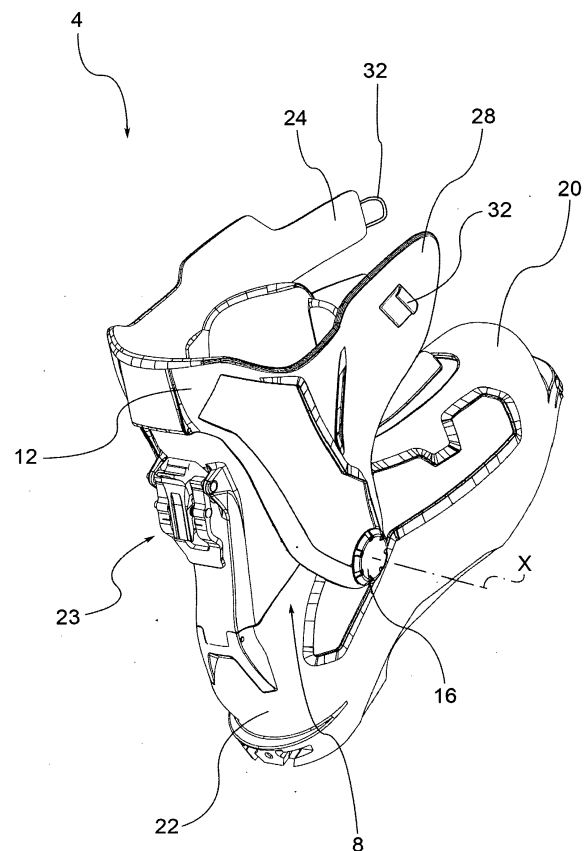


Fig.1

Description

FIELD OF APPLICATION

[0001] This invention relates to a ski boot or off-track ski boot comprising a perfected closure mechanism.

STATE OF THE ART

[0002] Ski boots or off-track ski boots comprise a foot portion, typically fixed, and suitable to accommodate the user's foot, and a leg portion, typically hinged to said foot portion, and suitable to accommodate the tibial portion of the user.

[0003] The leg portion and/or foot portion comprise two flaps facing one another and separated from one another so as to allow putting on the boot.

[0004] After putting on the boot, the user must then close it by means of a plurality of fastening means, such as, for example, closing levers associated with said flaps.

[0005] The closing levers usually comprise a rack, a hook suitable to engage on the teeth of the rack and a lever kinematically connected to the hook so as to allow the movement of the hook, its engagement on the rack and subsequent tightening, i.e., the closure of the foot portion and/or of the leg portion.

[0006] Normally the closing levers are also provided with an anti-release device, i.e., a flap or tongue covering the rack so as to oppose to the release of the hook from the respective tooth on which it is engaged.

[0007] This flap or tongue is in fact provided with a spring that pushes it in abutment against the rack and the hook. In this way, even in case of front or side impact of the leg portion against an obstacle, the flap prevents the lifting and, thus, the release of the hook with respect to the tooth of the rack.

PRESENTATION OF THE INVENTION

[0008] The solutions of the known art described above have several disadvantages.

[0009] In fact, if on the one hand the anti-release function is ensured, the other, the user is forced to use two hands to open/close the fastening means.

[0010] In fact, in the closing step, with a first hand he must lift the anti-release flap and, with the other, he must engage the hook on the selected tooth; then he can proceed with the actual closure by operating the corresponding lever.

[0011] In the step of opening, or simply loosening the leg portion or foot portion, for example to have greater mobility, of the foot or of the tibial part with respect to the boot, or greater comfort, the user must again use two hands since, with the first hand, he must keep the flap raised and, with the second, he must move the hook and then operate the closing lever. There is also the same need to use two hands in the case where the user simply wants to further tighten the fastening means.

[0012] The need to use two hands makes the operation particularly long and inconvenient, also because the user typically wears gloves during these operations.

[0013] The boots of the prior art are therefore rather inconvenient to use. The problem is further exacerbated when using off-track ski boots; in fact, under typical conditions of use of ski touring, i.e., off-track, boots, the user must continuously switch from the skiing configuration, during which the leg portion is fixed with respect to the foot portion, to the walking configuration, in which the leg portion is free to rotate with respect to the foot portion, supporting the rotation of the ankle of the user.

[0014] When the user switches to walking configuration, he needs to loosen the closing levers, precisely to recover greater mobility of the foot and of the leg; he has the opposite need, i.e., to close and/or tighten the closing levers, when he returns to the skiing configuration. In alpine skiing, one can switch from one configuration to the other even dozens of times every hour.

[0015] It is therefore clear that the user's movements are slowed since he must continually bend down on the boots and use both hands.

[0016] The purpose of this invention is to provide a ski, off-track ski, boot that solves the drawbacks cited with reference to the known art.

[0017] These drawbacks and limitations are solved by an off-track ski boot according to claim 1.

[0018] Other embodiments of the boot according to the invention are described in the subsequent claims.

DESCRIPTION OF THE DRAWINGS

[0019] Further characteristics and advantages of this invention will be more understandable from the following description of its preferred and non-limiting examples of embodiments, wherein:

Figure 1 is a perspective view of a ski boot equipped with a fastening means according to this invention; Figures 2a-2c are, respectively, a side view, from above and in perspective, of a fastening means according to this invention, in the closed configuration of both the closing lever and the anti-release flap; Figures 3a-3c are, respectively, a side view, from above and in perspective, of a fastening means according to this invention, in the opening configuration of the closing lever and closure of the anti-release flap; Figures 4a-4c are, respectively, a side view, from above and in perspective, of a fastening means according to this invention, in the opening configuration of the closing lever, of closure of the anti-release flap, with hook released from the rack; Figures 5a-5c are, respectively, a side view, from above and in perspective, of a fastening means according to this invention, in the opening configuration of the closing lever and of the anti-release flap.

[0020] The members, or parts of members, in common between the embodiments described below will be indicated with the same reference numbers.

DETAILED DESCRIPTION

[0021] With reference to the aforesaid figures, the number 4 globally indicates a ski or off-track ski boot consisting of a lower part or foot portion 8, suitable to enclose the foot of the user or skier and an upper part or leg portion 12, suitable to enclose the lower part of the skier's leg.

[0022] The definition of the ski boot or off-track ski boot should not be considered in a restrictive way, since this invention applies to any type of ski boot in general provided with flaps or portions that must be openable to allow putting on the boot and closable in order to use the boot after it is put on. So, this invention also applies to types of boots for telemark, snowboards and any other application.

[0023] Also the definitions of foot portion 8 and leg portion 12 should be considered in a general and not restrictive manner: this invention presents no type of limitation with respect to shapes, sizes, materials, type of foot portion and leg portion and therefore the invention also covers types of foot portion 8 and leg portion 12 that at least partially embrace the foot and the upper part of the leg, i.e., the shin of the skier.

[0024] For this reason, the type of boot shown in the figures should be considered as a non-limiting example for the purposes of the field of application of this invention.

[0025] In the type of off-track ski boot, as in the case of Figure 1, the leg portion 12 is hinged to the foot portion 8 with respect to hinges 16 defining an axis of rotation X-X, so as to be able to rotate with respect to the foot portion about said axis of rotation X-X.

[0026] The type of hinge 16 can be varied and, preferably, there is provided a pair of hinges 16 arranged on opposite sides with respect to the leg portion 12.

[0027] Preferably, the hinges 16 identify a horizontal rotation axis X-X, i.e., parallel to a sole 18 of the boot 4.

[0028] The leg portion 12 is hinged to the foot portion 8 so as to be able to rotate relative to the foot portion 8 around said hinges 16 both forwards, i.e., towards a tip 20 of the boot 4, and backwards toward a heel 22 of the boot 4.

[0029] According to an embodiment, the boot 4 comprises fastening means 23 suitable to selectively lock the rotation of the leg portion 12 with respect to the foot portion 8 depending on whether the user wishes to pass from a skiing configuration to a walking configuration, respectively.

[0030] It should be noted that selective locking/unlocking means that the user can actuate the fastening means 23 to switch at will from one configuration to another.

[0031] The foot portion 8 and/or leg portion 12 are provided with flaps 24,28 separate and facing each other, fitted with fastening means 32 to allow the opening, closing

and tightening of said flaps 24,28.

[0032] The opening of the flaps serves for example to allow a more comfortable fit or even the possibility of removing the boot; closing and tightening allow adjusting the stiffness as a function of the user's preferences.

[0033] According to an embodiment, the fastening means 32 comprise a rack 36 provided with teeth 40 and a closing lever 44 kinematically connected to a hook 48 suitable to engage on said teeth 40.

[0034] A ski boot 4 according to this invention may comprise a plurality of fastening means 32 with respective closing levers 44 and racks 36 arranged both on the leg portion 12 and on the foot portion 8.

[0035] The closing lever 44 passes from a closed configuration in which it tightens the hook 48 on a tooth 40 of the rack 36 to an open configuration in which it allows the release of the hook 48 from the rack 36.

[0036] Advantageously, the fastening means 32 comprise an anti-release flap 52, overlapping the rack 36 and movable from a blocking position, in which it attaches to the rack 36 or to the flap 24,28 provided with the rack 36, to a release configuration, in which it allows the release of the hook 48 from the rack 36.

[0037] Advantageously the anti-release flap 52 is shaped so that, in the locking configuration, it identifies with the rack 36 a free volume 56 suitable to allow the release of the hook 48 from a tooth 40 and its repositioning in engagement on another tooth 40 of the rack 36.

[0038] According to an embodiment, the anti-release flap 52 is shaped so as to have a recessed portion 60 on the side opposite the rack 36, to identify said free volume 56.

[0039] For example, the recessed portion 60 is concave towards the rack 36 when it is in the locking configuration, so as to allow the passage of the hook 48 and its shifting between different teeth 40 of the rack 36, in the locking configuration.

[0040] For example, the anti-release flap 52 has an inner wall 64, facing the rack 36, arc-shaped so as to form, in the locking configuration, a guide for receiving in abutment and supporting the hook 48 in its movement between various teeth 40 of the rack, even in the locking configuration.

[0041] For example, the anti-release flap 52 is snap constrained on a corresponding crest or tooth 40 of the rack 36.

[0042] It is possible to provide that the anti-release flap 52 comprises a spring which influences it towards and/or in abutment against the rack 36.

[0043] The anti-release flap 52 can be hinged to a portion of the rack 36 or a support base 68 of the rack 36.

[0044] The closing lever 44 is pivoted on a rotation pin 72 so as to present, on opposite sides of the rotation pin 72, a gripping portion 76 for the movement of the closing lever 44 by a user, and the hook 48 suitable to engage on the teeth 40 of the rack 36.

[0045] Preferably, the closing lever 44 is in one piece pivoted in relation to said rotation pin 72.

[0046] For example, the closing lever 44 is curved in a 'V' in order to present a concavity 60 facing the rack 36, in the closed configuration.

[0047] According to an embodiment, the closing lever 44 is associated with a first 24 of said flaps and the rack 36 is associated with a second 28 of said flaps 24,28.

[0048] For example, the closing lever 44 is associated with one of said flaps 24,28 by means of a flexible connection 84, fixed at the rotation pin 72 of the closing lever 44.

[0049] The flexible connection may, for example, be obtained through the adoption of a flexible cable, for example metallic, suitably fastened to a seat, to a pin or similar fastening means associated to a flap opposed to the one to which is associated the rack.

[0050] According to an embodiment, the closing lever 44, on the hook side 48, comprises a pair of rounded portions 88 which support opposite ends 92,94 of the hook 48, wherein the rounded portions 88 are arranged to straddle the rack 36 so as to abut against portions of the rack 36 or a support base 68 which is associated to the rack 36, and to facilitate the rotation of the closing lever 44.

[0051] Preferably, the closing lever 44 is shaped so as to delimit a window 96 counter-shaped to the anti-release flap 52 so as to allow the mutual overlapping of the flap 52 and the closing lever 44 during the respective rotations of the closing lever 44 and the anti-release flap 52.

[0052] According to an embodiment, the anti-release flap 52 and the closing lever 44 are hinged so as to rotate in a combined manner in the transition from the respective positions of release/opening, in which they move away from the rack 36, to the respective positions of locking/closing, in which they move towards the rack 36.

[0053] Now, the operation of the boot according to this invention will be described.

[0054] In particular, assuming that the fastening means 32 of the boot are in the closed (actuating lever 44) and locked (anti-release flap 52) configuration. This configuration is, for example, shown in Figures 2a-2c.

[0055] The user may need to adjust the fastening means 32, to either loosen or tighten them: in such case, he may proceed by opening the closing lever 44 which is gripped and rotated to the open position (Figures 3a-3c).

[0056] Thanks to the opening of the closing lever 44, the hook 48 is loosened and can therefore be disengaged from the corresponding tooth 40 of the rack 36 to which it is hooked.

[0057] In fact, thanks to the rotation of the closing lever 44 to the open position, the rotation pin 72 moves back, i.e., inverts its position with respect to the hook: in this way, the fastening means loosen the tightness between the corresponding flaps 24,28 and one has a length equal to the distance between the hook 48 and the rotation pin 72. This loosening allows the release of the hook 48 from the corresponding tooth 40.

[0058] In particular, to release the hook 48 from the

tooth 40 to which it is hooked, the user can leverage on the gripping portion 76 so as to rotate the closing lever 44 with respect to the rotation pin 72. This movement is, for example, facilitated by the rounded portions 88. In addition, such movement is facilitated, from an ergonomic point of view, by the 'V' conformation of the closing lever 44, which facilitates the leverage effect: all this, always with the aim of allowing the movement, opening, closing, and the adjustment of the tightness of the fastening means always with only one hand, without losing the anti-release function conferred by the anti-release flap 52.

[0059] Thanks to the leverage exerted by the user via the gripping portion 76, the hook 48 is released from the tooth 40; the hook 48 can in turn be moved along the teeth 40 of the rack 36 while leaving the anti-release flap 52 in the locked position. In fact, as seen, the anti-release flap 52 is shaped so as to allow the passage and displacement of the hook 48 along the rack 36.

[0060] In addition, the inner wall 64 of the anti-release flap 52 acts as a guide in the movement of the pin; the user is facilitated in the operation through the use of only one hand with which he can grasp the gripping portion 76 and, with it, also move the hook 48 so as to bring it on the tooth corresponding to the desired adjustment. After choosing the new tooth 40 on which to engage the hook 48, the user, always with the same hand, can simply rotate the closing lever 44 to the closed position.

[0061] Thanks to the fact that the anti-release flap 52 remains in the closed position, the hook is prevented from completely moving away from the rack 36; in this way, not only is the complete accidental opening of the fastening means 32 prevented during adjustment by the user (who always uses one hand), but the accidental unhooking of the fastening means is also prevented during skiing, for example due to hitting an obstacle.

[0062] Any complete opening of the fastening means 32 can be obtained by opening completely both the closing lever 44 and the anti-release flap (Figures 5a-5c).

[0063] As can be appreciated from the description, the ski boot or off-track ski boot according to the invention allows overcoming the drawbacks presented in the prior art.

[0064] In particular, the closing lever according to the invention allows being actuated by the user with one hand, greatly simplifying the steps by opening/closing of the levers of the boot.

[0065] In fact, the anti-release flap is shaped so as to allow the movement of the hook between different teeth of the rack without having to be moved or lifted by the user a hand. In fact, the flap is shaped so as to define a free volume for moving the hook between different teeth of the rack while remaining in the closed condition.

[0066] Moreover, the same anti-release flap is shaped so as to be itself a guide for the movement of the hook itself.

[0067] In addition, the actuating lever is secured to the support base of the hook. In this way, when the user

grasps and moves the closing lever, he has direct control of the position of the hook, with the guarantee that the latter cannot move in an uncontrolled manner since it is guided, as seen, by the same anti-release flap, when the latter is in the locked position.

[0068] So, the boot according to the invention comprises fastening means that can be operated by the user with one hand, greatly simplifying all the operations that the user must perform when he wants to loosen or tighten the locking levers of the boot and, especially, when in off-track skiing, he must continually switch between the skiing and walking configurations and vice versa.

[0069] A person skilled in the art, in order to satisfy contingent and specific needs, may make numerous modifications and variations to the boots described above, all however contained within the scope of the invention as defined by the following claims.

Claims

1. Ski boot and/or off-track ski boot (4) comprising a lower part or foot portion (8), suitable for enclosing the user's foot and an upper part or leg portion (12), suitable for enclosing the lower part of the skier's leg,

- the foot portion (8) and/or leg portion (12) being provided with flaps (24, 28) separate and facing each other, fitted with fastening means (32) to allow the opening, closing and tightening of said flaps (24,28),

- wherein the fastening means (32) comprise a rack (36) provided with teeth (40) and a closing lever (44) kinematically connected to a hook (48) suitable to engage on said teeth (40), the closing lever (44) moving from a closed configuration, in which it clamps the hook (48) on a tooth (40) of the rack (36), to an open configuration,

in which it allows the release of the hook (48), **characterised in that**

- the fastening means (32) comprise an anti-release flap (52), overlapping the rack (36) and movable from a blocking position, in which it attaches to the rack (36) or the flap (24,28) provided with the rack (36), to a release configuration,

- wherein the anti-release flap (52) is shaped so that, in the locking configuration, it identifies with the rack (36) a free volume (56) suitable to allow the release of the hook (48) from a tooth (40) and its repositioning in engagement on another tooth (40) of the rack (36).

2. Ski boot or off-track ski boot (4) according to claim 1, wherein the anti-release flap (52) is shaped so as to have a recessed portion (60) on the side opposite

the rack (36), to identify said free volume (56).

3. Ski boot or off-track ski boot (4) according to claim 2, wherein said recessed portion (60) is concave towards the rack (36) in the locking configuration of the anti-release flap (52), so as to allow the passage of the hook (48) and its shifting between different teeth (40) of the rack (36), even in the locking configuration of the anti-release flap (52).

4. Ski boot or off-track ski boot (4) according to any of the claims from 1 to 3, wherein the anti-release flap (52) has an inner wall (64), facing the rack (36), arc-shaped so as to form, in the locking configuration, a guide for receiving in abutment and supporting the hook (48) in its movement between various teeth (40) of the rack (36).

5. Ski boot or off-track ski boot (4) according to any of the previous claims, wherein the anti-release flap (52) is snap constrained on a corresponding crest or tooth (40) of the rack (36).

6. Ski boot or off-track ski boot (4) according to any of the previous claims, wherein the anti-release flap (52) comprises a spring which influences it towards and/or in abutment against the rack (36).

7. Ski boot or off-track ski boot (4) according to any of the previous claims, wherein the anti-release flap (52) is hinged to a portion of the rack (36) or a support base (68) of the rack (36).

8. Ski boot or off-track ski boot (4) according to any of the claims from 1 to 7, wherein the closing lever (44) is pivoted on a rotation pin (72) so as to present, on opposite sides of the rotation pin (72), a gripping portion (76) for the movement of the closing lever (44) by a user, and the hook (48) suitable to engage on the teeth (40) of the rack (36).

9. Ski boot or off-track ski boot (4) according to claim 8, wherein the closing lever (44) is in one piece pivoted in relation to said rotation pin (72).

10. Ski boot or off-track ski boot (4) according to any of the claims from 1 to 9, wherein the closing lever (44) is curved in a 'V' in order to present a concavity (60) facing the rack (36), in the closed configuration of the rack (36).

11. Ski boot or off-track ski boot (4) according to any of the claims from 1 to 10, wherein the closing lever (44) is associated with a first (24) of said flaps and the rack (36) is associated with a second (28) of said flaps.

12. Ski boot or off-track ski boot (4) according to any of

the claims from 1 to 11, wherein the closing lever (44) is associated with one of said flaps (24, 28) by means of a flexible connection, fixed at the rotation pin (72) of the lever.

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- 13.** Ski boot or off-track ski boot (4) according to any of the previous claims, wherein the closing lever (44), on the hook side (48), comprises a pair of rounded portions (88) which support opposite ends (92, 94) of the hook (48), wherein the rounded portions (88) are arranged to straddle the rack (36) so as to abut against portions of the rack (36) or a support base (68) which is associated to the rack (36), and to facilitate the rotation of the closing lever (44).

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- 14.** Ski boot or off-track ski boot (4) according to any of the claims from 1 to 13, wherein the closing lever (44) is shaped so as to delimit a window (96) counter-shaped to the anti-release flap (52) so as to allow the mutual overlapping of the flap (52) and the closing lever (44) during the respective rotations of the closing lever (44) and the anti-release flap (52).

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- 15.** Ski boot or off-track ski boot (4) according to any of the claims from 1 to 14, wherein the anti-release flap (52) and the closing lever (44) are hinged so as to rotate in a combined manner in the transition from the respective positions in which they move away from the rack (36), to the respective closed positions, in which they move towards the rack (36).

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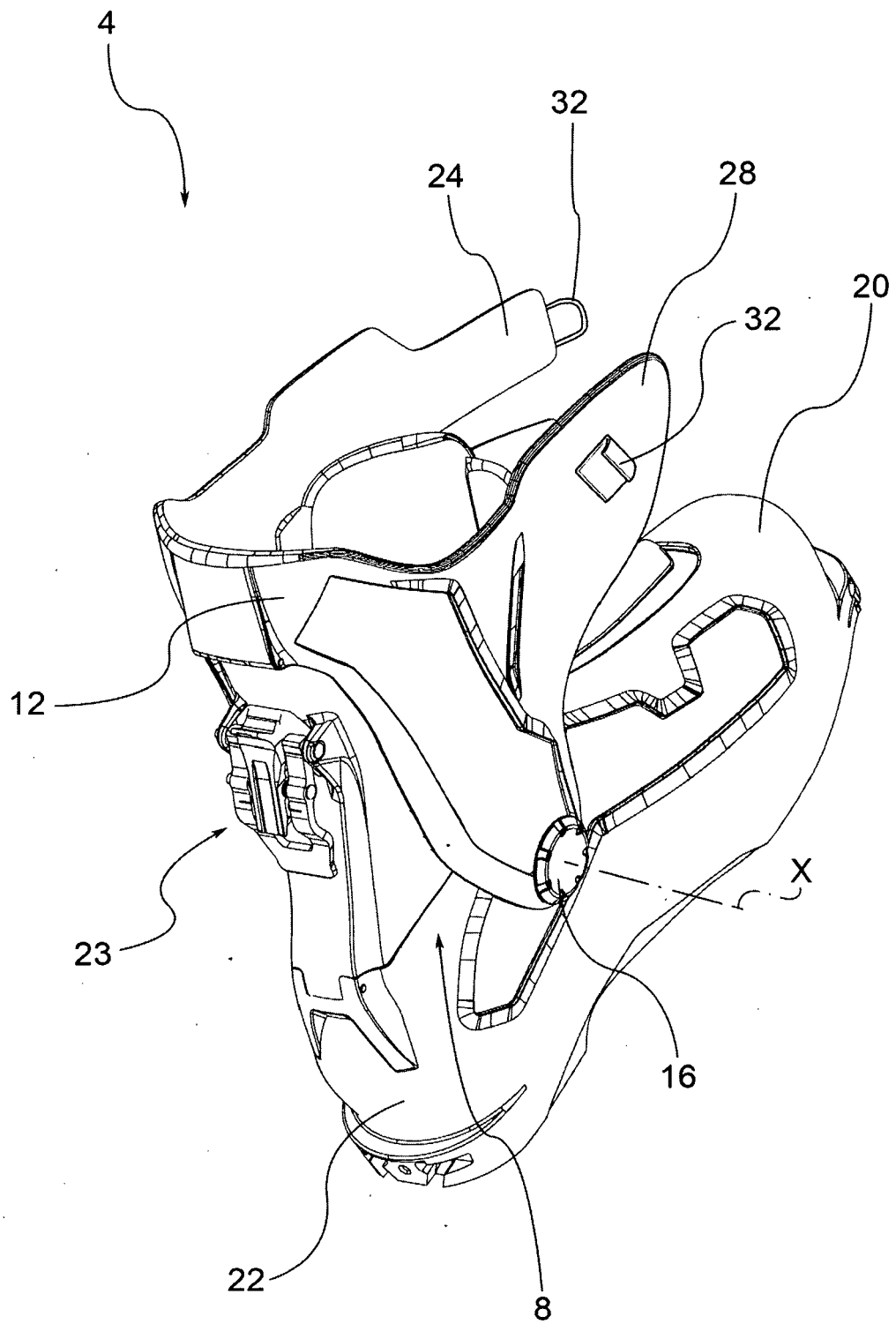


Fig.1

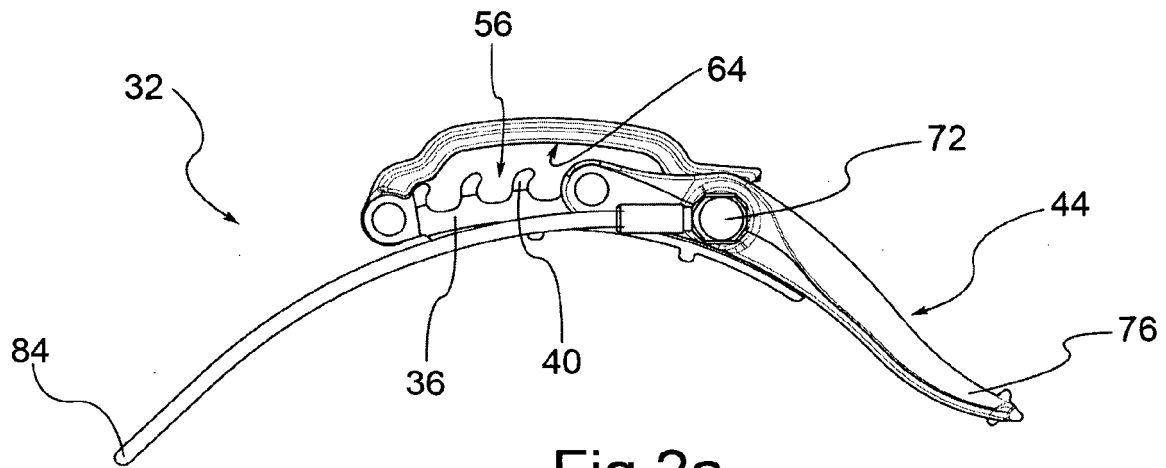


Fig.2a

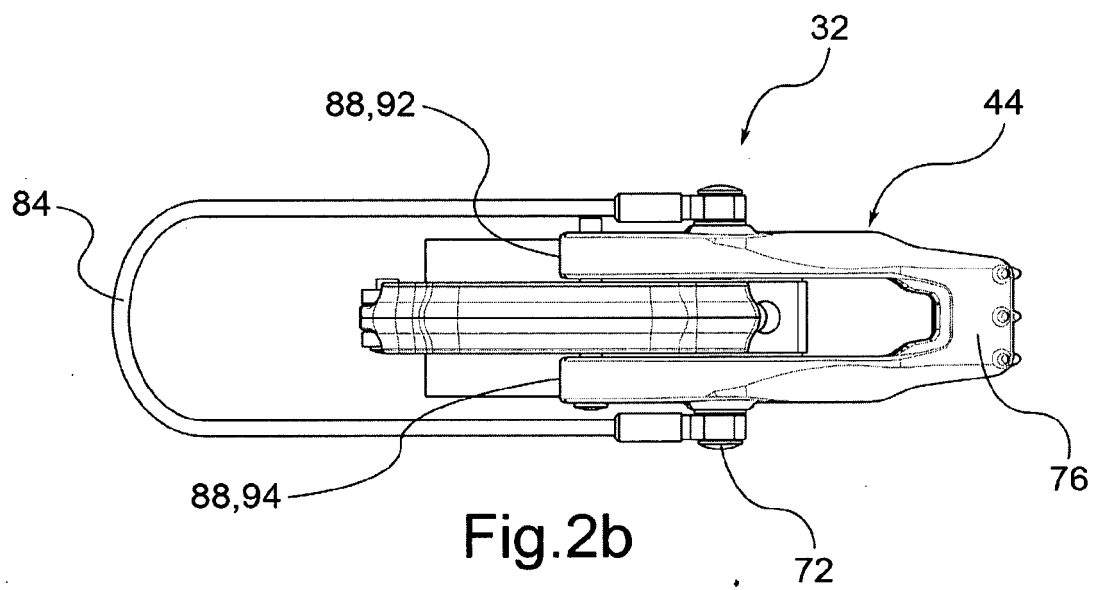


Fig.2b

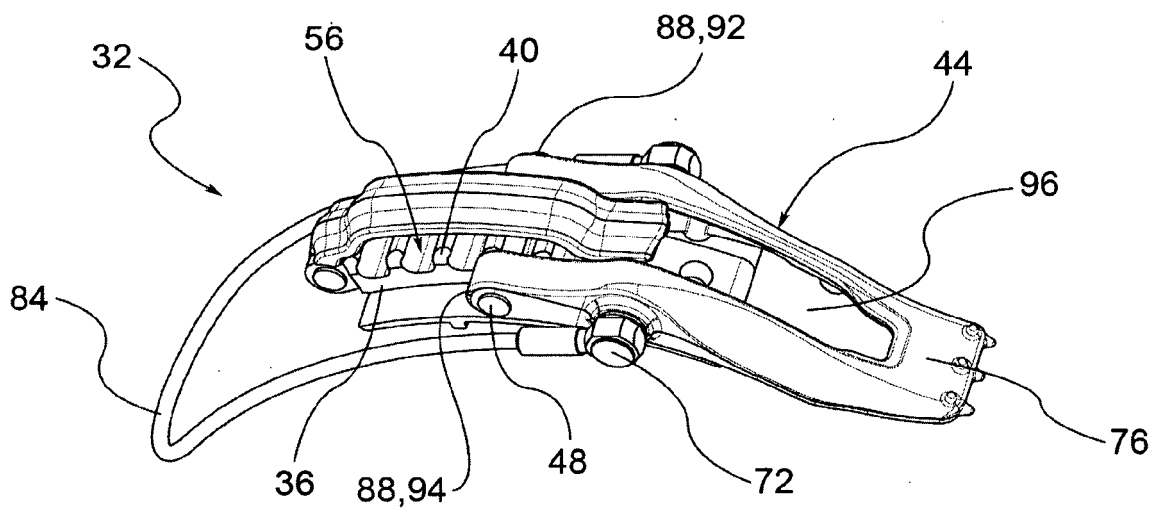
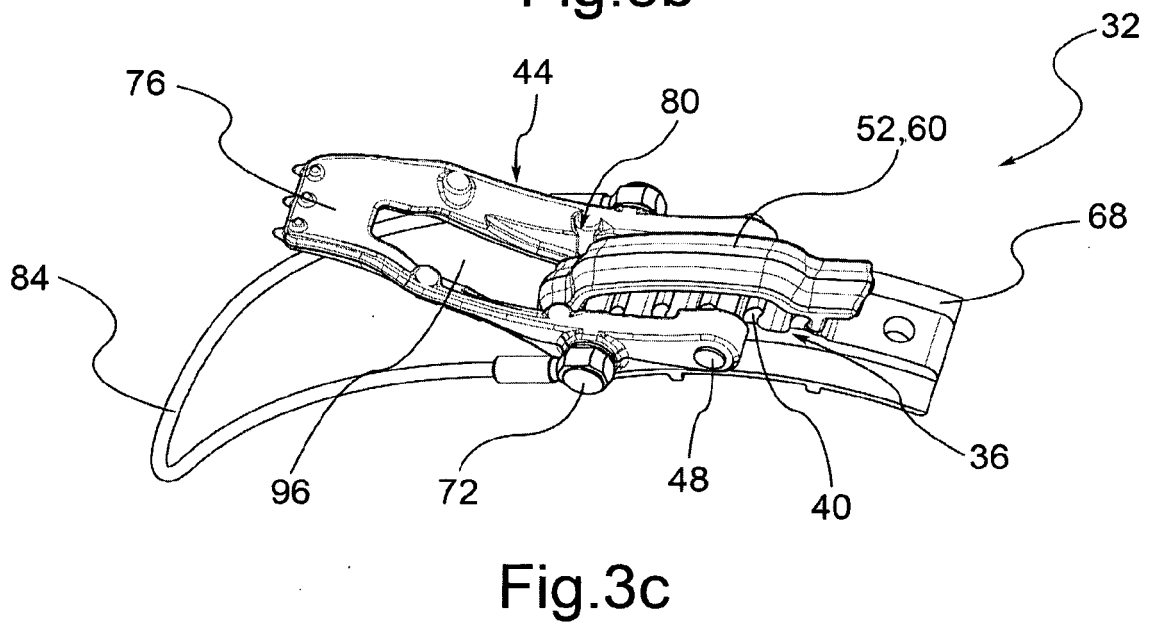
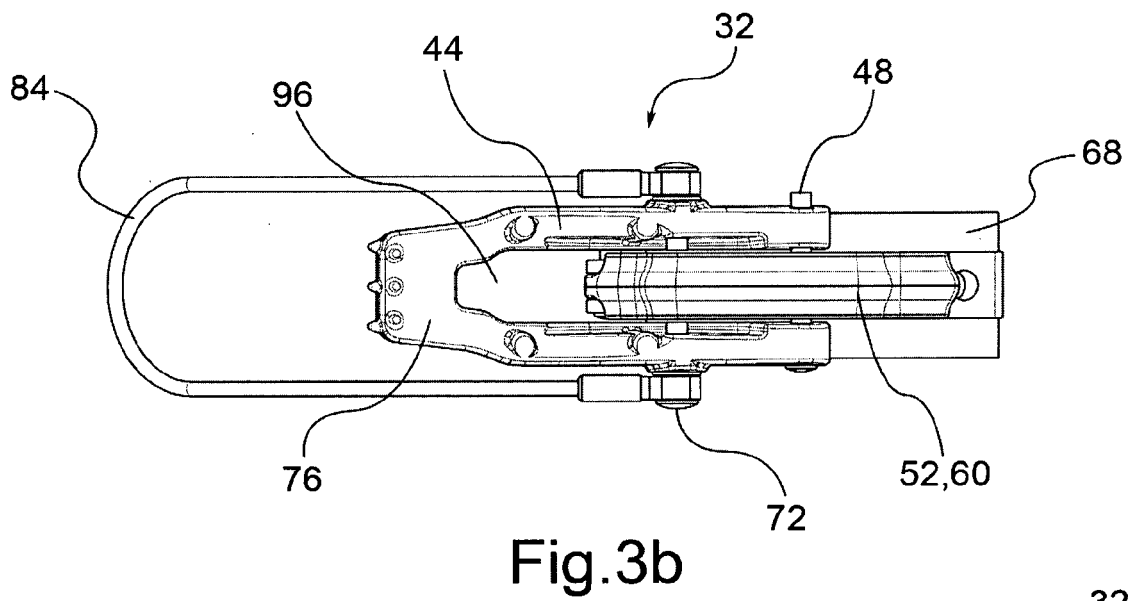
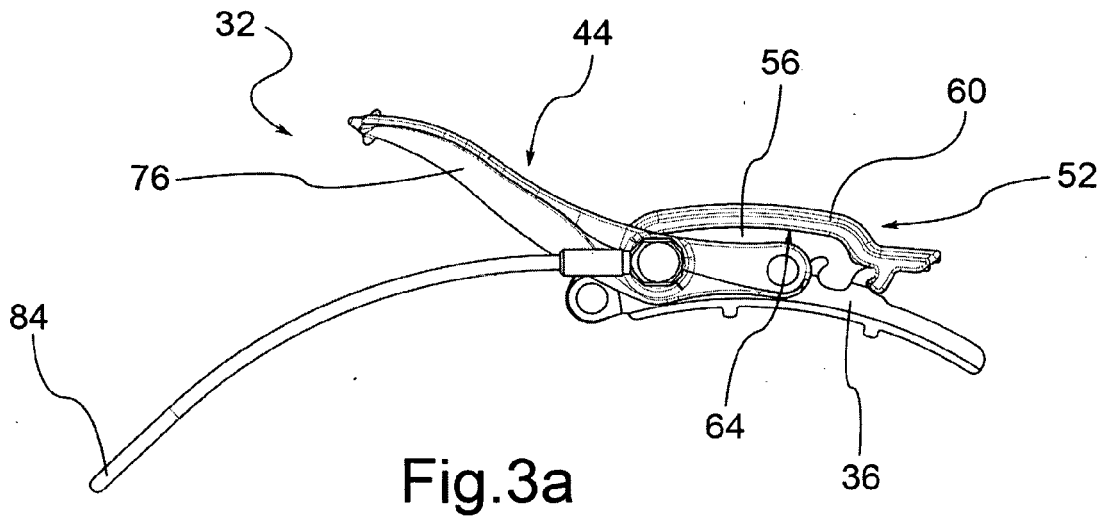
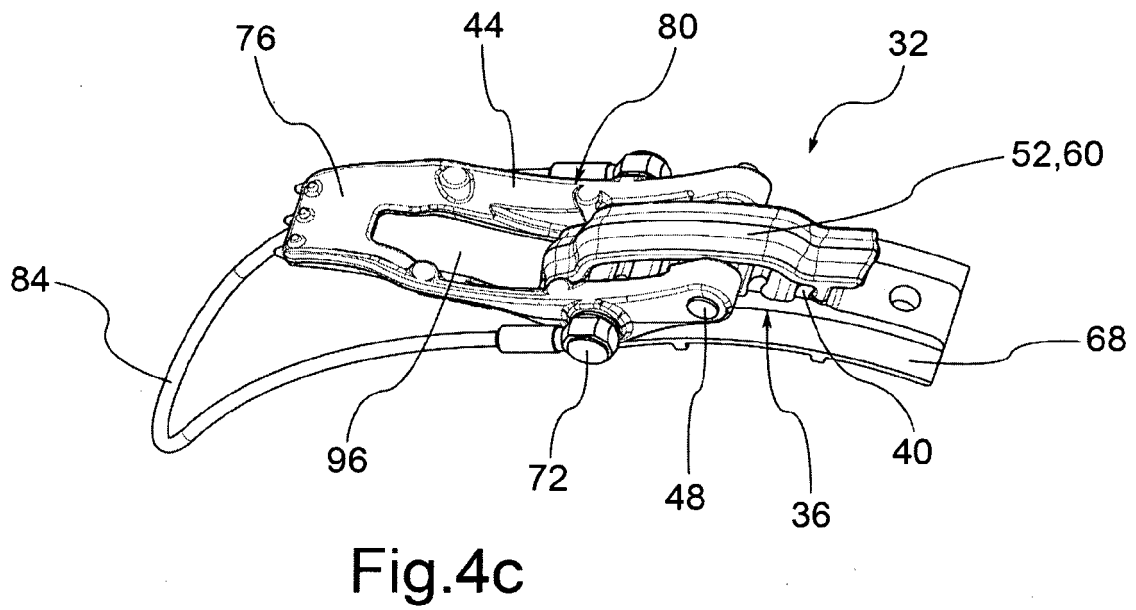
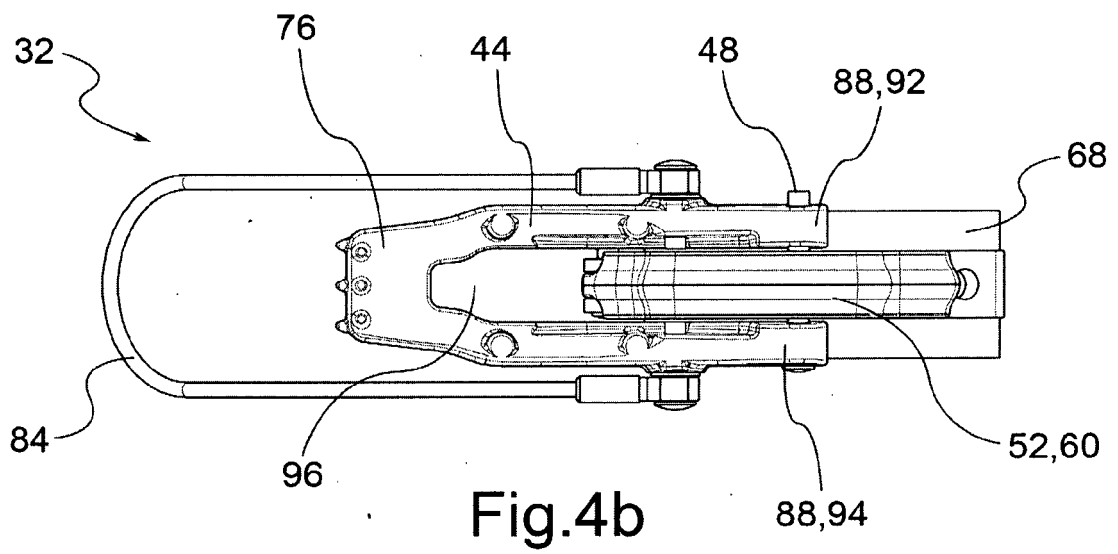
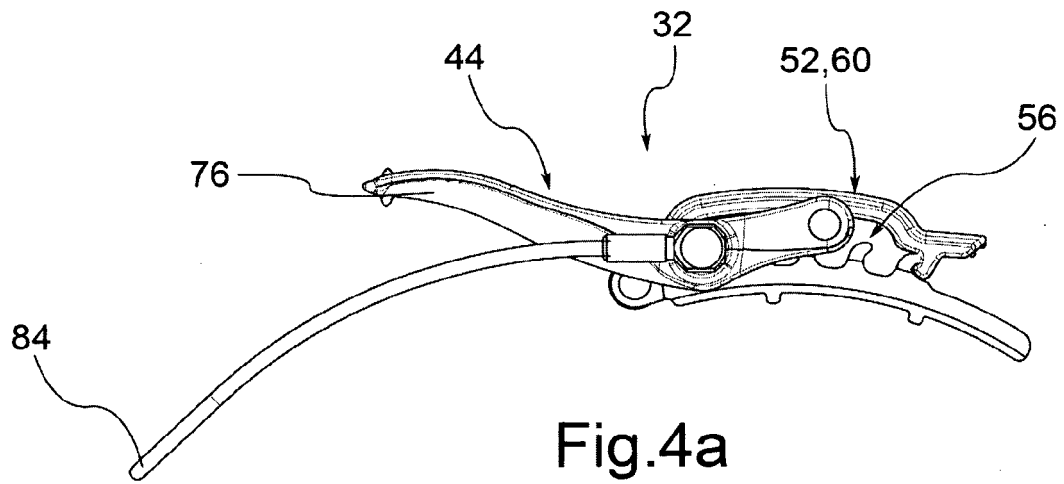


Fig.2c





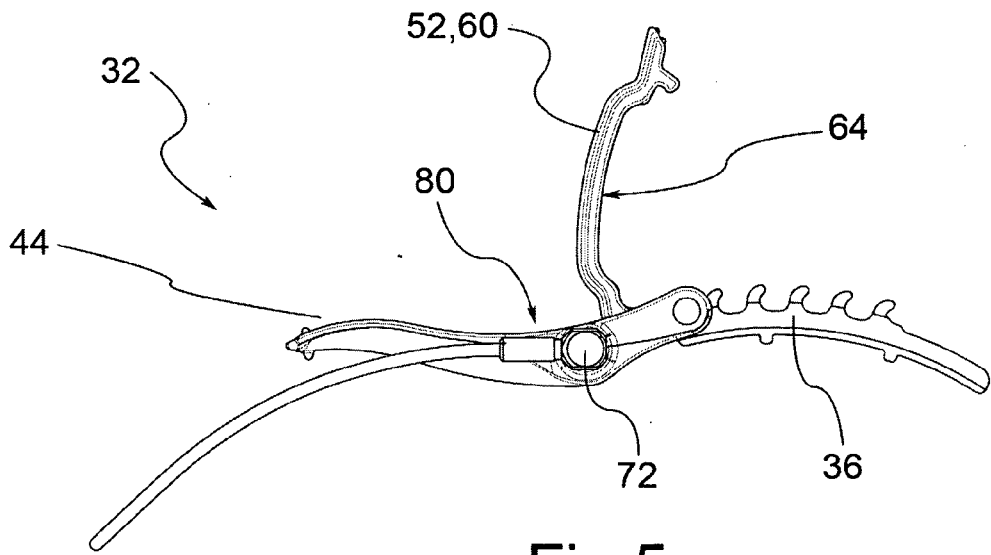


Fig. 5a

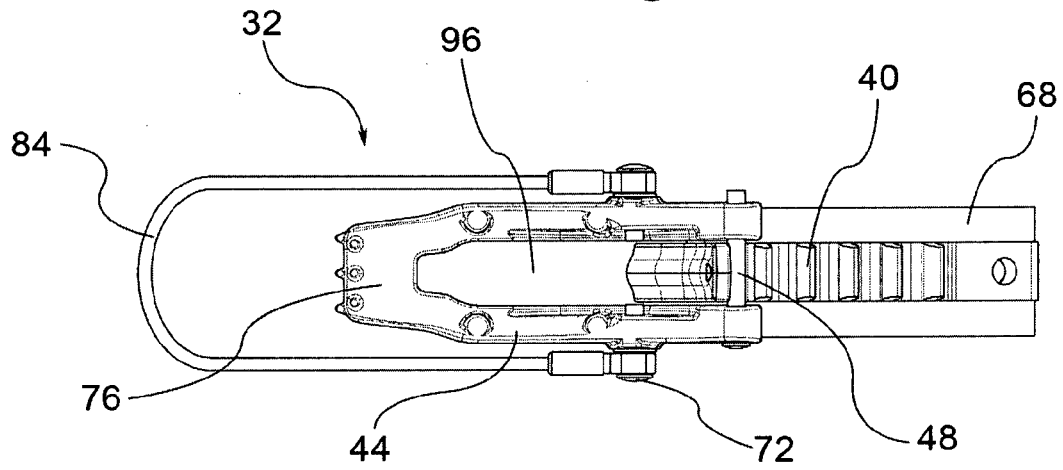


Fig. 5b

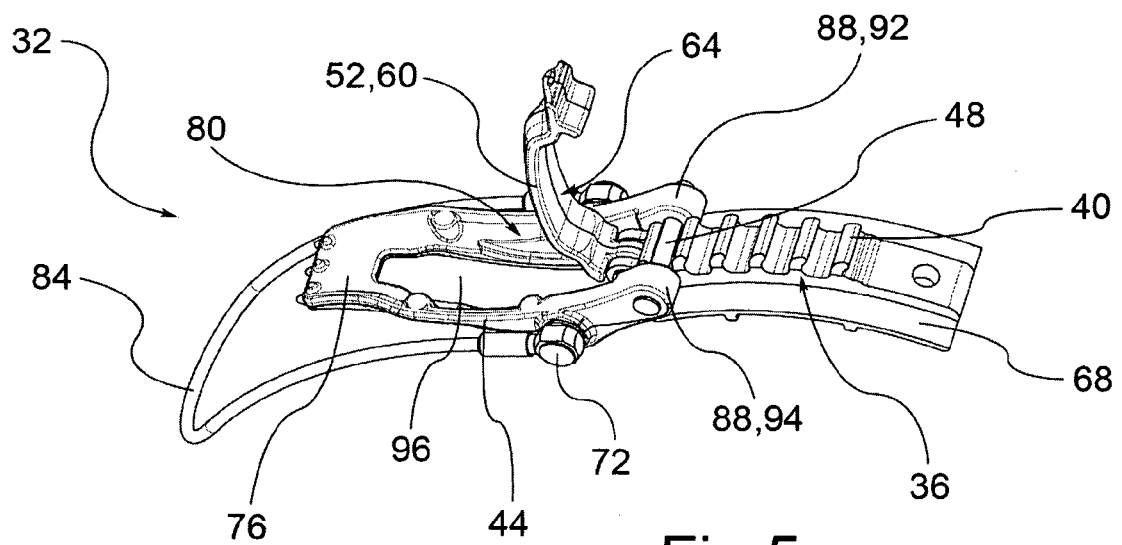


Fig. 5c



EUROPEAN SEARCH REPORT

Application Number
EP 15 00 3135

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DOCUMENTS CONSIDERED TO BE RELEVANT			
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A	DE 27 39 700 A1 (SALOMON & FILS F) 9 March 1978 (1978-03-09) * the whole document *	1-15	INV. A43C11/14
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			TECHNICAL FIELDS SEARCHED (IPC)
			A43C
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		21 April 2016	Cianci, Sabino
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P04C01)

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

EP 15 00 3135

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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