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(54) **BOOT COMPRISING A DEVICE FOR ADJUSTING THE CLOSURE OF THE LEG PORTION**

(57) A boot (12) comprising a foot portion (14) and a leg portion (16) projecting from the foot portion (14). The boot (12) also comprises a device (18) for adjusting the closure of the leg portion (16), which adjustment device is provided with at least one adjustment cable (20) adapted to at least partially surround the leg portion (16), the adjustment cable having a first end (202) that is integral with the leg portion (16), and a second end (204). The leg portion (16) is provided with a cable guide (22) comprising at least one through hole (24) having an inlet opening (242) and an outlet opening (244). The adjustment cable (20) is inserted into the at least one through hole (24) at the inlet opening (242) so as to protrude with a slot (26) from the outlet opening (244), and with an end portion (206) comprising the second end (204) from the inlet opening (242). The end portion (206) is inserted into the slot (26). Moreover, the adjustment device (18) comprises an opening element (28) for the slot (26), which element is at least partially inserted into the slot (26).

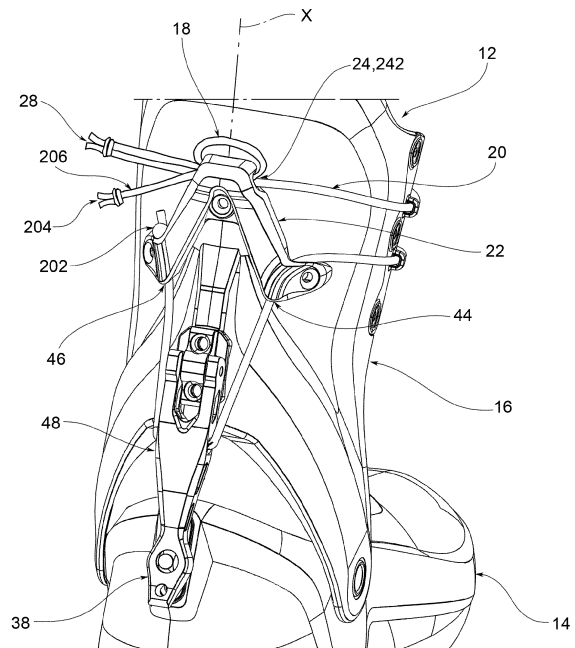


FIG.1

Description

FIELD OF APPLICATION

[0001] The present invention relates to a boot comprising a device for adjusting the closure of the leg portion. In particular, the present invention relates to a ski mountaineering boot comprising a device for adjusting the closure of the leg portion.

PRIOR ART

[0002] As is known, there is a wide variety of systems and devices for adjusting the closure of the leg portion of boots, in particular ski mountaineering boots.

[0003] In this discussion, reference is made in particular to boots for ski mountaineering; however, as will be clear to a person skilled in the art in the light of this description, the principles of the present invention may also be applied in a like manner to other types of boots.

[0004] Ski mountaineering boots need to satisfy two requirements: firstly it is necessary to have a boot which prevents the ankle from moving during descents, but which still allows this mobility during the hiking stages.

[0005] In the prior art, there are various boots which allow relative movement between the leg portion and foot portion, which movement may be blocked if needed.

[0006] However, these systems do not easily allow the closure of the leg portion to be adjusted, and in particular do not allow the possibility of adjusting the closure of the leg portion when the leg portion is prevented from rotating with respect to the foot portion.

[0007] For example, some systems provide a closing band which is adapted to at least partially surround the leg portion and which is fixed by means of an end hook and a corresponding fixed element integral with the leg portion, which fixed element has a plurality of seats for the hook.

[0008] In this case, the closure of the leg portion is adjusted by positioning the hook in a different seat provided by the fixed element integral with the leg portion.

[0009] Instead of a band, other systems use a cable which passes into a hook such that the hook may slide with respect to the cable. In these instances, a first end of the cable is fixed with respect to a portion of the leg portion, while the second end of the cable is adapted to cooperate with a rear lever in order to place the cable under tension or loosen said cable. When the cable is loosened, it is possible to position the hook in a seat. Once the hook is in position, the cable is placed under tension in order to lock the closure.

[0010] Although widely used and highly regarded, the systems of the prior art are not without disadvantages.

[0011] Firstly, they do not allow precise adjustment according to the needs of the user. Although a plurality of possible positions for the coupling between the hook and the fixed element are provided, it is not possible, for example, to have an intermediate adjustment between two

positions.

[0012] In fact, after having used the boot for a particular period of time, it is not possible, for example, to slightly loosen or tighten the closure of the leg portion during use.

[0013] Furthermore, the process of repositioning the hook is not particularly easy if done while wearing gloves, and requires additional elements such as laces or protuberances in order to be able to unhook and reposition the hook.

DISCLOSURE OF THE INVENTION

[0014] There is therefore a need to solve the drawbacks and limitations mentioned with reference to the prior art.

[0015] There is thus a need to provide a boot which allows the closure of the leg portion to be more precisely adjusted according to the needs of the user.

[0016] There is also a need for a system which allows flexible adjustment even when carried out while wearing gloves.

[0017] These requirements are met by a boot according to claim 1.

DESCRIPTION OF THE DRAWINGS

[0018] Further features and advantages of this invention will become more apparent from the following detailed description of preferred, non-limiting embodiments thereof, in which:

- Fig. 1 is a schematic rear view of a boot according to a possible embodiment of the present invention;
- Fig. 2 is a schematic front view of a boot according to a possible embodiment of the present invention;
- Fig. 3 and Fig. 4 are a schematic front view and a schematic rear view, respectively, of an adjustment device for the closure of a leg portion of a boot according to a possible embodiment of the present invention; and
- Fig. 5-7 are schematic views of the stages of using an adjustment device for the leg portion of a boot according to a possible embodiment of the present invention.

[0019] Elements or parts of elements common to the embodiments described in the following will be provided with the same reference signs.

DETAILED DESCRIPTION

[0020] Fig. 1 shows a boot 12 according to the present invention.

[0021] The boot 12 comprises, in a manner known per se, a foot portion 14 and a leg portion 16 projecting from the foot portion 14.

[0022] The boot 12 also comprises an adjusting device 18 for the closure of the leg portion 16, provided with at

least one adjustment cable 20 adapted to at least partially surround the leg portion 16, the adjustment cable having a first end 202 that is integral with the leg portion 16, and a second end 204.

[0023] The leg portion 16 is provided with a cable guide 22 comprising at least one through hole 24 having an inlet opening 242 and an outlet opening 244.

[0024] The adjustment cable 20 is inserted into the at least one through hole 24 at said inlet opening 242 so as to protrude with a slot 26 from the outlet opening 244 and with an end portion 206 comprising the second end 204 from the inlet opening 242.

[0025] The end portion 206 is inserted into the slot 26.

[0026] Moreover, the adjustment device 18 comprises an opening element 28 for the slot 26, at least partially inserted into the slot 26.

[0027] In the present description, reference is made to a boot and to the parts thereof; however, the principles of this invention may also be applied in a like manner to different types of boot construction. For example, the principles of the present invention may also be applied to boots which have a rigid external structure and an internal shoe.

[0028] According to a possible embodiment, the cable guide 22 may comprise a through hole 24 suitable for two portions of adjustment cable 20 to pass therethrough.

[0029] According to an alternative possible embodiment, the cable guide 22 may comprise two through holes 24 which are each suitable for a portion of adjustment cable 20 to pass therethrough.

[0030] The dimension of the at least one through hole 24 may be so that to allow the adjustment cable or adjustment cables to pass therethrough such that there is some friction between the hole and cable or between the cable and cable.

[0031] Advantageously, the at least one through hole 24 may have an extension axis substantially perpendicular to the direction x of extension of the leg portion 16. Alternatively, the axis may have different inclinations with respect to the direction x.

[0032] According to a possible embodiment not shown in the accompanying figures, the extension axis of the through hole may be curved.

[0033] According to a possible embodiment, the cable guide 22 may be made of polymeric material and is applied to the rear part of the leg portion 16.

[0034] As may be seen in the embodiment shown in Fig. 4, the through hole 24 at said outlet opening 244 may comprise a flaring 246. Advantageously, the flaring 246 may be used to compress cable portions of the adjustment cable 20 therebetween.

[0035] According to a possible embodiment, the adjustment cable 20 may be a cord having a diameter between 3 and 7 mm.

[0036] The adjustment cable may advantageously be made of Dyneema®.

[0037] According to a possible embodiment, the opening element 28 may be a substantially loop-shaped cable

passing inside the slot 26.

[0038] In other words, the opening element 28 may be a lace inserted inside the slot 26.

[0039] Now, with reference to Fig. 5-8, the operation of the adjustment device 18 of the present invention will be described.

[0040] Fig. 5 shows a condition in which the adjustment cable is locked and may not slide inside the at least one through hole 24. In fact, the slot 26 is tightened around the end portion 206 of the cable and, in this case, around the opening element.

[0041] In order to adjust the closure of the leg portion 16, it is sufficient to grip the opening element 28 and pull it, such that the slot 26 may open and thus allow the adjustment cable 20 to slide inside the through hole 24.

[0042] Therefore, by sliding the end portion 206 of the adjustment cable 20, it is possible adjust the closure of the leg portion 16, as shown in Fig. 7. In other words, the adjustment cable 20 is slid in one direction or in the other direction in order to loosen or tighten the leg portion 16.

[0043] Once the desired adjustment has been obtained, it is sufficient to pull the end portion 206 of the adjustment cable 20, so as to re-tighten the slot 26 around the end portion 206 of the cable and, in this case, around the opening element.

[0044] This process is shown by way of example in Fig. 8.

[0045] According to a possible embodiment, the end portion 206 comprised between the inlet opening 242 and slot 26 may be guided by an outer surface of the guide cable 22.

[0046] According to a possible embodiment, the boot may comprise a closing mechanism 30 for the leg portion 16.

[0047] The closing mechanism 30 may advantageously comprise a hook 32 and a fixed element 34 integral with the leg portion 16. The hook 32 may be connected to the leg portion by means of the adjustment cable 20.

[0048] According to a possible embodiment, the hook 32 may have a sliding seat 34 for the adjustment cable 20, with a substantially curved extension so that the hook 32 may slide with respect to the adjustment cable 20. In particular, the adjustment cable may make a sliding slot 36 in the sliding seat 34.

[0049] In other words, the adjustment cable 20 may comprise two substantially overlapping portions, at one end of which a sliding slot 36 is made. In this way, the position of the hook may be varied along the adjustment cable 20, by means of the adjustment device 18.

[0050] According to a possible embodiment, the guide cable 22 may be a substantially inverted V-shaped element in which the at least one through hole 24 may be placed at the cusp of the V. At the ends 40, 42 of the V there may be, respectively, a second through hole 44 and a third through hole 46, the second through hole 44 being engaged by a portion of adjustment cable coming from the closing mechanism 30, and the third through hole 46 being engaged by a portion of adjustment cable

coming from the second through hole 44.

[0051] According to a possible embodiment, the leg portion 16 may be selectively adapted to rotate with respect to the foot portion 14.

[0052] For example, a locking lever 38 may be provided, suitable for cooperating with a portion of adjustment cable 20 between the third through hole 46 and the second through hole 44, in order to place the adjustment cable 20 under tension.

[0053] Advantageously, the locking lever 38 may comprise a lever hole 48 inside which the adjustment cable 20 slides.

[0054] The advantages that may be achieved with the boot of this invention are now apparent.

[0055] Firstly, a boot has been provided which comprises a device for adjusting the closure of the leg portion that allows for easier adjustment by comparison with known systems. In fact, the elements involved in the adjustment may be easily gripped while wearing gloves.

[0056] Moreover, the adjustment has also been simplified, since the elements which cooperate for the purpose of adjustment do not have to be coupled to one another in predefined positions. In other words, in order to adjust the closure, the user only has to refer to the response of the leg portion with respect to the leg. Once the optimal closure has been identified, the system may be easily locked in place.

[0057] The system of this invention, unlike the known systems, also allows the position to be continuously adjusted, and not in predefined positions.

[0058] Moreover, the device used is extremely simple and economical, by comparison with adjustment systems that are adapted to obtain almost continuous adjustment of the closure.

[0059] A person skilled in the art will be able to make modifications to the embodiments described above or substitute described elements with equivalent elements, in order to satisfy particular requirements, without departing from the scope of the accompanying claims.

Claims

1. Boot (12) comprising a foot portion (14) and a leg portion (16) projecting from said foot portion (14), said boot further comprising an adjusting device (18) for the closure of the leg portion (16);

characterised in that said adjustment device (18) comprises

at least one adjustment cable (20) adapted to surround at least partially said leg portion (16); said adjustment cable (20) having a first end (202) and a second end (204), wherein said first end (202) is integral with said leg portion (16); said leg portion being provided with a cable guide (22) comprising at least one through hole (24) having an inlet opening (242) and an outlet

opening (244);

said adjustment cable (20) being inserted in said at least one through-hole (24) at said inlet opening (242) so as to protrude with a slot (26) from said outlet opening (244) and with an end portion (206) comprising said second end (204) from said inlet opening (242);

said end portion (206) being inserted in said slot (26); said adjustment device (18) comprising an opening element (28) for said slot (26), at least partially inserted in said slot (26).

2. Boot (12) according to the preceding claim, **characterized in that** said cable guide (22) comprises a through hole (24) suitable for the passage of two portions of adjustment cable (20).
3. Boot (12) according to claim 1, **characterized in that** said cable guide (22) comprises two through holes (24) each suitable for the passage of a portion of adjustment cable (20).
4. Boot (12) according to any one of the preceding claims, **characterized in that** said at least one through-hole (24) has an extension axis substantially perpendicular to the direction (x) of extension of the leg portion (16).
5. Boot (12) according to any one of the preceding claims, **characterized in that** said cable guide is made of polymeric material and is applied to the rear part of the leg portion (16).
6. Boot (12) according to any one of the preceding claims, **characterized in that** said through hole (24) at said outlet opening (244) comprises a flaring (246).
7. Boot (12) according to any one of the preceding claims, **characterized in that** said adjustment cable is made of Dyneema®.
8. Boot (12) according to any one of the preceding claims, **characterized in that** said opening element (28) is a substantially loop-shaped cable passing inside said slot (26).
9. Boot (12) according to any one of the preceding claims, **characterized by** comprising a closing mechanism (30) comprising a hook (32) and a fixed element (34) integral with the leg portion (16), said hook (32) having a sliding seat (34) for said adjustment cable (20); said sliding seat (34) having a substantially curved extension, so that said hook (32) can slide with respect to said adjustment cable (20), and said adjustment cable makes a sliding slot (36) in said sliding seat (34).

10. Boot (12) according to the preceding claim, **characterized in that** said cable guide (22) is a substantially inverted V-shaped element in which the at least one through-hole (24) is placed at the cusp of the V, and at the ends (40, 42) of the V there being respectively a second through-hole (44) and a third through-hole (46), said second through-hole (44) being engaged by a portion of adjustment cable coming from said closing mechanism (30), said third through-hole (46) being engaged by a portion of adjustment cable coming from said second through-hole (44).
11. Boot (12) according to any one of the preceding claims, **characterized in that** said leg portion (16) is selectively adapted to rotate with respect to said foot portion (14).
12. Boot (12) according to any one of the preceding claims, **characterized in that** said boot (16) is selectively adapted to rotate with respect to said foot portion (14), by means of a locking lever (38), suitable to cooperate with a portion of adjustment cable (20) between said third through-hole (46) and said second through-hole (44), to place said adjustment cable (20) in tension.
13. Boot (12) according to the preceding claim, **characterized in that** said locking lever (38) comprises a lever hole (48) inside which the adjustment cable (20) slides.
14. Boot (12) according to any one of the preceding claims, **characterised in that** it is a ski mountaineering boot.

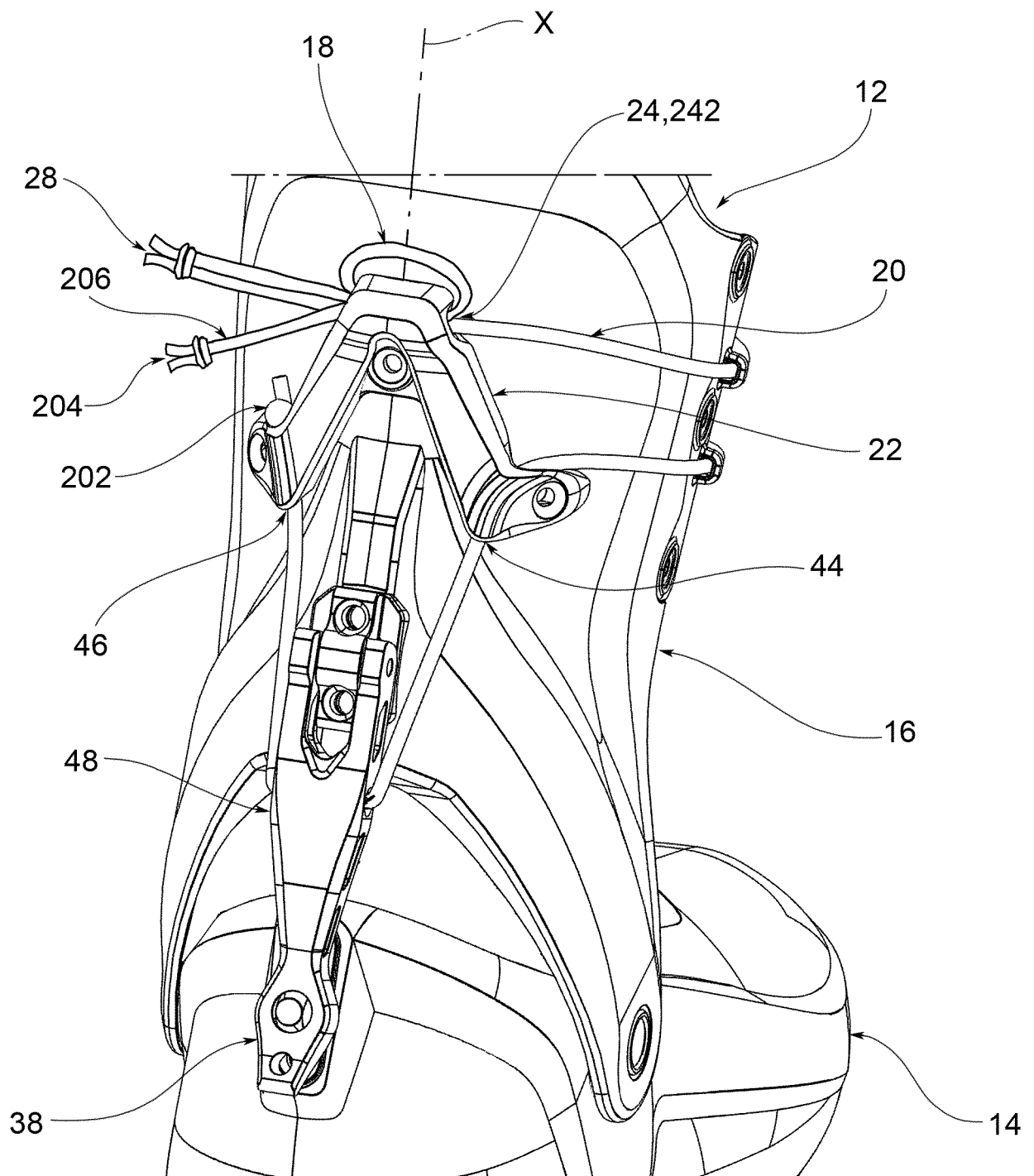


FIG.1

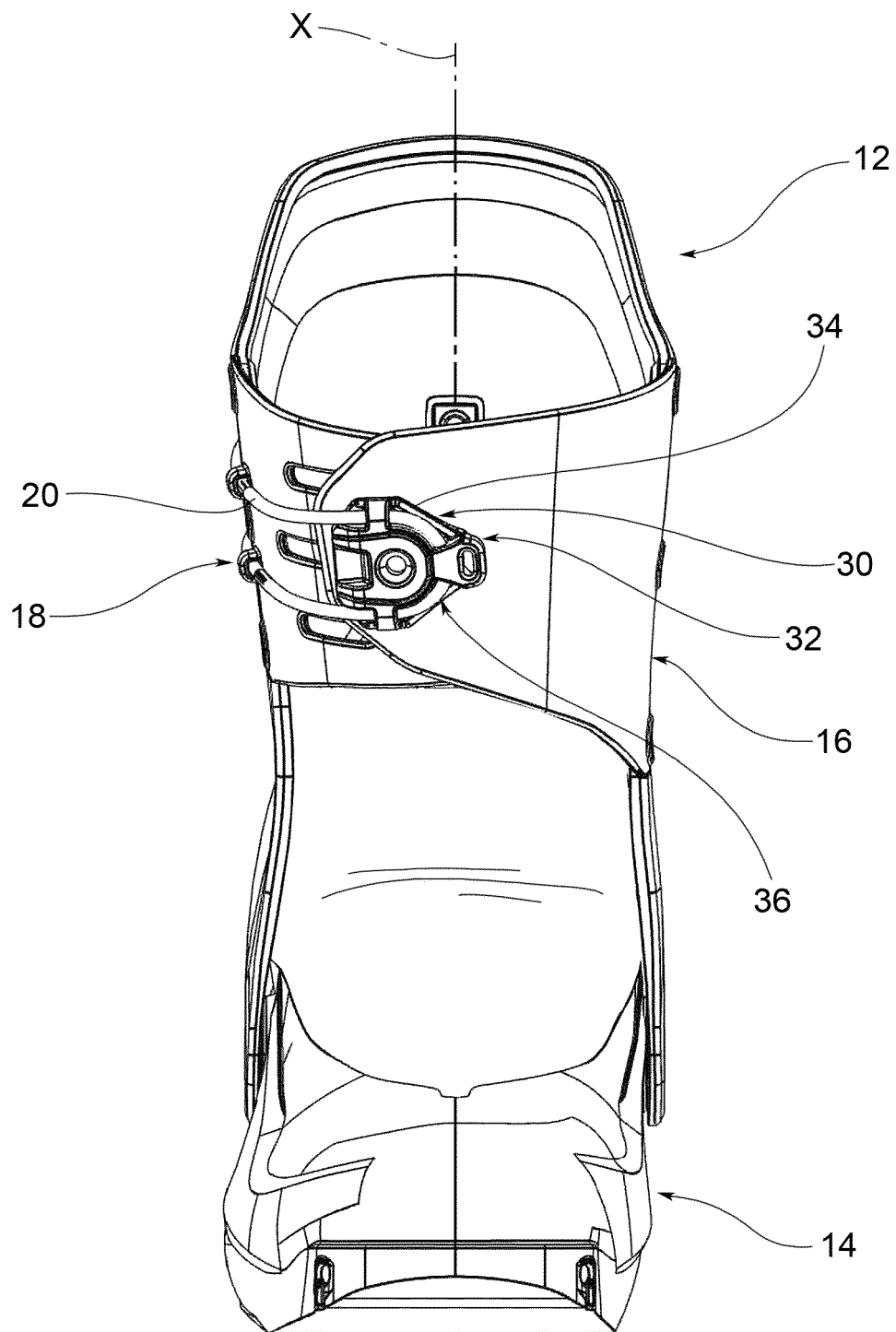


FIG.2

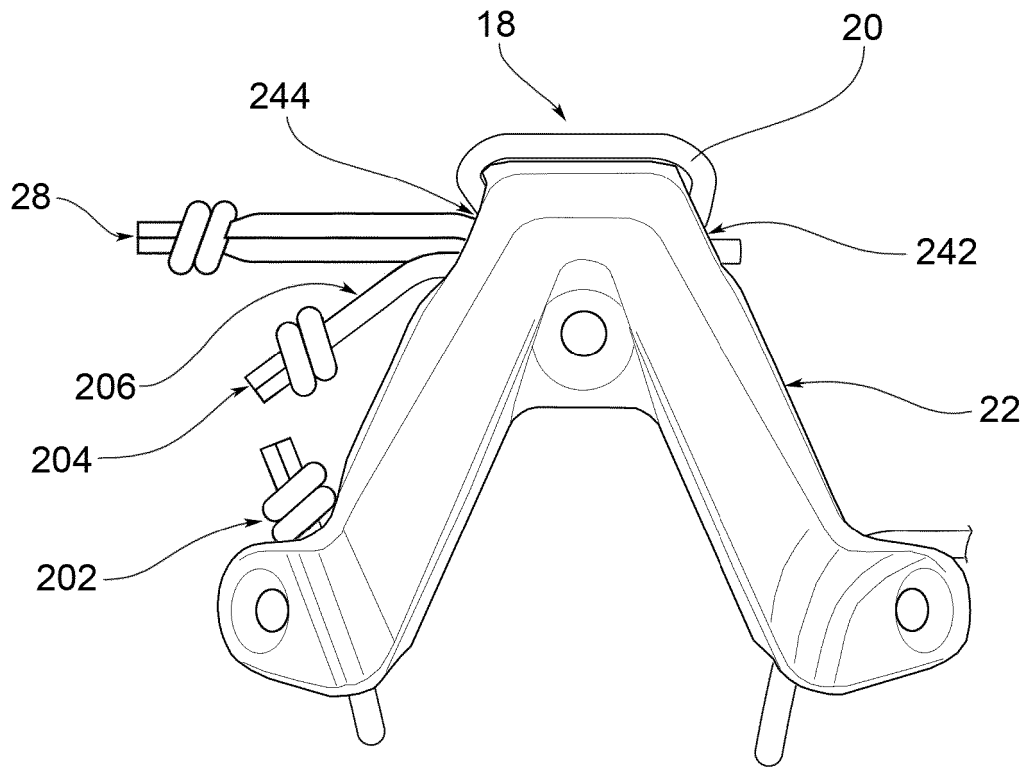


FIG.3

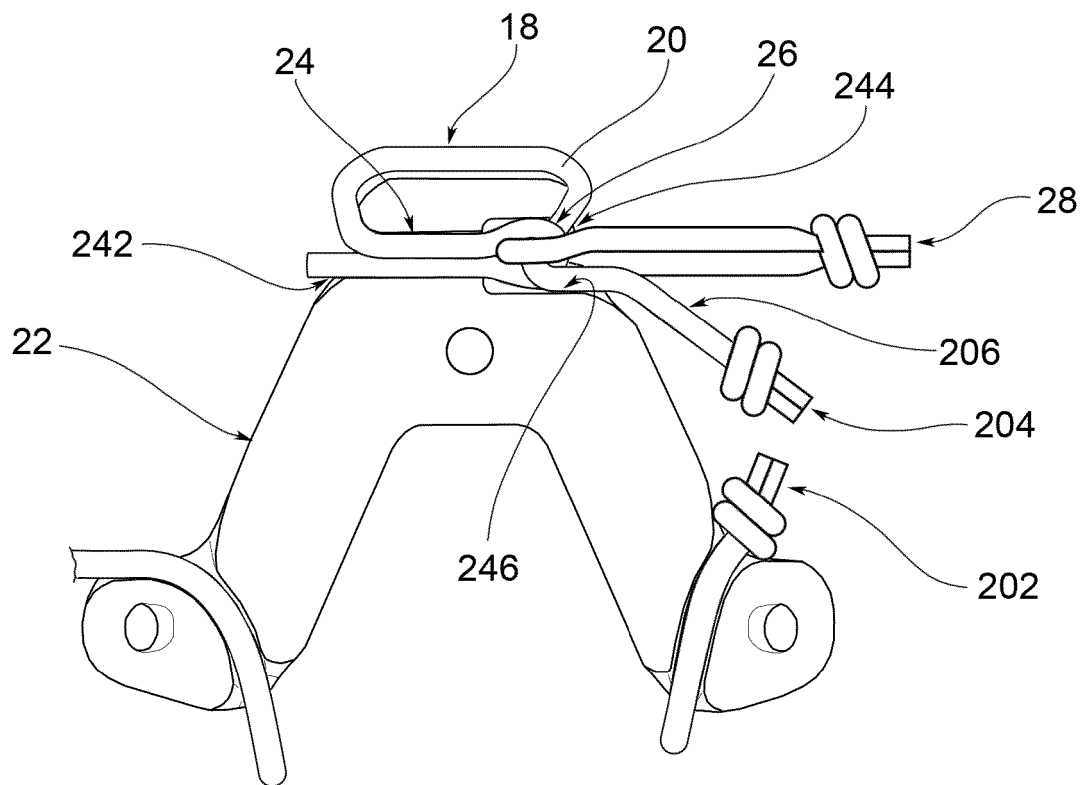


FIG.4

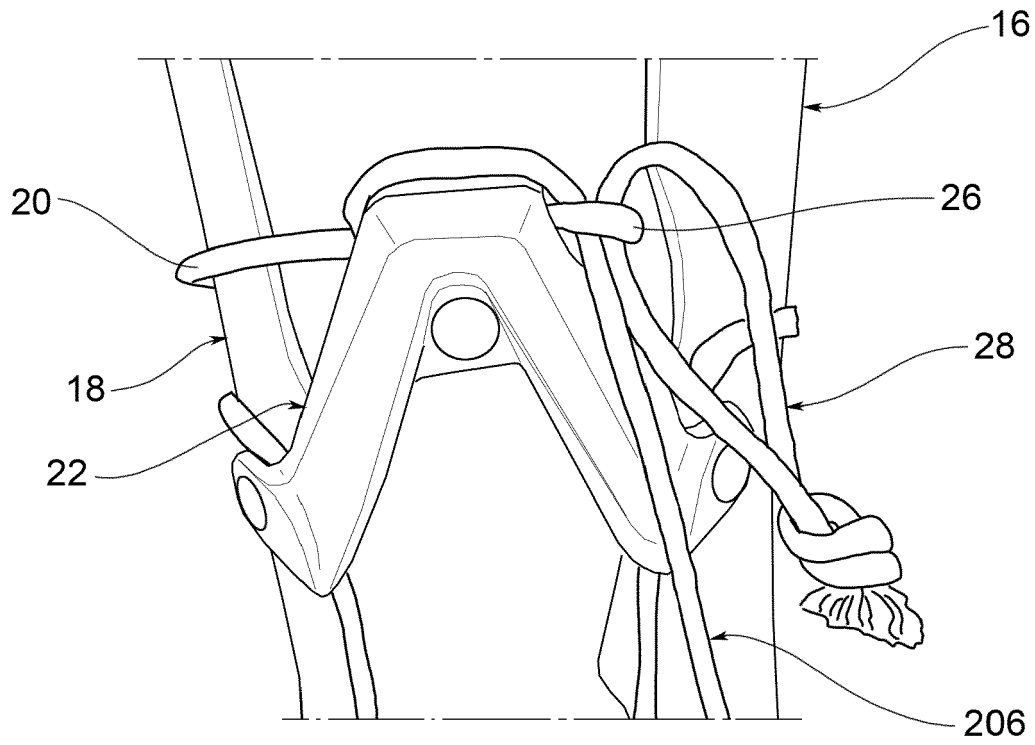


FIG. 5

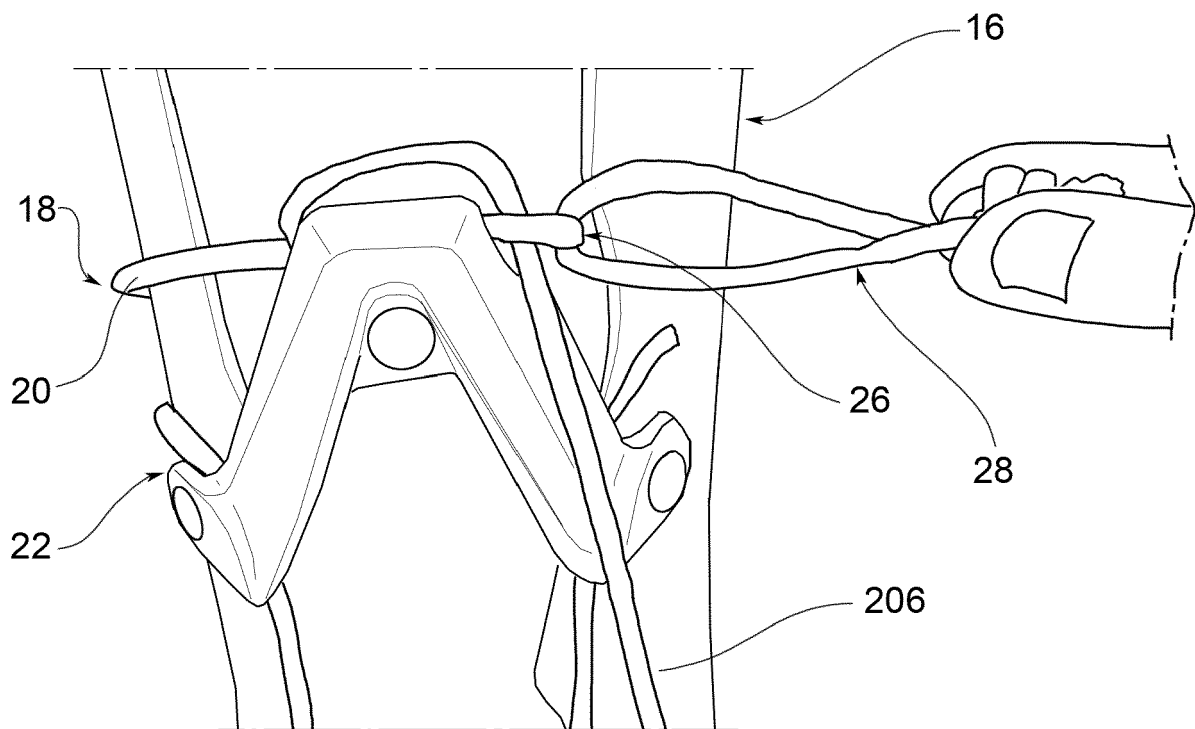


FIG. 6

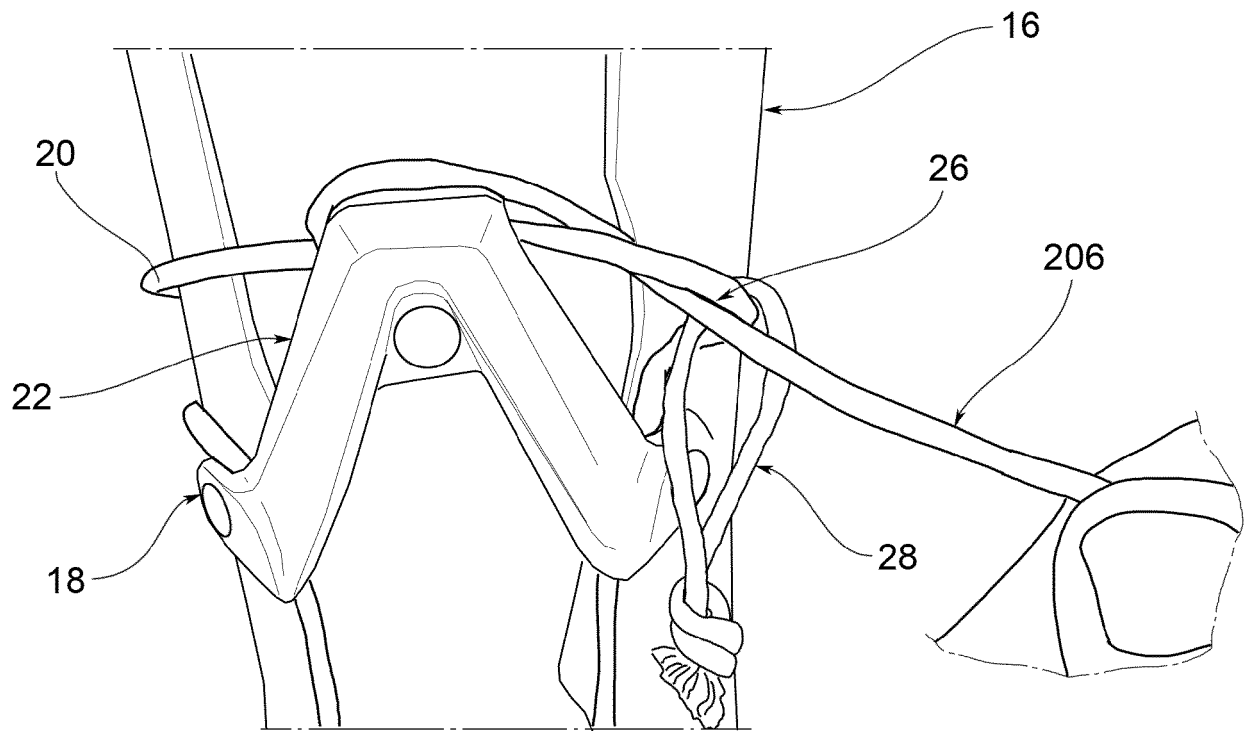


FIG.7

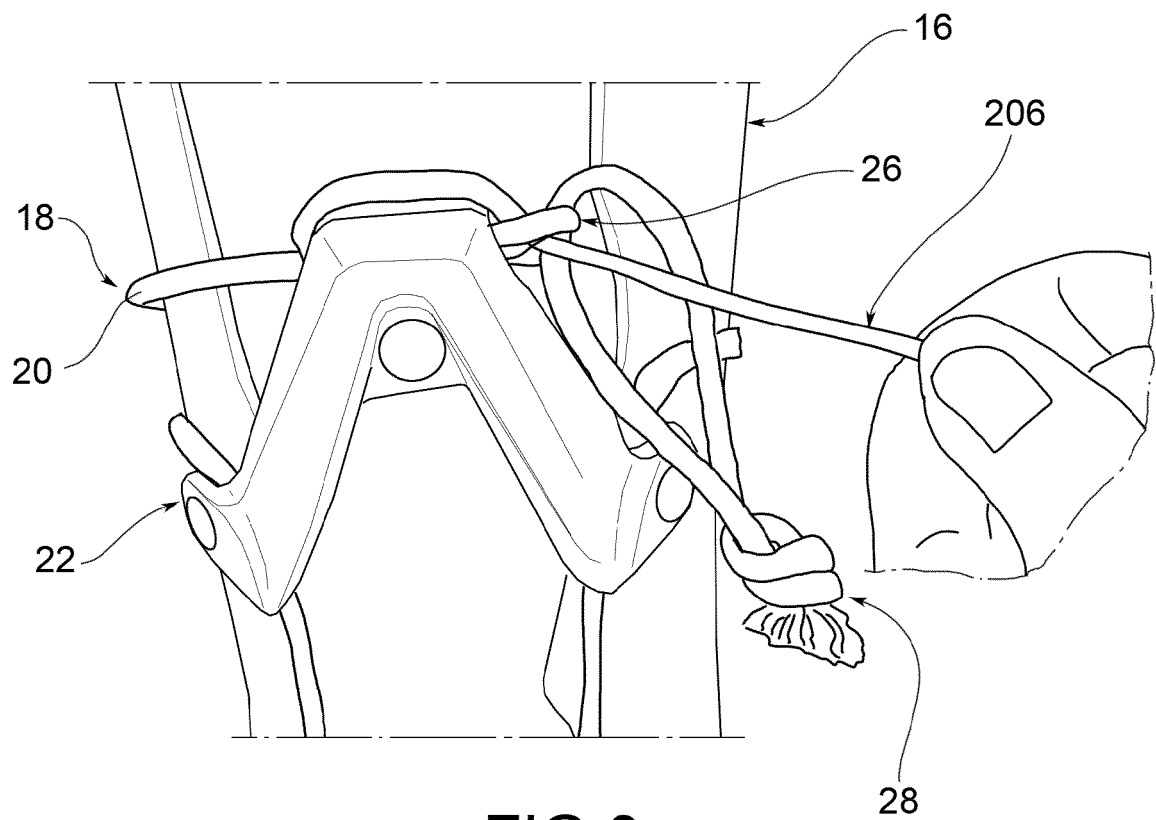


FIG.8



EUROPEAN SEARCH REPORT

Application Number

EP 21 21 3983

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			A43B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		6 May 2022	Papatheofrastou, M
CATEGORY OF CITED DOCUMENTS		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	
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			

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

EP 21 21 3983

5 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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