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(54) A fastening system for fastening a mountaineering boot to a mountaineering ski

(57) A fastening system (3) to fasten a mountaineering boot (2) onto a mountaineering ski (1), which is provided with a traditional-type locking system (5) for rigid mountaineering boots. The fastening system (3) including a rigid plate (4) which is adapted to couple firmly, but in easily releasable manner, to the sole (7) of the mountaineering boot (2), and which is structured so as to be locked firmly, but in easily releasable manner, to the mountaineering ski (1) by the locking system (5), so as to provide a coupling between the mountaineering boot (2) and the mountaineering ski (1).

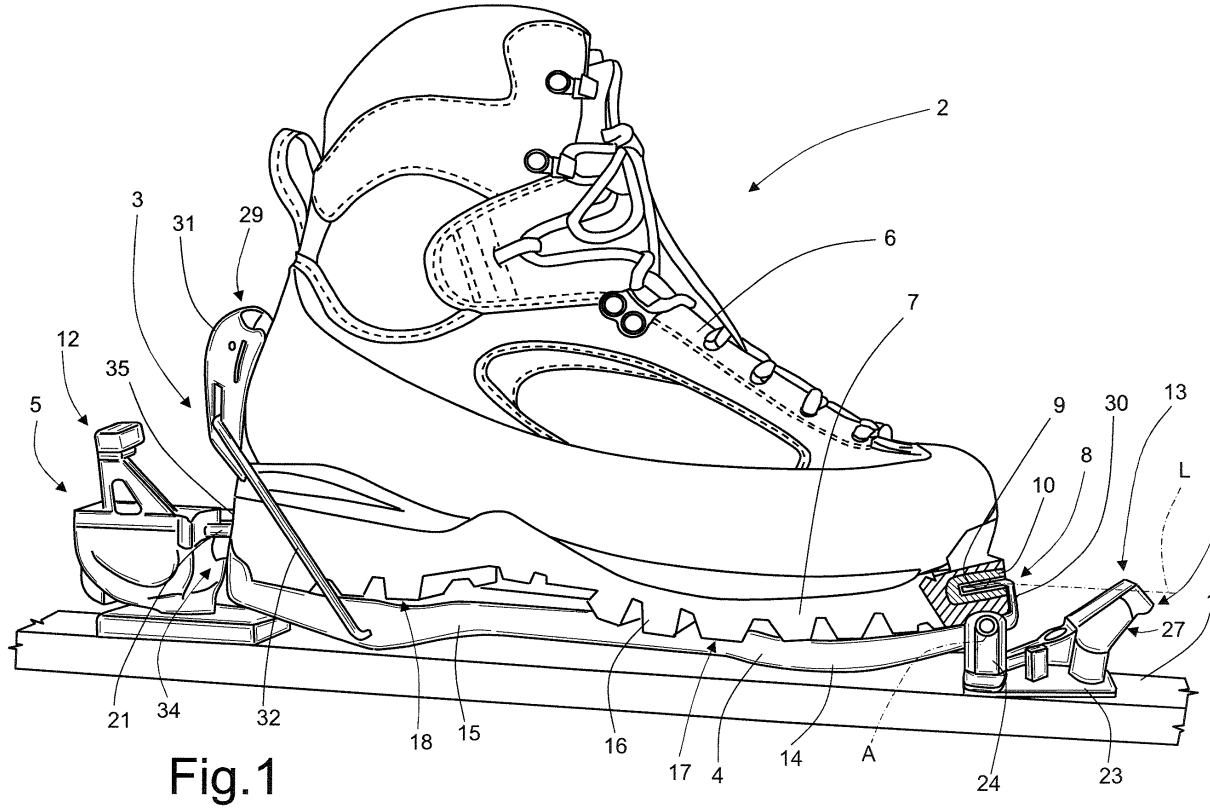


Fig.1

EP 1 997 397 A1

Description

[0001] The present invention relates to a fastening system for fastening a mountaineering boot to a mountaineering ski.

[0002] Specifically, the present invention relates to a system that allows to operate a connection between a mountaineering ski provided with a traditional-type locking system and a generic mountaineering boot of the non-rigid type such as, for instance, a mountaineering boot or a trekking boot or the like, to which the following disclosure will explicitly refer without thereby loosing in generality.

[0003] As known, the currently known mountaineering skis are provided with a locking system which is structured so as to allow the connection between the mountaineering skis themselves and specific rigid mountaineering boots, i.e. entirely made of non-deformable plastic material.

[0004] In particular, said locking system is typically provided with a rear locking system, typically indicated as "heelpiece", which firmly locks the rear portion of the rigid sole of the mountaineering boot to the ski so as to allow the mountaineer to ski downhill, and with a front locking device, typically indicated as "toe", which is structured so as to lock the front portion of the rigid sole of the mountaineering boot to the ski, allowing the mountaineering boot to perform, when the rear portion is released, a rotational motion about a rotation axis transversal to the longitudinal axis of the ski, so to allow the mountaineer to easily cover flat or uphill snow-covered distances.

[0005] More specifically, the heelpiece is provided with an elongated rigid engaging portion which is adapted to engage a seat obtained on the rear portion of the rigid sole of the mountaineering boot; whereas the toe is typically provided with a pair of side fins which extend upwards from the upper face of the mountaineering ski, and which are provided, at their ends, with two connecting pins, which extend coaxial to the rotation axis and are adapted to engage a corresponding pair of seats realized laterally to the front portion of the rigid sole of the mountaineering boot.

[0006] It is also known that one of the requirements which is most felt by mountaineers is to be able to use the mountaineering skis provided with the traditional-type locking system disclosed above, not only with mountaineering boots of the rigid type, but also with mountaineering boots displaying structural features other that those of the rigid mountaineering boot mentioned above.

[0007] In fact, it often occurs that the mountaineer must cover long distances wearing mountaineer boots of the "soft" type, i.e. characterized by a structure having a certain degree of deformability and flexibility, although he/she is forced to replace these soft mountaineering boots with the rigid mountaineering boots of the above disclosed type every time he/she needs to use the mountaineering skis for crossing stretches of snow. This condition results extremely disadvantageous as the mountaineer must carry different kinds of boots with all of the drawbacks this implies in terms of weight and volume, as well as being forced to perform an uncomfortable replacement of the boots.

[0008] Therefore, it is the aim of the present invention to provide a particularly simple fastening system allowing to fasten a generic soft-type mountaineering boot onto a mountaineering ski provided with a traditional-type locking system.

[0009] According to the present invention a fastening system is provided as set forth in claim 1 and preferably, though not necessarily, in any one of the dependent claims.

[0010] According to the present invention, a rigid plate is also provided for fastening a mountaineering boot onto a ski as set forth in claim 16 and preferably, though not necessarily, in any one of the dependent claims.

[0011] According to the present invention a mountaineering boot is finally provided as set forth in claim 24.

[0012] The present invention will now be disclosed with reference to the accompanying drawings, which show a non-limitative embodiment thereof, in which:

- Figure 1 shows a side perspective view, with parts removed for clarity, of a mountaineering boot coupled to a mountaineering ski by means of a fastening system in accordance with the teachings of the present invention;
- Figure 2 shows a front perspective view of a detail of the fastening system of the mountaineering boot on the mountaineering ski shown in Figure 1;
- Figure 3 shows a rear perspective view of a detail of the fastening system of the mountaineering boot on the mountaineering ski shown in Figure 1;
- Figure 4 shows a top perspective view of the rigid connecting plate shown in Figure 1;
- Figure 5 shows a side perspective view of the rigid connecting plate shown in Figure 4; whereas
- Figure 6 shows a side perspective view of a mountaineering boot coupled to a mountaineering ski by means of the fastening system shown in Figure 1 in two different operational configurations.

[0013] With reference to Figure 1, numbers 1 and 2 indicate, respectively, a mountaineering ski (partially shown) and a mountaineering boot, which are adapted to be reciprocally fastened by means of a new fastening system 3 essentially provided with an intermediate bracket or rigid connecting plate 4 which, as will be disclosed hereinafter in details, is structured so as to fasten the mountaineering boot 2 to a traditional locking system 5 of the mountaineering ski 1.

[0014] The mountaineering boot 2 is of the soft type, i.e. it is characterized by a structure which is at least partially deformable and flexible, and may correspond to a mountaineering boot or to a trekking boot or to any other similar mountaineering boot. Specifically, the mountaineering boot 2 substantially comprises an upper

6 made of leather or the like and having an appropriate shape, and a sole 7 attached to the lower part of the upper 6.

[0015] Sole 7 displays at its front portion, i.e. at its toe portion, at least one hooking seat 8 serving the function of allowing to fasten the rigid connecting plate 4 to the mountaineering boot 2. Specifically, the hooking seat 8 extends towards the inside of the sole 7 from the toe thereof, coaxially to a longitudinal axis L which, in the example shown, results coplanar to a centre plane of the sole 7 and substantially parallel to the upper and lower faces of the sole 7 itself.

[0016] In the example shown, the hooking seat 8 is defined by a blind hole 9 having preferably, though not necessarily, a substantially rectangular section and extending, parallel to the longitudinal axis L, from the external surface of the toe portion of the sole 7 towards the inner part of the sole 7 itself, so as to have an overall length, measured along the longitudinal axis L, ranging between about 1 and 1,5 cm.

[0017] The toe portion of the sole 7 is preferably, though not necessarily, provided with a reinforcing insert 10 made of highly rigid material, in which an end segment of the blind hole 9 is obtained, so as to confer a high rigidity to the hooking seat 8. In this case, the reinforcing insert 10 may be formed by an insert made of metal material and preferably, though not necessarily, profiled as a horseshoe.

[0018] To the above disclosure it should be added that the sole 7 of the mountaineering boot 2 is structurally similar to the sole of the mountaineering boot disclosed in European patent EP1254611B1, which has been filed by the same applicant and therefore will not be further disclosed.

[0019] As regards the locking system 5 of the mountaineering ski 1, it substantially comprises a rear locking device 12 which is firmly attached on the mountaineering ski 1, and serves the function of operating the rear locking of the rigid connecting plate 4 on the mountaineering ski 1 itself; and a front locking device 13 which is structured so as to lock the rigid connecting plate 4 at the front to the mountaineering ski 1, and at the same time to allow the rigid connecting plate 4 to perform a rotational movement about an axis A transversal to the longitudinal axis L (figure 6), when the rigid connecting plate 4 is released at the back, i.e. it is not locked by the rear locking device 12.

[0020] The rigid connecting plate 4 is structured so as to be coupled firmly, but in easily releasable manner, to the mountaineering boot 2 and at the same time is adapted to be locked by the locking system 5 of the mountaineering ski 1 so as to provide a coupling between the latter and the mountaineering boot 2 itself.

[0021] In the example shown in Figures 4 and 5, the rigid plate 4 comprises a front portion 14 and a rear portion 15, which are adapted to be attached under the sole 7 of the mountaineering boot 2 resting on the tread 16, respectively at the front 17 and back 18 of the sole 7 itself.

[0022] The front and rear portions 14, 15 of the rigid plate 4 are made of metal, each have a substantially circular shape so as to form altogether a profile shaped as a number eight, and are preferably, though not necessarily, reciprocally coupled by means of a mechanical member 19 allowing to adjust the distance between the two portions 14 and 15 as desired, therefore allowing to vary the overall length of the rigid plate 4 so as to allow to adapt in each case the size of the same to the size of the mountaineering boot 2.

[0023] The front and rear portions 14, 15 of the rigid plate 4 are also structured so as to be firmly locked by the front locking device 13 and the rear locking device 12, respectively, to the upper face of the mountaineering ski 1 so as to fasten the rigid plate 4 to the latter.

[0024] More specifically, the rear locking device 12 is of known type and will not be further disclosed if not to specify that, in the example shown in Figures 1 and 3, locking device 12 is provided with a pair of pins 21 which extend along a direction parallel to the longitudinal axis L, and are reciprocally spaced so as to engage two respective seats 22 obtained on the rear portion 15 of the rigid plate 4 so as to provide the rear fastening of the rigid plate 4 itself to the mountaineering ski 1.

[0025] As regards instead the front locking device 13, it is of known type and will not be further disclosed if not to specify that, in the example shown in Figures 1 and 2, locking device 13 comprises a bracket 23 attached to the upper face of the mountaineering ski 1, a pair of side fins 24 which extend upwards from the bracket 23, parallel and reciprocally facing one another, on opposite sides of the centre plane of the mountaineering boot 2, and which are provided, on the free ends thereof, with a pair of pins 25 which are adapted to engage a pair of seats 26 obtained on the front portion 15 of the rigid plate 4 itself.

[0026] More specifically, the side fins 24 may be splayed between a locking position (shown in Figure 2) in which they are arranged so that the corresponding pins 25 completely engage the corresponding seats 26 of the rigid plate 4, and a releasing position (not shown) in which the free ends are partially opened with respect to the locking position to allow the uncoupling, i.e. the extraction of the pins 25 from the corresponding seats 26.

[0027] In the example shown in Figures 1 and 2, the front locking device 15 further comprises a control member 27 which is manually operated and is selectively adapted to shift the side fins 24 from the locking position to the releasing position and vice versa.

[0028] With reference to Figures 4 and 5, the rigid plate 4 comprises a front hooking element 28 adapted to lock the front portion 14 of the rigid plate 4 onto the front part of the sole 7 of the mountaineering boot 2, and a rear locking member 29 which is selectively adapted to lock the rear part 18 of the mountaineering boot 2 to the rear portion 15 of the rigid plate 4.

[0029] In particular, the front hooking element 28 is firmly fixed to the front portion 14 of the rigid plate 4 at

the tip of the rigid plate 4 itself, and is shaped so as to be able to engage the hooking seat 8 of the mountaineering boot 2 so as to provide a coupling between the rigid plate 4 and the mountaineering boot 2 itself.

[0030] More specifically, the front hooking element 28 comprises an appendix 30 shaped so as to substantially display the shape of curved hook, and which protrudingly extends from the front portion 14 of the rigid plate 4 so as to present its free end 30a above the upper face of the front portion 14 of the rigid plate 4 so that said free end 30a may engage the hooking seat 8 present on the toe of the mountaineering boot 2.

[0031] In this case, with reference to the example shown in Figures 4 and 5, the appendix 30 is defined by a substantially C-shaped rigid metal piece which extends parallel to the longitudinal axis L, has a transversal section which is substantially complementary to that of the hooking seat 8, for instance a rectangular shape, and is centrally fixed to the front portion 14 of the rigid plate 4 so as to protrude above the front portion 14 itself.

[0032] In the example shown in Figures 1, 4 and 5, the appendix 30 is sized so as to have a length, measured along the longitudinal axis L, ranging between about 1 and 1,5 cm, so as to ensure a good fastening of the rigid plate 4 to the mountaineering boot 2.

[0033] It should be also specified that the fastening system 3 may be provided with a mechanical member (not shown) allowing to adjust the distance between the free end 30a of the appendix 30 and the upper face of the front portion 14 of the rigid plate 4 on which the sole 7 is arranged in abutment, so as to allow adapt in height the position of the free end 30a of the appendix 30 to the position of the blind hole 9.

[0034] As regards the rear locking member 29, it comprises a locking lever 31 adapted to be arranged in abutment on the heel of the mountaineering boot 2 (Figure 1) to keep the toe of the boot in abutment on the appendix 30 with its free end 30a completely within the blind hole 9 present on the toe of the sole 7, and a support bracket 32 adapted to connect the locking lever 31 to the rear portion 15 of the rigid plate 4.

[0035] More specifically, with reference to Figures 3, 4 and 5, the support bracket 32 is U-shaped and has its two free ends inserted within a pair of holes 33 obtained on the sides of the rear portion 15 of the rigid plate 4; while the locking lever 31 is hinged in the central portion of the support bracket 32, and is mobile from and towards a locking position, in which it is arranged with an end thereof in abutment on the rear end of the sole 7 and with the side thereof resting on the heel of the mountaineering boot 2 (Figure 1), so as to push and maintain the toe of the mountaineering boot 2 in abutment on the appendix 30, and so that the free end 30a of the appendix 30 completely engages the hooking seat 8.

[0036] With reference to Figures 4 and 5, the rigid plate 4 is also preferably, though not necessarily, provided with at least one pair of side holding projections 34 which, in the example shown in Figure 1, protrudingly extend upwards from the peripheral edge of the rear portion 15 of the rigid plate 4 on opposite sides of the centre plane of the rigid plate 4 itself, so as to enclose and lock on opposite sides the rear sides of the sole 7, i.e. of the tread 16.

[0037] Rigid plate 4 is also provided with a rear appendix 35 that extends upwards from the rear portion 15 and is structured so as to be firmly locked by the rear locking device 12.

[0038] In this case, in the example shown in Figure 3, appendix 35 is shaped so as to comprise the two seats 22 adapted to accommodate the pins 21 of the rear locking device 29 during the locking condition of the rigid plate 4.

[0039] From the above, it should be specified that appendix 35 may have a different structure from that disclosed above, i.e. it may be shaped so as to be locked by means of a rear locking device 12 provided with a locking mechanism which is structurally different from the mechanism disclosed above. In this manner, the rigid plate 4 may be locked to the mountaineering ski 1 by means of locking devices having a completely different structure from the locking system 5 indicated above.

[0040] It should also be specified that the holding projections 34 are included in fastening system 3 and they serve the function of advantageously preventing possible side shifts of the mountaineering boot 2 with respect to the rear portion 15 of the rigid plate 4, from causing the accidental escape of the free end 30a of the appendix 30 from the hooking seat 8.

[0041] In use, fastening of the mountaineering boot 2 onto the mountaineering ski 1 is obtained by two subsequent operations, the first of which implies the fastening of the rigid plate 4 onto the mountaineering boot 2, while the second operation implies the locking of the rigid plate 4 to the mountaineering ski 1 by means of the locking system 5.

[0042] More specifically, the rigid plate 4 is fastened to the mountaineering boot 2 by pushing the toe of the mountaineering boot 2, onto the front and rear portions 14, 15 of the rigid plate 4, against the hooked appendix 30, so that the free end 30a of the appendix 30 itself engages the hooking seat 8 on the sole 7, and that the two holding projections 34 are arranged in abutment on the rear sides of the rear part 18 of the sole 7 itself.

[0043] Upon completion of the above disclosed coupling, the sole 7 of the mountaineering boot 2 results trapped between the two holding protrusions 34, the appendix 30 and the front and rear portions 14, 15 of the rigid plate 4.

[0044] The coupling of the rigid plate 4 to the mountaineering boot 2 is finally completed, by closing the rear locking member 29 against the heel of the mountaineering boot 2 so that the locking lever 31 is arranged in the corresponding locking position.

[0045] Once the fastening of rigid plate 4 to mountaineering boot 2 has been completed, locking of the rigid plate 4 itself may be performed by means of the locking system 5 of mountaineering ski 1. In particular, such fas-

tening is performed by operating the rear and the front locking devices 12, 13 on the rear and front portions 15, 14 of the rigid plate 4 itself.

[0046] In this case, in the example shown in Figure 1, the front locking occurs by positioning the front portion 14 of the rigid plate 4 between the side fins 24, arranged in turn in the corresponding releasing position, and operating the control member 27 so as to bring the side fins 24 in the corresponding locking position, in which the pins 25 engage the seats 26 of the rigid plate 4. In this manner, the rigid plate 4 is fastened at the front onto the mountaineering ski 1, and at the same time it may rotate about the axis A so as to also rotate the mountaineering boot 2 about the axis A itself (Figure 6).

[0047] The fastening of the rigid plate 4, and therefore of the mountaineering boot 2 is completed by engaging the pins 21 of the rear locking device 13 within the seats 22 of the rear appendix 35 of the rigid plate 4.

[0048] The fastening system between the mountaineering ski 1 and the mountaineering boot 2 and disclosed above has the important advantage of offering the mountaineer a tool that considerably increases the versatility of the mountaineering skis provided with locking systems of the traditional type, as it allows to couple the skis themselves to any kind of mountaineering boots.

[0049] It is indeed apparent that the mountaineer, in virtue of the possibility to couple the mountaineering skis also to soft mountaineering boots, has the opportunity not to carry along the rigid mountaineering boots therefore obtaining obvious advantages in terms of weight and volume reduction.

[0050] Finally, it results apparent that modifications and variants may be made to the fastening system between the mountaineering boot and a mountaineering ski disclosed above without however departing from the scope of the present invention according to the appended claims.

Claims

1. A fastening system (3) adapted to fasten a mountaineering boot (2) to a ski (1); said mountaineering boot (2) including a sole (7); said ski (1) including a locking system (5); said fastening system (3) being **characterized by** comprising at least one rigid plate (4) which is adapted to be connected firmly, but in easily releasable manner, to the sole (7) of said mountaineering boot (2); said rigid plate (4) being structured be locked firmly, but in easily releasable manner, to said ski (1) by said locking system (5), so as to provide a coupling between said mountaineering boot (2) and said ski (1).

2. A fastening system according to claim 1, including a hooking seat (8) obtained in the sole (7) of said mountaineering boot (2), and at least one hooking element (28), which is carried by said rigid plate (4) and is adapted to engage said hooking seat (8) to fasten in a firm although easily releasable manner said rigid plate (4) to the sole (7) of said mountaineering boot (2).

3. A fastening system according to claim 2, wherein said hooking seat (8) is obtained on the front portion of said sole (7).

4. A fastening system according to claim 2 or 3, wherein said sole (7) comprises a front rigid insert (10) on which said hooking seat (8) is partially obtained.

5. A fastening system according to any one of the preceding claims, wherein said hooking seat (8) comprises a hole (9) which centrally extends from the external surface of said sole (7) towards the inside of the sole (7) itself along a longitudinal axis (L) of said mountaineering boot (2).

6. A fastening system according to any one of the claims from 2 to 5, wherein said hooking element (28) is fastened to a front portion (14) of said rigid plate (4).

7. A fastening system according to any one of the claims from 2 to 6, wherein said hooking element (28) comprises an appendix (30) which is centrally fastened to a front portion (14) of said rigid plate (4) and is shaped so as to engage said hooking seat (8) of the mountaineering boot (2).

8. A fastening system according to claim 7, wherein said appendix (30) is substantially shaped as a hook, and substantially extends parallel to said longitudinal axis (L).

9. A fastening system according to any one of the preceding claims, wherein said rigid plate (4) comprises a rear locking member (29) which is adapted to lock the rear part of said mountaineering boot (2) to the rigid plate (4) itself.

10. A fastening system according to any one of the preceding claims, wherein the locking system (5) of said ski (1) comprises front locking means (13); said rigid plate (4) comprising a front portion (14) shaped so as to be locked firmly, but in easily releasable manner, to said ski (1) by said front locking means (13).

11. A fastening system according to claim 10, wherein said front locking means (13) comprise a pair of side fins (24) provided on the free ends thereof with a pair of pins (25), which are adapted to engage a pair of seats (26) obtained on the front portion (14) of the rigid plate (4).

12. A fastening system according to any one of the pre-

ceding claims, wherein said locking system (5) comprises rear locking means (12); said rigid plate (4) including a rear portion (15) shaped so as to be locked firmly, but in easily releasable manner, to said ski (1) by said rear locking means (12).

13. A fastening system according to claim 12, wherein said rigid plate (4) comprises a rear appendix (35) adapted to be arranged in abutment on the rear part of said mountaineering boot (2); said rear appendix (35) being provided with at least one seat (22) adapted to be engaged by at least one connecting pin (21) of said rear locking device (12).

14. A fastening system according to any one of the preceding claims, wherein said mountaineering boot (2) is soft.

15. A fastening system according to any one of the preceding claims, wherein said locking system (5) is structured to lock a rigid mountaineering boot to said ski (1).

16. A rigid plate (4) to couple a mountaineering boot (2) to a ski (1); said mountaineering boot (2) including a sole (7); said ski (1) including a locking system (5); said rigid plate (4) being **characterized in that** it is structured so as to be coupled firmly, but in easily releasable manner, to the sole (7) of said mountaineering boot (2); said rigid plate (4) also being structured so as to be locked firmly, but in easily releasable manner, to said ski (1) by said locking system (5) so as to fasten said mountaineering boot (2) to said ski (1).

17. A rigid plate according to claim 16, including a hooking element (28), which is adapted to engage a hooking seat (8) obtained on the sole (7) of said mountaineering boot (2) to fasten in a firm although easily releasable manner said rigid plate (4) to the sole (7) of said mountaineering boot (2).

18. A rigid plate according to claim 17, wherein said hooking element (28) is fastened to a front portion (14) of said rigid plate (4).

19. A rigid plate according to claim 18, wherein said hooking element (28) comprises an appendix (30) shaped so as to engage said hooking seat (8) of the mountaineering boot (2).

20. A rigid plate according to claim 19, wherein said appendix (30) is substantially shaped as a hook and extends parallel to a longitudinal axis (L) of said rigid plate (4).

21. A rigid plate according to any one of the claims from 16 to 20, including a rear locking member (29), which is adapted to lock the rear part (18) of said mountaineering boot (2) to the rigid plate (4) itself.

22. A rigid plate according to any one of the claims from 16 to 21, wherein said locking system (5) of said skis (1) comprises front locking means (13); said rigid plate (4) including a front portion (14) shaped so as to be locked firmly, but in easily releasable manner, to said ski (1) by said front locking means (13).

23. A rigid plate according to any one of the claims from 16 to 22, wherein said locking system (5) comprises rear locking means (12); said rigid plate (4) including a rear portion (15) shaped so as to be locked firmly, but in easily releasable manner, to said ski (1) by said rear locking means (12).

24. A mountaineering boot (2) including an upper (6) and a sole (7) attached to the lower part of the upper (6); said mountaineering boot (2) being **characterized in that** it is structured so as to be coupled firmly, but in easily releasable manner, to a rigid plate (4) obtained according to any one of the claims from 16 to 23.

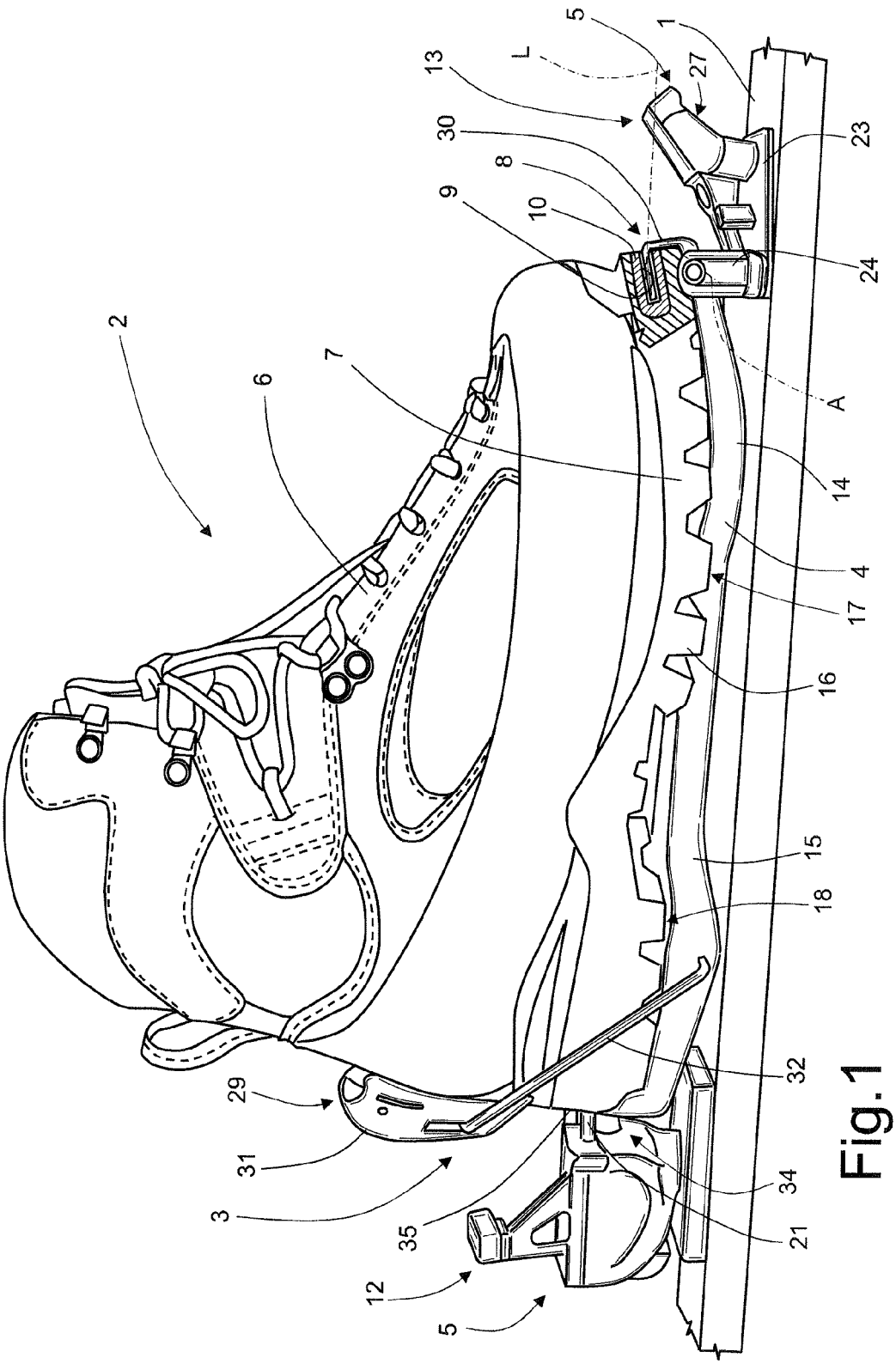


Fig.1

Fig.2

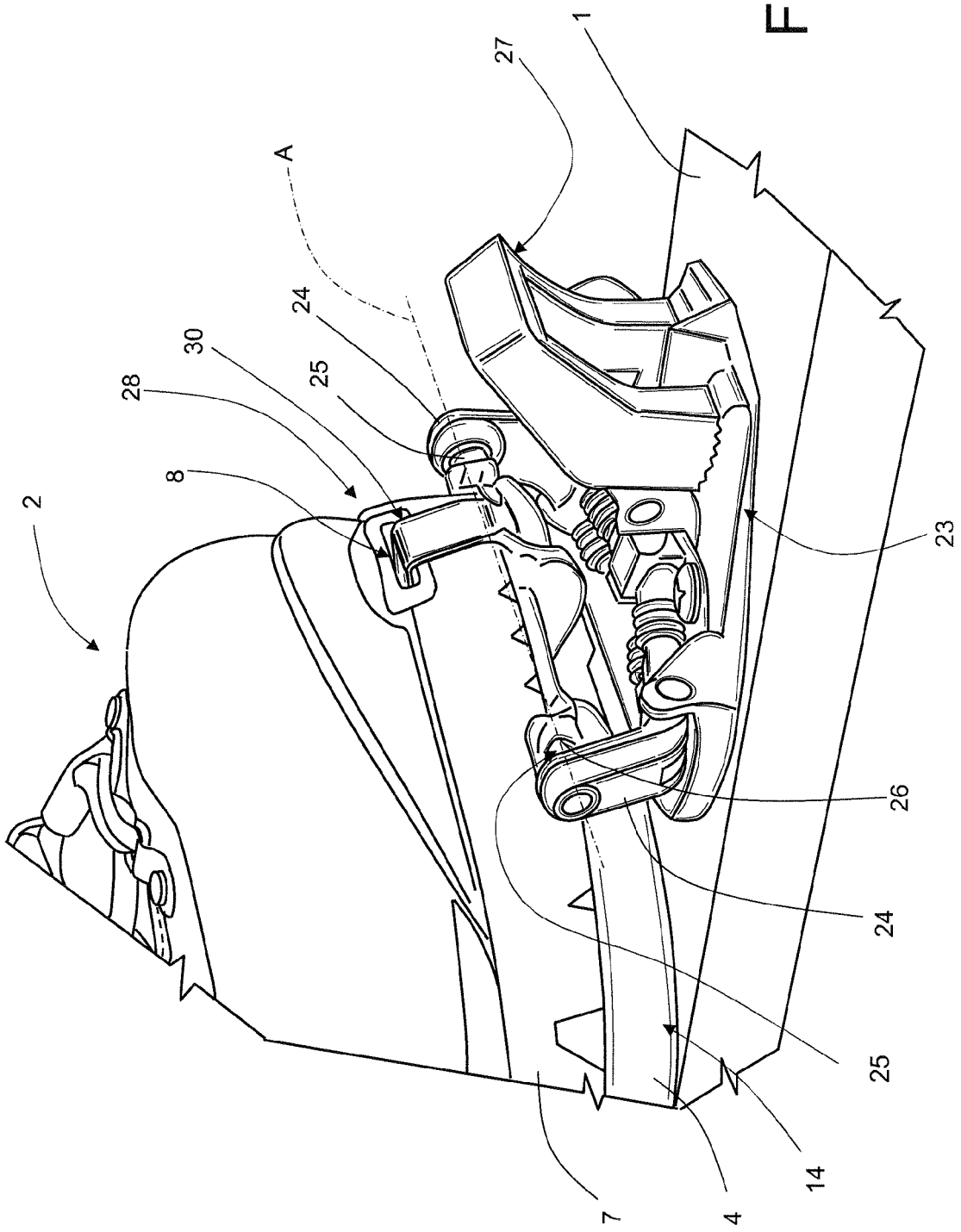
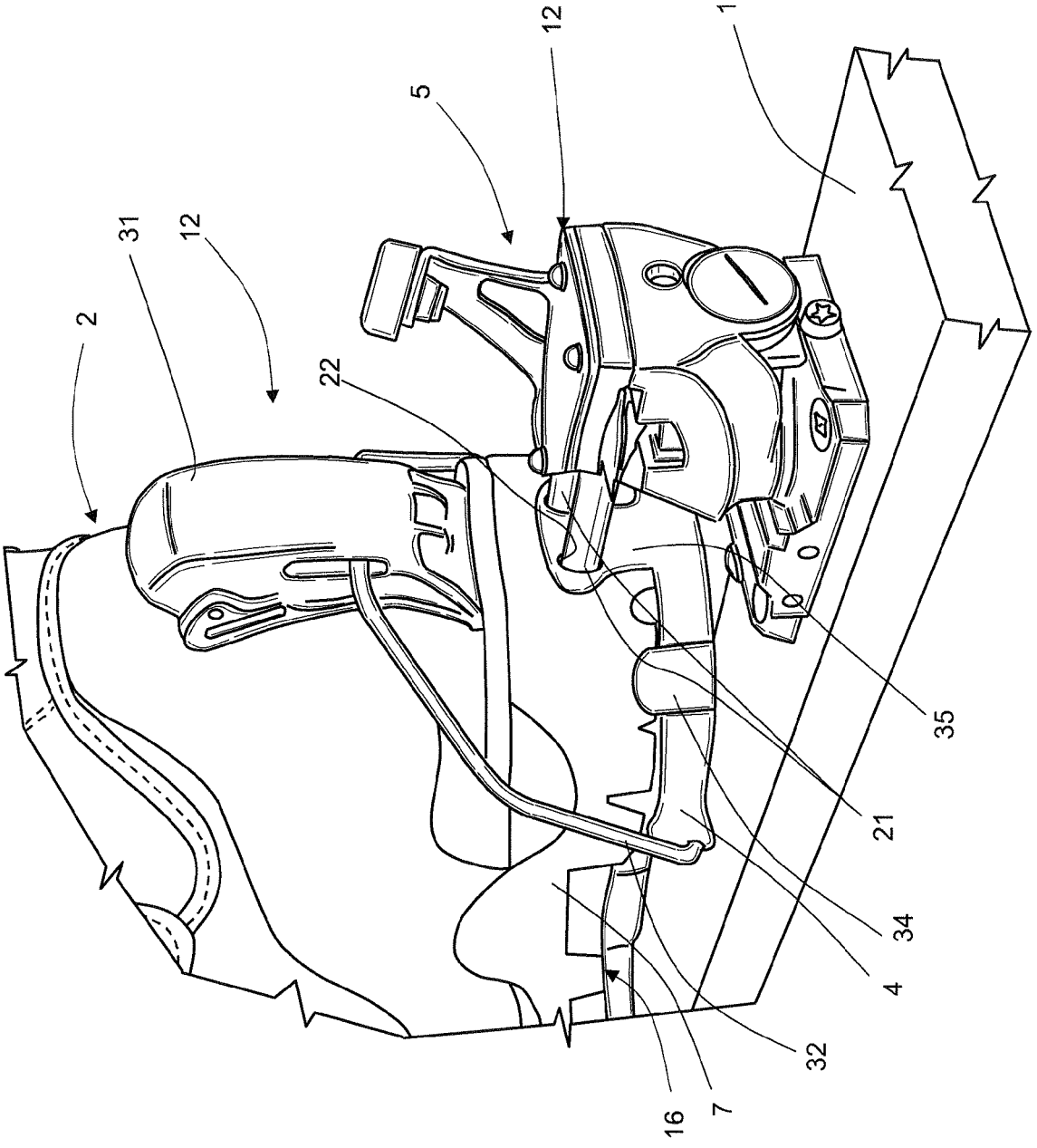


Fig.3



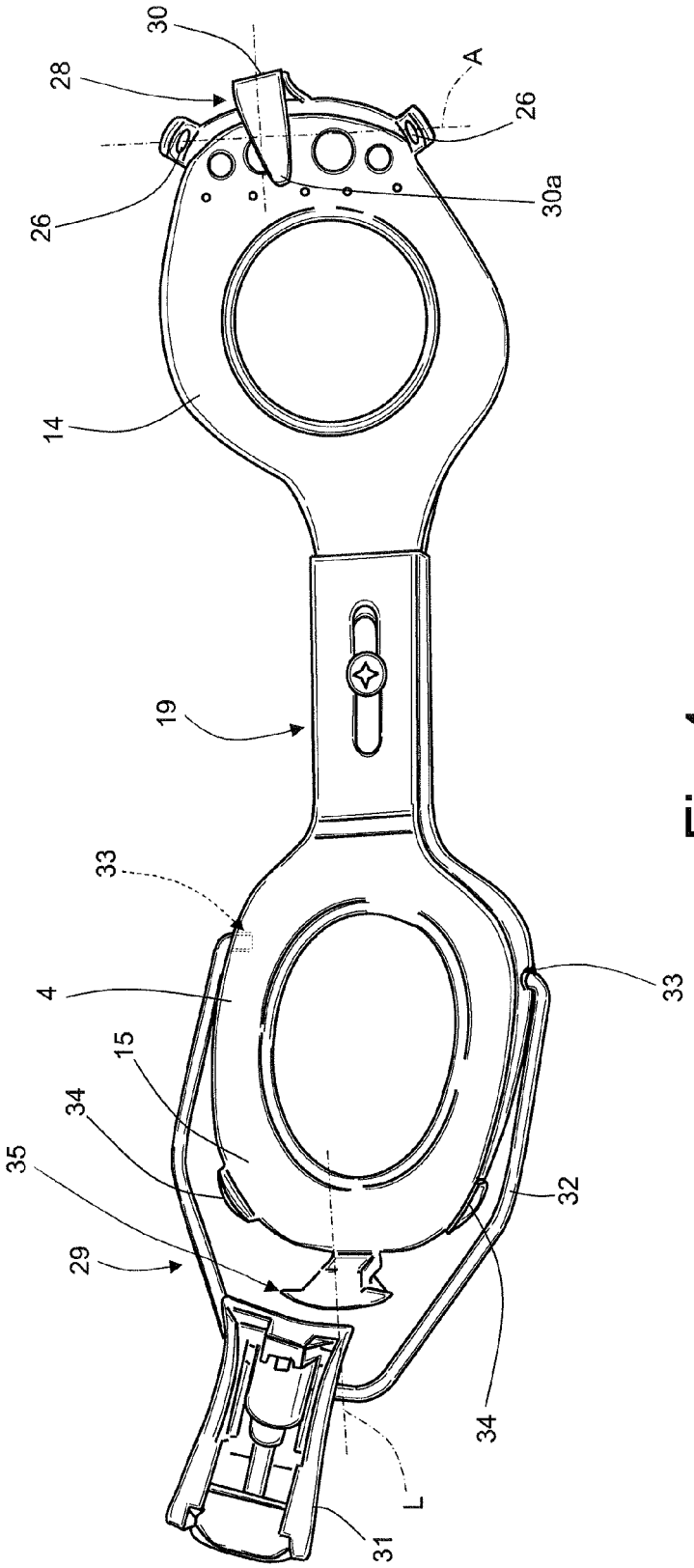


Fig.4

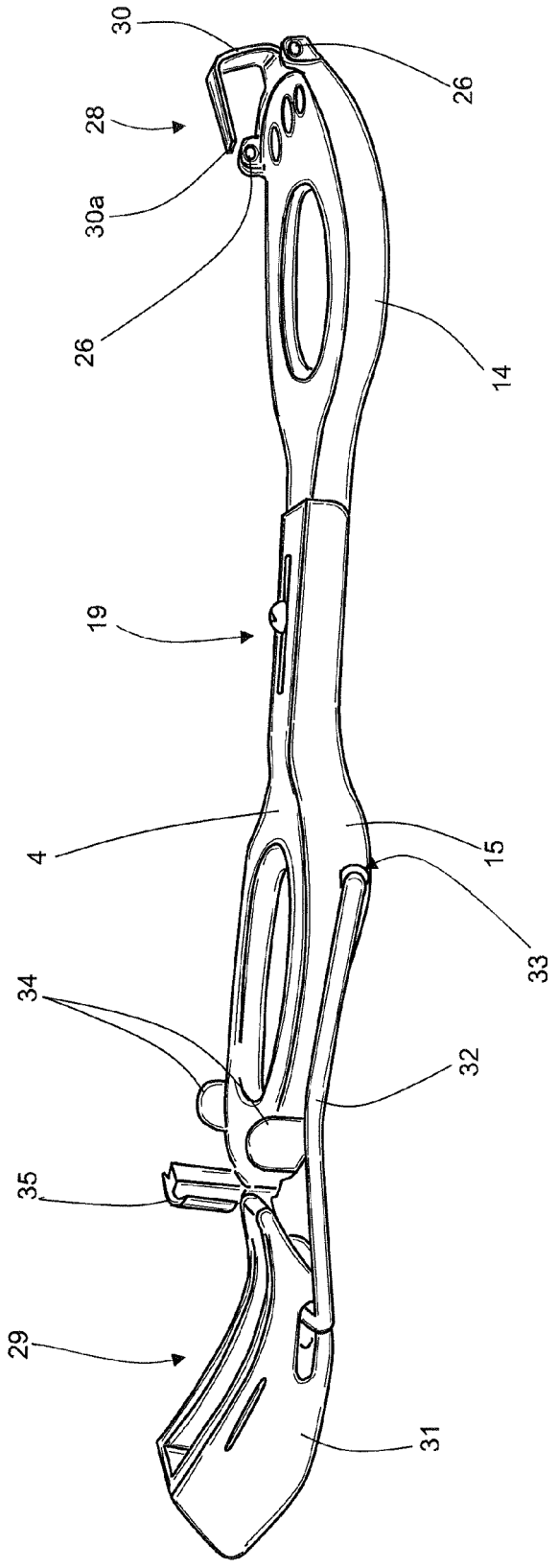


Fig.5

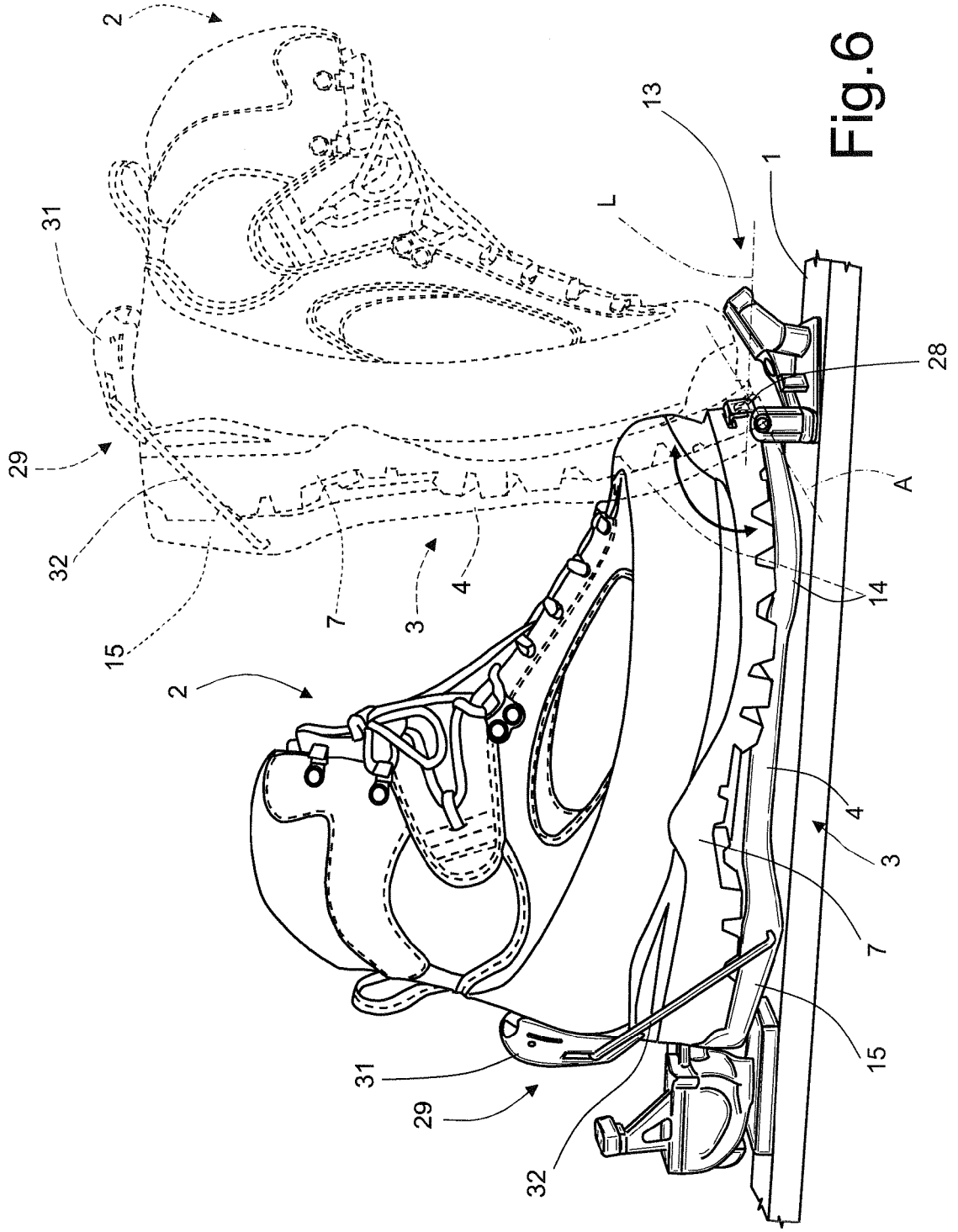


Fig.6

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 08 15 7127

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 3 908 971 A (ENGEL STEVEN F) 30 September 1975 (1975-09-30) * column 3, line 12 - column 4, line 39; figures 1-5 * -----	1-3, 6-10,12, 14-24	INV. A43B3/24 A43B5/00 A43B5/04 A63C9/08 A63C9/086
X Y	CH 535 590 A (HAEFLIGER ALFRED [CH]) 15 April 1973 (1973-04-15) -----	1,9,10, 12,14, 15,21-24 11,13	A63C11/16
X	DE 24 56 559 A1 (HUBER HANS PETER) 12 August 1976 (1976-08-12) * the whole document * -----	1-3, 6-10,12, 14-24	
A,D X	EP 1 254 611 A (SCARPA CALZATURIFICIO SPA [IT]; GRIVEL SRL [IT] SCARPA CALZATURIFICIO) 6 November 2002 (2002-11-06) * figures 1-3 * -----	2-8, 17-20 24	TECHNICAL FIELDS SEARCHED (IPC)
Y	EP 0 199 098 A (BARTHEL FRITZ) 29 October 1986 (1986-10-29) * claims 2,9; figures 3,4,6,7 * -----	11,13	A43B A63C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	2 September 2008	Vesin, Stéphane

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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