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(54) SKI BOOT

(57) Ski boot (1) comprising a rigid shell (2) that is shaped so as to accommodate the foot of the user, and a rigid cuff (3) that is shaped to as to surround the ankle of the user, and is pivotally jointed to the shell (2) so as to be able to pivot about a rotation axis (A) substantially perpendicular to the midplane of the boot; the shell (2) comprising a substantially basin-shaped, rigid casing (6) which is shaped so as to be able to accommodate therein the foot of the user, and a transversal stiffening insert (9) which is embedded inside the bottom wall (8) of the casing (6) at the tarsophalangeal region of the sole of the foot, and is structured so as to emerge/surface on the outside of the rigid casing (6) on opposite sides of the midplane of the boot, at the two lateral sides (10) of the tip (4) of the shell; the transversal stiffening insert (9) being provided with two first conjugated coupling ends (14) that surface on the outside of the rigid casing (6) along the two lateral sides (10) of the tip of the shell (4), on opposite sides of the midplane of the boot, and are structured so as to be engaged and clamped in an axially rotating manner about a transversal reference axis (B) by the toe piece of the ski binding device, and of two second conjugated coupling ends (16) that surface on the outside of the rigid casing (6) along the two lateral sides (10) of the tip of the shell (4), on opposite sides of the midplane of the boot, spaced beside said first conjugated coupling ends (14).

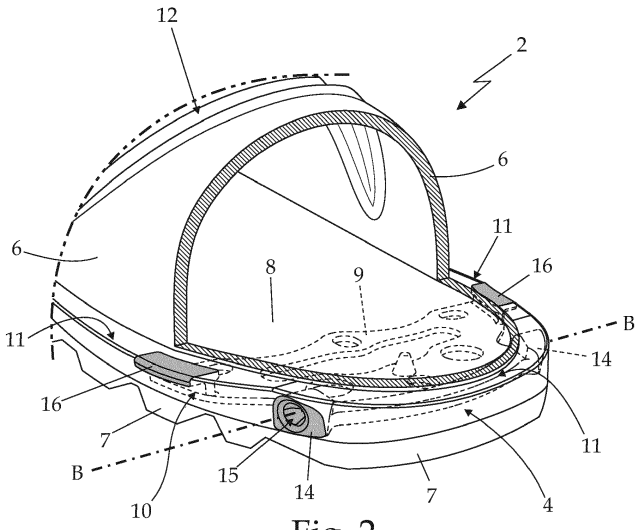

Fig. 2

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Description

[0001] The present invention relates to a ski boot.

[0002] In more detail, the present invention relates to a ski boot for ski-mountaineering and Telemark, use to which the following description will make explicit reference without thereby losing generality.

[0003] As is well known, ski boots for practicing ski-mountaineering and Telemark basically comprise: a rigid shell made of plastic or composite material, which is shaped so as to accommodate the foot of the user, and has the boom part specifically structured so as to be fastened onto the back of downhill ski or similar via a ski-mountaineering or Telemark ski binding device; and a rigid cuff made of plastic or composite material, which is shaped so as to enclose the lower part of the leg of the user from behind, and is hinged to the upper part of the shell so as to be able to rotate around a transversal reference axis, which is substantially perpendicular to the midplane of the boot and is also locally substantially coinciding with the articulation axis of the ankle.

[0004] In more detail, the bottom part of the shell is provided in the front with a tip specifically structured to be able to hook in a rigid and stable, though easily releasable manner to the toe piece of a ski-mountaineering or Telemark ski binding device which, in turn, is structured to firmly hold the tip of the shell on the backside of the ski beneath, with the possibility of freely rotating about a reference axis perpendicular to the midplane of the boot. In this way, the user is able to lift the heel of the ski boot from the backside of the ski as needed, while always and still maintaining the tip of the boot firmly anchored to the ski beneath.

[0005] To guarantee the necessary structural stiffness in the coupling point, in more modern ski-mountaineering and Telemark boots, the rigid shell is additionally provided with a transversal metal insert which is completely embedded in the plastic material and extends inside the tip of the shell perpendicular to the midplane of the boot. Moreover, the transversal insert is structured so as to surface on the outside of the shell at the two lateral sides of the tip, in symmetrical position on opposite sides of the midplane of the boot, so the two ends of the insert can be clamped firmly and in an axially rotatable manner by the locking clamp of the toe piece of the ski-mountaineering or Telemark ski binding device.

[0006] Aim of the present invention is to realize a transversal insert allowing the tip of the shell to be clamped in two distinct points along the lateral sides of the tip, and which is furthermore compatible with a great variety of ski-mountaineering and Telemark ski binding devices.

[0007] In compliance 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 depending claims.

[0008] The present invention will now be described with reference to

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

- Figure 1 is a side view of a ski-mountaineering boot realized according to the teachings of the present invention;
- Figure 2 is a perspectival view of the front part of the ski-mountaineering boot shown in Figure 1, with transparent parts; whereas
- Figure 3 is a prospective view of the transversal metal insert embedded in the tip of the ski-mountaineering boot shown in figure 1.

[0009] With reference to Figures 1 and 2, number 1 denotes as a whole ski boot and in particular a ski boot specifically structured for ski-mountaineering or Telemark practicing.

[0010] Ski boot 1 basically comprises: a rigid shell 2 which is shaped so as to accommodate the foot of the user, and which has the bottom part specifically structured/shaped so as to be able to couple/fasten in a rigid and stable, though easily releasable manner to a ski binding device (not shown) of known type and which, in turn, is structured to be rigidly secured to the backside of a generic downhill ski or similar; and a rigid cuff 3 which is shaped so as to enclose the leg of the user in the area of the ankle, and is hinged on the top part of the shell 2 so as to be able to freely pivot about a transversal rotation axis A which is locally substantially perpendicular to the midplane of the boot (i.e. perpendicular to the plane of the sheet in figure 1), and moreover locally substantially coincides with the articulation axis of the ankle of the user.

[0011] In more detail, the bottom part of shell 2 is provided with a front tip 4 and of a rear heel 5.

[0012] The front tip 4 is structured so as to be able to couple/fasten in a stable, though easily releasable manner to the toe piece (not shown) of a ski binding device which, in turn, is stably secured to the backside of a generic downhill ski or similar, and is structured so as to be able to couple/fasten in a stable, though easy releasable manner to the tip 4 of shell 2 in order to firmly hold the tip 4 of shell 2 on the backside of the ski, while allowing at the same time the tip 4, and thus the entire ski boot 1, to freely rotate about a rotation axis substantially perpendicular to the midplane of the boot.

[0013] In more detail, the tip 4 of shell 2 has, on opposite sides of the midplane of the boot, two conjugated coupling areas that are aligned along a same transversal reference axis B which is locally substantially perpendicular to the midplane of the boot, and preferably intersects the tip 4 of shell 2 roughly at the tip of the toes of the user's foot.

[0014] The two conjugated coupling areas are therefore substantially secularly arranged on the opposing sides of the midplane of the boot, and are overall structured so as to be engaged and clamped in axially rotatable manner by the locking clamp (not shown) of the toe piece of the ski binding device, so as to allow the shell

2, and thus the entire ski boot 1, to freely rotate about the transversal axis B.

[0015] Preferably, though not necessarily, the rear heel 5 is, on the other hand, structured so as to be able to couple/fasten in a stable, though easy releasable manner to the heel piece (not shown) of a ski binding device which is stably secured to the backside of a generic downhill ski or similar, and is structured so as to be able to selectively hold the heel 5 of shell 2 in abutment against the backside of the downhill ski or similar, thus preventing any rotation of the shell 2 about transversal axis B.

[0016] Preferably, the bottom part of shell 2 additionally has a treaded profile so as to allow the user to walk on snow and/or ice.

[0017] In more detail, with reference to Figures 1 and 2, shell 2 comprises: a substantially basin-shaped rigid casing 6 which is made of plastic or composite material and is shaped so as to be able to internally accommodate the foot of the user; and a front sole 7 preferably having antiskid structure and which covers the bottom wall 8 of the rigid casing 6, preferably at least in the area below the tarsophalangeal region of the sole of the foot.

[0018] In addition shell 2 moreover comprises a transversal stiffening insert 9, preferably made of metal material, which is embedded inside the bottom wall 8 of casing 6 at the tarsophalangeal region of the sole of the foot, and is structured so as to emerge/surface outside of the rigid casing 6 on opposite sides of the midplane of the boot, at the two lateral sides 10 of the tip 4 of shell 2 and immediately above the sole 7, so as to form the two conjugated coupling areas which are intended to be clamped in axially rotatable manner by the locking clamp (not shown) of the toe piece of the ski binding device.

[0019] In more detail, with particular reference to Figure 2, in the example shown rigid casing 6 is preferably provided with a substantially U-shaped, projecting ledge or shelf 11 that cantilevered protrudes from the front part of casing 6 while remaining locally substantially coplanar to the bottom wall 8 of casing 6, and surrounds the tarsophalangeal region of the sole of the foot so as to form the tip 4 of shell 2; and the two conjugated coupling areas are located along the two lateral sides 10 of the projecting shelf 11.

[0020] In other words, the transversal insert 9 is embedded inside the bottom wall 8 at the projecting shelf 11, so as to be able to emerge/surface outside of the rigid casing 6 at the two lateral sides 10 of projecting shelf 11, in substantially symmetrical position on opposite sides of the midplane of the boot.

[0021] With reference to Figure 1, preferably the rigid casing 6 is superiorly provided with a flexible transversal band 12 which is structured to elastically deform, and extends from the inner side to the outer side of the shell 2 more or less perpendicularly to the midplane of the boot, while passing over the instep of the foot substantially straddling the metatarsus, so as to allow the inside of the shell 2 to bend locally in order to meet the bending of the foot.

[0022] In the example shown, in particular, the rigid casing 6 is preferably made of PEBAX (polyether block amide), but could also be made of Nylon (polyamide) or other similar plastic polymers.

[0023] Alternatively, the rigid casing 6 could also be made of a composite material, preferably formed by one or more overlapping layers of carbon fibres and/or glass fibres and/or aramid fibres, conveniently interwoven with and/or overlapping each other and embedded in a matrix of epoxy, phenolic or polyester resin, preferably of the thermosetting variant.

[0024] The front sole 7, on the other hand, preferably has a treaded profile and is preferably made of vulcanized rubber of other elastomeric material with high friction coefficient, and is preferably unmovably fixed to the bottom wall 8 of rigid casing 6 by gluing.

[0025] With reference to Figures 1, 2 and 3, the transversal stiffening insert 9 in turn comprises: a preferably substantially platelike, central portion 13 which extends inside the bottom wall 8 of casing 6, straddling and substantially perpendicular to the midplane of the boot, so as to be locally substantially coplanar to the bottom wall 8 of the casing 6, and thus locally substantially parallel to the underlying sole 7; and two main lateral appendages 14 which extend cantilevered from the plate-like central portion 13, on opposite sides of the vertical midplane of the boot, and are structured so that the respective distal ends emerge/surface outside of rigid casing 6 on opposite sides of the midplane of the boot, at the two lateral sides 10 of tip 4 of shell 2, or better of the projecting shelf 11 of casing 6, and immediately above the sole 7, while remaining locally substantially coaxial to the transversal axis B, i.e. in substantially symmetrical position on opposite sides of the midplane of the boot.

[0026] In other words, the two lateral appendages 14 of transversal insert 9 extend cantilevered from the platelike central portion 13, on opposite sides of the latter, so that the distal ends of the two lateral appendages 14 are substantially coaxial to a same reference axis which is substantially perpendicular to the midplane of the platelike central form 13 and, in addition, coincides with the transversal axis B when transversal insert 9 is embedded in the bottom wall 8 of casing 6.

[0027] With particular reference to Figures 2 and 3, the distal ends of the two main lateral appendages 14 are moreover structured so as to be firmly engaged and clamped in axially rotatable manner by the locking clamp (not shown) of the toe piece of the ski binding device, and thus form the two conjugated coupling areas of the tip 4 of shell 2.

[0028] In other words, the distal end of each lateral appendage 14 is shaped/structured so as to be engaged in removable and axially rotatable manner about transversal axis B by the locking clamp of the toe piece of the ski binding device.

[0029] With reference to Figures 2 and 3, in the example shown, in particular, the distal end of each lateral appendage 14 of the transversal insert 9 is preferably

provided with a substantially ogival and/or cylindrical, blind hole or cavity 15 which extends coaxial to transversal axis B towards the inside of the shell 2, i.e. towards the plate-like central portion 13, and is preferably dimensioned so as to be engaged in axially rotatable and removable and manner by the distal end of a coupling pin (not shown) of the locking clamp of the toe piece of a ski-mountaineering or Telemark ski binding device of known type.

[0030] In more detail, in the example shown, the blind hole 15 is preferably dimensioned so as to be engaged in axially rotatable and removable manner by the distal end of the coupling pin of the main locking clamp of the toe piece of the Telemark ski binding device which is sold by the Italian company ATK RACE S.R.L. under the name "Newmark".

[0031] Obviously, blind hole 15 could also be engaged in axially rotatable and removable manner by the distal end of the coupling pin of the locking clamp of the tow piece of a Dynafit-type ski-mountaineering ski binding device or similar, like those described, for example, in European patents EP0199098 and EP1559457 and in international patent application WO2007/010392.

[0032] With reference to Figures 1, 2 and 3, the transversal stiffening insert 9 moreover comprises two additional lateral appendages 16 which extend cantilevered from the central portion 13 on opposite sides of the midplane of the boot, and are structured so that the respective distal ends emerge/surface outside of the rigid casing 6 on opposite sides of the midplane of the boot, at the two lateral sides 10 of tip 4 of shell 2, or better of the projecting shelf 11 of casing 6, and immediately above the sole 7, spaced beside the main lateral appendages 14.

[0033] In more detail, the two additional lateral appendages 16 are preferably structured so that the corresponding distal ends emerge/surface outside of the rigid casing 6 at the two lateral sides 10 of tip 4 of shell 2, or better of the projecting shelf 11 of casing 6, in a rearward position with respect to the main lateral appendages 14, i. e. between the main lateral appendages 14 and the rear heel 5.

[0034] Preferably the two additional lateral appendages 16 are moreover aligned perpendicularly to the midplane of the boot.

[0035] In other words, the two additional lateral appendages 16 of transversal insert 9 extend cantilevered from the plate-like central portion 13, on opposite sides of the same and beside the two main lateral appendages 14, so that the distal ends of the additional lateral appendages 16 are misaligned/displaced with respect to the axis intersecting the distal ends of the two main lateral appendages 14, i.e. to transversal axis B, and so that they are preferably aligned to a second reference axis locally parallel and placed beside the transversal axis B.

[0036] With reference to Figure 2, preferably these two additional lateral appendages 16 are moreover structured so that the corresponding distal ends emerge/surface outside of the rigid casing 6, at the upper edges of the two lateral sides 10 of projecting shelf 11.

[0037] The distal ends of the two additional lateral appendages 16 are therefore located at opposite sides of the tarsophalangeal region of the sole of the foot, preferably in a substantially symmetrical position on opposite sides of the midplane of the boot, and are overall structured so as to be selectively firmly engaged and clamped by the toe piece (not shown) of the ski binding device in a separate and independent manner with respect to the distal ends of the two main lateral appendages 14.

[0038] In more detail, the distal ends of the two additional lateral appendages 16 are preferably structured so as to be firmly engaged and clamped by the ends of the auxiliary locking clamp of the toe piece of the Telemark ski binding device sold by the Italian company ATK RACE S.R.L. under the name "Newmark", so that the toe piece (not shown) of the above-mentioned Telemark ski binding device can selectively prevent rotation of shell 2, or better of ski boot 1, about transversal axis B.

[0039] With particular reference to Figures 1 and 2, the transversal stiffening insert 9 of shell 2 is thus provided with two first conjugated coupling ends 14 that surface outside of rigid casing 6 along the two lateral sides 10 of the tip 4 of shell 2, on opposite sides of the midplane of the boot, substantially coaxial to the transversal axis B; and with two second conjugated coupling ends 16 that surface outside of rigid casing 6 along the two lateral sides 10 of the tip 4 of shell 2, on opposite sides of the midplane of the boot, spaced beside the first conjugated coupling ends 14.

[0040] The first two conjugated coupling ends 14 and the second two conjugated coupling ends 16 of the transversal insert 9 are therefore located at opposite sides of the tarsophalangeal region of the sole of the foot, preferably in pairs aligned with each other, and are intended to be separately engaged and clamped by the toe piece (not shown) of the ski binding device.

[0041] In more detail, the first pair of conjugated coupling ends 14 is structured for being engaged and clamped in axially rotatable manner about transversal axis B, by a first locking clamp (not shown) of the toe piece of the ski binding device. Said first locking clamp (not shown) of the toe piece of the ski binding device is therefore able to firmly hold the tip 4 of shell 2 on the backside of the ski, while allowing at the same time the shell 2 to freely rotate about transversal axis B.

[0042] The second pair of conjugated coupling ends 16 is spaced beside the first pair of conjugated coupling ends 14, or better is misaligned/displaced with respect to transversal axis B, preferably in rearward position with respect to the first pair of conjugated coupling ends 14, and is structured for being engaged and clamped by a second locking clamp (not shown) of the toe piece of the ski binding device. Said second locking clamp (not shown) of the toe piece of the ski binding device is therefore able hold the tip 4 of shell 2 in abutment against the backside of the ski, preventing in this way the shell 2 to

freely rotate about transversal axis B.

[0043] With reference to Figure 1, on the other hand, cuff 3 is fixed in freely rotating manner to the shell 2, or better to the top part of the rigid casing 6, by two lateral connecting hinges 17 that are placed on the inner and outer lateral sides of shell 2 and of cuff 3, aligned along rotation axis A, so as to allow the cuff 3 to freely pivot on the shell 2 either forwards or backwards, while always remaining on a reference plane orthogonal to axis A and substantially coinciding with the midplane of the boot.

[0044] In addition to the above, the ski boot 1 preferably additionally comprises an inner liner 18 having a soft and thermal insulating structure, optionally also of thermoformable type, and which is inserted into shell 2 and optionally also into cuff 3 preferably, though not necessarily in removable manner, and is shaped so as to accommodate and protect the foot and optionally also the lower part of the leg of the user.

[0045] Lastly, ski boot 1 is moreover provided with a series of manually-operated locking devices 19, in the example shown in particular a series traditional lever buckles, which are conveniently distributed on shell 2 and on cuff 3, and are structured so as to be able to selectively close /tighten shell 2 and cuff 3 against the leg of the user, in order to stably immobilize the leg of the user inside the ski boot 1, or better inside the inner liner 18; and optionally also with a manually-operated or automatic cuff locking device 20 which is structured so as to be able to selectively link the cuff 3 in a rigid manner to the shell 2, in order to prevent the cuff 3 from freely pivoting about the transversal axis A.

[0046] With reference to Figure 1, in the example shown, in particular, the cuff locking device 20 is preferably located on the area above the heel of the boot, straddling between the shell 2 and the cuff 3, and is structured so as to be able to selectively

- rigidly lock the cuff 3 to shell 2 preferably in a given position in which the cuff 3 is tilted forward with respect to the vertical of a pre-set angle, thus preventing any pivoting movement of the cuff 3 on the shell 2; and
- completely unblock/release the cuff 3 from the shell 2 so as to allow the cuff 3 to freely pivot on the shell 2 about axis A, while remaining on the midplane of the boot.

[0047] In more detail, in the example shown, the cuff locking device 20 is preferably structured so as to be able to rigidly lock the cuff 3 to the shell 2 in a given downhill position in which the cuff 3 is tilted forward with respect to the vertical of an angle preferably, though not necessarily, ranging between 3° and 30°.

[0048] Operation of the ski boot 1 is easily inferable from the description above, and does not require additional explanation.

[0049] The advantages correlated to the particular structure of transversal stiffening insert 9 are remarkable.

[0050] The particular shape of transversal insert 9 prevents the ends of the auxiliary locking clamp of the toe piece of the Telemark ski binding device which is sold by the Italian company ATK RACE S.R.L. under the name "Newmark", from directly abutting on plastic- or composite-material rigid casing 6, thus ensuring a more firm and rigid locking of shell 2 on the backside of the downhill ski. Increased rigidity which brings into a perceptible improvement in the response speed of the ski to the movements of the user.

[0051] In addition, the particular shape of transversal insert 9 allows the ski boot 1 to be used with numerous other ski-mountaineering or Telemark ski binding devices currently found on the market, such as, for example, the Telemark ski binding devices sold by the American company OLYMPUS MOUNTAIN GEAR LLC under the name "TTS", the ski-mountaineering ski binding devices sold by the Norwegian company MOONLIGHT under the name "Pure Tele", or the Telemark ski binding devices sold by the French company THE M-EQUIPMENT under the name "Meidjo".

[0052] Clearly changes and variations may be made to the ski boot 1 disclosed above without, however, departing from the scope of the present invention.

[0053] For example, front sole 7 could also be made in one piece with the bottom wall 8 of rigid casing 6, or could be secured in removable manner to the bottom wall 8 of rigid casing 6 via anchoring screws.

Claims

1. Ski boot (1) comprising a rigid shell (2) which is shaped so as to accommodate the foot of the user, and a rigid cuff (3) which is shaped so as to surround the ankle of the user and is pivotally jointed to the shell (2) so as to be able to pivot about a rotation axis (A) substantially perpendicular to a midplane of the boot;
the shell (2) comprising a substantially basin-shaped, rigid casing (6) which is shaped so as to be able to accommodate therein the foot of the user; and a transversal stiffening insert (9) which is embedded inside the bottom wall (8) of the casing (6) at the tarsophalangeal region of the sole of the foot, and is structured so as to emerge/ surface on the outside of the rigid casing (6) on opposite sides of the midplane of the boot, at two lateral sides (10) of the tip (4) of the shell;
the ski boot (1) being **characterised in that** the transversal stiffening insert (9) is provided with two first conjugated coupling ends (14) that surface on the outside the rigid casing (6) along the two lateral sides (10) of the tip of the shell (4), on opposite sides of the midplane of the boot, substantially coaxial to a same reference axis (B) substantially perpendicular to the midplane of the boot, and with two second conjugated coupling ends (16) that surface on the

outside the rigid casing (6) along the two lateral sides (10) of the tip of the shell (4), on opposite sides of the midplane of the boot, spaced beside said first conjugated coupling ends (14) ;
said first conjugated coupling ends (14) being structured so as to be engaged and clamped in an axially rotating manner about said reference axis (B) by the toe piece of the ski binding device.

2. Ski boot according to claim 1, **characterised in that** the second conjugated coupling ends (16) are located along the two lateral sides (10) of the tip of the shell (4), in a rearward position with respect to said first conjugated coupling ends (14).

3. Ski boot according to claim 1 or 2, **characterised in that** the second conjugated coupling ends (16) are aligned perpendicularly to the midplane of the boot.

4. Ski boot according to any one of the preceding claims, **characterised in that** the second conjugated coupling ends (16) are structured so as to be engaged and clamped by the toe piece of the ski binding device to prevent rotation of the shell (2) around said reference axis (B).

5. Ski boot according to any one of the preceding claims, **characterised in that** each of the first conjugated coupling ends (14) is provided with a cavity or blind hole (15) which extends coaxial to said reference axis (B) and is dimensioned so as to be engaged in a removable and axially rotatable manner by the distal end of a coupling pin of the toe piece of the ski binding device.

6. Ski boot according to any one of the preceding claims, **characterised in that** the shell (2) also comprises a front sole (7) that covers the bottom wall (8) of the casing (6) at least in the area below the tarsophalangeal region of the sole of the foot; said first (14) and second (16) conjugated coupling ends being located along the two lateral sides (10) of the tip (4) of the shell, immediately above said front sole (7).

7. Ski boot according to any one of the preceding claims, **characterised in that** the rigid casing (6) is provided with a substantially U-shaped, projecting ledge or shelf (11) that cantilevered protrudes from the front part of the casing (6) while remaining locally substantially coplanar to the bottom wall (8) of the casing (6), and surrounds the tarsophalangeal region of the sole of the foot so as to form the tip (4) of the shell (2); said first (14) and second (16) conjugated coupling ends being located along the two lateral sides (10) of said substantially U-shaped projecting ledge or shelf (11).

8. Ski boot according to claim 7, **characterised in that** the second conjugated coupling ends (16) emerge/surface on the outside of the rigid casing (6), at the upper edges of the two lateral sides (10) of said substantially U-shaped projecting ledge or shelf (11).

9. Ski boot according to any one of the preceding claims, **characterised in that** the transversal stiffening insert (9) comprises: a substantially plate-like central portion (13) which extends inside the bottom wall (8) of the casing (6), straddling and substantially perpendicular to the midplane of the boot; two main lateral appendages (14) that extend cantilevered from the central portion (13) on opposite sides of the midplane of the boot, and are structured so that the related distal ends emerge/surface on the outside of the rigid casing (6) at the two lateral sides (10) of the tip (4) of the shell (2) while remaining locally substantially coaxial to said reference axis (B); and two supplementary lateral appendages (16) that extend cantilevered from the central portion (13) on opposite sides of the midplane of the boot, and are structured so that the related distal ends emerge/surface on the outside of the rigid casing (6) at the two lateral sides (10) of the tip (4) of the shell (2), spaced beside the main lateral appendages (14).

10. Ski boot according to any one of the preceding claims, **characterised in that** the rigid casing (6) is superiorly provided with a flexible transversal band (12) which is structured so as to elastically deform and extends from the inner side to the outer side of the shell (2) more or less perpendicularly to the midplane of the boot, while passing over the instep substantially straddling the metatarsus.

11. Ski boot according to any one of the preceding claims, **characterised in that** the rigid casing (6) is made of plastic or composite material.

12. Ski boot according to any one of claims 6 to 11, **characterised in that** the front sole (7) is made of vulcanized rubber or other elastomeric material with high friction coefficient.

13. Ski boot according to any one of the preceding claims, **characterised in that** the transversal stiffening insert (9) is made of metal material.

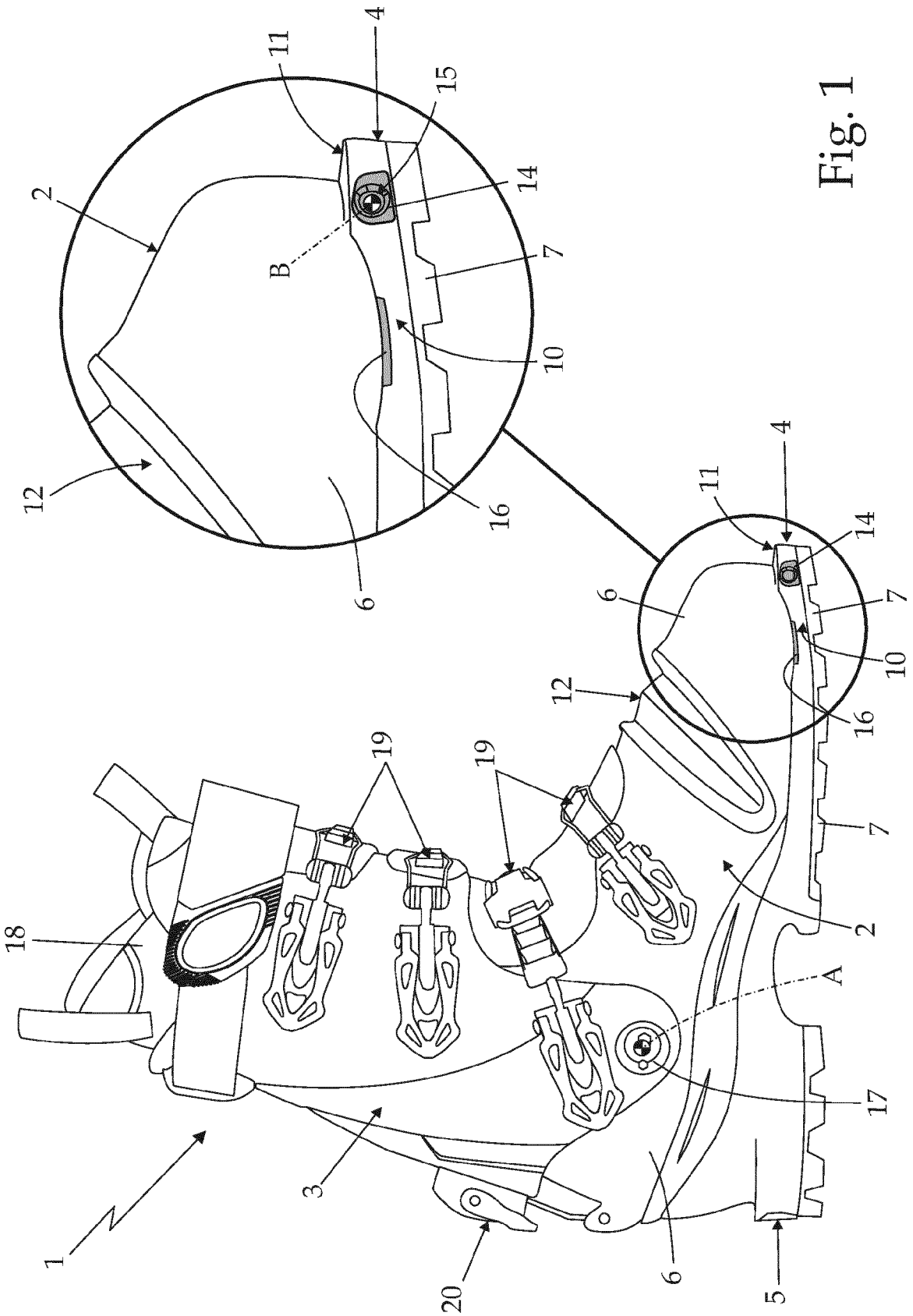

Fig. 1

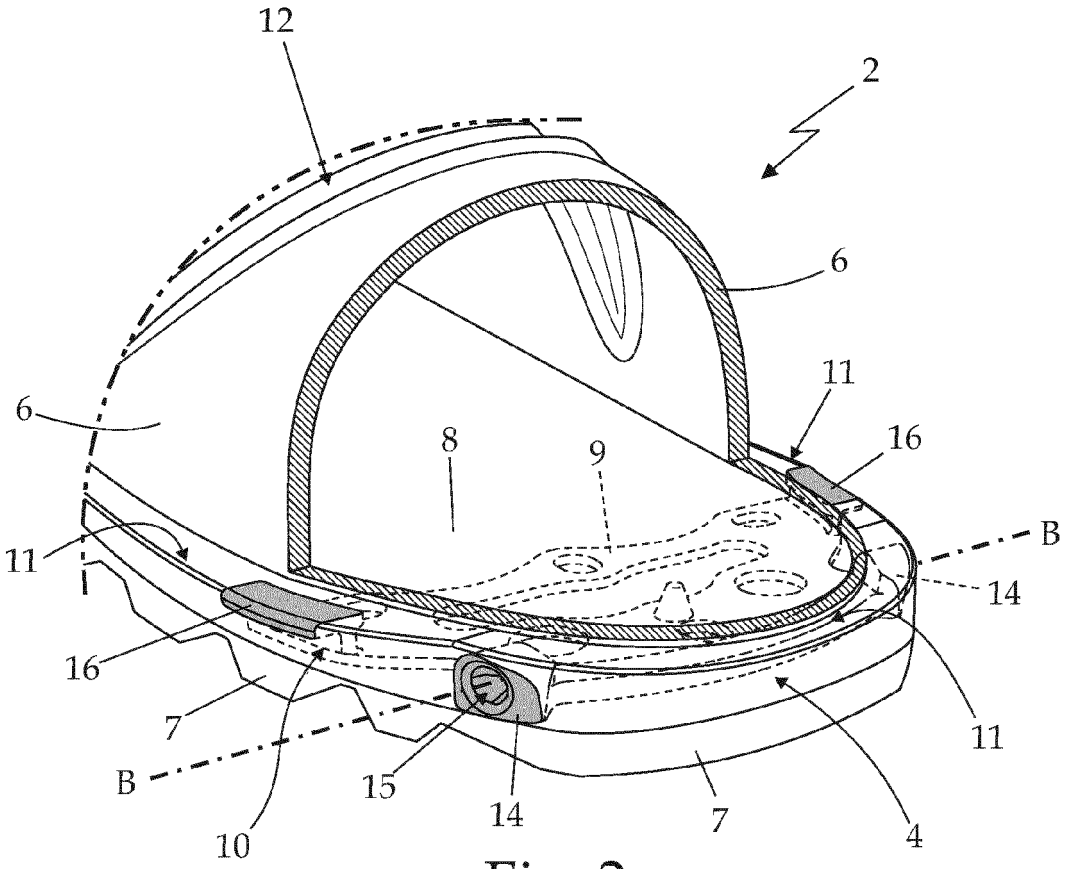

Fig. 2

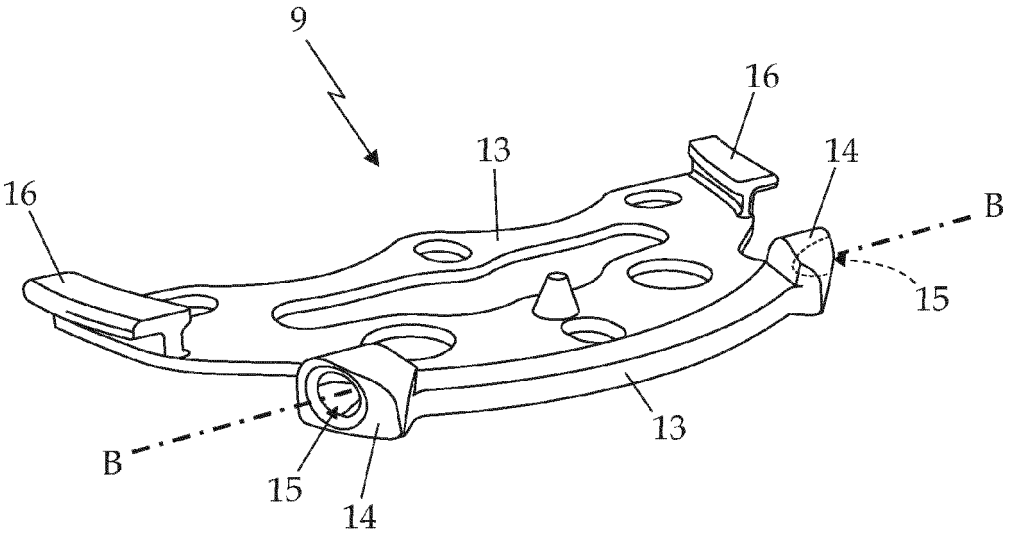

Fig. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 16 18 3266

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2014/298688 A1 (BARTHEL FRITZ [AT]) 9 October 2014 (2014-10-09) * paragraphs [0021], [0039] - [0041], [0044] *	1-13	INV. A43B5/04
A	US 2012/227286 A1 (PARISOTTO DAVIDE [IT] ET AL) 13 September 2012 (2012-09-13) * claims; figures *	1-13	
A	US 2012/042542 A1 (LEHNER EDWIN [DE]) 23 February 2012 (2012-02-23) * claims; figures *	1-13	

TECHNICAL FIELDS SEARCHED (IPC)

A43B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	15 December 2016	Claudel, Benoît

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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