(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 749 702 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
27.12.1996 Bulletin 1996/52

(51) Int. Cl.[6]: **A43B 1/00**, A43B 5/04

(21) Application number: **96304648.7**

(22) Date of filing: **24.06.1996**

(84) Designated Contracting States:
CH DE FR LI SE

(30) Priority: **23.06.1995 JP 181059/95**

(71) Applicant: **SHIMANO INC.**
Osaka 590 (JP)

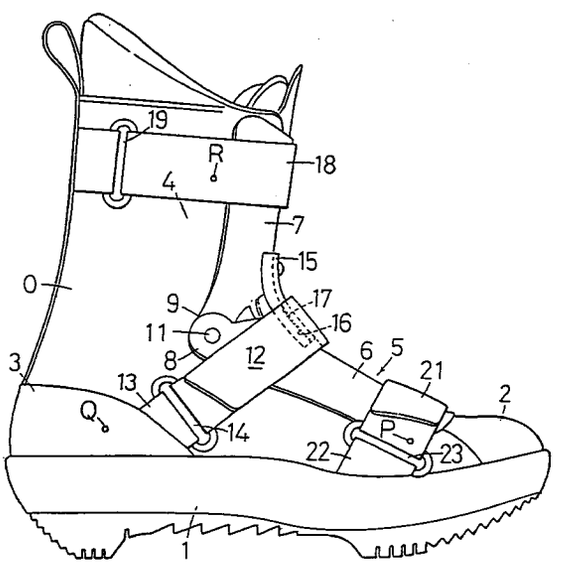
(72) Inventor: **Okajima, Shinpei**
Sakai, Osaka 590 (JP)

(74) Representative: **Pacitti, Pierpaolo A.M.E. et al**
Murgitroyd and Company
373 Scotland Street
Glasgow G5 8QA (GB)

(54) Snowboard boot

(57) A snowboard boot includes a sole (1), a toe section (2) coupled to the sole, a heel section (3) coupled to the sole, and a leg section (4) coupled to the heel section. An adjustment means (15,16,17) is provided for adjusting an angle of the leg section relative to the sole. A fixing means (12,13,14) also may be provided for fixing the angle of the leg section relative to the sole after the angle of the leg section relative to the sole is adjusted.

Figure 2



EP 0 749 702 A1

Description

BACKGROUND OF THE INVENTION

The present invention is directed to snowboard boots and, more particularly, to a snowboard boot which includes an adjusting means for adjusting an angle between the leg section and the sole of the boot.

Snowboard boots are usually firmly secured to snowboards with the aid of cleats. During riding, the legs of a rider moving downhill in the direction orthogonal to the longitudinal direction of the snowboard must be bent forward with considerable force. As a result, novice snowboarders sometimes tire very quickly, so it is believed that a person will acquire snowboarding skills faster if the snowboard boot itself is capable of creating conditions in which the leg of the snowboard boot above the heel is tilted forward and held steady in this position. There are, however, no snowboard boots capable of creating conditions in which the leg is tilted forward and held steady in this position.

SUMMARY OF THE INVENTION

The present invention is directed to a snowboard boot which can be adjustably set into a tilted position and maintained in that position without extra effort by the user. In one embodiment of the present invention, a snowboard boot includes a sole, a toe section coupled to the sole, a heel section coupled to the sole, and a leg section coupled to the heel section. An adjustment means is provided for adjusting an angle of the leg section relative to the sole. A fixing means also may be provided for fixing the angle of the leg section relative to the sole after the angle of the leg section relative to the sole is adjusted.

The adjusting means may take many different forms. In a simple embodiment, a saddle member is retained to a front portion of the boot and extends from the leg section toward the toe section. An adjustable strap is coupled to opposite sides of theboot and passes over the saddle member so that pressure against the saddle member causes the leg section to pivot toward the toe section. This arrangement also is capable of fixing the adjustment angle.

In a more specific embodiment, a toe member is retained to the toe section, and a leg member is retained to the leg section. The leg member is pivotably coupled to the toe member so that the leg member is capable of forward motion toward the toe member. An adjustable strap is coupled to opposite sides of the boot and passes over at least one of the toe member or leg member so that pressure against the at least one of the toe member or leg member causes the leg member to pivot toward the toe member. In this embodiment, the adjustment means may include a first engagement member coupled to the leg member and a second engagement member coupled to the toe member, wherein the first engagement member and the second engagement member contact each other through serrations for stepwise adjustment of the angle between the leg member and the toe member.

In another embodiment, the adjustment means may comprise tightening means for coupling an upper leg portion of the leg section with a toe portion of the boot in close proximity to the toe section and for varying a distance between the upper leg portion and the toe portion. For example, the tightening means may include an eccentric cam retained to the leg section. A cord assembly is retained to opposite sides of the toe portion and passes over the cam so that rotation of the cam causes the cord assembly to move vertically. This, in turn, causes the leg section to move forward toward the toe section. Another example of such a tightening means comprises a fixed member retained to the leg section and a movable member slidingly contacting the fixed member. A cord assembly is retained to opposite sides of the toe portion and is retained to the movable member so that movement of the movable member causes the cord assembly to move vertically. As with the tightening means just described, vertical movement of the cord causes the leg section to move forward toward the toe section. In both embodiments the angle may be further fixed by the combination of a saddle member retained to a front portion of the boot which extends from the leg section toward the toe section, and an adjustable strap coupled to opposite sides of the bootso that the strap passes over the saddle member.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a side view of a particular embodiment of a snowboard boot according to the present invention;

Figure 2 is a side view of an alternative embodiment of a snowboard boot according to the present invention;

Figure 3 is a more detailed view of a stepwise adjusting mechanism shown in Figure 2;

Figure 4 is a side view of another alternative embodiment of a snowboard boot according to the present invention; and

Figure 5 is a side view of another alternative embodiment of a snowboard boot according to the present invention.

DETAILED DESCRIPTION OF THE EMBODIMENTS

Figure 1 is a side view of a particular embodiment of a snowboard boot according to the present invention. As shown in Figure 1, a snowboard boot main body 0 comprises a sole 1 in contact with the back surface of the foot, a toe 2 that accommodates the toes of the foot, a heel 3 that accommodates the heel, and a leg 4 that envelopes the leg. The toe 2 is integral with the sole 1 and is positioned in front and above it. The heel 3 is integral with the sole 1 and is positioned behind and above it. The leg is integral with the toe 2 and heel 3, is posi-

tioned above them, and is roughly shaped as a cylinder to accommodate the leg. A cleat (not shown) is secured in a recess on the back surface of the sole 1.

For the sake of convenience, an approximate first center of the three-dimensional toe 2 is established and designated as P, an approximate third center of the three-dimensional heel 3 is established and designated as Q, and an approximate second center of the three-dimensional leg 4 is established and designated as R. The first center P, the third center Q, and the second center R each lie in a space inside the snowboard boot and do not have an axis or the like.

A saddle-shaped component 5 for reinforcing the front surface of the snowboard boot is provided along the concave surface that extends from the toe 2 to the leg 4. The saddle-shaped component 5 is affixed to the snowboard boot main body 0 by a stitch, a snap ring, or by another conventional means (not shown).

A first strap 12 is provided for pressing down on the saddle-shaped component 5. The two fixed ends 13 for the first strap 12 are affixed at approximate centers on the two sides of the heel 3.The distance between the two fixed ends 13 of the first strap 12 can be adjusted with a first tightening ring 14, but two first tightening rings 14 (one on each side) can also be used. In such a case, the two first tightening rings 14 are attached to the free ends of auxiliary bands on both sides of the heel 3; the first strap 12 that starts at one of the first tightening rings 14, passes through the opposite first tightening ring 14 and folds back on itself. The resulting fold is secured by a hook-and-loop fastener (such as a Velcro® fastener) on the facing sides of strap 12.

Asecond strap 21 passes around the toe 2. The two fixed ends 22 for thesecond strap 21 are affixed to the sole 1 by a stitch or some other conventional means. The degree to which the toe 2 is tightened by the second strap 21 is adjusted by a second tightening ring 23. Of course, two tightening rings 23 (one on the right and one on the left) can also be used. Strap 23 folds back on itself in the same manner as first strap 12.

To use the snowboard boot, the first strap 12 and thesecond strap 21 are loosened, and the foot is placed on the sole 1. The second strap 21 is pulledthrough the second tightening ring 23, and the toe 2 is tightened. The first strap 12 is subsequently tightened through the first tightening ring 14. The tightening force of the first strap 12 reduces the distance between the third center Q approximately in the middle of the heel 3 and the area of contact between a saddle-shaped component 5 and the first strap 12. The reduction of this distance draws the first center P approximately in the middle of the toe 2 and the second center R approximately in the middle of the leg 4 closer to each other, creating a pulling force or a tensile force. This binding force reduces the apex angle PQR of the roughly isosceles triangle, thus reducing the angle of the leg 4 with respect to the sole 1.

Figure 2 is a side view of an alternative embodiment of a snowboard boot according to the present invention. As in the first embodiment, a snowboard boot main body 0 comprises a sole 1 in contact with the back surface of the foot, a toe 2 that accommodates the toes of the foot, a heel 3 that accommodates the heel, and a leg 4 that envelopes the leg. The toe 2 is integral with the sole 1 and is positioned in front and above it. The heel 3 is integral with the sole 1 and is positioned behind and above it. The leg is integral with the toe 2 and heel 3, is positioned above them, and is roughly shaped as a cylinder to accommodate the leg. A cleat (not shown) is secured in a recess on the back surface of the sole 1.

As with the first embodiment, an approximate first center of the three-dimensional toe 2 is established and designated as P, an approximate third center of the three-dimensional heel 3 is established and designated as Q, and an approximate second center of the three-dimensional leg 4 is established and designated as R. The first center P, the third center Q, and the second center R each lie in a space inside the snowboard boot and do not have an axis

A saddle-shaped component 5 for reinforcing the front surface of the snowboard boot is provided along the concave surface that extends from the toe 2 to the leg 4. The saddle-shaped component 5 comprises a toe-side saddle-shaped component 6 and a leg-side saddle-shaped component 7. The toe-side saddle-shaped component 6 and the leg-side saddle-shaped component 7 are bent into a combined dogleg structure, forming a saddle shape. The toe-side saddle-shaped component 6 and the leg-side saddle-shaped component 7 are affixed to the snowboard boot main body 0 by a stitch, a snap ring, or another conventional means (not shown).

The toe-side saddle-shaped component 6 and the leg-side saddle-shaped component 7 have a pivot connection. More specifically, a pivot 11 provides a rotatable coupling between the left and right ends 8 (only one is shown in the figures) of the toe-side saddle-shaped component 6 on the side of the leg-side saddle-shaped component 7, and the left and right ends 9 of the leg-side saddle-shaped component 7 on the side of the toe-side saddle-shaped component 6.

A first strap 12 is provided for pressing down the toe-side saddle-shaped component 6. Two fixed ends 13 for the first strap 12 are affixed at the approximate center of the heel 3. The distance between the two fixed ends 13 of the first strap 12 can be adjusted with a first tightening ring 14.

A member for adjusting the angle of the saddle-shaped component is provided in the lower part of the front surface of the leg-side saddle-shaped component 7. As shown more clearly in Figure 3, the member for adjusting the angle of the saddle-shaped component comprises [i] a first engagement member 15 secured to the front surface of the leg-side saddle-shaped component 7 and provided with a leg-side member 16 for engaging the saddle side along the surface facing the saddle-shaped component, and [ii] a second engagement member 17 formed in the toe-side saddle-shaped component 6 and designed to engage the leg-side

member 16 for engaging the saddle side. The leg-side member 16 for engaging the saddle side and the toe-side member 17 for engaging the saddle side are mutually enmeshed serrations (shaped as saw teeth) made of a metal, resin, or the like.

A second strap 18 passes around the top of the leg 4. The degree to which the leg 4 is tightened by the second strap 18 is adjustedusing a second tightening ring 19. A third strap 21passes around the toe 2. The two fixed ends 22 for the third strap 21 are affixed to the sole 1 by a stitch or other conventional means. The degree to which the toe 2 is tightened by the third strap 21 is adjusted using a third tightening ring 23.

To use this embodiment of the snowboard boot, the first strap 12, the second strap 18, and the third strap 21 are loosened, and the foot is placed on the sole 1. The second strap 18 and the third strap 21 are pulled using the second tightening ring 19 and the third tightening ring 23, and the leg 4 and the toe 2 are tightened. The first strap 12 is subsequently tightened using the first tightening ring 14. The tightening force of the first strap 12 reduces the distance between the third center Q approximately in the middle of the heel 3 and the area of contact between leg-side saddle-shaped component 7 and the first strap 12. The reduction of this distance draws the first center P approximately in the middle of the toe 2 and the second center R approximately in the middle of the leg 4 closer to each other, creating a pulling force or a tensile force. This binding force reduces the apex angle PQR of the roughly isosceles triangle, thus reducing the angle of the leg 4 with respect to the sole 1. The magnitude of the angle PQR can be adjusted by changing the meshing position of the leg-side component 16 for engaging the saddle side of the member 15 (designed to adjust the angle of the saddle-shaped component), and the toe-side member 17 for engaging the saddle side of the toe-side saddle-shaped component 6 before the first strap 12 is tightened.

Figure 4 is a side view of another alternative embodiment of a snowboard boot according to the present invention. As in the first two embodiments, the snowboard boot main body 0 comprises a sole 1, a toe 2, a heel 3, and a leg 4. Also, an approximate first center of the three-dimensional toe 2 is established and designated as P, an approximate third center of the three-dimensional heel 3 is established and designated as Q, and an approximate second center of the three-dimensional leg 4 is established and designated as R. The first center P, the third center Q, and the second center R each lie in a space inside the snowboard boot and do not have an axis or the like.

A saddle-shaped component 5 for reinforcing the front surface of the snowboard boot is provided along the concave surface that extends from the toe 2 to the leg 4. In contrast to the second embodiment shown in Figure 2, the saddle-shaped component 5 is a single-piece component. The entire saddle-shaped component 5 is bent into a dogleg shape, forming a saddle shape. The saddle-shaped component 5 is affixed to the snowboard boot main body 0 by a stitch, a snap ring 26, or some other conventional means.

A first strap 12 is provided for pressing down on the saddle-shaped component 5, and the two fixed ends 13 for the first strap 12 are affixed at the approximate center of the heel 3. The distance between the two fixed ends 13 for the first strap 12 can be adjusted using a first tightening ring 14. A second strap 21 passes around the toe 2, and two fixed ends 22 for the second strap 21 are affixed to the sole 1 by a stitch or other conventional means. The degree to which the toe 2 is tightened by the second strap 21 is adjusted by asecond tightening ring 23.

A cord engagement member 31 is provided on the back surface of the leg 4. The cord engagement member 31 comprises a main body 30, a rotatable mounting stem 32, an eccentric cam 33 rotating in conjunction with the mounting stem 32, and a vertically moving member 35 that is shifted up and down by the rotation of the eccentric cam 33.Eccentric cam 35 slides inside a guiding slit 34 so that rotation of the eccentric cam 33 varies the vertical position of the vertically moving member 35. This, in turn, varies the vertical position of the folding portion of the cord 37 threaded througha hole in the vertically moving member 35 and changes the tension of the cord 37.

Cord-fixing members 39 are provided on the left and right ends of the toe 2, and each of the cord-fixing members 39 is provided with a cord-fixing hole 36. One end of a cord or wire 37 is secured in the cord-fixing hole 36 of a cord-fixing member 39, and the other end is threaded through the slit 34 of the cord engagement member 31 and then secured in the cord-fixing hole 36 of the other cord-fixing member 39.

To use this embodiment of the snowboard boot, the eccentric cam 33 of the cord engagement member 31 is rotated 180 degreesso that the vertical position of the slit 34 in the eccentric cam 33 is shifted to its lowest position, the cord 37 is loosened (as are the first strap 12 and thesecond strap 21), and the foot is placed on the sole 1. The second strap 21 is tightened using the second tightening ring 23, the eccentric cam 33 is rotated 180 degrees in the opposite direction, and moving member 35 is raised to its highest position for tightening cord 37. The first strap 12 is subsequently tightened using the first tightening ring 14, thus fixing the angle of the boot.

As a result, the distance is reduced between the first center P approximately in the middle of the toe 2, and the area of contact between cord 37 and the cord engagement member 31. The reduction of this distance draws the first center P approximately in the middle of the toe 2 and the second center R approximately in the middle of the leg 4 closer to each other, creating a pulling force or a tensile force. This binding force reduces the angle PQR, thus reducing the angle of the leg 4 with respect to the sole 1. The magnitude of the angle PQR can be adjusted by changing the position of the compression point area of the cord 37 and the cord engage-

ment member 31. As noted above, the tightened state created by the cord 37 can be preserved by tightening the first strap 12 through the first tightening ring 14. The magnitude of the angle PQR can also be adjusted by varying the degree of tightening of the first strap 12.

Figure 5 is a side view of another alternative embodiment of a snowboard boot according to the present invention. As with the above embodiments, the snowboard boot main body 0 comprises a sole 1, a toe 2, a heel 3, and a leg 4. An approximate first center of the three-dimensional toe 2 is established and designated as P, an approximate third center of the three-dimensional heel 3 is established and designated as Q, and an approximate second center of the three-dimensional leg 4 is established and designated as R. The first center P, the third center Q, and the second center R each lie in a space inside the snowboard boot.

A saddle-shaped component 5 for reinforcing the front surface of the snowboard boot is provided along the concave surface that extends from the toe 2 to the leg 4. In contrast to the embodiment shown in Figure 2, the saddle-shaped component 5 is a single-piece component. The entire saddle-shaped component 5 is bent into a dogleg shape, forming a saddle shape. The saddle-shaped component 5 is affixed to the snowboard boot main body 0 by a stitch, a snap ring 26, or another conventional means.

A first strap 12 is provided for pressing down on the saddle-shaped component 5, and the two fixed ends 13 for the first strap 12 are affixed at the approximate center of the heel 3. The distance between the two fixed ends 13 for the first strap 12 can be adjusted with a first tightening ring 14. Asecond strap 21 passes around the toe 2, and the two fixed ends 22for the second strap 21 are affixed to the sole 1 by a stitch or other conventional means. The degree to which the toe 2 is tightened by thesecond strap 21 is adjusted by asecond tightening ring 23.

A cord engagement member 31 is attached to the back surface of the leg 4. The cord engagement member 31 comprises a moving-side member 40 and a fixed-side member 42. The upper end of the moving-side member 40 is provided with a tab 40a, and the back surface of the lower part of the moving-side member 40 is provided with sharp moving-side serrations 41. The fixed-side member 42 is attached to the back portion of the leg 4 at a position facing the moving-side serrations 41, and the surface of the fixed-side member 42 is provided with fixed-side serrations 43 for engaging the moving-side serrations 41. The serrations 41 and 43 are oriented in such a way that the moving-side serrations 41 cannot move downward with respect to the fixed-side member 42 during engagement. The moving-side member 40 is provided with a cord-threading hole 44.

Cord-fixing members 46 are provided on the left and right ends of the toe 2, and each of the cord-fixing members 46 is provided with a cord-fixing ring 47. One end of a cord or wire 48 is secured in the cord-fixing ring 47 of one cord-fixing member 46, and the other end of cord 48 is run through the cord-threading hole 44 of the moving-side member 40 of the cord engagement member 31 and then secured in the cord-fixing ring 47 of the other cord-fixing member 46.

To use this embodiment of the snowboard boot, the first strap 12 and the second strap 21 are loosened using the first tightening ring 14 and the second tightening ring 23, the moving-side serrations 41 are disconnected from the fixed-side serrations 43 to reduce the tension of the leg 4, and the foot is inserted into the snowboard boot main body 0. The first strap 12 and thesecond strap 21 are tightened using the first tightening ring 14 and thesecond tightening ring 23. The moving-side member 40 of the cord engagement member 31 is pulled upward with considerable force, and the moving-side serrations 41 are brought into engagement with the fixed-side serrations 43.

Because the cord 48 has constant length, the tensile force of the cord 48 reduces the distance between the first center P approximately in the middle of the toe 2, and the contact areabetween the moving-side serrations 41 and fixed-side serrations 43. The reduction of this distance draws the first center P approximately in the middle of the toe 2 and the second center R approximately in the middle of the leg 4 closer to each other, creating a pulling force or a tensile force. This binding force reduces the angle PQR, thus reducing the angle of the leg 4 with respect to the sole 1. The magnitude of the angle PQR can be adjusted by changing the position of the compression point area of the moving-side serrations 41 and fixed-side serrations 43. The tightened state created by the cord 48 can be preserved by tightening the first strap 12 through the use of the first tightening ring 14. The magnitude of the angle PQR can also be reduced by changing the degree of tightening of the first strap 12.

While the above is a description of various embodiments of the present invention, further modifications may be employed without departing from the spirit and scope of the present invention. For example, metals (for example, piano wire), resins, chains, or the like can be used for the cords in Figures 4 and 5, and resins and metals can be used for the cord-engagement members. Resins, fabrics, and the like can be used for the straps. Velcro® fasteners can be used instead of the serrations in the embodiments shown in Figures 3 and 5. Resins, leather, or metal can be used for the saddle-shaped member.

Thus, the scope of the invention should not be limited by the specific structures disclosed. Instead, the true scope of the invention should be determined by the following claims. Of course, although labeling symbols are used in the claims in order to facilitate reference to the figures, the present invention is not intended to be limited to the constructions in the appended figures by such labeling.

Claims

1. A snowboard boot comprising:
   a sole (1);
   a toe section (2) coupled to the sole (1);
   a heel section (3) coupled to the sole (1);
   a leg section (4) coupled to the heel section (3); and
   adjustment means (5, 6, 7, 12, 13, 14, 15, 16, 17, 31, 32, 33, 34, 35, 36, 37, 40, 41, 42, 43, 44, 46, 47, 48) for adjusting an angle of the leg section (4) relative to the sole (1).

2. The snowboard boot according to Claim 1 wherein the adjustment means includes fixing means (12, 13, 14) for fixing the angle of the leg section (4) relative to the sole (1) after the angle of the leg section (4) relative to the sole (1) is adjusted.

3. The snowboard boot according to either preceding claim wherein the adjustment means includes stepwise adjustment means (15, 16, 17, 40, 41, 42, 43) for adjusting the angle of the leg section (4) relative to the sole (1) in a stepwise manner.

4. The snowboard boot according to any preceding claim wherein the adjustment means includes tightening means (12, 13, 14) for coupling an instep portion of the snowboard boot with a heel portion of the boot in close proximity to the heel section (3) and for varying a distance between the instep portion and the heel portion.

5. The snowboard boot according to any preceding claim wherein the adjustment means comprises:
   two fixed ends (13) connected to opposite sides of the heel section (3);
   a tightening ring (14) coupled to at least one of the fixed ends (13); and
   a strap (12) coupled to one of the two fixed ends, passing through the tightening ring (14), and folding back on itself for adjusting a distance between the two fixed ends (13).

6. The snowboard boot according to Claim 2 or any claim dependent thereon wherein the fixing means (12, 13, 14) comprises:
   two fixed ends (13) connected to opposite sides of the heel section (3);
   a tightening ring (14) coupled to at least one of the fixed ends (13); and
   a strap (12) coupled to one of the two fixed ends, passing through the tightening ring (14), and folding back on itself for adjusting a distance between the two fixed ends (13).

7. The snowboard boot according to any preceding claim wherein the adjustment means comprises:
   a saddle member (5) retained to a front portion of the boot and extending from the leg section (4) toward the two section (2); and
   an adjustable strap (12) coupled to opposite sides of the boot and passing over the saddle member (5) so that pressure against the saddle member (5) causes the leg section (4) to pivot toward the toe section (2).

8. The snowboard boot according to any preceding claim wherein the adjustment means comprises:
   a toe member (6) retained to the toe section (2);
   a leg member (7) retained to the leg section (4) and pivotably coupled to the toe member (6) so that the leg member (7) is capable of forward motion toward the toe member (6).

9. The snowboard boot according to Claim 8 wherein the adjustment means further comprises:
   an adjustable strap (12) coupled to opposite sides of the boot and passing over at least one of the toe member (6) or leg member (7) so that pressure against the at least one of the toe member (6) or leg member (7) causes the leg member (7) to pivot toward the toe member (6).

10. The snowboard boot according to either of Claims 8 or 9 wherein the adjustment means includes adjustment means (15, 16, 17) disposed in close proximity to the toe member (6) and the leg member (7) for adjusting the angle of the leg section (4) relative to the sole (1).

11. The snowboard boot according to Claim 10 wherein the adjustment means (15, 16, 17) includes stepwise adjustment means comprising:
   a first engagement member (15) coupled to the leg member (7);
   a second engagement member (17) coupled to the toe member (6); and
   wherein the first engagement member (15) and the second engagement member (17) contact each other through serrations (16).

12. The snowboard boot according to any preceding claim wherein there is provided adjustment means including tightening means (31, 32, 33, 34, 35, 36, 37, 40, 41, 42, 43, 44, 46, 47, 48) for coupling an upper leg portion of the leg section (4) with a toe portion of the boot in close proximity to the toe section (2) and for varying a distance between the upper leg portion and the toe portion.

13. The snowboard boot according to Claim 12 wherein the tightening means couples an upper rear portion of the leg section (4) with the toe portion of the boot.

14. The snowboard boot according to either of Claims 12 or 13 wherein the tightening means (31, 32, 33,

34, 35, 36, 37) comprises:

a eccentric cam (33) retained to the leg section (4); and

a cord assembly (35, 36) retained to opposite sides of the toe portion and passing over the cam (33) so that rotation of the cam (33) causes the cord assembly (36) to move vertically.

15. The snowboard boot according to Claim 14 wherein the cord assembly (35, 36) includes a moving member (35) for interfacing the cord (36) to the cam (33).

16. The snowboard boot according to either one of Claims 14 to 15 wherein the cam (33) is retained to an upper rear surface of the leg section (4).

17. The snowboard boot according to either of Claims 12 or 13 wherein the tightening means (40, 41, 42, 43, 44, 46, 47, 48) comprises:

a fixed member (42) retained to the leg section;

a movable member (40) slidingly contacting the fixed member (42); and

a cord assembly (48) retained to opposite sides of the toe section (2) and retained to the movable member (40) so that movement of the movable member (40) causes the cord assembly (48) to move vertically.

18. The snowboard boot according to Claim 17 wherein the tightening means (40, 41, 42, 43, 44, 46, 47, 48) includes stepwise adjustment means (41, 43) disposed in close proximity to the fixed member (42) and to the movable member (40) for adjusting the angle of the leg section (4) relative to the sole (1) in a stepwise manner.

19. The snowboard boot according to Claim 18 wherein the adjustment means comprises:

first serrations (41) disposed on the movable member (40); and

second serrations (43) disposed on the fixed member (42) for meshing with the first serrations (41).

20. The snowboard boot according to any of Claims 12 to 19 wherein the adjustment means (5, 12, 13, 14, 40, 41, 42, 43, 44, 46, 47, 48) further comprises:

a saddle member (5) retained to a front portion of the boot and extending from the leg section (4) toward the toe section (2); and

an adjustable strap (12) coupled to opposite sides of the boot and passing over the saddle member (5).

Figure 1

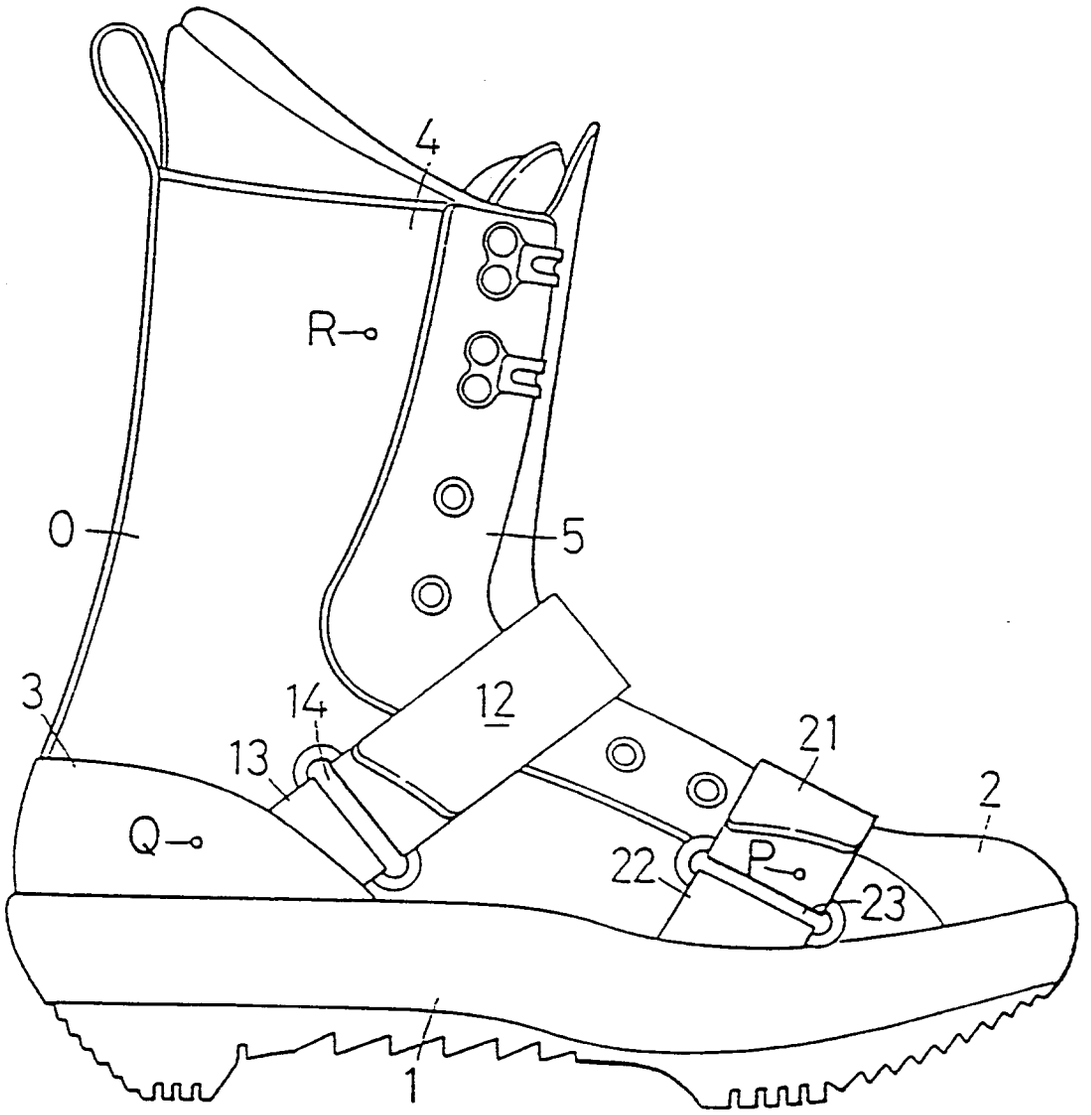


Figure 2

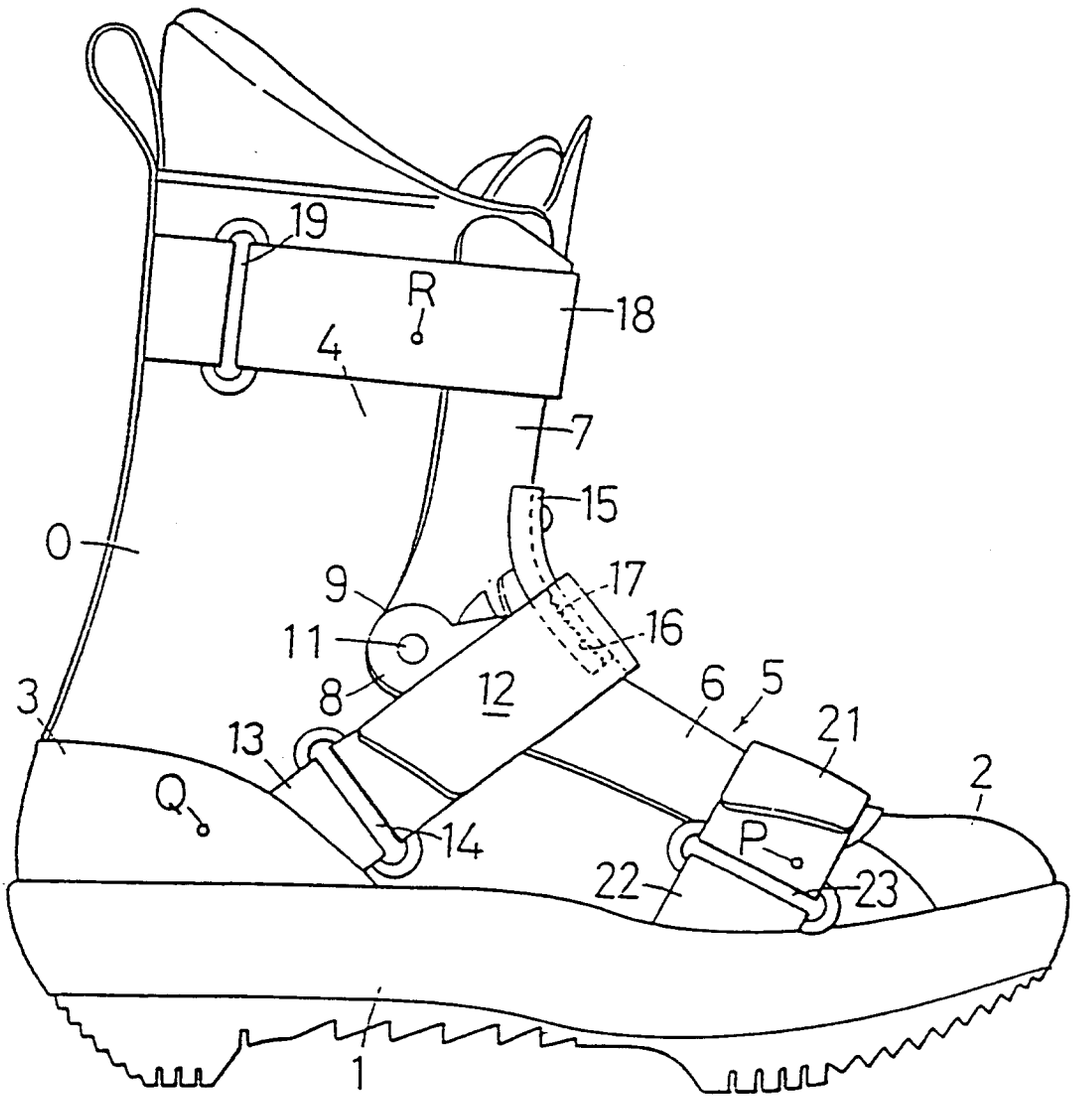


Figure 3

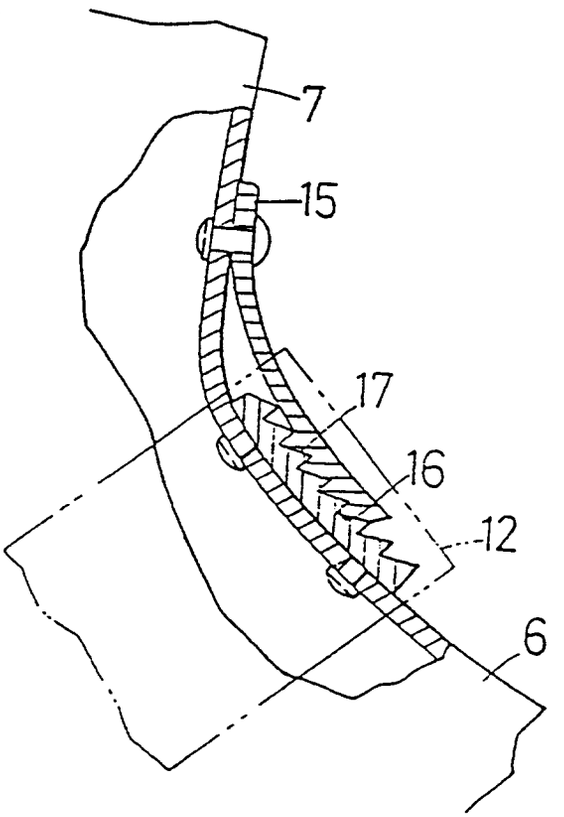


Figure 4

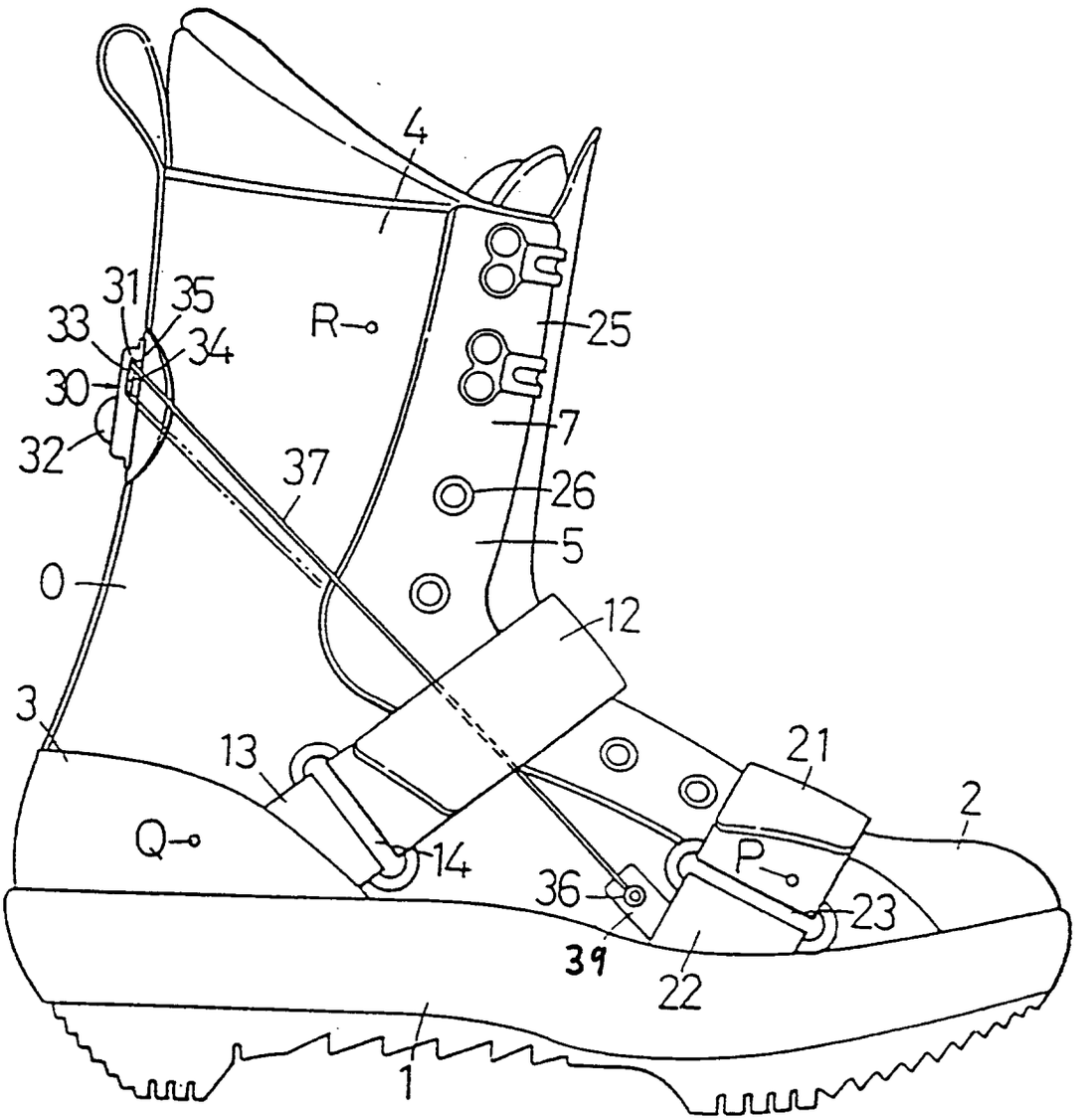
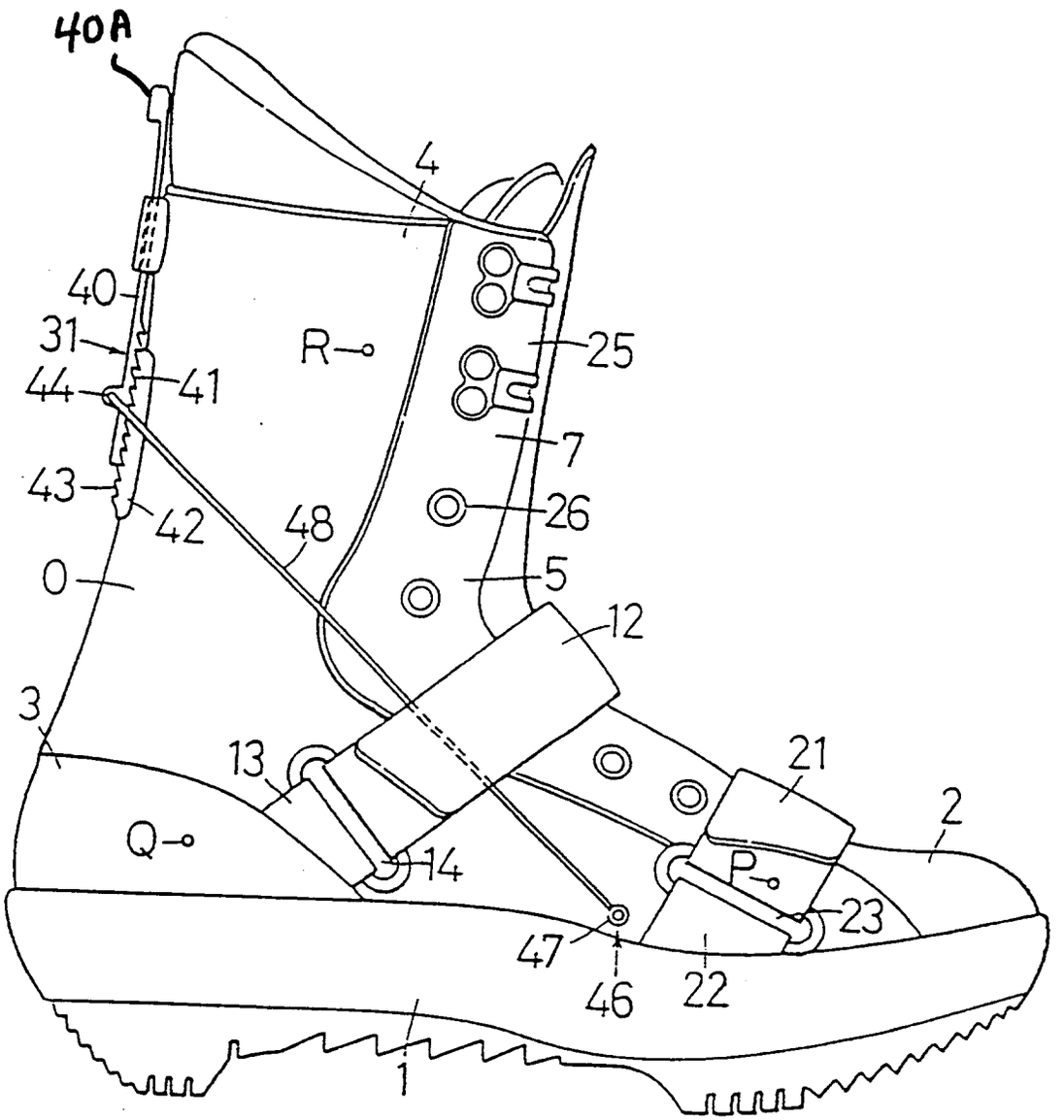


Figure 5



European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 96 30 4648

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X Y	EP-A-0 133 237 (NORDICA SPA) 20 February 1985 * the whole document *	1-3,8 4-7,9,11	A43B1/00 A43B5/04
Y	FR-A-2 576 192 (ARTICLES SPORT CIE FSE) 25 July 1986 * claims; figure 4 *	4-7,9	
X Y	EP-A-0 117 430 (RAICHLE SPORTSCHUH AG) 5 September 1984 * the whole document *	1-3,8, 10,12 4-7,9, 11,13, 17-20	
Y	EP-A-0 146 502 (RAICHLE SPORTSCHUH AG) 26 June 1985 * the whole document *	4-7,9,20	
Y	EP-A-0 255 680 (NORDICA SPA) 10 February 1988 * the whole document *	13,17-19	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
X	US-A-4 916 835 (BEGEY JEAN MARIE ET AL) 17 April 1990 * the whole document *	1-4,7-9	A43B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	3 October 1996	Mathey, X

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)