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(54) Snowboard boot equipped with a heel cup

(57) A snowboard boot (21) comprises a sole (22); an upper portion having lateral side surfaces defining a heel part (24), a toe part (23) and a leg part (25) extending from the heel part (24); and a heel cup (1) mounted to the heel part (24) and extending toward the front of

the boot to a location beyond a central portion of the boot. The heel cup (1) is formed from a material which is more rigid and harder than the lateral side surfaces of the upper portion adjacent to the heel cup, in order to provide stability in the side regions.

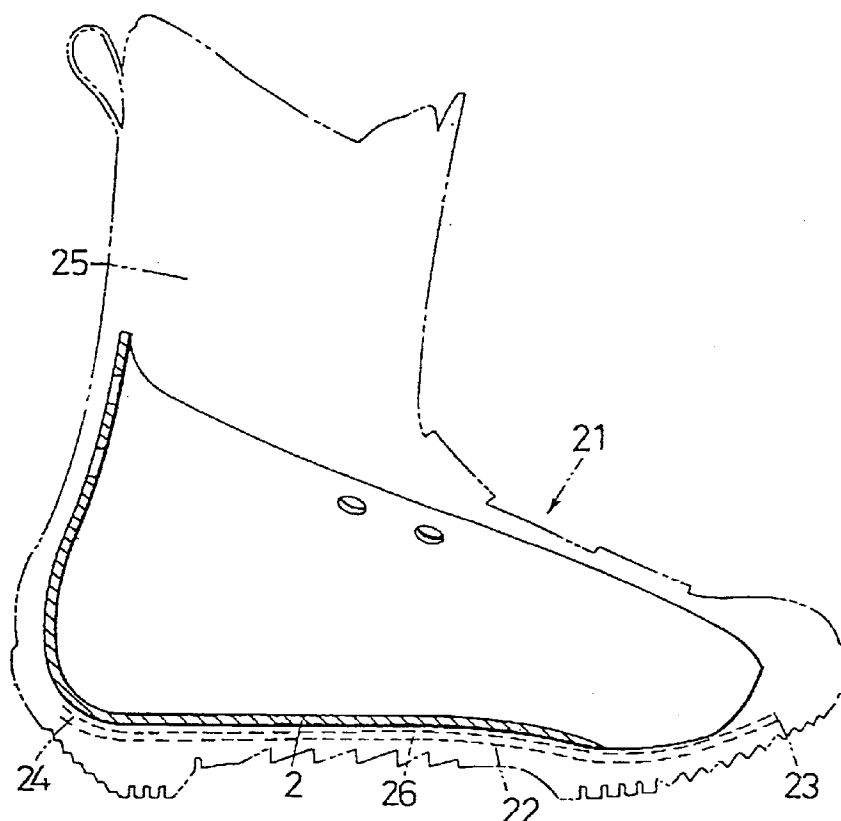


Figure 3

Description

BACKGROUND OF THE INVENTION

The present invention is directed to snowboard boots and, more particularly, to a snowboard boot equipped with a heel cup to enhance rigidity of the boot.

Snowboards, used as modern sports equipment, are a modification of skis. Typical snowboards are simple short boards which accommodate two feet, but they require greater leg strength to operate than skis. As a result, snowboard boots must be fixed more strongly to the snowboard than ski boots are fixed to skis, and the snowboard boots must also be fixed more strongly to the feet.

Another difference between a snowboard and skis is that both feet are placed on the snowboard at a right angle to the direction of motion. As a result, during use there is a great deal of rotational movement (precession) around the leg axis that is perpendicular to the snow plane and located in the approximate center of the snowboard where the boots are fixed. In order for the leg energy required for this considerable rotational movement to be transferred efficiently to the snowboard, the snowboard boots must be securely fixed to the snowboard, but also there must be sufficient rigidity on the sides of the boot so that the rotational energy of the foot is not wasted.

SUMMARY OF THE INVENTION

The present invention is directed to a snowboard boot with a heel cup which holds the foot in a stable manner inside the snowboard boot. In one embodiment of the present invention, a snowboard boot comprises a sole; an upper having lateral side surfaces defining a heel part, a toe part and a leg part extending from the heel part; and a heel cup mounted to the heel part and extending toward a front of the boot to a location beyond a central portion of the boot. The heel cup is formed from a material that is more rigid and harder than the lateral side surfaces of the upper adjacent to the heel cup to provide stability in the side regions. To provide very good stability, the heel cup may have a hardness of 85 or greater.

In a more specific embodiment, the heel cup includes a bottom part, a rear part integrally formed with the bottom part and extending upwardly so as to conform to a heel of the foot, and left and right side parts integrally formed with the bottom part and extending upwardly so as to conform to side portions of the foot. The left and right side parts may extend further toward the front of the boot than the bottom part to maximize stability at the sides of the foot.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a bottom view of a particular embodiment

of a heel cup according to the present invention; Figure 2 is a side cross sectional view of the heel cup taken along line II-II in Figure 1; and Figure 3 is a side view of a particular embodiment of a snowboard boot which incorporates a heel cup according to the present invention.

DETAILED DESCRIPTION OF THE EMBODIMENTS

As shown in Figures 1-3, a snow board boot heel cup 1 comprises a bottom part 2, a rear part 3 which rises (while bending) as a continuation of the rear portion of the bottom part 2, and side parts 4 which rise from both sides of the bottom part 2 as continuations of the bottom part 2 and rear part 3. The side parts 4 extend further toward the front of the boot than the bottom part 2. The upper end surfaces 4a of the side parts 4 are inclined downward toward the front ends of the side parts 4 in the direction of the toes.

The bottom part 2 mainly supports the underside of the heel of the foot, and the rear part 3 mainly supports the rear portion of the heel part of the foot. An upper rear part 5 is integrally formed with heel part 3 and extends further upward. The side parts 4 support both side portions of the foot from the heel forward. Forward portions 6 of side parts 4 are structured and positioned to support the side surfaces of the widest portion of the foot. Because of the long length of side parts 4, much of the side of the foot is stabilized. Furthermore, forward portions 6 are located in positions where the maximum force is applied in the case of turns executed with the heel as a fulcrum. As a result, the foot is properly stabilized in such turns.

In this embodiment, the snowboard boot heel cup 1 is formed from a hard synthetic resin material by injection molding on the outermost surface of the leather which makes up the main body of the boot (not shown in the figures). A hard engineering plastic such as a nylon resin is desirable as the hard material. In the present example, a polyhexamethylene adipamide (Nylon 66®) with a hardness of approximately 90 or greater (according to the Rockwell hardness R scale in ASTM D785) was used. This resin is molded so that the thickness is 2.5 mm to 3.0 mm. Alternatively, the snow board boot heel cup may be formed from some other material such as an FRP, etc., as long as the material is a flexible material with tough mechanical characteristics which will not expand or contract.

The heel cup can be formed into an integral unit with the boot by (e. g.) bonding the bottom part 2 to a bottom portion of the boot such as the middle bottom of the boot, etc. The forward portions 6, 6 extend forward as continuations of the side parts 4, 4 so that the snow board boot heel cup 1 extends from the rear end of the boot to the central portion or toe portion of the boot. Furthermore, a means such as bonding or stitching, etc., may also be used to fasten the side parts 4 to the side parts of the boot, and to fasten the rear part 3 to the heel portion of

the boot. The heel cup may also be mounted inside the boot so that said heel cup is freely detachable.

Figure 3 shows a snow board boot 21 which is used to mount heel cup 1. This snow board boot 21 consists of a sole part 22 and an upper portion forming a toe part 23, a heel part 24 and a leg part 25. A hard insole 26 is mounted on the sole part 22. Figure 3 illustrates a case where the heel cup 1 is mounted inside the snow board boot 21. The bottom part 2 of the heel cup 1 is fastened to the sole part of the snow board boot 21 via the insole 26. The side parts 4, 4 including parts 6, 6 of the heel cup 1 can be fastened to the side parts of the snow board boot 21 and to both side portions of the toe part 23 of boot 21. The heel part 3 of the heel cup 1 can be fastened to the heel part 24 of the snow board boot 21.

The snow board boot heel cup 1 can also be mounted on the outside surface of the boot. In this case as well, a means such as bonding or stitching, etc., can be used to fasten the side parts 4 to the outside of the side parts of the boot, and to fasten the rear part 3 to the outside of the heel part of the boot. Furthermore, the heel cup can also be mounted inside the boot so that said heel cup is freely detachable.

A plurality of holes or openings 31 are formed in the rear part and the side parts of the snow board boot heel cup 1. These holes 31 are fastening holes which are used for fastening by means of a band, etc. The boot is equipped with a means for adjusting the angle between the bottom part and the leg part. This means is a means which tightens down the bottom part and leg part so that the distance between said parts is shortened. This means can be realized by using a strap whose end portions are fastened to both sides of the heel part, and whose intermediate portion passes between the toe part and the front portion of the leg part (the instep). The angle can be adjusted by tightening such a strap. Furthermore, the aforementioned angle could also be adjusted by tightening a strap or cord connecting the rear portion of the leg part with the toe part. Such an angle adjustment makes it possible to secure the fastening of the foot by the heel cup of the present invention.

The heel part of the boot, which is reinforced by the rear part of the snow board boot heel cup 1, is firmly fastened in place by the bindings of the snow board. In the case of a step-in type snow board, the heel part of the boot which is reinforced by the snow board boot heel cup is inserted into the attachment/detachment engaging part of the snow board. The reinforced heel part of the boot is firmly fastened to the snow board regardless of whether the snow board boot heel cup 1 is attached to the inside of the boot or the outside of the boot.

In the case of a boot equipped with a snow board boot heel cup 1 according to the present invention, the rotational force of the foot centered on the heel part is effectively transmitted to the snow board. In this case, the side parts 4, 4 and forward portions 6, 6 firmly support both sides of the foot in the snow board boot.

While the above is a description of various embod-

iments of the present invention, further modifications may be employed without departing from the spirit and scope of the present invention. For example, a polyhexamethyleneadipamide (Nylon 66) with a hardness of approximately 90 (according to the Rockwell hardness R scale in ASTM D785) was used for the described embodiment snow board boot heel cup 1, but in the case of polypropylene (PP), a resin with a hardness of 85 (according to the Rockwell hardness R scale in ASTM D785) can be used instead. Any heel cup which is more rigid and/or harder than the adjacent upper portions can be used. 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.

Claims

1. A snowboard boot (21) comprising:
 - a sole (22); and
 - an upper portion having lateral side surfaces defining a heel part (24), a toe part (23) and a leg part (25) extending from the heel part (24);
 characterised in that the snowboard boot (21) further comprises:
 - a heel cup (1) mounted to the heel part (24) and extending toward the front of the boot to a location beyond a central portion of the boot; wherein the heel cup (1) is formed from a material which is more rigid and harder than the lateral side surfaces of the upper portion adjacent to the heel cup.
2. The snowboard boot according to Claim 1 wherein the heel cup (1) comprises:
 - a bottom part (2);
 - a rear part (3) integrally formed with the bottom part (2) and extending upwardly so as to conform to a heel of a foot; and
 - left and right side parts (4) integrally formed with the bottom part (2) and extending upwardly so as to conform to side portions of the foot.
3. The snowboard boot according to claim 2 wherein the left and right side parts (4) of the heel cup (1) extend further toward the front of the boot than the bottom part (2).
4. The snowboard boot according to either of Claims 2 or 3 wherein the left and right side parts (4) of the heel cup (1) extend to the toe part (23) of the boot.
5. The snowboard boot according to any of Claims 2

to 4 wherein the left and right side parts (4) of the heel cup (1) incline downwardly from the heel part (24) to the toe part (23) of the boot.

6. The snowboard boot according to any of Claims 1 to 5 wherein the heel cup (1) has a hardness of 85 or greater according to Rockwell hardness R scale in ASTM D785. 5
7. The snowboard boot according to any of Claims 1 to 6 wherein the heel cup (1) is formed from a synthetic resin. 10
8. The snowboard boot according to Claim 7 wherein the heel cup (1) is formed from polyhexamethylenedipamide. 15

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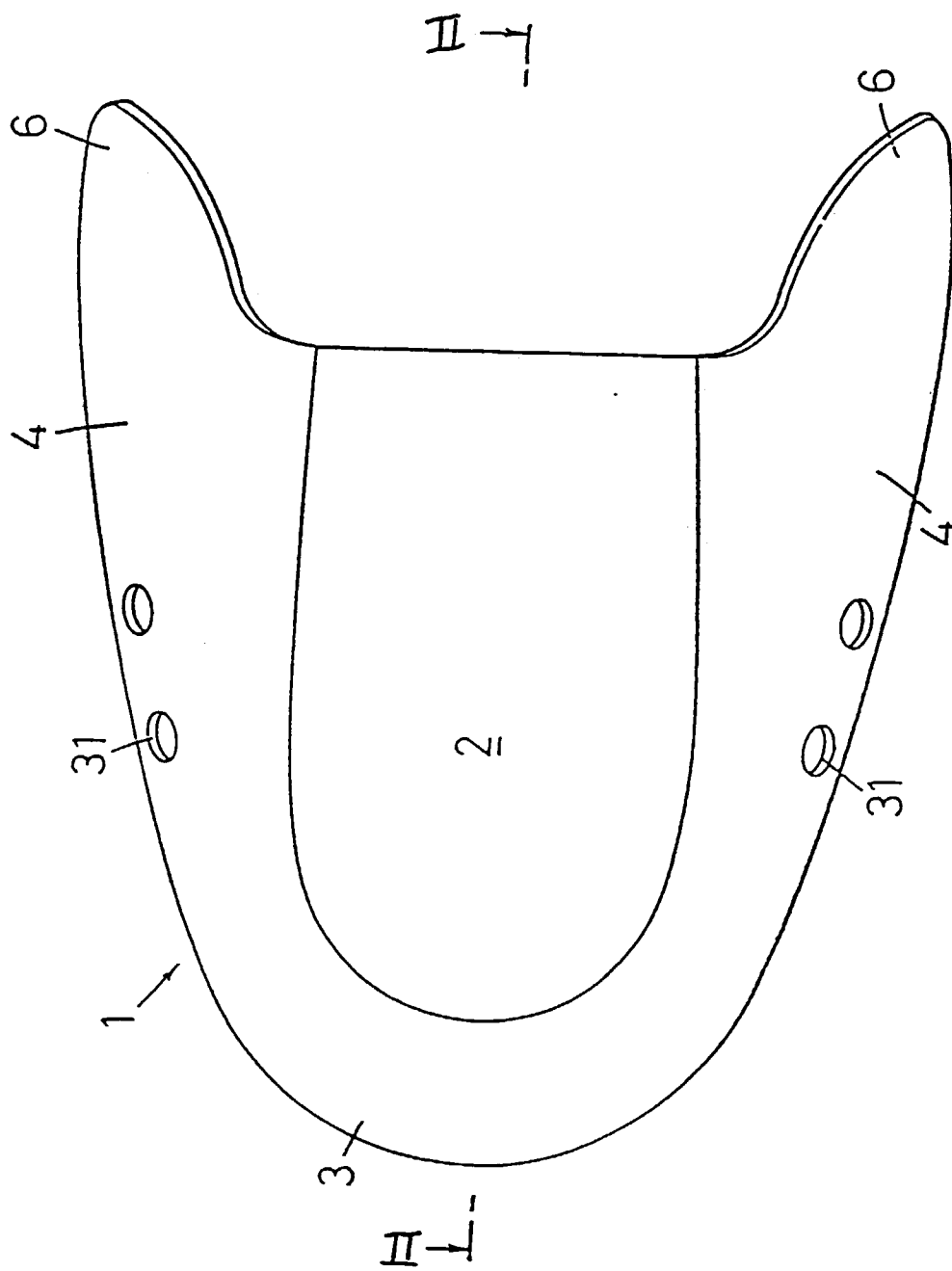


Figure 1

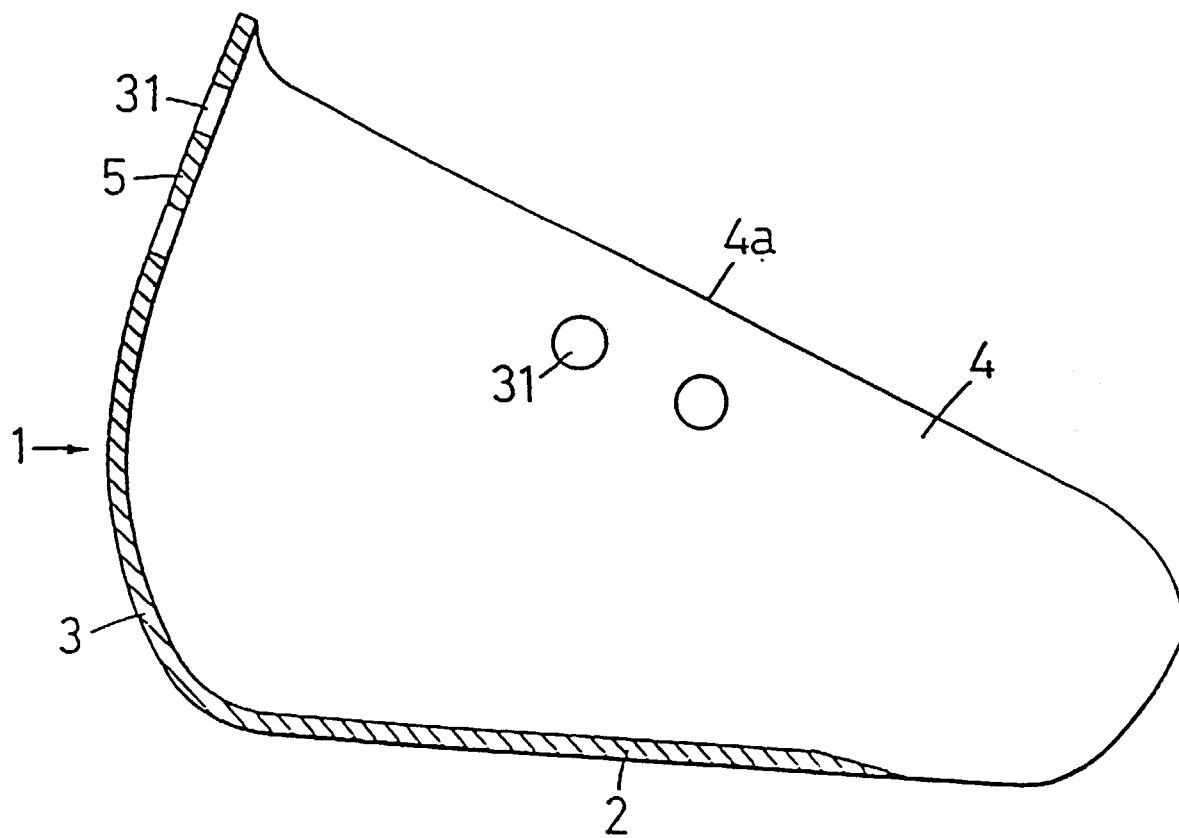


Figure 2

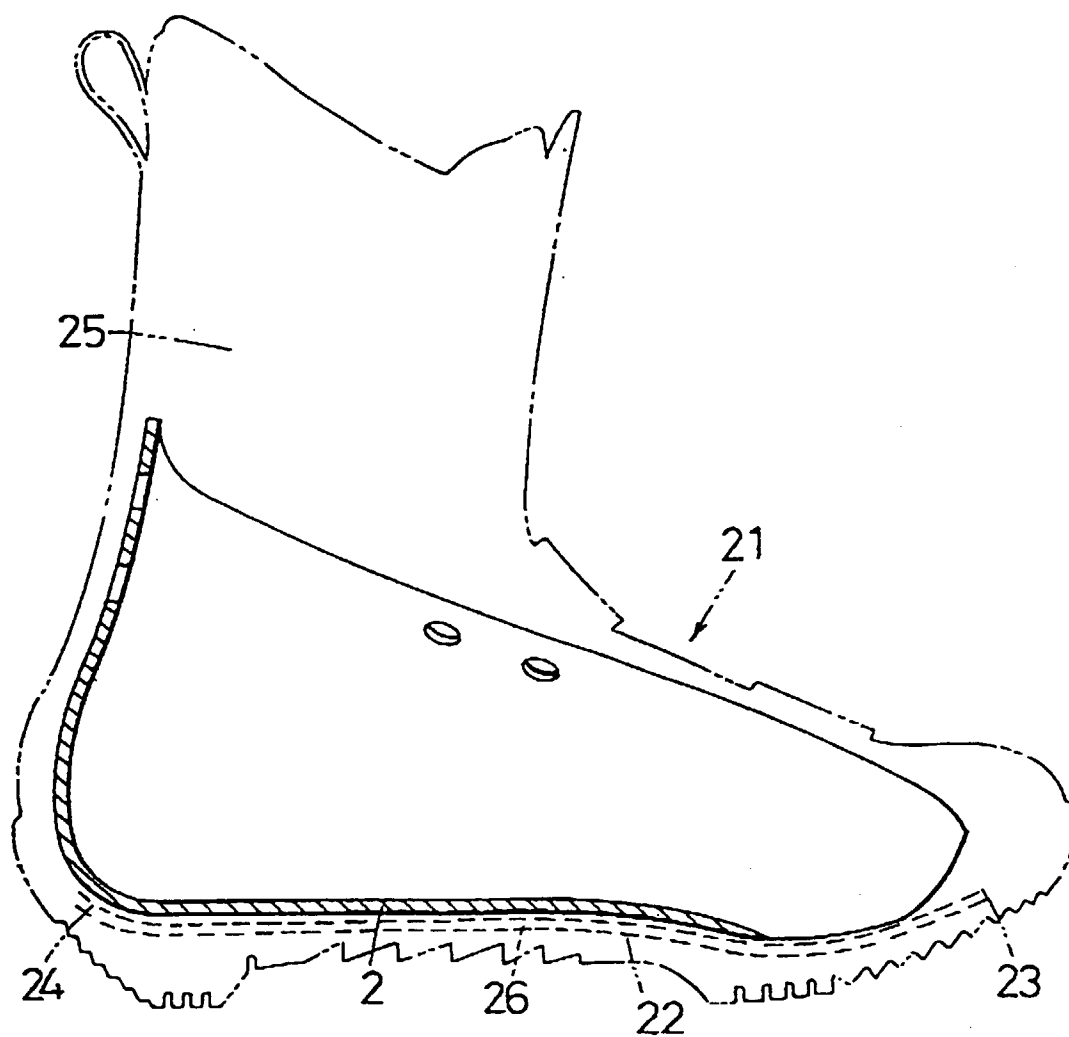


Figure 3



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EUROPEAN SEARCH REPORT

Application Number
EP 96 30 5132

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)
A	EP-A-0 309 437 (HARTJES FUSSFORM-SCHUH) * the whole document *	1	A43B23/08 A43B23/16 A43B5/04 A43B5/00
A	DE-A-20 05 900 (LUTHER AUSTIN) * the whole document *	1	
A	US-A-4 704 808 (W. BIANCHINI) * the whole document *	1	
A	FR-A-2 208 279 (M. UHLMANN) * the whole document *	1	
A	US-A-4 287 675 (E. NORTON) * the whole document *	1	
A	US-A-3 807 062 (I. MARTIN SOIER) * the whole document *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			A43B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 22 October 1996	Examiner Declerck, J
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