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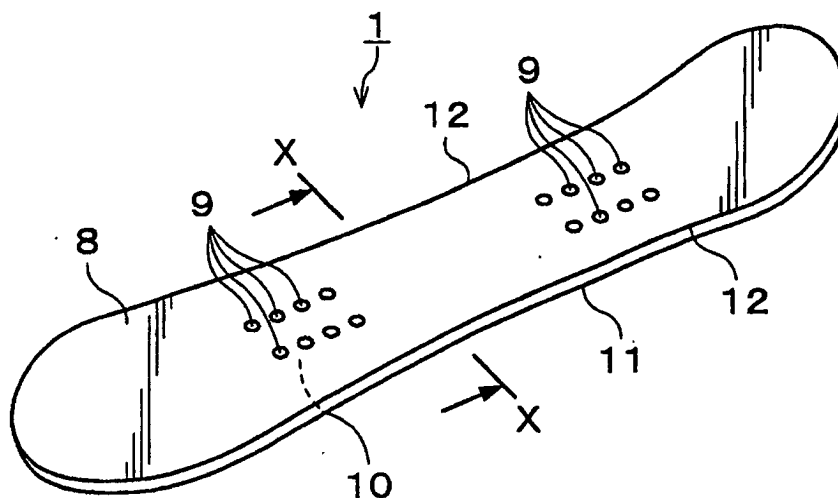
(54) **SNOW BOARD, SKI AND UPPER EDGE FIXING METAL**

(57) An object of the present invention is to provide a snowboard and a ski whose edges are not released easily even when being strongly engaged and which are easy to operate.

In the snowboard and the ski, left and right upper edges are respectively provided above left and right sole

edges so as to protrude more to both the left and right sides than the left and right sole edges. When the board is greatly tilted, a snow surface can be caught by both the sole edge and the upper edge, and even when the sole edge is released, the snow surface can be caught, by the upper edge.

FIG.1



Description

Technical Field

[0001] The present invention relates to a snowboard and a ski each provided with upper edges above sole edges, and moreover relates to an upper edge fixture for fixing the upper edges on the snowboard and the ski.

Background Art

[0002] Winter sports such as snowboarding and skiing are becoming popular not only among young people but also among various generations. In the case of snowboarding and skiing, in turning and braking, so-called edging is performed by tilting skis or a snowboard to engage the edge thereof while sliding.

[0003] When such edging is performed, for strong edging, it is required to greatly tilt the snowboard or the skis, and engage the edge at a large angle to a snow surface. However, if the edge is strongly engaged, there is the possibility that the edge is easily released and thereby force is not transmitted to the snow surface. When the edge is released, turning and braking cannot be performed any longer, which causes falling. Especially in the case of the hard snow surface such as a frozen ski slope, the edge tends to be released more often, and hence the operation of a snowboard and skis tends to become unstable.

Disclosure of the Invention

[0004] An object of the present invention is to provide a snowboard and a ski whose edges are not released easily even when being strongly engaged and which are easy to operate.

[0005] To attain this object, in the present invention, a snowboard provided with sole edges along corner portions on both the left and right sides of a sliding surface comprises left and right upper edges respectively provided above the left and right sole edges so as to protrude more to the left and right sides of the snowboard than the left and right sole edges.

[0006] Moreover, in the present invention, a ski provided with sole edges along corner portions on both the left and right sides of a sliding surface comprises left and right-upper edges respectively provided above the left and right sole edges so as to protrude more to the left and right sides of the ski than the left and right sole edges.

[0007] In the snowboard and the ski of the present invention, when the board is greatly tilted, a snow surface can be caught by both the sole edge and the upper edge, and even when the sole edge is released, the snow surface can be caught by the upper edge.

[0008] In the present invention, it is recommended that the left and right upper edges be tilted so that the ground contact angles of the left and right upper edges

become smaller than the ground contact angles of the left and right sole edges. If so, the upper edge comes in contact with the snow surface at an angle smaller than the ground contact angle of the sole edge, whereby the tendency for the upper edge to be released reduces, and the snow surface can be easily caught.

[0009] Moreover, according to the present invention, an upper edge fixture characterized by comprising upper edges provided on both the left and right sides of a fixture body which is overlappingly attached to an upper surface of a snowboard or a ski is provided. By overlappingly attaching this upper edge fixture to the upper surface of the snowboard or the ski, the upper edges can be easily attached to the snowboard or the ski. Further, the upper edge fixture is equal to or shorter than the snowboard or the ski in length.

Brief Description of Drawings

[0010]

FIG. 1 is a perspective view of a snowboard according to an embodiment of the present invention;

FIG. 2 is a sectional view taken along the line X-X in FIG. 1;

FIG. 3 is a partial -enlarged sectional view showing the relation between an upper edge and a sole edge;

FIG. 4 is a partial enlarged sectional view showing the relation between the upper edge and the soled edge in which the ground contact angle of the upper edge is formed smaller than that of the sole edge;

FIG. 5 is a partial enlarged sectional view showing a structure in which the upper edge and the soled edge are integrally provided;

FIG. 6 is a partial enlarged sectional view showing a structure in which two upper edges are provided above the sole edge;

FIG. 7 is a partial enlarged sectional view showing a structure in which three upper edges are provided above the sole edge;

FIG. 8 is a perspective view of a ski according to an embodiment of the present invention;

FIG. 9 is a sectional view taken along the line Y-Y in FIG. 8;

FIG. 10 is a perspective view of an upper edge fixture according to an embodiment of the present invention;

FIG. 11 is a perspective view of a snowboard on which the upper edge fixture is mounted;

FIG. 12 is a sectional view showing a state in which the upper edge fixture is mounted while sandwiched between a binding and the snowboard;

FIG. 13 is a plan view of the snowboard on which an upper edge fixture according to another embodiment of the present invention is mounted; and

FIG. 14 is a sectional view showing a state in which a spacer is mounted while sandwiched between the

upper edge fixture and the snowboard.

Best Mode for Carrying out the Invention

[0011] Preferred embodiments of the present invention will be explained below with reference to the drawings. FIG. 1 is a perspective view of a snowboard 1 according to an embodiment of the present invention. FIG. 2 is a sectional view taken along the line X-X in FIG. 1.

[0012] Screw holes 9 for attaching a binding 40 described later are provided at plural positions of an upper surface 8 of the snowboard 1. By using these plural screw holes 9, the binding 40 can be attached to the upper surface 8 of the snowboard 1 in a desired position.

[0013] A lower surface 10 of the snowboard 1 is a flat sliding surface and made of resin resistant to adhesion of snow. Sole edges 11 and 11 are provided along corner portions on both the left and right sides of the lower surface 10 (sliding surface). The sole edges 11 and 11 are formed of a hard material such as metal.

[0014] As shown in FIG. 3, a corner portion 11' of the sole edge 11 is formed to have almost a right angle (approximately 85° to approximately 90°), a bottom surface 11a of the sole edge 11 is placed on the same plane with the lower surface of the snowboard 1, and in the shown example, similarly to a side surface 13 of the snowboard 1, a side surface 11b of the sole edge 11 is formed on a plane which stands almost perpendicular to the bottom surface 11a of the sole edge 11.

[0015] As shown in FIG. 2, above the left and right sole edges 11 and 11, left and right upper edges 12 and 12 are provided, each being fixed to an upper portion of the side surface 13 of the snowboard 1. These left and right upper edges 12 and 12 are provided so as to protrude more to the left and right sides of the snowboard 1 than the sole edges 11--and 11 provided at the corner portions on both sides of the lower surface of the snowboard 1.

[0016] In this embodiment, as shown in FIG. 3, a corner portion 12' of the upper edge 12 is also formed to have almost a right angle (approximately 85° to approximately 90°), a bottom surface 12a of the upper edge 12 is placed parallel to the bottom surface 11a of the sole edge 11 and the lower surface 10 of the snowboard 1, and a side surface 12b of the upper edge 12 is formed parallel to the side surface 11b of the sole edge 11 and the side surface 13 of the snowboard 1 and on a plane which stands almost perpendicular to the bottom surface 12a of the upper edge 12.

[0017] Moreover, in this embodiment, such an arrangement that an angle α which the bottom surface 11a of the sole edge 11 forms with a virtual line L connecting the corner portion 11' of the sole edge 11 and the corner portion 12' of the upper edge 12 and an angle β which the bottom surface 12a of the upper edge 12 forms therewith are both approximately 70° is made, and the upper edge 12 is provided so as to protrude more to the side of the snowboard 1 than the sole edge 11.

[0018] Incidentally, when a person rides the snowboard 1 structured as above according to the embodiment of the present invention and performs turning and braking while sliding, he or she performs so-called edging by tilting the snowboard 1 to engage the sole edge 11. In this case, if the snowboard 1 is tilted approximately 70° , it becomes possible to catch a snow surface by the corner portion 11' of the sole edge 11 and the corner portion 12' of the upper edge 12. Further, even if the sole edge 11 is released since the snowboard 1 is excessively tilted, the snow surface can be caught by the upper edge 12. Hence, even if the snowboard 1 is greatly tilted, the edge is not easily released, therefore turning and braking can be performed easily- without falling, and the operation of the snowboard 1 is stabilized.

[0019] The example of such an arrangement that the angle α which the bottom surface 11a of the sole edge 11 forms with the virtual line L connecting the corner portion 11' of the sole edge 11 and the corner portion 12' of the upper edge 12 and the angle β which the bottom surface 12a of the upper edge 12 forms therewith are equal to each other is shown in FIG. 3, but it is also possible that the ground contact angle of the upper edge 12 is made smaller than that of the sole edge 11 by tilting the upper edge 12 upward as shown in FIG. 4.

[0020] In the example shown in FIG. 4, by tilting the bottom surface 12a of the upper edge 12 by an angle θ upward from the bottom surface 11a of the sole edge 11 and the lower surface 10 of the snowboard 1, the angle β which the bottom surface 12a of the upper edge 12 forms with the virtual line L connecting the corner portion 11' of the sole edge 11 and the corner portion 12' of the upper edge 12 becomes smaller than the angle α which the bottom surface 11 a of the sole edge 11 forms therewith by the angle θ ($\beta = \alpha - \theta$).

[0021] If the upper edge 12 is tilted upward as described above, the upper edge 12 comes in contact with the snow surface at the ground contact angle β which is smaller than the ground contact angle α of the sole edge 11 when the snow surface is caught by both the corner portion 11' of the sole edge 11 and the corner portion 12' of the upper edge 12, whereby the tendency for the upper edge 12 to be released reduces, and the snow surface can be easily caught. As a result, it is more difficult to release the edge, and the operation of the snowboard 1 becomes more stable. Incidentally, when the upper edge 12 is tilted upward as stated above, it is recommended that the angle θ by which the upper edge 12 is tilted upward be set so that the ground contact angle β of the upper edge 12 is approximately 45° when the snow surface is caught by both the corner portion 11' of the sole edge 11 and the corner portion 12' of the upper edge 12.

[0022] Although the example in which the side surface 13 of the snowboard 1 is formed on the same plane with the side surface 11b of the sole edge 11 is shown in FIGS. 3 and 4, it is also possible to form the side surface 13 of the snowboard 1 at a concave surface which is

recessed deeper to the inside than the side surface 11b of the sole edge 11 as written in FIGS. 3 and 4 by a dashed line 13'. In so doing, the tendency for snow to adhere to the side surface 13 of the snowboard 1 reduces, and strong edging can be continuously performed.

[0023] Moreover, although the example in which the upper edge 12 protrudes higher than the upper surface 8 of the snowboard 1 is shown in FIG. 4, such a structure that the upper surface 8 of the snowboard 1 is elevated according to the upward tilting of the upper edge 12 as written in FIG. 4 by a dashed line 8' and thereby the upper edge 12 does not protrude higher than the upper surface 8 of the snowboard 1 is also possible.

[0024] Further, although the example in which the upper edge 12 is provided separately from the sole edge 11 is shown in any of FIGS 2 to 4, it is also suitable to attach an edge member 15 to the side surface 13 of the snowboard 1, form the upper edge 12 in an upper portion of the edge member 15, and form the sole edge 11 in a lower portion thereof as shown in FIG. 5. As stated just above, the upper edge 12 and the sole edge 11 may be provided integrally.

[0025] Furthermore, although the example in which one upper edge 12 is provided above the sole edge 11 in any of FIGS 2 to 5, two upper edges 15 and 16 may be provided above the sole edge 11, for example, as shown in FIG. 6, and three upper edges 15, 16, and 17 may be provided above the sole edge 11, for example, as shown in FIG. 7. In addition, four or more upper edges may be provided above the sole edge 11.

[0026] Moreover, the upper edge provided above the sole edge 11 may be shorter than or equal to the sole edge 11 in length. Further, it is also possible to change the angle of the upper edge depending on its position. Furthermore, although the case where the binding 40 is attached to the upper surface 8 of the snowboard 1 by using the plural screw holes 9 provided in the upper surface 8 of the snowboard 1 is explained in FIG. 1, the present invention can be also applied to a case where the binding 40 is attached to the upper surface 8 of the snowboard 1 by using a rail provided on the upper surface 8 of the snowboard 1.

[0027] Next, FIG. 8 is a perspective view of a ski 2 according to an embodiment of the present invention. FIG. 9 is a sectional view taken along the line Y-Y in FIG. 8.

[0028] Similarly to the snowboard 1 previously explained in FIGS. 1, 2, and so on, also in the ski 2 shown in FIGS. 8 and 9, a lower surface 20 is formed at a sliding surface, and sole edges 21 and 21 are provided along corner portions on the left and right sides of the lower surface 20. Moreover, left and right upper edges 22 and 22 are respectively fixed to side surfaces of the ski 2 in such a manner to protrude more to the left and right sides of the ski 2 than the sole edges 21 and 21.

[0029] Also in the ski 2 thus structured according to the embodiment of the present invention, it is possible to catch the snow surface by both the sole edge 21 and

the upper edge 22 when edging is performed. Moreover, even when the ski 2 is excessively tilted and thereby the sole edge 21 is released, the snow surface can be caught by the upper edge 22 and the edge is not easily released even if the ski 2 is greatly tilted, whereby turning and braking can be performed easily without falling, which results in the stabilization of the operation of the ski 2.

[0030] Incidentally, also in this ski 2, similarly to the previously explained snowboard 1, the ground contact angle of the sole edge 21 and the ground contact angle of the upper edge 22 may be the same, or the ground contact angle of the upper edge 22 may be smaller than the ground contact angle of the sole edge 21 by tilting the upper edge 22 upward. Moreover, for example, a side surface of the ski 2 may be formed at a concave surface which is recessed deeper to the inside than a side surface of the soled edge 21. Further, the upper edge 22 may or may not protrude higher than an upper surface 19 of the ski 2. Furthermore, the upper edge 22 and the sole edge 21 may be provided integrally. In addition, two or more upper edges 21 may be provided above the sole edge 21. Additionally, the upper edge provided above the sole edge 21 may be shorter or equal to the sole edge 21 in length. Moreover, it is also possible to change the angle of the upper edge depending on its position.

[0031] Next, FIG. 10 is a perspective view of an upper edge fixture 3 according to an embodiment of the present invention. FIG. 11 is a perspective view of a snowboard 4 on which the upper edge fixture 3 is mounted. Incidentally, the snowboard 4 shown in FIG. 11 is a heretofore publicly known snowboard (snowboard including only a sole edge 43 without including the upper edge which is characteristic of the present invention), which is different from the snowboard 1 explained previously in FIGS. 1, 2, and so on.

[0032] In the shown example, front and rear portions of this upper edge fixture 3 are formed to protrude in the shape of a semicircle. The upper edge fixture 3 has a structure in which upper edges 31 and 31 are attached to both the left and right sides of a fixture body 30 which is slightly wider than the snowboard 4. In the fixture body 30, holes 39 for passing screws therethrough when the binding 40 is attached to an upper surface of the snowboard 4 are provided at respective positions.

[0033] As shown in FIG. 11, the upper edge fixture 3 thus structured is overlappingly and closely attached to the upper surface of the snowboard 4. In this case, similarly to the case previously explained in FIG. 1, screw holes (not shown) for attaching the binding 40 are provided at plural positions of the upper surface of the snowboard 4. When the upper edge fixture 3 is placed on the upper surface of the snowboard 4, each of the holes 39 provided in the upper edge fixture 3 is aligned with each of the screw holes (not shown) provided in the upper surface of the snowboard 4.

[0034] In the aforementioned state in which the upper

edge fixture 3 is placed on the upper surface of the snowboard 4, the binding 40 is mounted on the upper edge fixture 3, and as shown in FIG. 12, the binding 40, the upper edge fixture 3, and the snowboard 4 are securely fixed by screws 41. As a result, it becomes possible to fix the upper edge fixture 3 between a bottom surface of the binding 40 and the upper surface of the snowboard 4.

[0035] In the aforementioned state in which the upper edge fixture 3 is mounted on the upper surface of the snowboard 4, the upper edges 31 and 31 provided on both the left and right sides of the fixture body 30 protrude to both the left and right sides of the snowboard 4 above sole edges 43 and 43 which are provided on both the left and right sides of a lower surface of the snowboard 4, and hence similarly to the snowboard 1 explained previously in FIGS. 1, 2, and so on, the snow surface can be caught by both the sole edge 43 and the upper edge 31, leading to the stabilization of the operation of the snowboard 4.

[0036] If the thickness of this upper edge fixture 3 is increased, boots can be fitted at a high position from the upper surface of the snowboard 4, and consequently so-called lift up becomes possible. Moreover, it is also suitable to reduce the thickness of the upper edge fixture 3 or provide cut-outs, holes, or the like at appropriate intervals so as to give elasticity to the upper edge fixture 3. Further, by shifting the fixing position of the upper edge fixture 3 forward and backward on the upper surface of the snowboard 4, the upper edge 31 can be arranged in the front or in the rear.

[0037] Incidentally, although the example in which the front and rear portions of the upper edge fixture 3 are formed to protrude in the semicircular shape is shown in FIGS. 10 and 11, as written in FIGS. 10 and 11 by a dashed line 30' and a chain double-dashed line 30", the front and rear portions of the upper edge fixture 3 may be recessed inward. Further, the upper edge fixture 3 may be formed to have a rectangular shape as a whole with its front and rear portions formed in a linear shape. Furthermore, two or more upper edges may be provided. In addition, the upper edge may be shorter than or equal to the sole edge 43 in length. Additionally, the angle of the upper edge may be changed depending on its position.

[0038] Next, FIG. 13 is a plan view of the snowboard 4 on which an upper edge fixture 5 according to another embodiment of the present invention is mounted. The snowboard 4 shown in FIG. 13 is the heretofore publicly known snowboard (snowboard including only a sole edge without including an upper edge). The upper edge fixture 5 of this embodiment includes two separate left and right fixture bodies 50 and 50, and upper edges 51 and 51 are respectively attached to outer surfaces of these fixture bodies 50 and 50. In the left and right fixture bodies 50 and 50, long holes 52 for passing screws therethrough when the binding 40 is attached to the upper surface of the snowboard 4 are provided at respec-

tive positions.

[0039] In the upper edge fixture 5 thus structured, by attaching the fixture bodies 50 and 50 to the left and right of the upper surface of the snowboard 4 as shown in FIG. 13, likewise with the upper edge fixture 3 explained previously in FIGS. 10 to 12, the upper edges 51 and 51 can be provided to protrude above the sole edges of the lower surface of the snowboard 4. In this case, if the long holes 52 are formed in the fixture bodies 50 and 50 as in the case of the upper edge fixture 5 explained in FIG. 13, it is possible to adjust the amount of protrusion of the upper edges 51 and 51 by changing the fixing positions of the fixture bodies 50 and 50 on the upper surface of the snowboard 4.

[0040] Moreover, when the upper edge fixture 3 (5) is attached to the upper surface of the snowboard 4, it is also suitable to lift up the upper edge fixture 3 (5) by placing a spacer 60 between the upper edge fixture 3 (5) and snowboard 4 as shown in FIG. 14. The use of such a spacer 60 facilitates the adjustment of the height of the upper edge. Furthermore, although the case where the binding 40 is attached to the upper surface of the snowboard 4 by the screws 41 in FIGS. 10 to 14, the present invention is also applicable to a case where the binding 40 is attached to the rail provided on the upper surface of the snowboard 1.

[0041] Incidentally, what is similar to the upper edge fixtures 3 and 5 explained in FIGS. 10 to 14 may be applied to a ski.

Industrial Availability

[0042] According to the present invention, it becomes possible to provide a snowboard and a ski whose edges are not released easily even when being strongly engaged and which are easy to operate, and consequently even a beginner can securely catch the snow surface and easily perform edging.

Claims

1. A snowboard, comprising:

sole edges provided along corner portions on both the left and right sides of a sliding surface; and
left and right upper edges respectively provided above the left and right sole edges so as to protrude more to the left and right sides of the snowboard than the left and right sole edges.

2. A snowboard as set forth in claim 1,

wherein the left and right upper edges are tilted upward so that the ground contact angles of the left and right upper edges become smaller than the ground contact angles of the left and right sole edges.

3. A ski, comprising:

sole edges provided along corner portions on both the left and right sides of a sliding surface; and

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left and right upper edges respectively provided above the left and right sole edges so as to protrude more to the left and right sides of the ski than the left and right sole edges.

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4. A ski as set forth in claim 3,

wherein the left and right upper edges are tilted so that the ground contact angles of the left and right upper edges become smaller than the ground contact angles of the left and right sole edges.

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5. An upper edge fixture, comprising:

upper edges provided on both the left and right sides of a fixture body which is overlappingly attached to an upper surface of a snowboard or a ski.

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6. An upper edge fixture as set forth in claim 5,

wherein the upper edge fixture is equal to or shorter than the snowboard or the ski in length.

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FIG.1

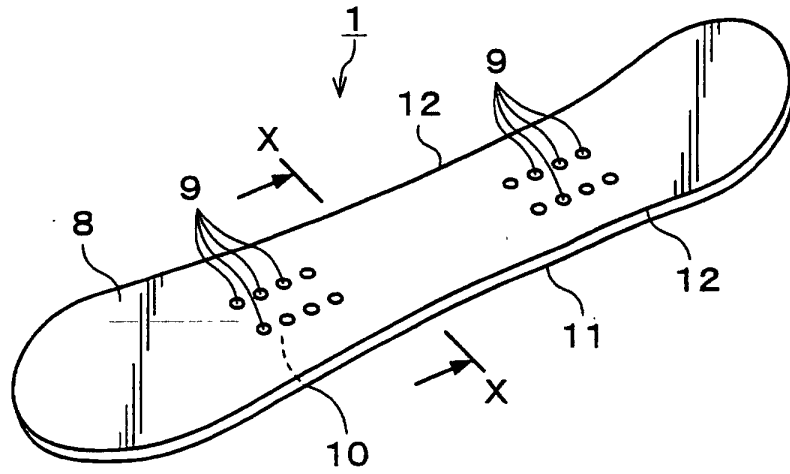


FIG.2

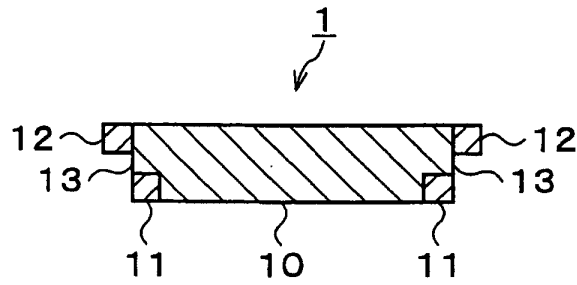


FIG.5

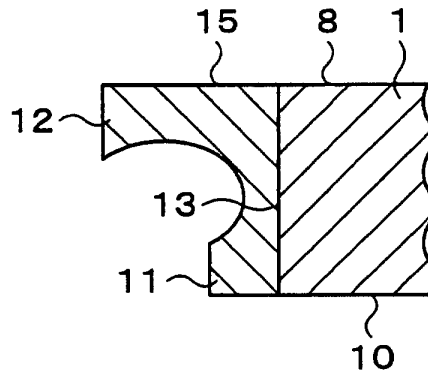


FIG.6

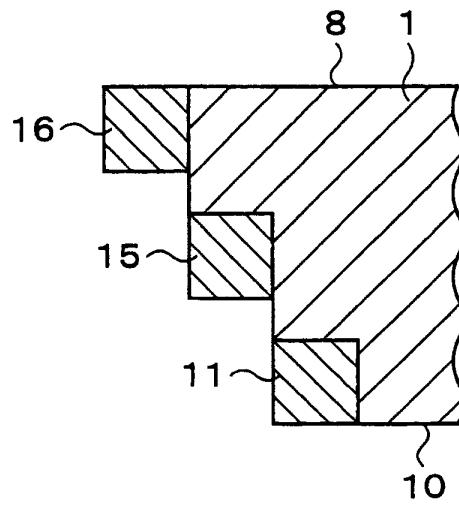


FIG.7

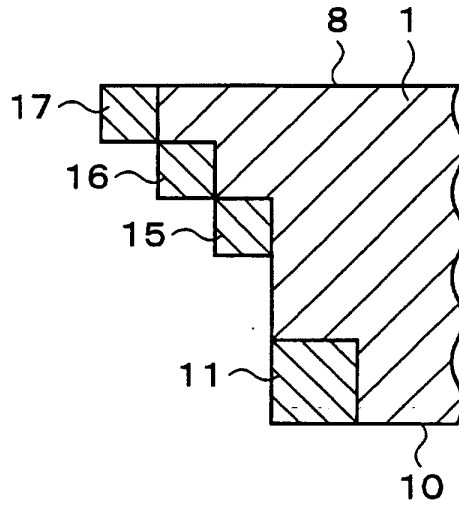


FIG.8

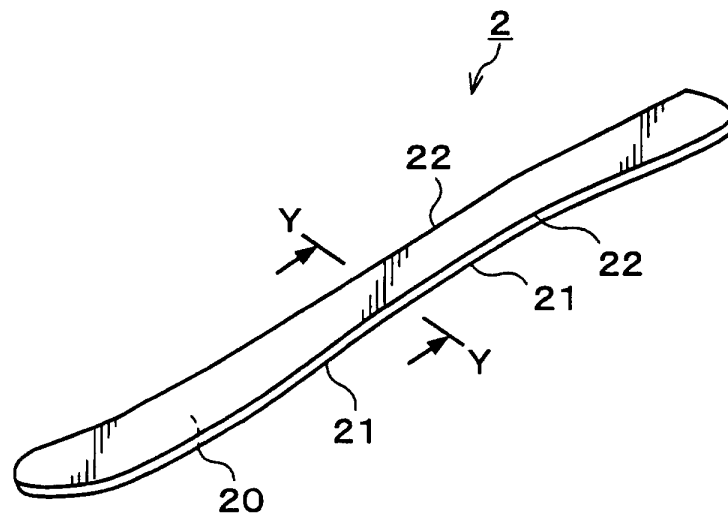


FIG.9

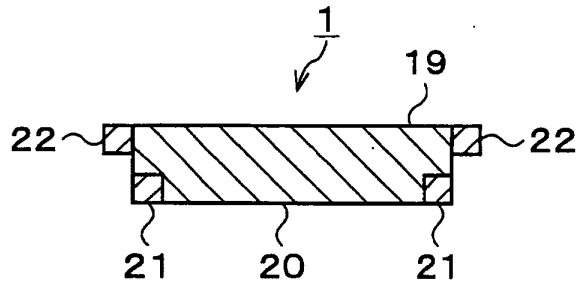


FIG.10

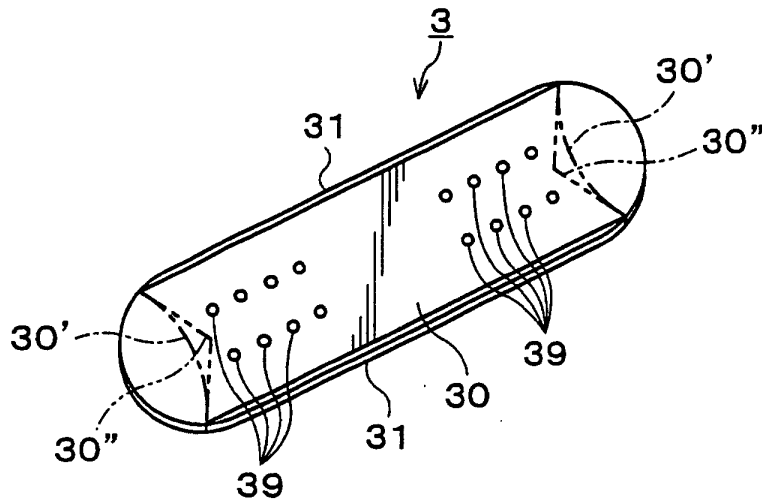


FIG.13

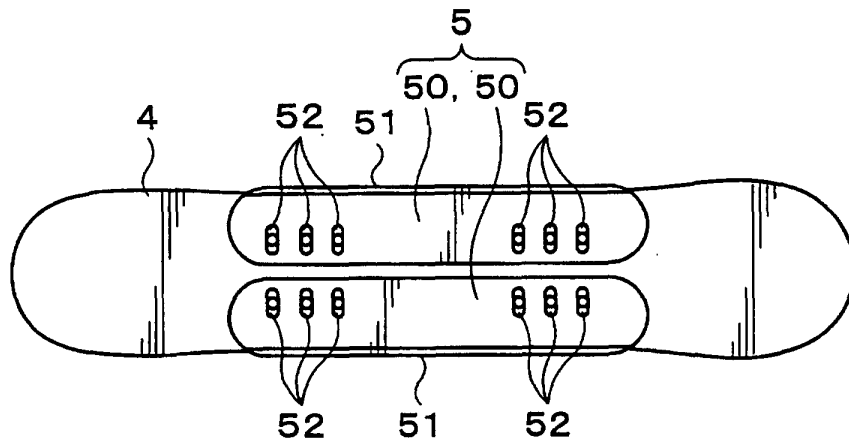
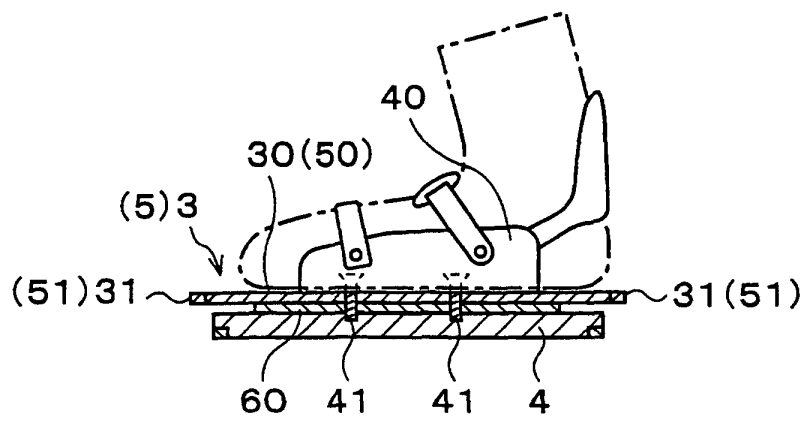


FIG.14



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP02/03812

A. CLASSIFICATION OF SUBJECT MATTER Int.Cl ⁷ A63C5/048, 5/00		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) Int.Cl ⁷ A63C5/048, 5/00		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Jitsuyo Shinan Koho 1922-1996 Toroku Jitsuyo Shinan Koho 1994-2002 Kokai Jitsuyo Shinan Koho 1971-2002 Jitsuyo Shinan Toroku Koho 1996-2002		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5580078 A (Mark D. Vance), 03 December, 1996 (03.12.96), Full text; Figs. 1 to 6	1
Y	Full text; Figs. 1 to 6 & EP 729372 A1 & AU 1056095 A & WO 95/13119 A1 & CA 2176495 A	2
Y	US 5083810 A (James D. Minidis), 28 January, 1992 (28.01.92), Full text; Figs. 8, 9 (Family: none)	2, 4
X	US 5303949 A (Luke J. Harper; Melvin L. Harper), 19 April, 1994 (19.04.94), Full text; Figs. 1 to 8	3
Y	Full text; Figs. 1 to 8 & EP 622097 A1	4
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed		"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family
Date of the actual completion of the international search 17 May, 2002 (17.05.02)		Date of mailing of the international search report 04 June, 2002 (04.06.02)
Name and mailing address of the ISA/ Japanese Patent Office		Authorized officer
Facsimile No.		Telephone No.

Form PCT/ISA/210 (second sheet) (July 1998)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP02/03812

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 63858/1986 (Laid-open No. 174573/1987) (Takafumi DOI), 06 November, 1987 (06.11.87), Full text; Figs. 1, 2 (Family: none)	3
X	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 129012/1987 (Laid-open No. 34081/1989) (Sumitomo Rubber Industries, Ltd.), 02 March, 1989 (02.03.89), Full text; Figs. 1 to 3 (Family: none)	5, 6

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