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(54) **SLIDE PLAY APPARATUS AND BLADE**

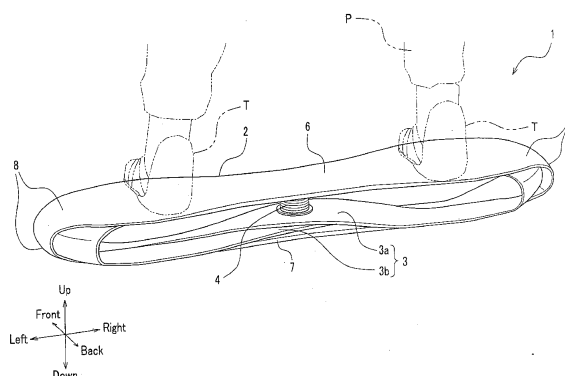
(57) [Problems]

To provide a slide play apparatus for sliding not only on the surface of snow but also on the surfaces of lawn and sand. The apparatus is constructed such that an impact from a sliding surface to a player can be cushioned and that sliding fun different from those obtained from conventional slide play apparatuses can be provided to the player.

[Means for Solving the Problems]

In the slide play apparatus 1, a body part 2 has a substantially cylindrical shape, and a slide board 7 and an upper board 6 positioned over the slide board 7 are connected to each other by a nose plate 8 and a tail plate 9. Therefore, the nose plate 8 and the tail plate 9 function as cushions to cushion an impact applied to the feet of the player P. Since the impact applied to the feet of the player P is cushioned, the player can have sliding fun and feeling different from those of the conventional apparatuses.

FIG. 1



Description

[Field of the Invention]

[0001] The present invention relates to a slide play apparatus for sliding on a surface of snow, lawn, or the like.

[Background of the Invention]

[0002] Slide play apparatuses for sliding on a slope with a player's own weight have been known such as a snowboard for sliding on a snow surface. A snowboard which has been used according to previously existing technology is manufactured from a single board formed of a substantially oval as viewed from above. A lower surface of the board is used as a sliding surface, and an upper surface, as a boarding surface on which a player rides. The player can make a turn to right or left by transmitting his/her weight shift onto the board (see Japanese Published Patent Application Publication No. 2004-160095).

[Disclosure of the Invention]

[Problems to be Solved by the Invention]

[0003] Most snowboards are, however, manufactured from a single board and are formed of a substantially oval as viewed from above. Thus, sliding fun and feeling that a player on such snowboards receives from a snow surface is not so much different from one another. Further, it is only a single board that is interposed between the snow surface and the feet of a player, so that an impact which the player receives from the snow surface is extremely large.

The present invention is made in an attempt to solve the problems and to provide: a slide play apparatus for sliding on a slope not only a surface of snow but also a surface of lawn, sand, or the like, which can reduce a physical load subjected to the player and obtain sliding fun different from that obtained from the apparatuses according to previously existing technology; and a blade suited to cushioning the impact.

[Means for Solving the Problems]

[0004] There is provided a slide play apparatus which includes: a slide board having a first edge at an outer end and sliding on a slope; an upper board positioned above the slide board; a nose board connecting one end of the slide board to one end of the upper board; and a tail board connecting the other end of the slide board to the other end of the upper board, and which is formed of a substantial cylinder.

[0005] With the invention described above, the slide play apparatus is formed of a substantial cylinder, and the slide board and the upper board positioned above the slide board are connected with the nose board and

the tail board. Therefore, the nose board and the tail board function as cushions to cushion an impact applied to the feet of a player. Since the impact applied to the feet of the player is cushioned, the player can have sliding fun and feeling different from that obtained from the apparatuses according to previously existing technology.

[0006] In the present invention, the outer end may have a first side curve.

[0007] With the invention described above, the outer end has a first side curve. Therefore, a first edge disposed at the outer end and having a curve catches the sliding surface, which enables a turn to be made smoothly.

[0008] In the present invention, a blade includes; a protruding portion protruding more outward than the outer end of the slide board; a second side curve formed on the outer end of the protruding portion and having a curvature larger than that of the first side curve; and a second edge disposed on the outer end of the protruding portion, and the blade may come in contact with the upper surface of the slide board.

[0009] With the invention described above, the blade has the protruding portion having the second edge positioned more outward than the first edge disposed on the outer end of the slide board, and the blade comes in contact with the upper surface of the slide board. Therefore, the slide board and the blade tilt when the player shifts his/her weight, which allows the second edge disposed on the protruding portion to catch the sliding surface. The second side curve having the curvature larger than that of the first side curve of the slide board is disposed on the outer end of the protruding portion, which allows a turn to be made sharply. The player can make various types of turns because the player can use the first edge or the second edge as he/she likes by adjusting the weight shift.

The blade in the present invention means a board interposed between the slide board and the upper board, functioning as a cushion for absorbing an impact, and guiding a turn by contacting with the sliding surface.

[0010] In the present invention, two blades are disposed crossly with respect the longitudinal axis X of the slide board to have a substantially X shape as viewed from above. Each blade may have a contact portion coming in contact with the upper surface of the slide board, curved portions disposed on a nose board side and on a tail board side, and a fixing portion fixed to the lower surface of the upper board.

[0011] Herein, description of the present invention is made assuming that a left foot of a player is positioned frontward in a sliding direction.

With the invention described above, the two blades each having the curved portions disposed on the nose board side and on the tail board side are disposed crossly with respect the longitudinal axis X of the slide board to have a substantially X shape as viewed from above. That is, one blade is disposed at a part covering from a left foot tiptoe through a right foot heel. The other blade is disposed a part covering from a left foot heel through a right

foot tiptoe. Therefore, if the player shifts the weight to a left foot tiptoe side, a distance between the fixing portion and the contact portion on the left foot tiptoe side is compressed, and, at the same time, because of reaction force, a distance between the fixing portion and the contact portion on a right foot heel side is extended. This facilitates a smooth weight shift of the player due to elasticity of the blade.

Further, the curved portion of the blade functions as a cushion, which cushions an impact applied to the feet of the player.

[0012] In the present invention, a support member for reducing friction between the slide board and the blade and between the two blades may be disposed at respective portions at which the slide board and the blade, and the two blades are crossed.

[0013] With the invention described above, friction caused when the slide board and the blade, and the two blades each come in contact with each other can be reduced. This enables a smooth slide of the blade.

[0014] In the present invention, an elastic body may be interposed between the slide board and the upper board.

[0015] With the invention described above, the interposition of the elastic body between the slide board and the upper board enhances a cushioning property therebetween, which allows a flexible response to a vertical load subjected to the upper board and the slide board.

[0016] In the present invention, a width of the sliding surface is smaller than that of the boarding surface.

[0017] With the invention described above, the frictional resistance of the sliding surface is reduced, and a sliding speed is increased. Additionally, a possible range of the weight shift is narrowed, thus enabling a turn to be made easily.

[0018] In the present invention, the upper board may have a recessed portion which is depressed toward the slide board.

[0019] With the invention described above, a height of the foot of the player can be lowered, thus enabling the player to get on and off the slide play apparatus without difficulty. Further, a distance between the foot of the player and the slide board is reduced. This makes it possible to easily transmit the weight shift of the player onto the slide board, thus enabling a further smooth slide.

[0020] In the present invention, the two blades are disposed crossly with respect the longitudinal axis X of the slide board between the slide board and the upper board disposed thereabove to have a substantially X shape as viewed from above. Each blade has the contact portion coming in contact with the upper surface of the slide board, the curved portions disposed on both ends of the contact portion, and the fixing portion fixing both ends of the blade to the lower surface of the upper board. Each blade further has a protruding portion protruding more outward than the outer end of the slide board.

[0021] With the invention described above, the blade with the curved portions provided therein is interposed

between the slide board and the upper board. Therefore, an impact applied to the slide board and the upper board can be reduced.

[0022] In the present invention, the slide play apparatus can cushion the impact applied to the feet of the player and can give the player sliding fun and feeling different from that obtained from the slide play apparatuses according to previously existing technology.

[Brief Description of the Drawings]

[0023]

[FIG. 1] A perspective view showing a slide play apparatus according to a first embodiment.

[FIG. 2] Views each showing the slide play apparatus according to the first embodiment. FIG. 2 (a) is a side view showing the slide play apparatus. FIG. 2 (b) is a side view showing a body part thereof. FIG. 2(c) is a cross sectional view showing the apparatus when cut along the line F-F in Fig. 2(b). FIG. 2 (d) is an enlarged view of the part G in FIG. 2(c),

[FIG. 3] A plan view showing the slide play apparatus according to the first embodiment.

[FIG. 4] A rear view showing the slide play apparatus according to the first embodiment.

[FIG. 5] A front view showing the slide play apparatus as viewed from a nose board according to the first embodiment.

[FIG. 6] Views each showing a blade according to the first embodiment. FIG. 6(a) is a perspective view. FIG. 6(b) is a cross sectional view when cut along the line H-H in FIG. 6(a) FIG. 6(c) is an enlarged view of the part I in FIG. 6(b).

[FIG. 7] A cross sectional view when cut along the line D-D in FIG. 2.

[FIG. 8] A cross sectional view when cut along the line E-E in FIG. 2.

[FIG.9] A cross sectional view when cut along the line A-A in FIG. 4.

[FIG. 10] A cross sectional view when cut along the line B-B in FIG. 4.

[FIG. 11] A cross sectional view when cut along the line C-C in FIG. 4.

[FIG. 12] A front view showing the slide play apparatus in a resting state according to the first embodiment, in which a weight of a player acts thereon in a vertical direction.

[FIG. 13] A view showing the slide play apparatus in an operating state according to the first embodiment, in which a player shifts his/her weight to his/her left foot along a sliding direction.

[FIG. 14] Views each showing the slide play apparatus in an operating state according to the first embodiment. FIG. 14(a) is a front view showing the state in which the player shifts his/her weight to a left foot front side (tiptoe side). FIG. 14 (b) is a front view showing the state in which the player shifts his/her

weight to a left foot rear side (heel side).

[FIG. 15] A cross sectional view at a lapping portion La showing the slide play apparatus in an operating state according to the first embodiment, in which the player directs toward a central part C.

[FIG. 16] A perspective view showing the slide play apparatus in an operating state according to the first embodiment, in which the player makes a turn.

[FIG. 17] Views each showing a second embodiment. FIG. 17 (a) is a perspective view showing a slide play apparatus. FIG. 17 (b) is a cross sectional view when cut along the line J-J in FIG. 17(a).

[FIG. 18] Views each showing the second embodiment. FIG. 18 (a) is a cross sectional view when cut along the line K-K in FIG. 17 (a). FIG. 18 (b) is a cross sectional view when cut along the line L-L in FIG. 17(a).

[FIG. 19] A perspective view showing a third embodiment.

[FIG. 20] Views each showing a fourth embodiment. FIG. 19(a) is a perspective view showing a slide play apparatus. FIG. 19(b) is a cross sectional view when cut along the line V-V in FIG. 19(a). FIG.(c) is a sectional side view showing a body part.

[FIG. 21] Views each showing a support member according to the fourth embodiment. FIG. 21(a) is a perspective view. FIG. 21(b) is a side view.

[FIG. 22] An enlarged side view showing a joint according to the fourth embodiment.

[Best Mode for Carrying Out the Invention]

[0024] Embodiments of the present invention are described in detail hereinafter with reference to related drawings. In the description, the same reference numerals are assigned to the same components, and the overlapped description thereof is omitted herefrom. Arrows in FIG. 1 indicating up, down, right, left, front, and rear are applicable to the description in whole, if not otherwise specified.

<First Embodiment>

[0025] As shown in FIG. 1 and FIG. 2, a slide play apparatus 1 in the first embodiment includes: a body part 2 formed of a substantially elongated cylinder; a blade 3 including an upper blade 3a and a lower blade 3b; a spring 4 inserted between an upper board 6 and a slide board 7 of the body part 2; and support members 5, 5 (see FIG. 2) disposed at a part (a central part C) at which the upper blade 3a and the lower blade 3b intersect.

[0026] As shown in FIG. 1 and FIG. 2, the body part 2 includes: an upper board 6 on which a player P rides; a slide board 7 for contacting with a sliding surface; a nose board 8 for connecting a left side end of the upper board 6 and a left side end of the slide board 7; and a tail board 9 for connecting a right side end of the upper board 6 and a right side end of the slide board 7. As shown in

FIG. 2 (a) and FIG. 2 (b), the body part 2 is formed of a substantially elongated circle as viewed from a lateral side and is substantially symmetrical with respect to a vertical axis Z.

[0027] As shown in FIG. 3, the upper board 6 is formed of a substantially elongated circle having a constricted portion K in the middle thereof as viewed from above and is substantially symmetrical with respect to a longitudinal axis X and an across-the-width axis Y.

An upper surface of the upper board 6 includes boarding portions 11 on which the player P rides. The blade 3 to be described later is fixed to a lower surface of the upper board 6. A foot fixing instrument T (see FIG. 1) for fixing a foot of the player P is provided on an upper surface of the boarding portion 11. A position of the foot fixing instrument T may be changed according to a height, a playing style, or the like of the player P. A well-known technique such as a binding may be used in providing the foot fixing instrument T. The constricted portion K may not be provided.

[0028] As shown in FIG. 2(c), FIG. 2(d) and FIG. 4, the slide board 7 is flat. Each of two outer ends 13, 13 has first edges 14a, 14b made of carbon steel. An upper surface of the slide board 7 contacts with the blade 3 to be described later. As shown in FIG. 4, the outer ends 13, 13 have respective first side curves R (for example, a radius of the side curve of 8.8 m). As shown in FIG. 5, the slide board 7 has a width smaller than that of the upper board 6. In the first embodiment, the outer end 13 has the first side curve R, however, is not limited to this configuration. The outer end 13 may be formed linearly.

[0029] As shown in FIG. 1 and FIG. 2, the nose board 8 connects the left side end of the upper board 6 and the left side end of the slide board 7. The tail board 9 connects the right side end of the upper board 6 and the right side end of the slide board 7. The nose board 8 and the tail board 9 are each curved to protrude outwardly.

[0030] In the first embodiment, the slide board 7 is formed flat, however, is not limited to this configuration. The slide board 7 may have a raised central part as a camber (not shown).

In the first embodiment, the body part 2 is formed substantially symmetrical with respect to the longitudinal axis X, the across-the-width axis Y, and the vertical axis Z. This is advantageous in that the body part 2 is equally used even when either a right foot or a left foot is put forward. In the first embodiment, the body part 2 is formed as described above, however, is not limited to this configuration. The body part 2 may be formed asymmetrical. In the first embodiment, the nose board 8 and the tail board 9 are formed as described above, however, are not limited to this configuration. The nose board 8 and the tail board 9 may be formed vertically to the slide board 7. The nose board 8 and the tail board 9 may be formed streamlined.

[0031] As shown in FIG. 6, the blade 3 is formed of a substantially X shape as viewed from above and includes an upper blade 3a disposed on an upper side and a lower

blade 3b disposed on a lower side. The upper blade 3a and the lower blade 3b are formed of a substantially same shape and have each a C shape with an upper part thereof opened as viewed from above.

[0032] Description hereinafter assumes that a left foot of the player P is put on a left side on the upper board 6. As shown in FIG. 1 and FIG. 6, the upper blade 3a includes: on a front side (a toe side) of the left foot, a left foot front fixation portion 31 fixed to the lower surface of the upper board 6; a left foot front contact portion 32 positioned below the left foot front fixation portion 31 and contacted by the upper surface of the slide board 7; and a left foot front curved portion 33 connecting the left foot front fixation portion 31 and the left foot front contact portion 32; and, on a right foot rear side (on a heel side) of the right foot, a right foot rear fixation portion 34 fixed to the lower surface of the upper board 6; a right foot rear contact portion 35 positioned below the right foot rear fixation portion 34 and contacted by the upper surface of the slide board 7; and a right foot rear curved portion 36 connecting the right foot rear fixation portion 34 and the right foot rear contact portion 35.

[0033] As shown in FIG. 1 and FIG. 6, the lower blade 3b includes: on a rear side (a heel side) of the left foot, a left foot rear fixation portion 37 fixed to the upper surface of the upper board 6; a left foot rear contact portion 38 positioned below the left foot rear fixation portion 37 and contacted by the upper surface of the slide board 7; and a left foot rear curved portion 39 connecting the left foot rear fixation portion 37 and the left foot rear contact portion 38; and, on a front side (on a toe side) of the right foot, a right foot front fixation portion 40 fixed to the lower surface of the upper board 6; a right foot front contact portion 41 positioned below the right foot front fixation portion 40 and contacted by the upper surface of the slide board 7; and a right foot front curved portion 42 connecting the right foot front fixation portion 40 and the right foot front contact portion 41.

The left foot front fixation portion 31, right foot rear fixation portion 34, left foot rear fixation portion 37, and right foot front fixation portion 40 may each be simply referred to as a fixation portion. The left foot front contact portion 32, right foot rear contact portion 35, left foot rear contact portion 38, and right foot front contact portion 41 may each be simply referred to as a contact portion. The left foot front curved portion 33, right foot rear curved portion 36, left foot rear curved portion 39, and right foot front curved portion 42 may each be simply referred to as a curved portion.

[0034] As shown in FIG. 4 and FIG. 7, the blade 3 includes a protruding portion 43 (including protruding portions 43a to 43d) protruding more outward than the outer ends 13, 13 of the slide board 7. As shown in FIG. 6(b) and FIG. 6(c), a second edge 45b made of carbon steel is disposed at the outer end 44b of the protruding portion 43b. Similarly, second edge 45a, 45c and 45d are disposed at the protruding portions 43a, 43c and 43d. As shown in FIG. 7, a second side curve r formed on the

outer end 44 (44a to 44d) of the protruding portion 43 has a radius smaller (or a curvature larger) than that of a first side curve R formed on the outer ends 13, 13 of the slide board 7. As shown in FIG. 7, the blade 3 includes a lapping portion L (La to Ld) having torsion starting from a central part C of the slide board 7 in respective longitudinal directions of the left foot front contact portion 32, right foot rear contact portion 35, left foot rear contact portion 38, and right foot front contact portion 41.

[0035] As shown in FIG. 1 and FIG. 6(a), the blade 3 comes in contact with the upper surface of the slide board 7 at the left foot front contact portion 32, right foot rear contact portion 35, left foot rear contact portion 38, and right foot front contact portion 41. The blade 3 can slide on the upper surface of the slide board 7 because it comes in contact only with the upper surface of the slide board 7.

[0036] As shown in FIG. 8, the left foot front fixation portion 31, right foot rear fixation portion 34, left foot rear fixation portion 37, right foot front fixation portion 40 are each fixed to the lower surface of the upper board 6.

[0037] As shown in FIG. 9, the upper blade 3a, lower blade 3b, upper board 6, and slide board 7 are disposed in this order from top to bottom and substantially in parallel to one another, at a central intersection part of the blade 3. Respective cross sections of the upper blade 3a and the lower blade 3b are curved downwards. This facilitates a catch of a sliding surface by the blade 3. However, the curved cross sections may not be necessarily provided.

[0038] As shown in FIG. 10, the upper blade 3a and lower blade 3b have respective torsion angles, α and β , so as to have substantially chevron shapes at respective lapping portions Ld and Lb (see FIG. 7). More specifically, the upper blade 3a is warped at a prescribed angle from a horizontal axis h at a center of the upper blade 3a in a counterclockwise direction. The lower blade 3b is warped at a prescribed angle from a horizontal axis f at a center of the lower blade 3b in a clockwise direction. The upper blade 3a and lower blade 3b have torsion angles also at the lapping portions La and Lc.

[0039] As shown in FIG. 9, the central part C has a torsion angle of 0° . As shown in FIG. 11, the contact portions 35, 41 (as well as the contact portions 32, 38) each have a torsion angle of 0° . That is, the lapping portions La to Ld (see FIG. 7) are lapped so as to maximize the torsion angles α and β in substantially middle parts between the central part C and the contact portions 32, 35, 38 and 41, respectively. Further, the torsion angle α of the upper blade 3a is made larger than the torsion angle β of the lower blade 3b. This is because the upper blade 3a has a longer lapping distance than the lower blade 3b as the formed is positioned more upwards than the latter. It is desirable that the torsion angles α and β satisfy following inequalities, respectively: $0^\circ < \alpha < 45^\circ$ and $0^\circ < \beta < 45^\circ$.

[0040] As shown in FIG. 11, the outer ends 44b, 44d at respective protruding portions 43b, 43d (as well as the

outer ends 44a, 44c at respective contact portions 32, 38) have equivalent relative heights at the contact portions 35, 41. That is, a distance from the second edge 45b of the outer end 44b to the sliding surface is equivalent to a distance from the second edge 45d of the outer end 44d to the sliding surface. This allows the player P to make a turn equally to right and left.

[0041] The blade 3 is not limited to have a configuration as described in the first embodiment. The lapping portion L may not be provided, for example. The blade 3 may have a torsion angle at the contact portions 32, 35, 38 and 41 (not shown).

[0042] As shown in FIG. 9, the spring 4 is interposed between the lower surface of the upper board 6 and the upper surface of the upper blade 3a, at the central part C of the body part 2. Rubber M is disposed both an upper end and a lower end of the spring 4 so as to closely attach the spring 4 to the upper board 6 and the upper blade 3a, respectively. The spring 4 in the first embodiment has a diameter of about 8 cm. The rubber M may not be used. The interposition of the spring 4 between the upper board 6 and the slide board 7 enhances a cushioning property therebetween, which allows a flexible response to a vertical load subjected to the upper board 6 and the slide board 7.

[0043] In the first embodiment, an elastic body interposed between the upper board 6 and the slide board 7 is the spring 4, however, is not limited to this configuration. A well-known elastic body such as rubber (not shown) may be used. A size, a type, or the like of the elastic body may be selected according to a size and a material of the body part 2, a weight and a playing style of the player P, or the like. In the first embodiment, one unit of the spring 4 is used, however, a plurality of springs may be used. A position of the spring 4 is not specifically limited.

[0044] As shown in FIG. 9, the support member 5 is a ball transfer with a spherical body installed therein and serves for a smooth slide of the blade 3. The support member 5 used in the first embodiment is, for example, manufactured by FREEBEAR Corporation (FreeBare: C-85).

As shown in FIG. 2 and FIG. 9, two support members 5 are interposed, each at the central part C, between the lower surface of the upper blade 3a and the upper surface of the lower blade 3b and between the lower surface of the lower blade 3b and the upper surface of the slide board 7. In one of the two support members 5, a spherical body installed therein is formed to come in contact with the lower surface of the upper blade 3a. In another support member 5, a spherical body installed therein is formed to come in contact with the upper surface of the slide board 7.

The blade 3 slides according to a weight shift of the player P as described later. Therefore, the blade 3 slides smoothly by interposing the support members 5 at a part where the upper blade 3a and the lower blade 3b intersect and at a part where the lower blade 3b and the slide board

7 intersect.

In the first embodiment, an iron plate (not shown) is each disposed at a part where the spherical body installed in the support member 5 comes in contact with the lower surface of the upper blade 3a and the upper surface of the slide board 7. In the first embodiment, the support member 5 is a ball transfer, however, is not limited to this. The support member 5 may be a well-known means for a smooth slide of two plates being in contact with each other.

[0045] In the first embodiment, the first edge 14 and the second edge 45 are made of carbon steel, however, are not limited to this, and any other material may be used.

<Manufacture Method>

[0046] Next is described a method of manufacturing the slide play apparatus 1.

The body part 2 is unitarily formed and is made of carbon fiber reinforced plastic (CFRP) having elasticity and high strength. As shown in FIG. 2(c), in the first embodiment, the body part 2 (or a carbon fiber reinforced plastic plate 51) is formed by laminating commercially available prepreg while changing orientation directions of fiber thereof, into a tubular mold, and allowing it to cure. The prepreg may be, for example, Besfight (registered trademark) [original yarn: HTA-12K, containing a 37% by mass of epoxy resin] manufactured by TOHO TENAX Co., Ltd. As shown in FIG. 2 (c) and FIG. 2(d), the slide board 7 is formed by adhering the polyethylene plate 52 to the lower surface of the carbon fiber reinforced plastic plate 51 with an epoxy resin-based adhesive. The first edges 14a, 14b made of chevron-shaped carbon steel are fitted to both ends of the polyethylene plate 52 and are attached by pressure to the carbon fiber reinforced plastic plate 51 and the polyethylene plate 52.

[0047] Material of which the body part 2 is made is not limited to the carbon fiber reinforced plastic, and may be, for example, glass fiber reinforced plastic (GFRP), acrylonitrile butadiene styrene (ABS), or the like. Further, the material is not limited to resin and may be wood, metal, or the like. The material is preferably light and excellent in durability, elasticity and strength.

In the first embodiment, the body part 2 is unitarily formed, however, is not limited to this configuration. The body part 2 may be formed by joining separately-formed boards such as, for example, the upper board 6, slide board 7, nose board 8, and tail board 9.

Alternatively, the body part 2 may be formed in a so-called sandwich structure, in which a wooden board or foamed polyurethane is interposed between a pair of carbon fiber reinforced plastic plates 51, 51.

[0048] As shown in FIG. 6(a), FIG. 6(b) and FIG. 6(c), to form the blade 3, both ends of the carbon fiber reinforced plastic plate 51, in which the fixing portions 31, 34, 37, 40 and the protruding portion 43 are formed, are curved and are adhered to the lower surface of the upper

board 6. More specifically, the upper blade 3a and the lower blade 3b are crossed at respective substantially central parts and are fixed to the lower surface of the upper board 6 at the left foot front fixation portion 31 and right foot rear fixation portion 34 and at the left foot rear fixation portion 37 and right foot front fixation portion 40, respectively (see FIG. 8). The second edge 45 (45a to 45d) is disposed at the outer end 44 (44a to 44d). The respective central parts of the upper blade 3a and the lower blade 3b are preferably lapped over the central part C of the body part 2 (see FIG. 7).

[0049] In the first embodiment, material of which the blade 3 is made is carbon fiber reinforced plastic, however, is not limited to this. For example, the material may be glass fiber reinforced plastic (GFRP), acrylonitrile butadiene styrene (ABS), or the like. Further, the material is not limited to resin and may be wood, metal, or the like. The material is preferably light and excellent in durability, elasticity and strength. The material for the body part 2 may be different from that for the blade 3.

[0050] The support members 5, 5 are interposed between the upper blade 3a and lower blade 3b and between the lower blade 3b and the upper surface of the slide board 7 (see FIG. 2). An iron plate is each embedded at the part where the spherical body of the support member 5 comes in contact with the lower surface of the upper blade 3a and the upper surface of the slide board 7. Respective centers of the spring 4 and the support members 5 are preferably lapped over the central part C of the body part 2. In the first embodiment, a configuration is provided, but is not limited to, that each spherical body of the support members 5 is brought into contact with the lower surface of the upper blade 3a and the upper surface of the slide board 7 (see FIG. 9).

[0051] The spring 4 is then interposed between the upper board 6 and the upper blade 3a. In the first embodiment, an upper end of the spring 4 and the lower surface of the upper board 6 as well as a lower end of the spring 4 and the upper surface of the upper blade 3a are fixed with an epoxy resin adhesive. The spring 4 may not necessarily be fixed but may only come in contact with the lower surface of the upper board 6 and the upper surface of the upper blade 3a utilizing elasticity of the spring 4.

[0052] In the first embodiment, a configuration is provided, but is not limited to, that the blade 3 and the lower surface of the upper board 6 are fixed to each other with the epoxy resin adhesive. Any other adhesive or a fastening member such as a screw may be used for the fixation. Both an adhesive and a fastening member may be used for the fixation.

[0053] As shown in FIG. 1 through FIG. 4, the slide play apparatus 1 according to the first embodiment has a longitudinal length thereof of about 150 cm and a length between the lower surface of the slide board 7 and the upper surface of the upper board 6 of about 20 cm. The body part 2 has a thickness of about 1.5 cm. The upper board 6 has a maximum width of about 35 cm and a width

at the constricted portion K of about 25 cm. The slide board 7 has a width of 22 cm. As shown in FIG. 4, the first side curve R of the slide board 7 has a radius of about 8.8 m (see FIG. 4), and the second side curve r of the blade 3 has radius of about 8.2 m. In the first embodiment, a configuration is provided, but is not limited to, that the first side curve R and the second side curve r are formed of circular arcs. The curves may be formed of quadratic curves of the like.

Dimensions described above are not intended to limit the present invention.

The manufacture method described above is only for illustration and is not intended to limit the present invention.

<Operations>

[0054] Next are described operations of the slide play apparatus 1. In the first embodiment, description is made assuming a slide on snow surface (piste).

As shown in FIG. 1, the slide play apparatus 1 has foot fixing instruments T, T fixed to the upper board 6, into which feet of the player P are fixed, and, when the player P goes on to a slope (sliding surface), slides on the sliding surface with the player P's own weight. In the first embodiment, description is made assuming that a left foot of the player is positioned frontward in a sliding direction.

In the first embodiment, a term "compressed" means that a distance between the upper board 6 and the slide board 7 (between the fixing portion and the contact portion) becomes smaller than that in a resting state, due to a weight shift of the player P. Herein, the resting state is referred to as a state in which the player P's weight acts on the slide board 7 in a vertical direction. Further, a term "extended" means that the distance between the upper board 6 and the slide board 7 (between the fixing portion and the contact portion) becomes smaller than that in the resting state.

(Sliding straight)

[0055] As shown in FIG. 12, the player P can slide straight by acting his/her weight on the slide board 7 in the vertical direction. That is, if the player P's weight acts on the slide board 7 in the vertical direction, the second edges 45a, 45c disposed on the blade 3 do not come in contact with the sliding surface S. This allows a substantially whole area of the lower surface of the slide board 7 to come in contact with the sliding surface, thus enabling the player P to slide straight.

As shown in FIG. 13, if the player P shifts the weight to the left foot along the sliding direction, the distance between the upper board 6 and the slide board 7 on a left foot side is compressed (see arrow 55), and, at the same time, the distance therebetween on a right foot side is extended (see arrow 56) because of reaction force of the blade 3. This facilitates a smooth weight shift.

(Making a turn)

[0056] As shown in FIG. 14, the slide play apparatus 1 according to the first embodiment makes a turn when the player P shifts his/her weight to bring the first edge 14 or second edge 45 into contact with the sliding surface S (that is, make the first edge 14 or second edge 45 sink into the sliding surface S).

[0057] Herein, description is made assuming that the player P makes a turn to the right in the sliding direction (in a direction of arrow 62 of FIG. 16).

As shown in FIG. 14(a), if the player P shifts his/her weight to a left foot front side (tiptoe side), the distance between the upper board 6 and the slide board 7 on the left foot front side (tiptoe side) is compressed (see arrow 57), and, at the same time, the distance therebetween on a rear side (heel side) is extended (see arrow 58). This tilts the slide play apparatus 1 as a whole at a degree of γ to allow the first edge 14a to catch the sliding surface S.

Then the protruding portion 43a of the upper blade 3a is pushed in a direction of the weight shift. This allows the second edge 45a to catch the sliding surface S, enabling a turn to be made sharply.

[0058] More specifically, if the player P shifts his/her weight to the left foot front side (tiptoe side), the distance between the left foot front fixation portion 31 and the left foot front contact portion 32 is compressed, and, at the same time, the distance between the right foot rear fixation portion 34 and the right foot rear contact portion 35 is extended because of reaction force of the compression (see FIG. 6). At this time, the protruding portion 43a slides along with the weight shift of the player P, because the left foot front contact portion 32 and the right foot rear contact portion 35 are only in contact with the upper surface of the slide board 7, though the left foot front fixation portion 31 and the right foot rear fixation portion 34 of the upper blade 3a are fixed to the lower surface of the upper board 6.

As shown in FIG. 15, when the distance between the left foot front fixation portion 31 and the left foot front contact portion 32 of the upper blade 3a is compressed (see FIG. 6), the upper blade 3a turns around in a direction of arrow 60 owing to the torsion in the lapping portion La. Since the upper blade 3a has both ends thereof fixed at the left foot front fixation portion 31 and the right foot rear fixation portion 34, the protruding portion 43a then slides with the upper surface of the slide board 7 and is pushed in the direction of the weight shift (see arrow 61). As shown in FIG. 14(a), this allows the second edge 45a disposed in the protruding portion 43a to catch the sliding surface S.

[0059] In the central part C, the upper blade 3a, lower blade 3b, and the support member 5, 5 slide toward the rear side (heel side). That is, as shown in FIG. 9, respective centers of the upper blade 3a, the lower blade 3b, and the support members 5, 5 are substantially lapped over the central part C in resting state. However, when the weight shift of the player P to the left foot front side (tiptoe side), the upper blade 3a, the lower blade 3b and

the support member 5, 5 are pushed to slide toward the heel side.

[0060] As shown in FIG. 16, if the weight is shifted to the left foot front side (tiptoe side), a load is also applied to the tiptoe side of the right foot, which compresses a distance between the right foot front fixation portion 40 and the right foot front contact portion 41 (see arrow 59). Nevertheless, the weight of the player P is consistently applied to the left foot front side, the distance between the left foot front fixation portion 31 and the left foot front contact portion 32 is more compressed than the distance between the right foot front fixation portion 40 and the right foot front contact portion 41. The protruding portion 43d slides along a shift of the player P due to an action similar to that of the protruding portion 43a to be pushed toward the sliding surface S. This allows the second edge 45d to catch the sliding surface S (see arrow 63).

[0061] For the reasons described above, the second edge 45a disposed on the protruding portion 43a, the first edge 14a disposed on the slide board 7, and the second edge 45d disposed on the protruding portion 43d catch the sliding surface. Further, the player P can make a turn sharply, because the protruding portions 43a, 43d having the second edges 45a, 45d are each provided with a second side curve r (see FIG. 7) having a radius smaller than that of the first side curve R of the slide board 7.

The protruding portions 43a, 43d are pushed toward the sliding surface S along with the weight shift of the player P. This allows the second edges 45a, 45d to keep on contacting with the sliding surface S without bouncing back from the sliding surface S while the player P is making a turn.

Further, the player P can make a sharp turn and good braking, if the player P makes a turn in a direction of arrow 62 while shifting the weight (applying a large load) to the right foot front side (tiptoe side). This is because the edge 45d disposed on the protruding portion 43d further catches the sliding surface S.

[0062] As shown in FIG. 14(b), if the player P makes a turn to the left, the player P shifts his/her weight to a left foot rear side (heel side).

The player P can also make a turn to the left by shifting the weight to the right foot front side (tiptoe side) or the right foot rear side (heel side).

[0063] The player P can make various types of turns because the player P can use the first edge 14 or the second edge 45 accordingly by adjusting the weight shift.

[0064] As shown in FIG. 14(a), if the player P shifts his/her weight to the left foot front side (left foot tiptoe side), the distance between the upper board 6 and the slide board 7 on the front side is compressed (see arrow 57), and, at the same time, the distance between the upper board 6 and the slide board 7 on the rear side (heel side) is extended (see arrow 58). At this time, as shown in FIG. 6, because the blade 3 is formed of a substantially X shape as viewed from above, the distance between the left foot front fixation portion 31 and the left foot front

contact portion 32 is compressed, and, at the same time, the distance between the right foot rear fixation portion 34 and the right foot rear contact portion 35 is extended because of reaction force of the compression. This facilitates a smooth weight shift in a diagonal direction of the longitudinal axis.

[0065] The slide play apparatus 1 according to the first embodiment has a configuration in which the body part 2 is formed of a substantial cylinder, and the slide board 7 and the upper board 6 positioned above the slide board 7 are connected with the nose board 8 and the tail board 9. In the configuration, the nose board 8 and the tail board 9 serves as cushions, to thereby cushion an impact exerted on the feet of the player P. Since the impact exerted on the feet of the player P is cushioned, the player P can have sliding fun and feeling different from those obtained from conventional apparatuses.

[0066] The slide play apparatus 1 has the outer end 13 of the slide board 7, having the first side curve R. This allows a turn to be made smoothly because the first edge 14 catches the sliding surface S along the first side curve R.

[0067] The blade 3 has the protruding portion 43 with the second edge 45 disposed thereon. The second edge 45 is positioned further outside than the first edge 14 disposed on the outer end 13 of the slide board 7. Upon the weight shift of the player P, the blade 3 slides in a direction of the weight shift, and the second edge 45 disposed on the protruding portion 43 catches the sliding surface S. The player P can make a sharper turn because the second side curve r formed on the outer end 44 of the protruding portion 43 has a curvature larger than that of the first side curve R of the slide board 7.

[0068] The slide play apparatus 1 includes the upper blade 3a and the lower blade 3b disposed crossly with respect the longitudinal axis X of the slide board 7 to have a substantially X shape as viewed from above. If the player P puts his/her weight, for example, on the left foot front side (tiptoe side), the distance between the left foot front fixation portion 31 and the left foot front contact portion 32 is compressed, and, at the same time, the distance between the right foot rear fixation portion 34 and the right foot rear contact portion 35 is extended because of reaction force of the compression. This facilitates a smooth weight shift of the player P. Further, the curved portion of the blade 3 also enhances a cushioning property.

[0069] The slide play apparatus 1 has the support member 5. This allows friction caused between the slide board 7 and the blade 3 which are in contact with each other to be reduced, thus enabling a smooth slide of the blade 3.

[0070] The slide play apparatus 1 has the spring 4 interposed between the upper board 6 and the slide board 7. This enhances a cushioning property therebetween, which allows a flexible response to a vertical load subjected to the upper board 6 and the slide board 7.

[0071] The slide board 7 has a width smaller than that

of the upper board 6. This allows frictional resistance of the slide board 7 to be reduced and a possible range of the weight shift to be narrowed, thus enabling a turn to be made easily.

5 **[0072]** As described above, the embodiment according to the present invention has been explained in detail with reference to the related drawings. However, the present invention is not limited to the embodiment, and various changes are possible without departing from the gist of the present invention.

<Second Embodiment>

10 **[0073]** As shown in FIG. 17, a slide play apparatus 71 includes: a body part 72 formed of a substantial cylinder; a blade 73; a spring 74 interposed therein at a central part thereof; and a support member (not shown) interposed between the blade 73 and a slide board 82.

The blade 3 in the first embodiment is formed by combining two boards. However, as shown in FIG. 17(a) and FIG. 17(b), the blade 73 in the second embodiment includes a central part W, and a foot portion 76 (76a to 76d) extending from the central part W to have a substantially X shape as viewed from above.

25 **[0074]** The blade 73 has a curved portion 78 (78a to 78d) formed by bending the foot portion 76. An end 77 (77a to 77d) of the foot portion 76 is fixed to a lower surface of the upper board 79.

As shown in FIG. 17(b), the blade 73 has a protruding portion 85 (85a to 85d) protruding more outward than outer ends (shown in dotted lines) of the slide board 82. A second side curve r is formed on an outer end 86 (86a to 86d) of the protruding portion 85 and has a radius smaller than that of a first side curve R formed on the outer end 85 of the slide board 82. A second edge 84 (84a to 84d) is disposed on the outer end 86 (86a to 86d) of the protruding portion 85.

As shown in FIG. 18(a), the foot portions 76b, 76d of the blade 73 are formed of a substantial chevron when cut along the line K-K in Fig. 17(b). As shown in FIG. 18 (b), when the foot portion 76b and the foot portion 76d come in contact with an upper surface of the slide board 82, the foot portions 76b, 76d are horizontally positioned.

A manufacture method and operations in the second embodiment are substantially same as those in the first embodiment, and description thereof is omitted herefrom.

45 **[0075]** In the second embodiment, the blade 73 has the foot portion 76 extending from the central part W to have a substantially X shape as viewed from above. That is, the blade 73 is formed from a single board. This prevents the upper blade 3a and the lower blade 3b from having different distances therebetween, unlike in the first embodiment. Therefore, it becomes easy to lap the foot portions 76a to 76d of the blade 73.

<Third Embodiment>

[0076] In the first embodiment and the second embod-

iment, the feet of the player P are fixed at right angles with respect to a longitudinal direction of the slide play apparatuses 1, 71. However, the present invention is not limited to this configuration. For example, as shown in FIG. 19, one of the feet of the player P is fixed to one of a pair of the slide play apparatuses 90, 90, and the other to the other. In this case, the feet of the player P are fixed in parallel with respect to a longitudinal direction of the slide play 1.

In the third embodiment, the slide play apparatus 90 includes: a body part 93 including an upper board 91 and a slide board 92; a blade 94; a spring 95; and a support member (not shown). Each width of the upper board 91 and the slide board 92 is formed to be smaller than a width of the player P. A length in the longitudinal direction of the slide play apparatus 90 is formed shorter than that of the slide play apparatus 1, and is about 100 cm. Each foot of the player P is fixed substantially above the spring 95.

A manufacture method and operations in the third embodiment are substantially same as those in the first embodiment, and description thereof is omitted herefrom.

[0077] In the third embodiment, the slide play apparatus 90 has a configuration as described above, however, is not limited to this. The length, width, or the like of the slide play apparatus 90 may be determined according to a height and a playing style of the player P.

<Fourth Embodiment>

[0078] As shown in FIG. 20, a slide play apparatus 110 according to a forth embodiment is different from the embodiments described above in structures of an upper board 116 and a support member 130.

As shown in FIG. 20 (a) and FIG. 20(c), the upper board 116 of the slide play apparatus 110 has recessed portions 120, 120 substantially equally spaced from a central part C. As shown in FIG. 20(c), the recessed portion 120 is formed by putting a dent in a portion of the upper board 116 toward the slide board 117. A bottom face of the recessed portion 120 is flat, to which the foot of the player P is fixed with a foot fixing instrument T.

[0079] With the recessed portion 120 on the upper board 116, a height of the foot of the player P is lowered, thus enabling the player P to get on and off the slide play apparatus 110 without difficulty. Further, a distance between the foot of the player and the slide board 117 is reduced. This makes it possible to easily transmit a weight shift of the player P onto the slide board 117, thus enabling a further smooth slide. Alternatively, as shown in FIG. 20(b), both ends of the upper board 116 may be curved downward from the central part C thereof.

[0080] In the fourth embodiment, as shown in FIG. 20 (c), the upper board 116 has the central part C is positioned higher than the bottom face of the recessed portion 120, however, is not limited to this configuration. For example, the central part C may be formed as high as the bottom face of the recessed portion 120. Additionally, the

recessed portion 120 may have any other shape.

[0081] As shown in FIG. 20(b) and FIG. 21(a), a support member 130 in the fourth embodiment penetrates a through hole 131 formed in the lower blade 113b and is disposed between the slide board 117 and the upper blade 113a.

The support member 130 includes: a rotating body 132 disposed to be in contact with above and below; a rotational axis 133 inserted into the rotating body 132; a T-shaped support metal 134 into which the rotational axis 133 is inserted; and a joint 135 jointing the T-shaped support metal 134 and the lower blade 113b.

[0082] The rotating body 132 includes a first rotating body 132a positioned below and a second rotating body 132b positioned above, which are spherical bodies having same diameters and made of hard rubber. A lower end of the first rotating body 132a is in contact with the slide board 117, and an upper end thereof, with the second rotating body 132b. A lower end of the second rotating body 132b is in contact with the first rotating body 132a, and an upper end thereof, with the upper blade 113a.

[0083] The rotational axis 133 includes a first rotational axis 133a and a second rotational axis 133b, which are inserted into respective centers of the first rotating body 132a and the second rotating body 132b. Axis directions of the first rotational axis 133a and the second rotational axis 133b are parallel to a longitudinal direction of the slide play apparatus 110 and are horizontal. Both ends of the rotational axis 133 are provided with grooves, on which respective nuts 133c are screwed for fixation.

[0084] T-shaped support metal 134 is configured by a first T-shaped support metal 134a and a second T-shaped support metal 134b in a pair. The T-shaped support metal 134 pivotally supports the rotating body 132 and is jointed to the lower blade 113b via the joint 135. As shown in FIG. 22, the T-shaped support metal 134 includes: a long hole 136; a base portion 137 on which the long hole 136 is created; and an outrigger 138 vertically formed from the base portion 137. Two long holes 136 are created on the base portion 137 and have each an oval cross section elongated upward and downward. The long hole allows the rotational axis 133 to be inserted therein and to move up and down therein. That is, a diameter of the rotational axis 133 is formed smaller than a width of the long hole 136. The nuts 133c disposed at both ends of the rotational axis 133 are fixed at respective positions spaced apart from the base portion 137. The outrigger 138 extends parallel to the longitudinal direction of the slide play apparatus 110 and is jointed to the lower blade 113b via the joint 135.

[0085] As shown in FIG. 22, the joint 135 joints the T-shaped support metal 134 and the lower blade 113b. The joint 135 includes an absorber 140 with a communication hole for communicating the outrigger 138 and the lower blade 113b, which are fixed with a bolt 142 and a nut 143 via a washer 141. The absorber 140 is formed of a cylinder having a hollow portion into which the bolt 142 is

inserted. The absorber 140 is constricted in a middle portion thereof. That is, both ends of the absorber 140 are formed thicker than the middle portion. The absorber 140 may be, for example, a well-known rubber bush. The absorber 140 is used for absorbing load acting on the support member 130 and allowing a travel thereof in the longitudinal direction. Further, the absorber 140 flexibly responds to a load subjected thereto, because both ends of the absorber 140 are formed thicker than the middle portion.

[0086] With the support member 130, if the player P shifts his/her weight in a front/rear direction (on a tiptoe/heel side), the first rotating body 132a and the second rotating body 132b rotate about the rotational axis 133 while coming in contact with above and below. This causes a smooth slide of the upper blade 113a and the lower blade 113b in a width direction thereof. The support member 130 with the absorber 140 inserted therein absorbs load acting thereon and allows a travel of the upper blade 113a and the lower blade 113b in the longitudinal direction. This makes it possible to make a sharp turn, because, similarly to the slide play apparatus 1 in the first embodiment, the player P's weight shift enables the second edges of the upper blade 113a and the lower blade 113b to catch a sliding surface.

[0087] Suppose that the rotational axis 133 is fixed to the T-shaped support metal 134. The first rotating body 132a and the second rotating body 132b galls to create a gap therebetween, rotating without any contact with each other. In the fourth embodiment, however, the long hole 136 is formed to allow the rotational axis 133 to travel up and down therein. This makes it possible for the first rotating body 132a and the second rotating body 132b to be constantly in contact with each other, when a load of the player P acts on the upper board 116, thus preventing rotation without contact.

[0088] In the fourth embodiment, the support member 130 used has a configuration as described above, however, other configuration is also available. For example, the rotating body 132 used is spherical, however, it may be oval spherical. The T-shaped support metal 134 used is a pair of metal members, however, may be integrally formed. A shape and a material of the absorber 140 may be determined according to a playing style of the player P. A cushion may be provided in the long hole 136 in accordance with an inner shape thereof so as to prevent the long hole 136 and the rotational axis 133 from galling.

[0089] As described above, the embodiment according to the present invention has been explained with reference to the related drawings. However, the present invention is not limited to the embodiments, and various changes are possible without departing from the gist of the present invention. Further, the present invention may be used not only for recreation but also for other purpose. In the first and second embodiments, the slide play apparatus 1 is used in a substantially same way as a snowboard. However, for example, the slide play apparatus 1 may be used in a same way as a sled by putting a box-

like body suited for carrying something or someone on the upper board 6 of the slide play apparatus 1. This case is described with reference to FIG. 16. A player rides in a box-like body (not shown) disposed on the upper board 6. The player can operate the slide play apparatus 1 by shifting his/her weight with substantially same operations as those in the first embodiment.

[0090] Further, the slide play apparatus with such a box-like body put an object (including a person) therein may be pulled from a side of the nose board 8 (see FIG. 1). For example, if pulled from a side of arrow 62 in FIG. 16, a load of the object put in the box-like body acts on the blade 3 according to a pulling direction or a change in the sliding surface S. This makes the blade 3 slide, and the slide play apparatus 1 thus slides smoothly following the pulling direction, because the second edge 45a acting in the pulling direction catches the sliding surface S. Moreover, the slide play apparatus 1 has the protruding portion 43, which can prevent an overturn thereof due to an abrupt operation.

[0091] The slide play apparatus according to the present invention may only include the body part 2 without including the blade 3, spring 4, and support member 5, for example (see FIG. 2(b)). This configuration minimizes components of the slide play apparatus to make the slide play apparatus lighter and to be applied to a play containing aerial actions.

[0092] In the first embodiment, description is made assuming that the slide play apparatus according to the present invention slides on a snow surface, however, is not limited to this configuration. The slide play apparatus may slide on a surface of, for example, lawn, sand or water.

[0093] In the first embodiment, the blade 3 is used for the slide play apparatus 1, however, is not limited to this configuration. The blade 3 may be used for other structure.

Claims

1. A slide play apparatus comprising:

a slide board having a first edge at an outer end thereof and sliding on a slope;
an upper board positioned above the slide board;
a nose board connecting one end of the slide board to one end of the upper board; and
a tail board connecting the other end of the slide board to the other end of the upper board,
the slide play apparatus being formed of a substantial cylinder.

2. The slide play apparatus according to Claim 1, wherein the outer end has a first side curve.

3. The slide play apparatus according to Claim 2,

wherein a blade comprising: a protruding portion protruding more outward than the outer end of the slide board; a second side curve formed on the outer end of the protruding portion and having a curvature larger than that of the first side curve; and a second edge disposed on the outer end of the protruding portion, comes in contact with an upper surface of the slide board. 5

4. The slide play apparatus according to Claim 3, wherein the slide play apparatus further comprising two blades disposed crossly with respect a longitudinal axis of the slide board and having a substantially X shape as viewed from above, each blade having: a contact portion coming in contact with the upper surface of the slide board; curved portions disposed on a nose board side and on a tail board side; and a fixing portion fixed to a lower surface of the upper board. 10 15 20

5. The slide play apparatus according to Claim 4, wherein the slide play apparatus further comprising a support member each for reducing friction between the slide board and one of the two blades and between the two blades, the support member each being disposed at portions at which the slide board and the one blade, and the two blades are crossed. 25

6. The slide play apparatus according to Claim 5, wherein an elastic body is interposed between the slide board and the upper board. 30

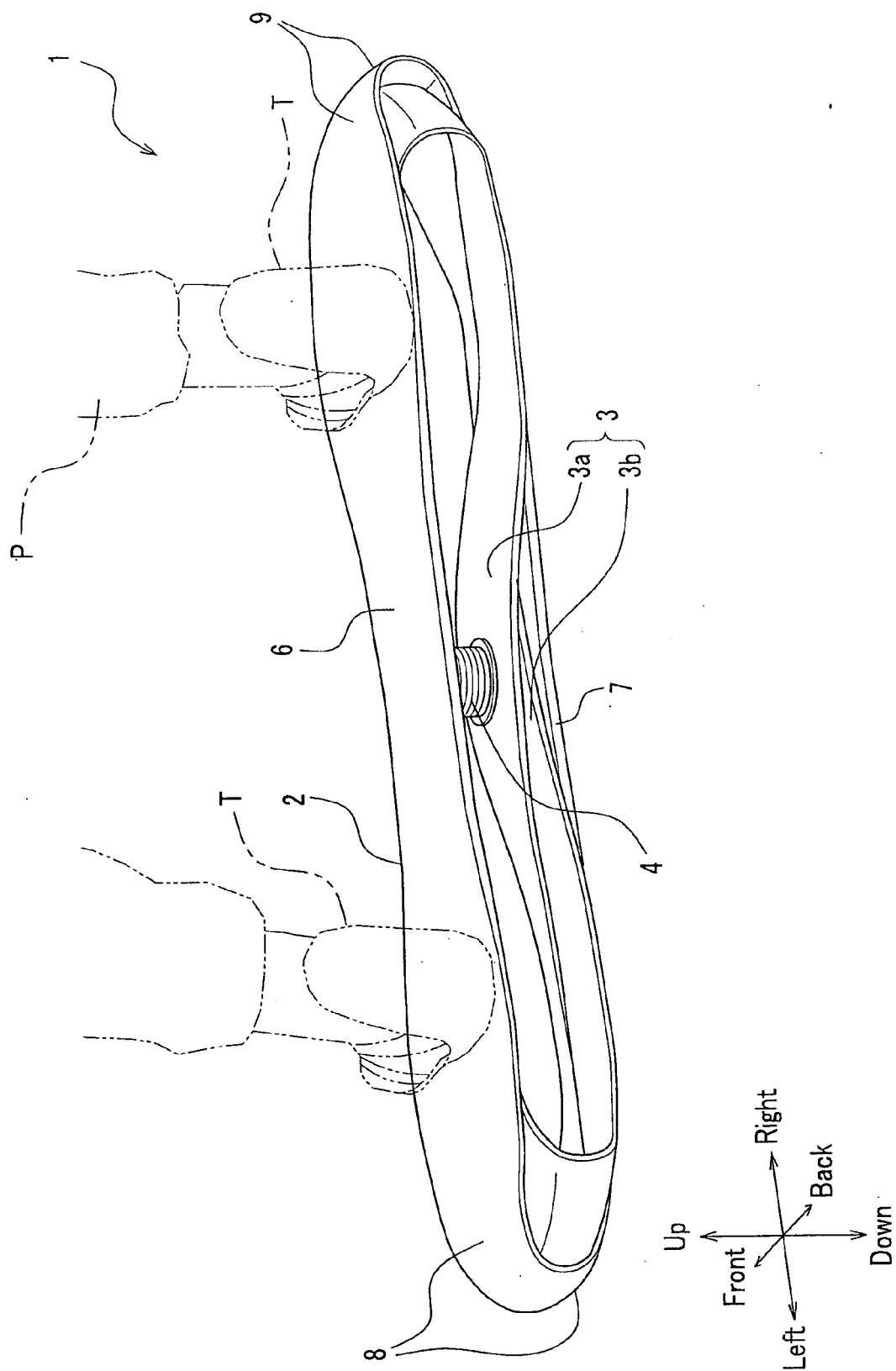
7. The slide play apparatus according to Claim 6, wherein a width of the sliding surface is smaller than a width of the boarding surface. 35

8. The slide play apparatus according to Claim 1, wherein the upper board has a recessed portion which is depressed toward the slide board. 40

9. A pair of blades disposed crossly with respect a longitudinal axis of a slide board between the slide board and an upper board disposed thereabove and having a substantially X shape as viewed from above, each blade comprising: 45

a contact portion coming in contact with an upper surface of the slide board;
curved portions disposed on both ends of the contact portion; and 50
a fixing portion each fixed to both ends of the blade to a lower surface of the upper board, each blade further comprising a protruding portion protruding more outward than the outer end of the slide board. 55

FIG.1



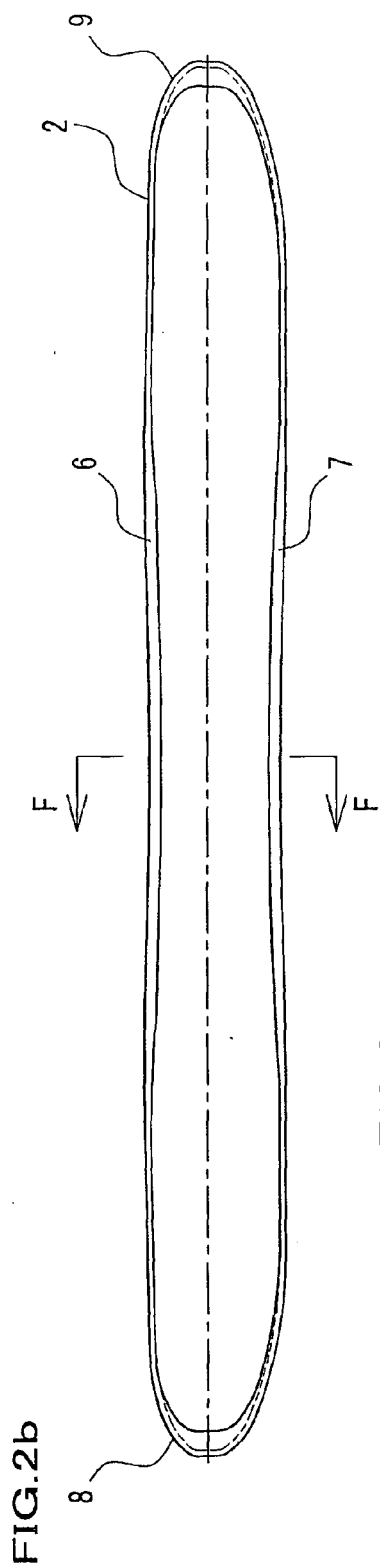
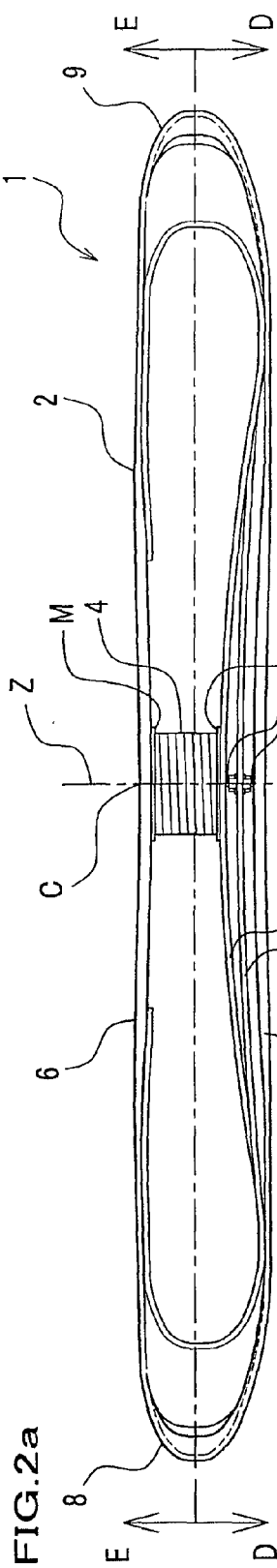


FIG.2c

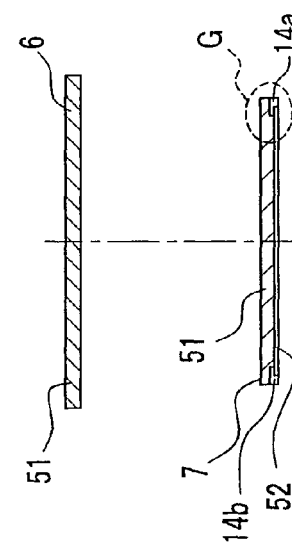


FIG.2d

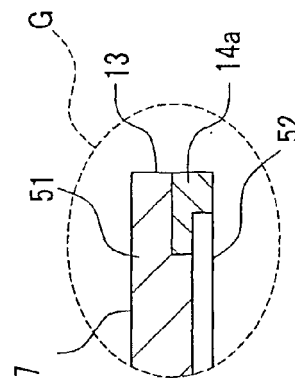


FIG.3

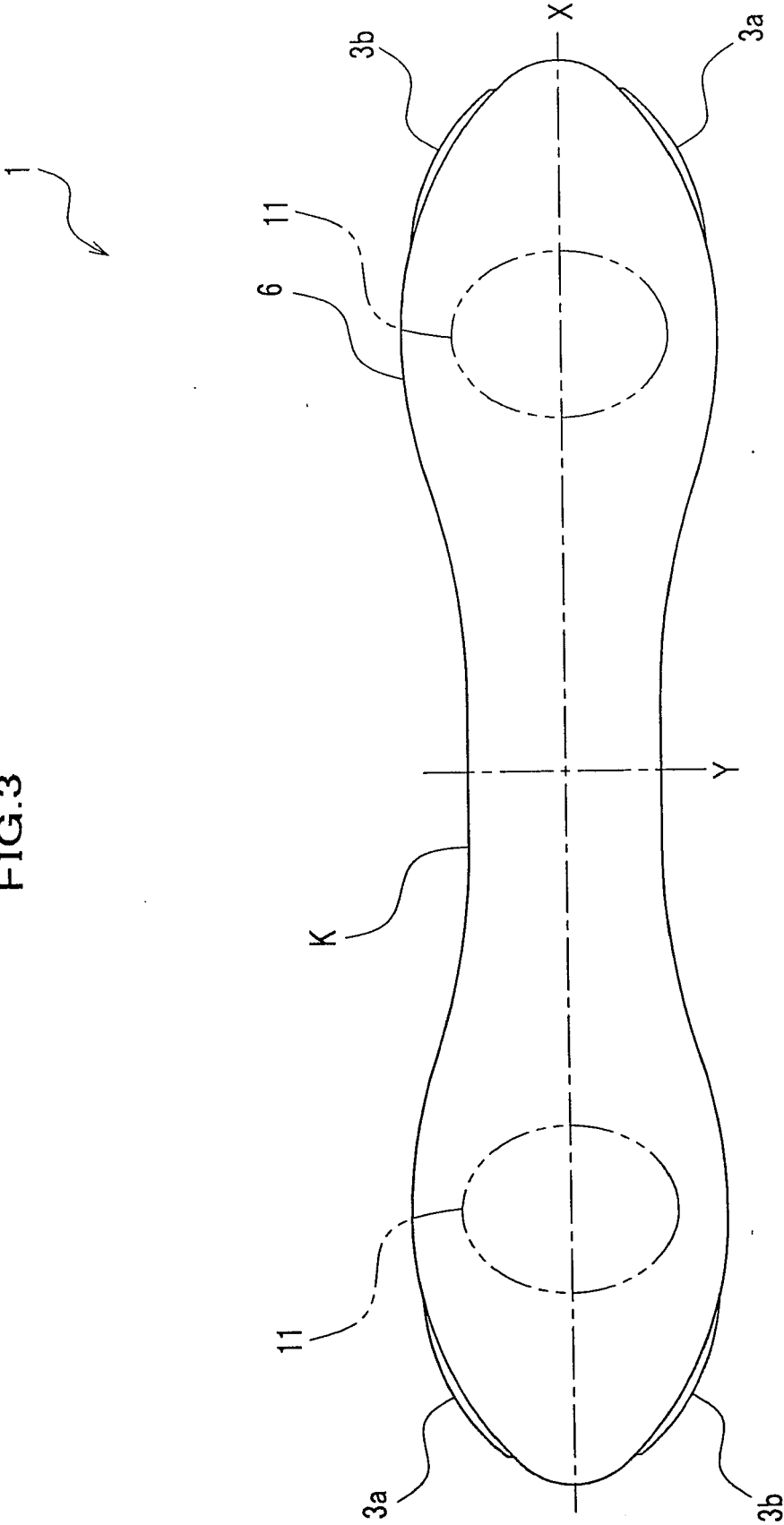


FIG.4

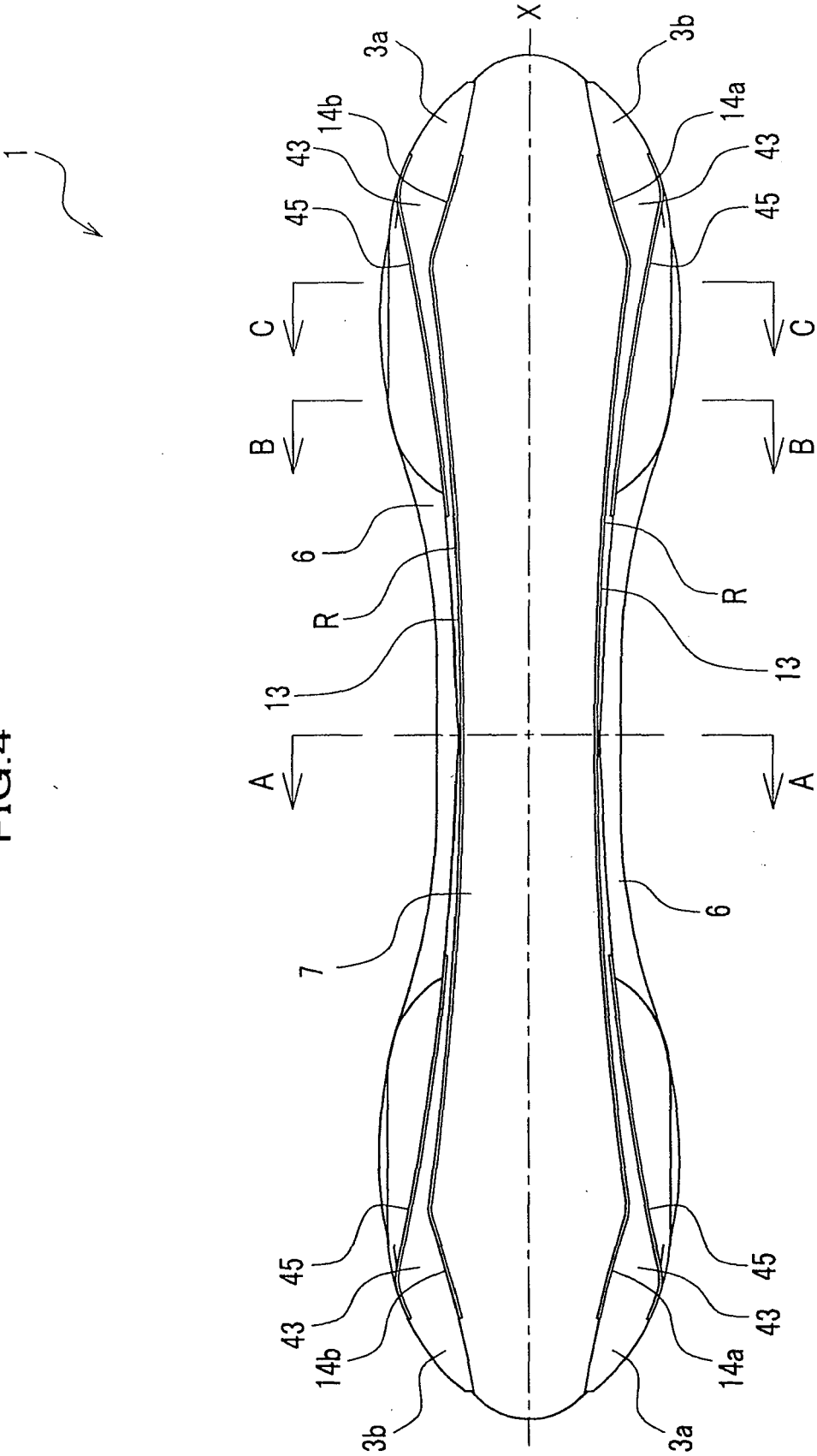
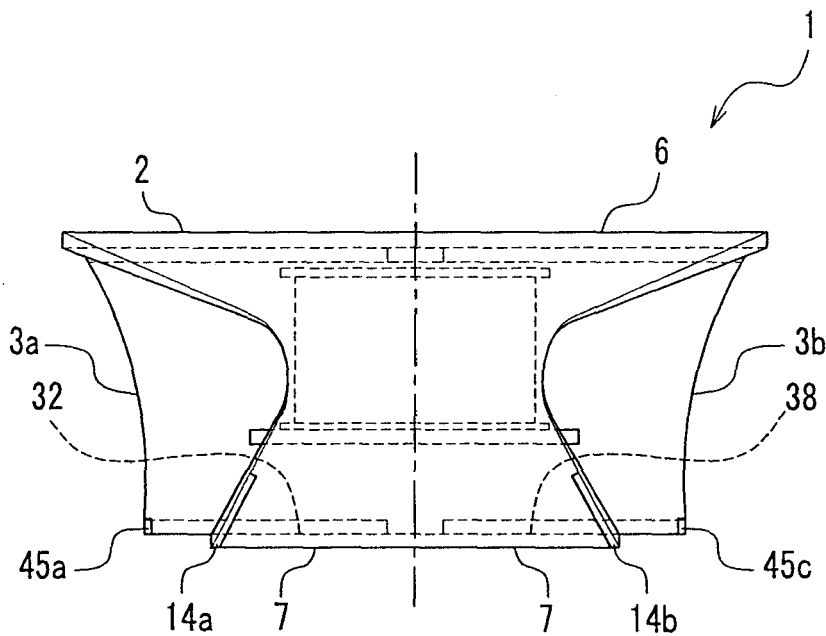


FIG.5



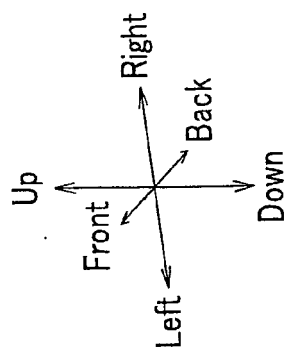
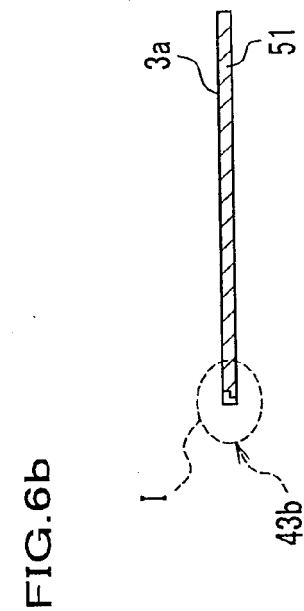
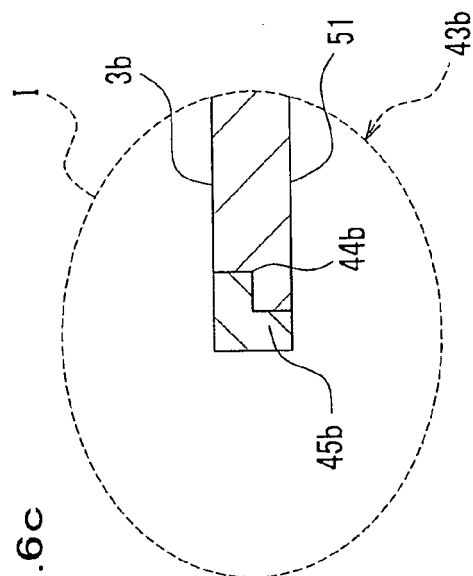
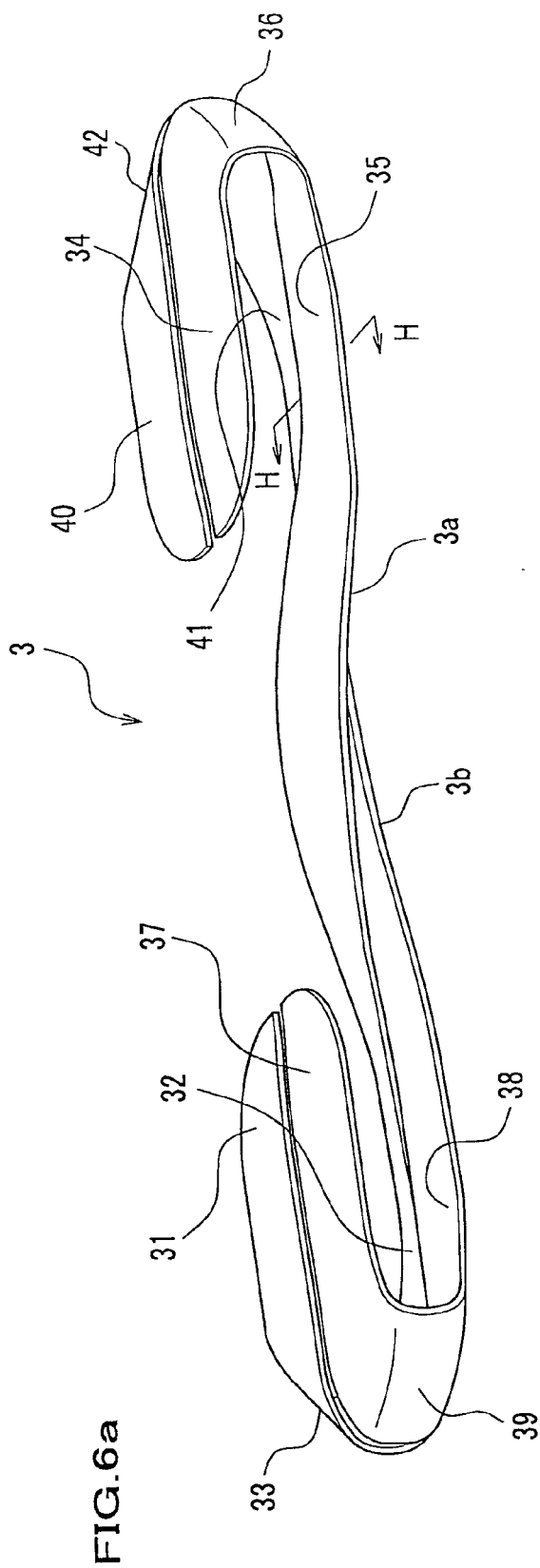


FIG.7

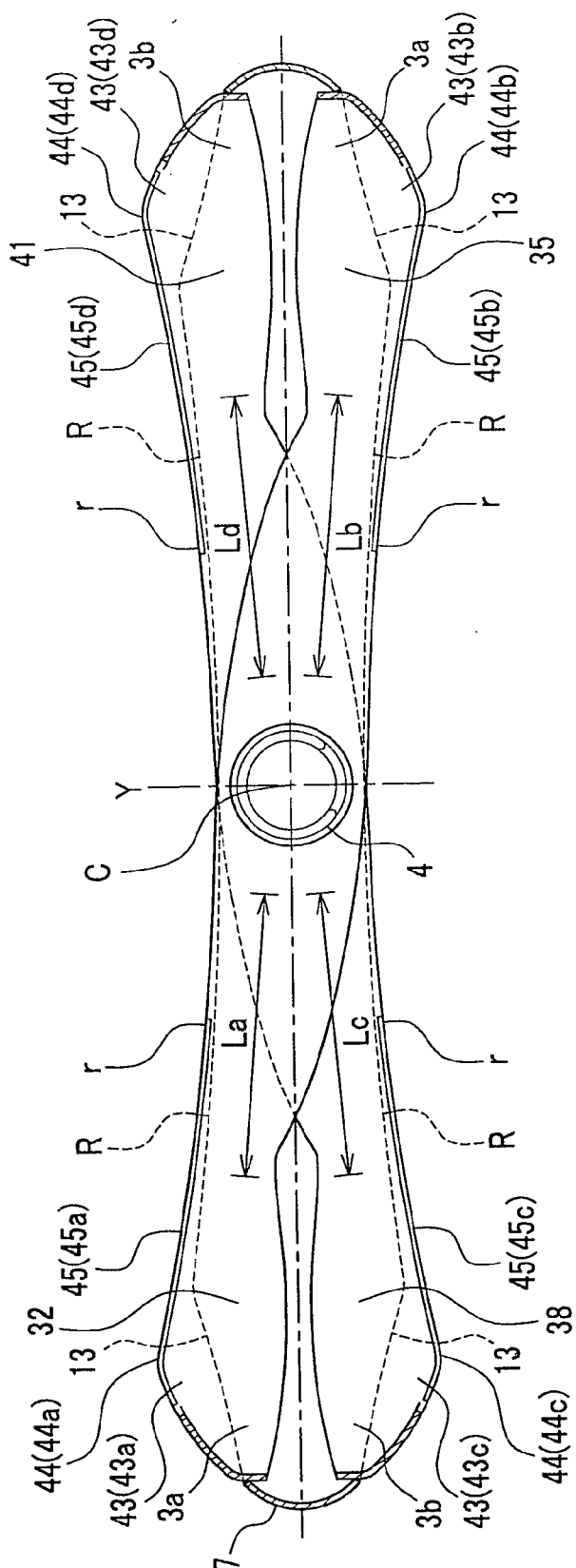


FIG.8

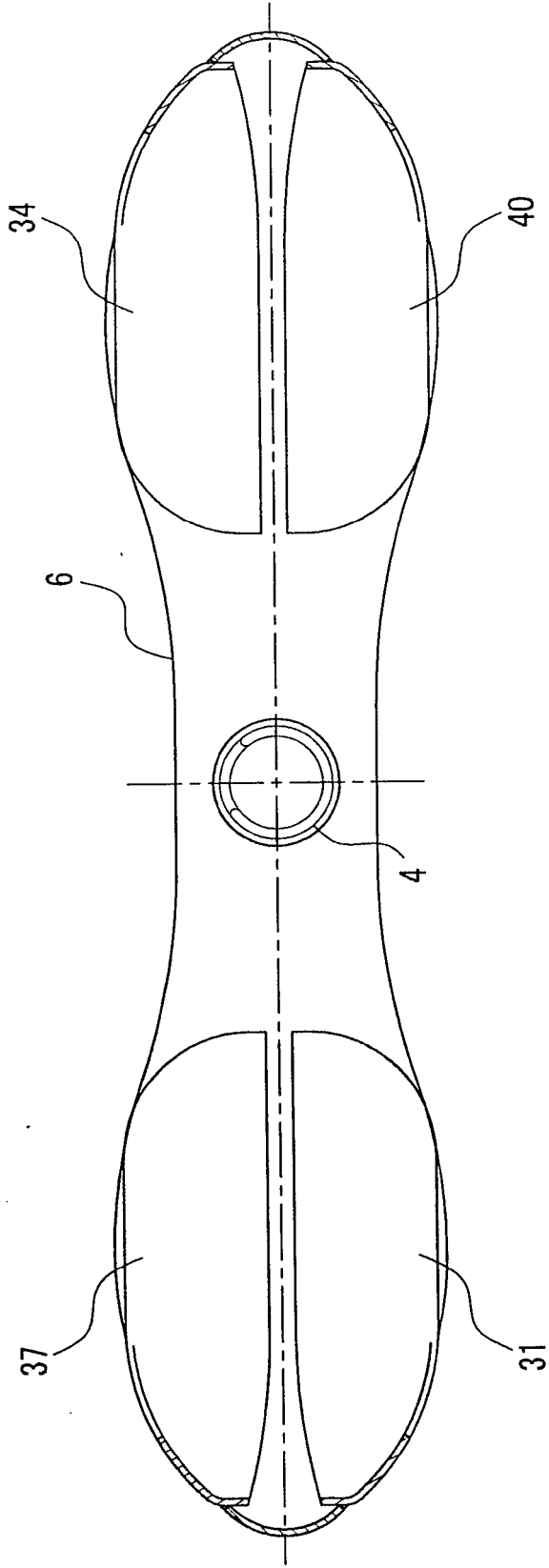


FIG.9

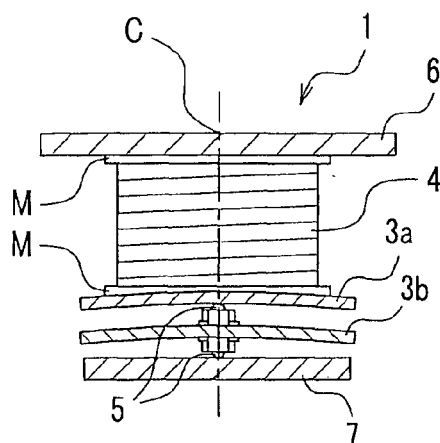


FIG. 10

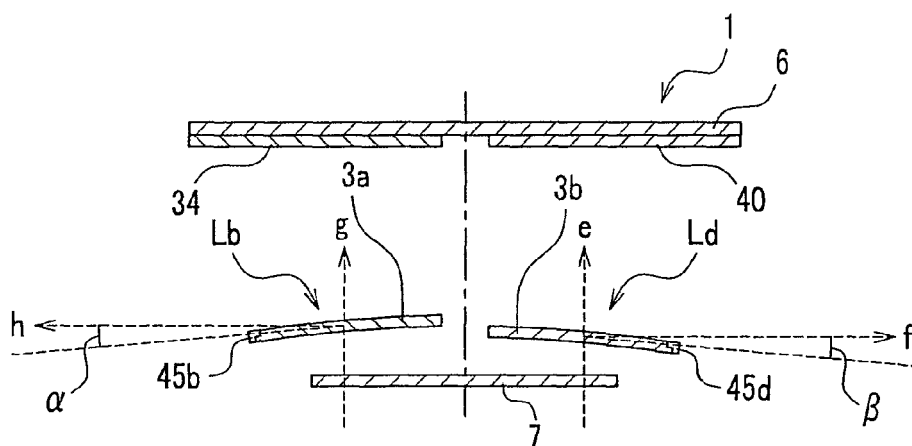


FIG. 11

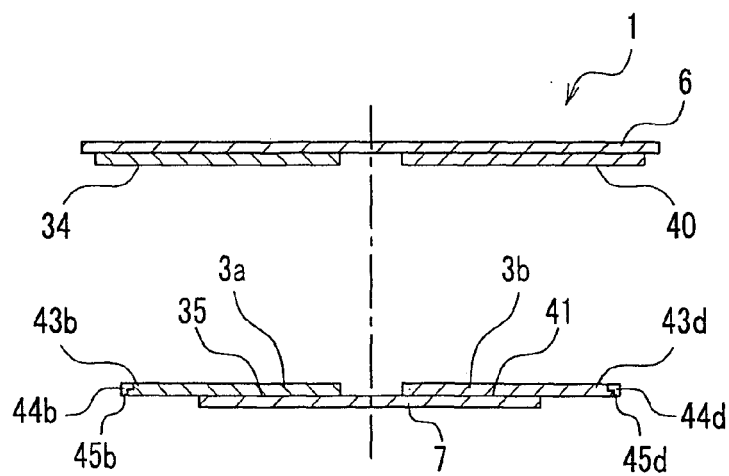


FIG. 12

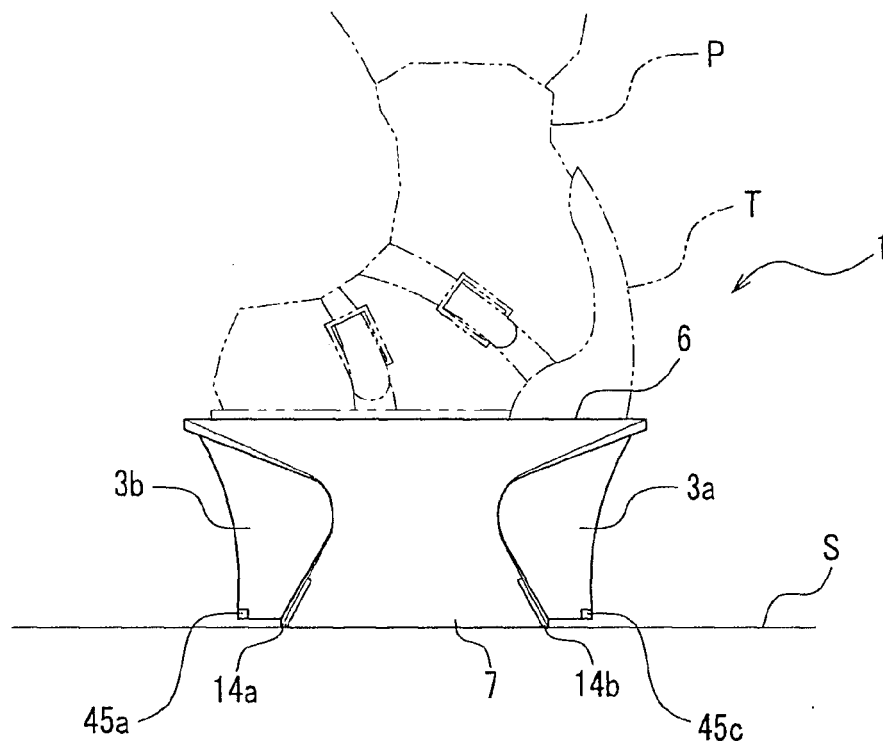


FIG. 13

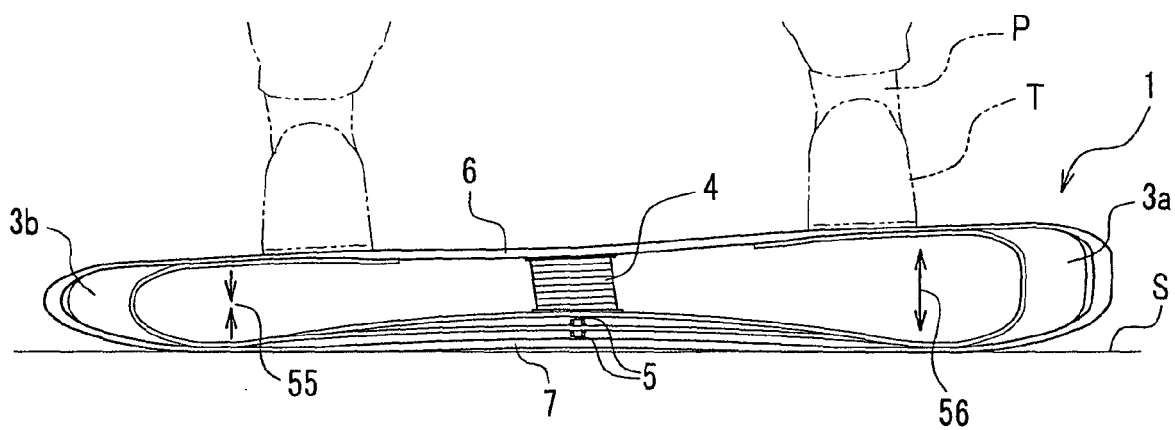


FIG.14a

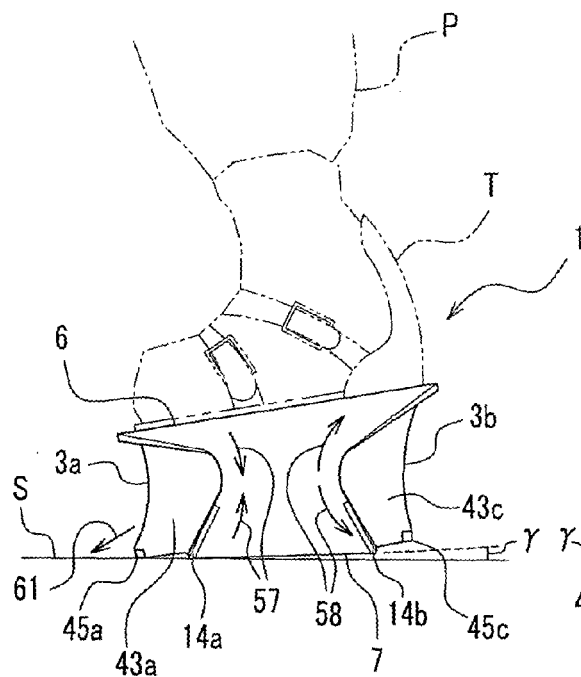


FIG.14b

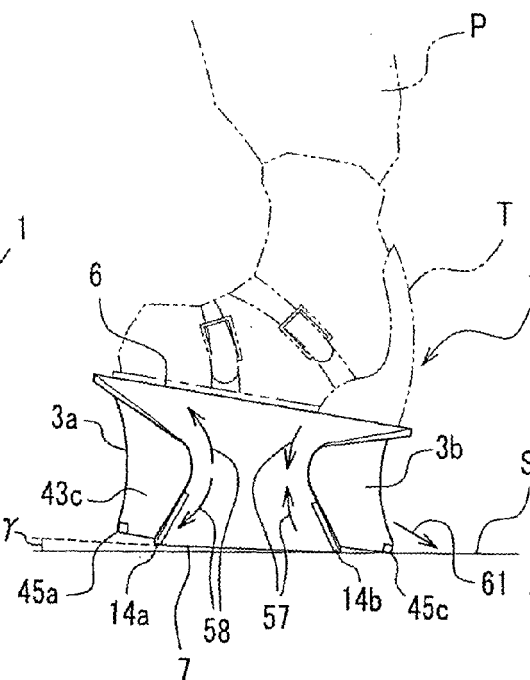


FIG. 15

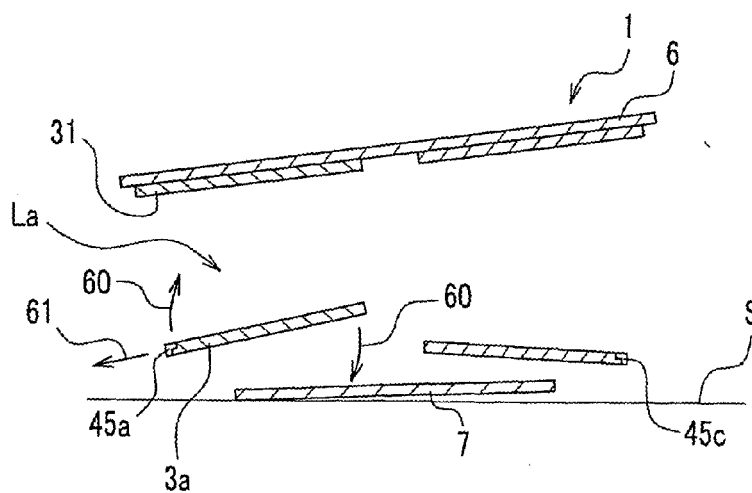


FIG.16

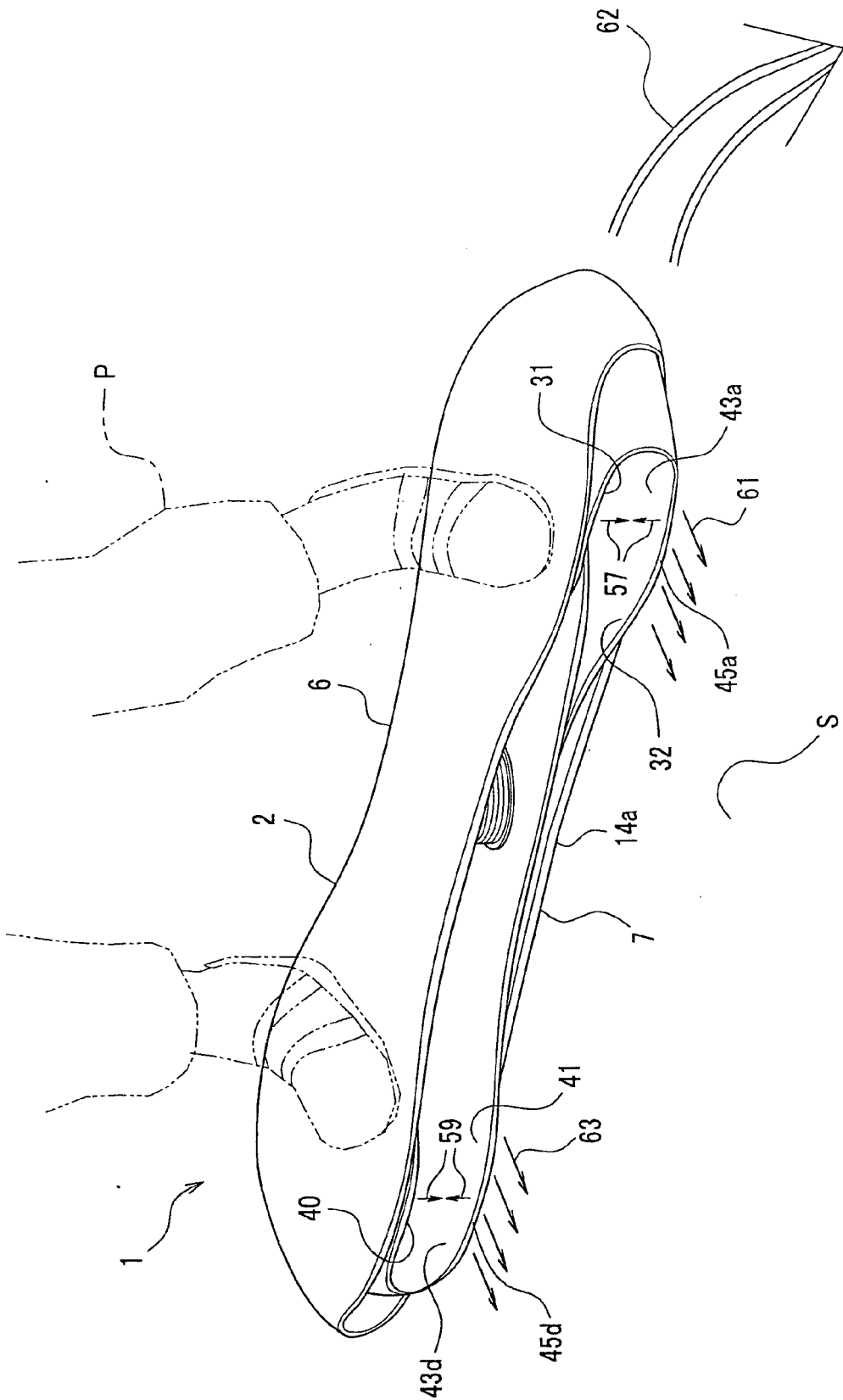


FIG.17a

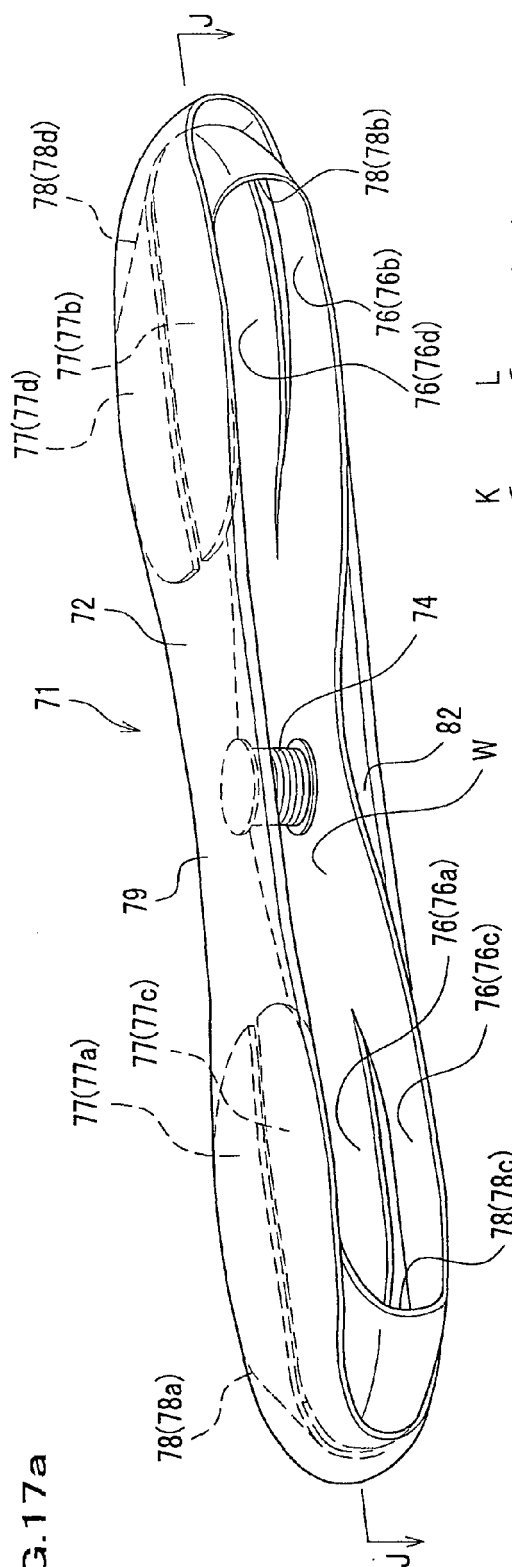


FIG.17b

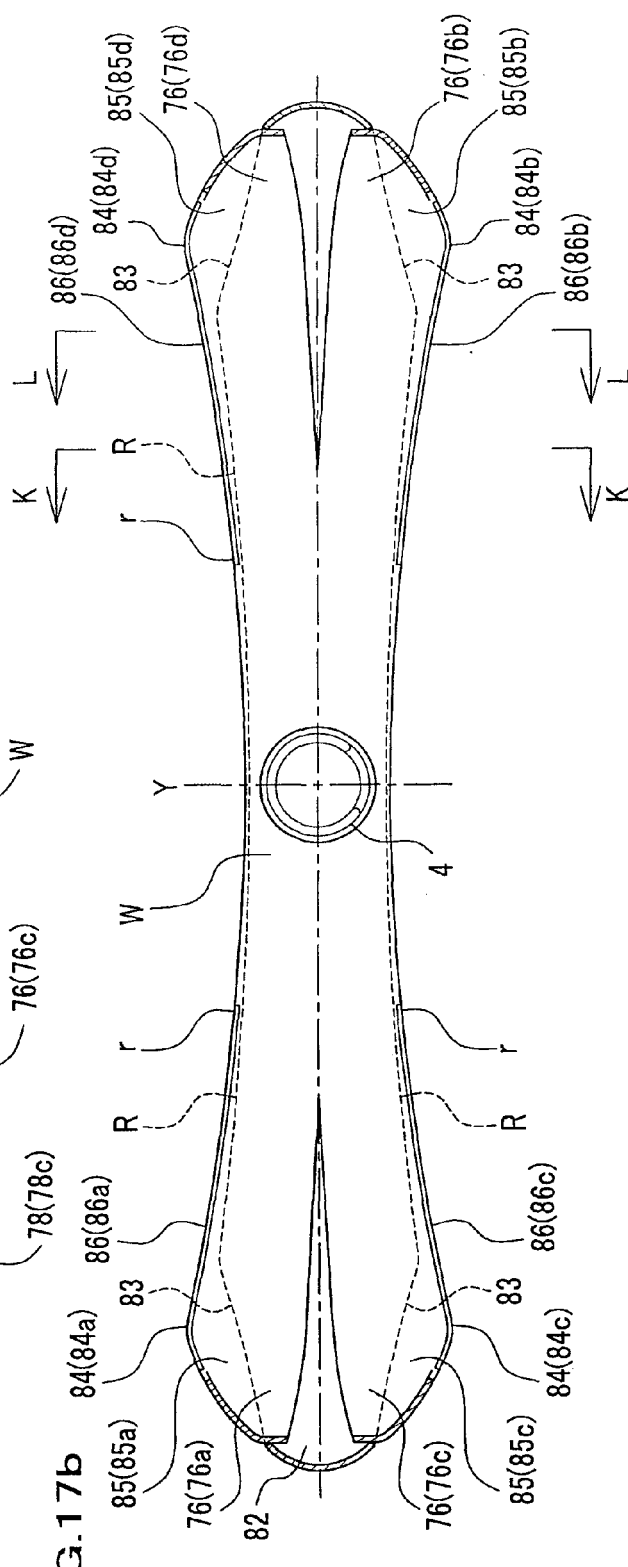


FIG.18a

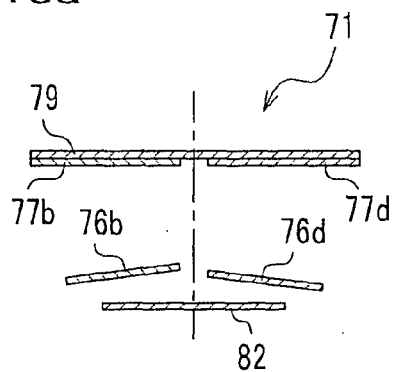


FIG.18b

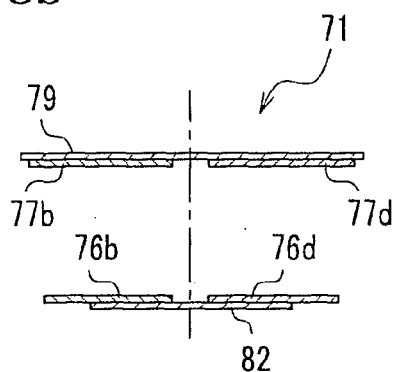


FIG.19

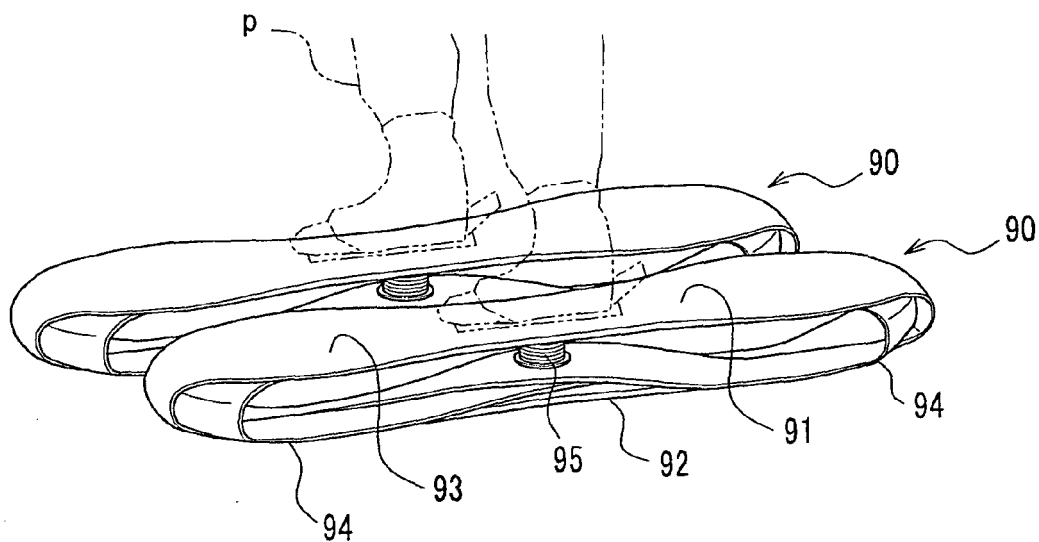


FIG.20a

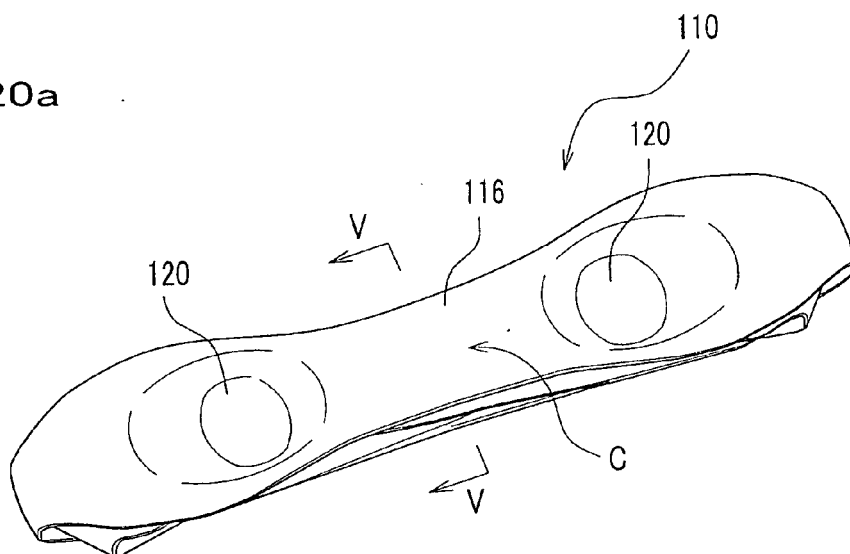


FIG.20b

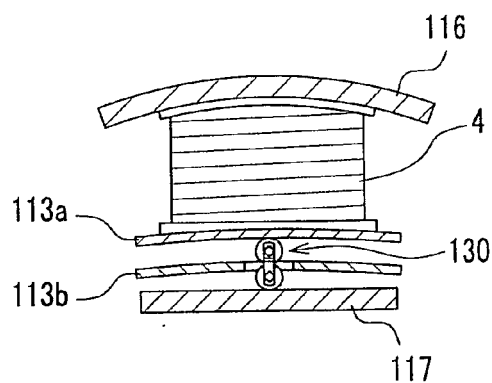


FIG.20c

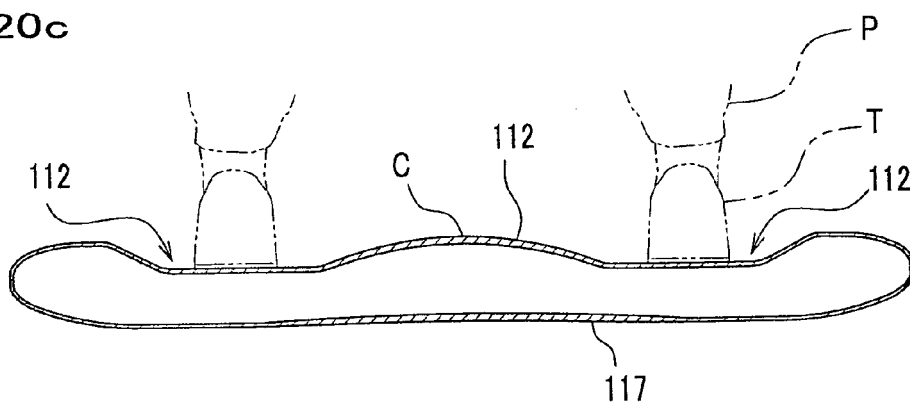


FIG.21a

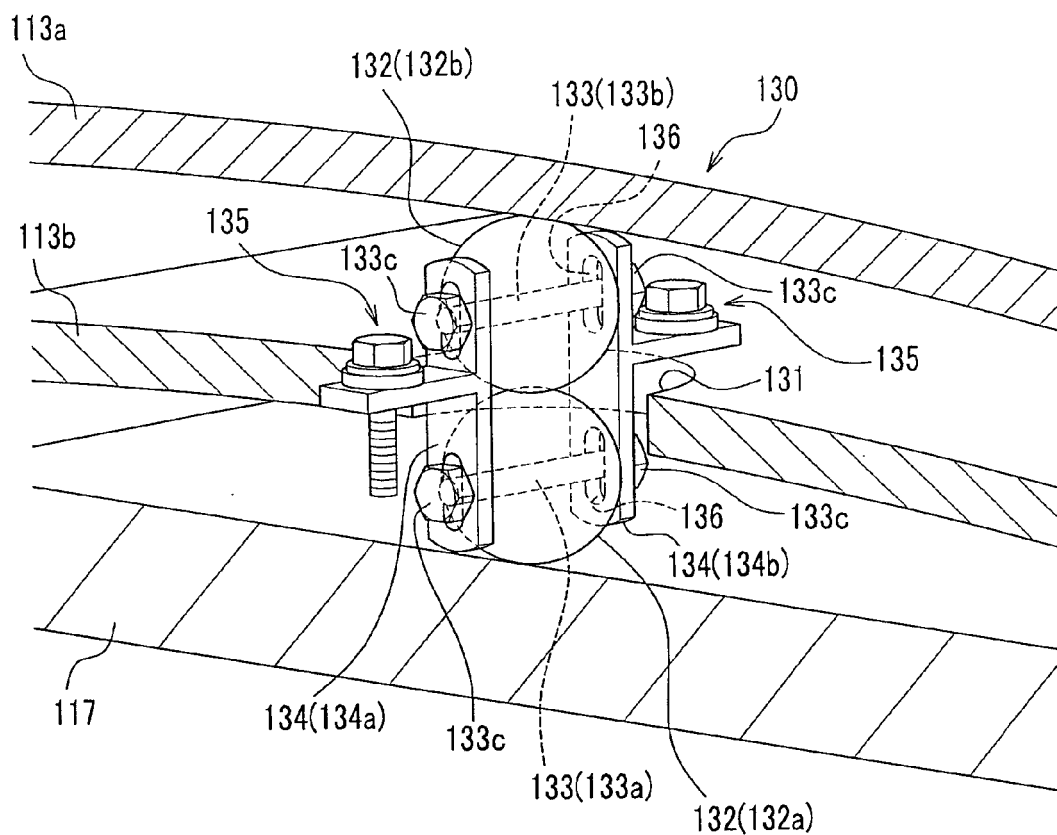


FIG.21b

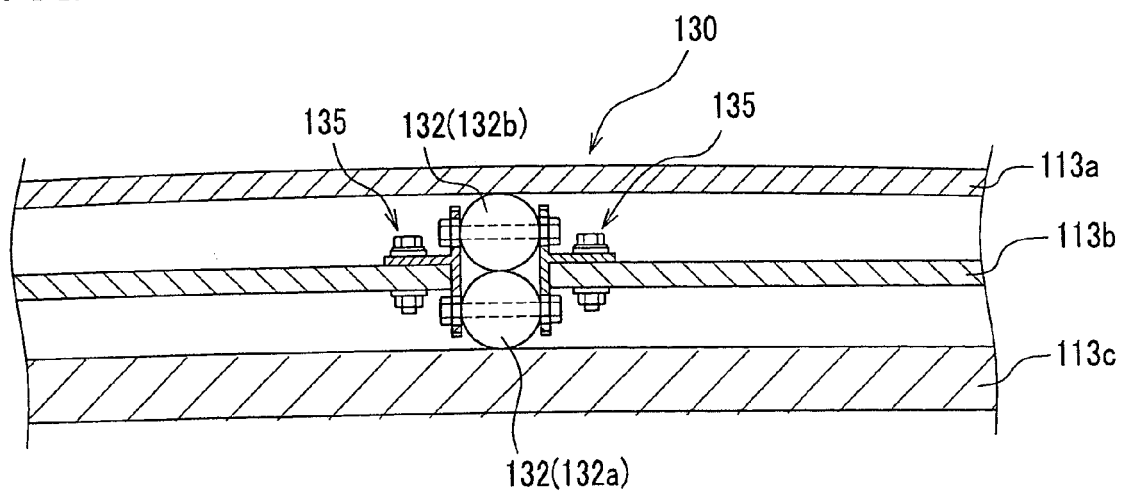
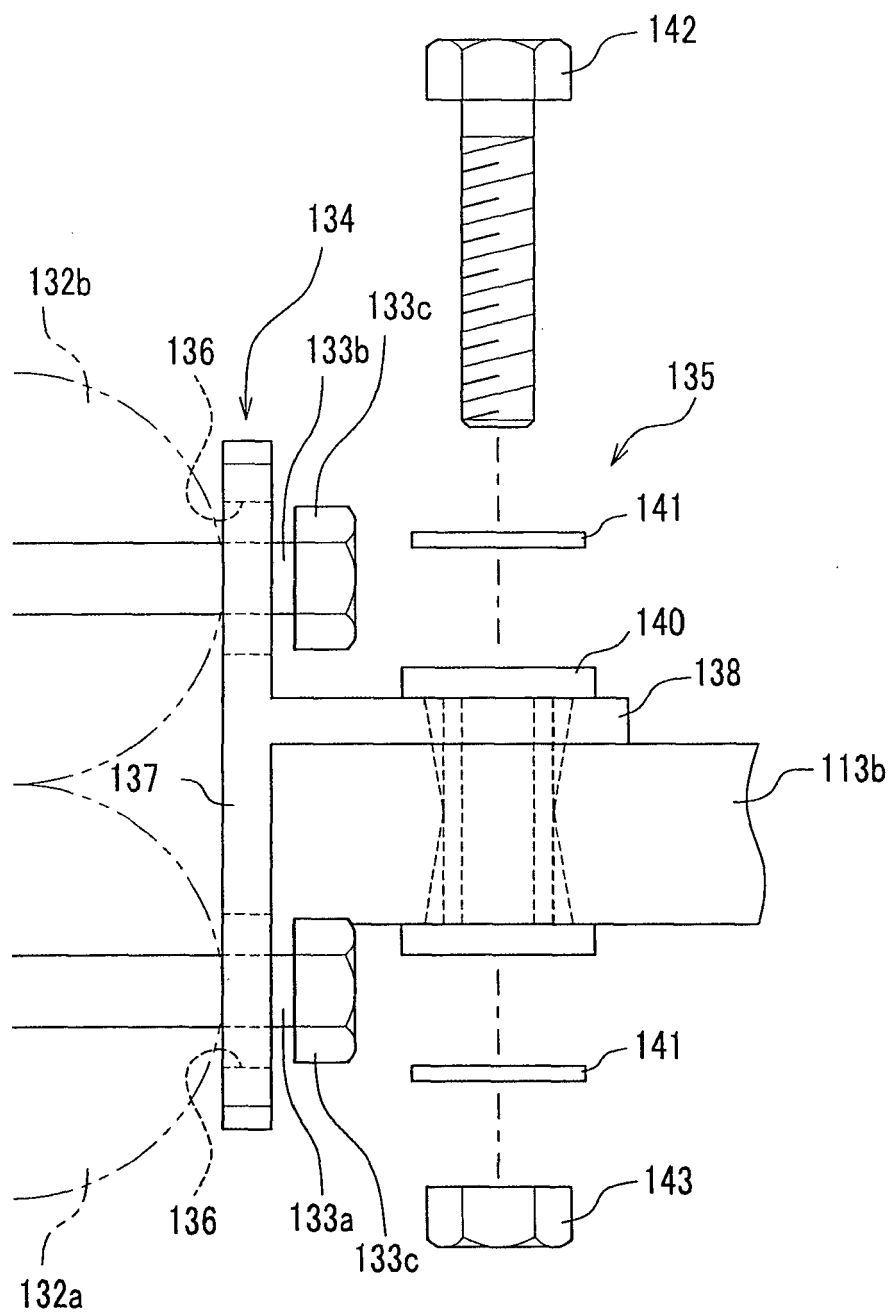


FIG.22



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2007/055038

A. CLASSIFICATION OF SUBJECT MATTER

A63C5/00(2006.01) i

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)

A63C5/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2007
Kokai Jitsuyo Shinan Koho	1971-2007	Toroku Jitsuyo Shinan Koho	1994-2007

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.
Y A	JP 2003-93574 A (K2 Japan Corp.), 02 April, 2003 (02.04.03), Claim 1; Par. Nos. [0008] to [0023]	1-3, 8 4-7, 9
Y A	JP 62-501821 A (KUCHLER, Walter), 23 July, 1987 (23.07.87), Page 5, upper right column, line 15 to lower left column, line 6	1-3, 8 4-7, 9
Y	JP 63-226380 A (Stadthalter, Ludwig), 21 September, 1988 (21.09.88), Page 4, lower right column, lines 6 to 11; Fig. 2	3
Y	JP 10-179835 A (Maker Deutschland GmbH.), 07 July, 1998 (07.07.98), Par. No. [0030]; Figs. 2, 3	8

☒ Further documents are listed in the continuation of Box C.☒ 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 application or patent 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
04 April, 2007 (04.04.07)Date of mailing of the international search report
17 April, 2007 (17.04.07)Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2007/055038

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 10-24140 A (Shigezo FUKUNAKA), 27 January, 1998 (27.01.98), Par. No. [0009]; Fig. 2	8
Y	JP 2001-513411 A (North Shore Parthers), 04 September, 2001 (04.09.01), Par. Nos. [0055], [0056]	8

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

EP 2 002 869 A9 (W1A1)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/JP2007/055038

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		DE 3510717 A	1986.09.25
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JP 63-226380 A	1988.09.21	EP 280164 A2	1988.08.31
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JP 10-24140 A	1998.01.27	(Family: none)	
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		AU 744581 B	2002.02.28
		NZ 503573 A	2001.11.30

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2007/055038

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

The inventions in Claims 1-8 relate to the slide play apparatus.
The invention in Claim 9 relates to the blade.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

the

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, payment of a protest fee..
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2004160095 A [0002]