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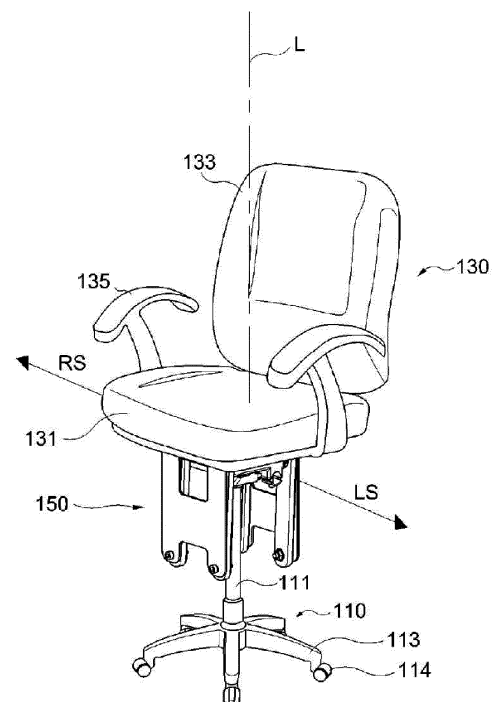
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(54) **CHAIR HAVING SWING MOTION FUNCTION AND SWING MODULE FOR USE THEREIN**

(57) The present invention provides a chair having a swing motion function and a swing module for use therein, the chair comprising: a leg module formed to be supported on the floor; a seat module disposed above the leg module and formed to support the body of a user; and a swing module configured to connect the leg module and the seat module and swing the seat module to both sides of the user with reference to the leg module as the user sitting on the seat module moves from side to side, wherein the swing module comprises: a lower fixed unit coupled to the leg module; an upper moving unit coupled to the seat module; and a link unit having a lower connection end rotatably connected to the lower fixed unit and an upper connection end rotatably connected to the upper moving unit so as to allow the upper moving unit to swing about the lower fixed unit.

Fig. 1



Description

[Technical Field]

[0001] The present invention relates to a chair having a swing motion function and a swing module used therein.

[Background Art]

[0002] Generally, many office workers and students spend most of their time other than mean time sitting in chairs during the day. In such a living environment, their waists often maintain a fixed posture for several tens of minutes to several hours.

[0003] When a person sits on a chair for a long time, their muscles around the shoulders, waist and pelvis become stiff. Particularly, if a person does not have good posture, the above-described symptoms may become more severe. These symptoms can lead to chronic pelvic pain, back pain, and shoulder stiffness.

[0004] In addressing such an issue, a principle solution is to frequently stand up and relax the body by stretching the body and the like, rather than sitting in place for a long time.

[0005] However, it is almost impossible for an office worker or a student to frequently stand up and stretch while the office worker is working or the student is in class. Accordingly, there is a need for realistic measures for preventing the above-described symptoms by allowing such people to exercise in a sitting position.

[Disclosure]

[Technical Problem]

[0006] Therefore, it is one object of the present invention to provide a chair having a swing motion function and a swing module used therein, which enable a worker or a student to exercise a main part of the body while maintaining a posture for work or study while sitting on a chair.

[Technical Solution]

[0007] In accordance with one aspect of the present invention, provided is a chair having a swing motion function, including: a leg module configured to be supported on a floor; a seat module disposed on the leg module and configured to support a user's body; and a swing module configured to connect the leg module and the seat module and swing the seat module to both sides of the user with respect to the leg module according to side-to-side movement of the user sitting on the seat module, wherein the swing module includes: a lower fixed unit coupled to the leg module; an upper movable unit coupled to the seat module; and a link unit having a lower connection end rotatably connected to the lower fixed unit and an upper connection end rotatably connected to the

upper movable unit, the link unit allowing the upper movable unit to perform a swing operation about the lower fixed unit.

[0008] The lower connection end may be positioned closer to the seat module than the upper connection end, such that the upper movable unit is raised as the upper movable unit moves away from the leg module during the swing operation.

[0009] The link unit may include a pair of sub-links arranged parallel to each other, the link unit allowing the upper movable unit to remain in a horizontal position during the swing operation.

[0010] The upper movable unit may include: an upper base coupled with the seat module; and a wing extending from the upper base so as to bend, wherein the upper connection end is connected to the wing.

[0011] The wing may include a pair of sub-wings opposed to each other, wherein the link unit may include: a pair of first sub-links arranged to face one of the pair of sub-wings; and a pair of second sub-links disposed to face the other one of the pair of sub-wings.

[0012] The lower fixed unit may include: a lower base coupled to the leg module; and a pivot rod fixed to the lower base and rotatably connected to one of the pair of first sub-links and one of the pair of second sub-links.

[0013] The link unit may further include a thrust bearing arranged for rotatable connection between the wing and the upper connection end.

[0014] The swing module may further include a stop unit configured to stop the swing operation between the upper movable unit and the lower fixed unit.

[0015] The stop unit may include: an operation lever installed on the lower fixed unit and configured to be rotated; an engagement piece provided to the operation lever and having an engagement portion; and a catch piece provided to the upper movable unit and engaged with the engagement portion as the operating lever is rotated.

[0016] The swing module may further include a restriction unit configured to limit a range of the swing operation between the upper movable unit and the lower fixed unit.

[0017] The restriction unit may include: a first catch piece provided to the lower fixed unit; and a second catch piece provided to the upper movable unit so as to be positioned on a movement trajectory of the first catch piece according to the swing operation, the second catch piece being engaged with the first catch piece during the swing operation.

[0018] The seat module may include: a hip seat coupled to the upper movable unit to support hips of the user; and an armrest disposed at a side of the hip seat and installed on the lower fixed unit.

[0019] The seat module may include a back seat having a tension bar protruding downward and configured to support the user's back, wherein the upper movable unit may include a fixing bracket coupled to the tension bar to support tilting of the back seat.

[0020] In accordance with another aspect of the

present invention, provided is a swing module used in a chair having a swing motion function, the swing module including: a lower fixed unit configured to be coupled to a leg module of the chair; an upper movable unit configured to be coupled to a seat module of the chair; and a link unit having a lower connection end rotatably connected to the lower fixed unit and an upper connection end rotatably connected to the upper movable unit, the link unit allowing the upper movable unit to perform a swing operation about the lower fixed unit, wherein the lower connection end is positioned farther from the leg module than the upper connection end.

[0021] The link unit may include a pair of sub-links arranged parallel to each other, the link unit allowing the upper movable unit to remain in a horizontal position during the swing operation.

[0022] The upper movable unit may include: an upper base coupled to the seat module; and a pair of sub-wings extending from the upper base so as to bend, the sub-wings being opposed to each other, wherein the link unit may include: a pair of first sub-links arranged to face one of the pair of sub-wings; and a pair of second sub-links disposed to face the other one of the pair of sub-wings, wherein each of upper connection ends of the pair of first sub-links may be connected to one of the pair of wings, and each of upper connection ends of the pair of second sub-links may be connected to the other one of the pair of wings.

[Advantageous effects]

[0023] In a chair having a swing motion function and a swing module used thereon according to the present invention configured as described above, when a user sitting on the chair moves their hips in both lateral directions, the swing module operates such that a seat module performs a swing motion to both sides with respect to a leg module. Thereby, the user can exercise their pelvis, waist, hips, abdomen and the like while maintaining the sitting position.

[0024] At this time, since the upper and lower parts of the body such as the head, chest, and feet are almost kept in place, the user can stably maintain the basic posture for work or learning.

[0025] Further, by the combination of a link unit with an upper movable unit and a lower fixed unit of the swing module, the seat module always maintains a horizontal position even during the swing operation. Thereby, the user can always maintain the correct posture during the swing motion, and may not have anxiety about inclination of the body.

[Description of Drawings]

[0026]

FIG. 1 is an assembled perspective view of a chair 100 having a swing motion function according to a

first embodiment of the present invention.

FIG. 2 is an exploded perspective view of the chair 100 having the swing motion function of FIG. 1.

FIG. 3 is an assembled perspective view of the swing module 150 of FIG. 2 seen from another angle.

FIG. 4 is an exploded perspective view of the swing module 150 of FIG. 2.

FIG. 5 is a side view illustrating a state according to a swing operation of the swing module 150 of FIG. 2. FIG. 6 is a side view illustrating another state according to the swing operation of the swing module 150 of FIG. 2.

FIG. 7 is a diagram illustrating usage modes in which a user uses the chair 100 having the swing motion function of FIG. 1.

FIG. 8 is a conceptual diagram illustrating motion of the user's waist according to use of the chair 100 having the swing motion function of FIG. 1.

FIG. 9 is a conceptual diagram illustrating motion of the user's pelvis according to use of the chair 100 having the swing motion function of FIG. 1.

FIG. 10 is an exploded perspective view of a swing module 250 of a chair 200 having a swing motion function according to a second embodiment of the present invention.

FIG. 11 is a partially assembled perspective view showing main parts around a lower fixed unit 255 of FIG. 10.

FIG. 12 is a partially exploded perspective view showing the main parts of FIG. 11 viewed from the bottom side.

FIG. 13 is an assembled perspective view illustrating a relationship between an upper movable unit 251 and a seat module 230 of the chair 200 having the swing motion function according to the second embodiment of the present invention.

[Best mode]

[0027] Hereinafter, a chair having a swing motion function and a swing module used therein according to preferred embodiments of the present invention will be described in detail with reference to the accompanying drawings. In this specification, the same reference numerals are given to the same and similar parts even in different embodiments, and redundant description thereof will be omitted.

[0028] FIG. 1 is an assembled perspective view of a chair 100 having a swing motion function according to a first embodiment of the present invention, and FIG. 2 is an exploded perspective view of the chair 100 having the swing motion function of FIG. 1.

[0029] Referring to the drawings, the chair 100 having a swing motion function may include a leg module 110, a seat module 130, and a swing module 150.

[0030] The leg module 110 is configured to be supported against the floor. In this embodiment, the leg module 110 has a prop 111 and an extension 113. The prop 111

may be a rod extending in a height direction. The extension 113 may include a plurality of rods arranged to radially extend from the prop 111. Instead of the extension 113, an expansion plate formed in a plate shape may be provided. A wheel 114 may be coupled to a lower end of the extension 113.

[0031] The seat module 130 is positioned on an upper side of the leg module 110 and is configured to support a user's body. In this embodiment, the seat module 130 may include a hip seat 131, a back seat 133, and armrests 135. The hip seat 131 may be disposed parallel to the floor, as a portion supporting the user's hips. The back seat 133 is connected to a rear end of the hip seat 131 to support the back of the user. The armrests 135 may be disposed on both sides of the user on the hip seat 131. Of course, the chair 100 may be configured without the back seat 133 and/or the armrests 135.

[0032] The swing module 150 is disposed between the leg module 110 and the seat module 130 to connect the leg module and the seat module. The swing module 150 is configured to swing the seat module 130 to both sides of the user with respect to the leg module 110 according to movement of the seat module 130, specifically, the user sitting on the hip seat 131 to both sides.

[0033] The swing module 150 may include an upper movable unit 151, a lower fixed unit 155, and a link unit 158.

[0034] The upper movable unit 151 may be coupled to a lower end of the hip seat 131 of the seat module 130. In contrast, the lower fixed unit 155 may be coupled to an upper end of the leg module 110. The link unit 158 is rotatably coupled to the upper movable unit 151 and the lower fixed unit 155, respectively. Specifically, one end of the link unit 158 is coupled to the upper movable unit 151, and the other end thereof is coupled to the lower fixed unit 155.

[0035] Specifically, the lower end of the link unit 158 is coupled to the upper movable unit 151 and the upper end of the link unit 158 is coupled to the lower fixed unit 155, such that upper the center of swing motion is at the upper end of the link unit 158. As a result, the lower end of the link unit 158 moves along a trajectory SOT of the swing motion (see FIG. 3). In accordance with such a swing operation, the upper movable unit 151 and the seat module 130 ascend as the upper movable unit and the seat module are moved away from the leg module 110 to both sides during the swing operation.

[0036] Further, the link unit 158 may have four link units (sub-links) (see FIG. 4). The four link units 158 (sub-links) may be symmetrically arranged with respect to an alignment line L.

[0037] According to this configuration, the swing center of the link unit 158 is located above the trajectory SOT of the swing operation. Accordingly, while no force is applied to the seat module 130, the seat module 130 is placed in a standby position thereof aligned with the alignment line L along the prop 111 by the weight thereof.

[0038] In addition, as the seat module 130 swings to

the right side RS and the left side LS of the user, the seat module 130 moves away from the leg module 110. Thereby, the body of the user does not sink at the initial stage of swinging the hips from side to side while the user is positioned on the alignment line L. Thus, the user does not have any anxiety about falling at the initial stage.

[0039] Hereinafter, the configuration of the swing module 150 will be described in detail with reference to FIGS. 3 and 4.

[0040] FIG. 3 is an assembled perspective view of the swing module 150 of FIG. 2 seen from another angle, and FIG. 4 is an exploded perspective view of the swing module 150 of FIG. 2.

[0041] Referring to the drawings, the upper movable unit 151 may have an upper base 152 and wings 153a and 153b. The upper base 152 is coupled to the hip seat 131 (FIG. 1) of the seat module 130. To this end, the upper base 152 may have a top plate having a substantially flat plate shape. The wings 153a and 153b may be bent from the upper base 152 and extend toward the leg module 110. In this embodiment, the wings 153a and 153b have a pair of sub-wings 153a and 253b. The first and second sub-wings 153a and 253b may be disposed substantially perpendicular to the upper base 152.

[0042] The lower fixed unit 155 may include a lower base 156 and a pivot rod 157. The lower base 156 may be coupled to the leg module 110 (FIG. 1) and may have a substantially flat shape. The lower base 156 may be disposed within a space defined by the upper base 152 and the wings 153a and 153b.

[0043] The pivot rod 157 is a member installed in the lower base 156. The pivot rod 157 is an object to which the upper end of the link unit 158 is rotatably coupled. In this embodiment, the link unit 158 has four sub-links 159 and 161, and thus two pivot rods 157 are provided. The two pivot rods 157 may be arranged symmetrically with respect to the alignment line L (see FIG. 1).

[0044] Both ends of the link unit 158 are connected to the upper base 152 and the lower base 156, respectively. The link unit 158 may include a plurality of sub-links. Specifically, in this embodiment, the link unit 158 may include a pair of first sub-links 159 (also referred to as "a pair of sub-links") and another pair of second sub-links 161 (also referred to as "another pair of sub-links"). When the first sub-links 159 are disposed parallel to each other while facing the first sub-wing 153a, the pair of second sub-links 161 may be disposed parallel to each other while facing the second sub-wing 153b. Here, for example, one of the first sub-links 159 and one of the second sub-links 161 are connected to each other by one pivot rod 157.

[0045] The link unit 158, for example, the first sub-links 159 may have an upper connection end 159a and a lower connection end 159b. Here, the upper connection end 159a is the lower end of the first sub-links 159 and the lower connection end 159b is the upper end of the first sub-links 159 in the drawings. The upper connection ends 159a are rotatably connected to the upper movable unit 151 and the lower connection ends 159b are rotat-

ably connected to the lower fixed unit 156. The upper connection ends 159a of the first sub-links 159 are connected to the lower portion of the first sub-wing 153a. The lower connection ends 159b of the first sub-links 159 are connected to the pivot rods 157. Thereby, the lower connection ends 159b are located farther from the leg module 110 (FIG. 1) 159a (higher on the bottom) than the upper connection ends 159a. Thrust bearings 159c and 161c may be used for rotatable connection between the upper connection ends 159a and 161a of the link unit 158 and the wings 153a and 153b and between the lower connection ends 159b and 161b and the lower base 156. The thrust bearings 159c and 161c cause rotation of the link unit 158 along the trajectory SOT of the swing operation (FIG. 3) to be smooth. The thrust bearings 159c and 161c prevents force applied in a direction perpendicular to the plane in which the trajectory SOT of the swing operation is positioned from creating play between the link unit 158 and the upper movable unit 151/lower fixed unit 155.

[0046] Next, a mechanism for enabling the user to swing using the chair 100 having the above-described swing motion function will be described with reference to FIGS. 5 to 7.

[0047] FIG. 5 is a side view illustrating a state according to a swing operation of the swing module 150 of FIG. 2, and FIG. 6 is a side view illustrating another state according to the swing operation of the swing module 150 of FIG. 2.

[0048] Referring to the drawings, when the swing operation of the swing module 150 is performed as a user moves their hips in both lateral directions, the lower fixed unit 155 is always in place, while the upper movable unit 151 moves to the left or right side of the lower fixed unit 155. When the upper movable unit 151 is moved to both sides, the upper movable unit is positioned farther from the lower fixed unit 155 in the height direction than when in the standby position right over the lower fixed unit 155.

[0049] During this swing operation, the parallel arrangement of the pair of sub-links 159/161 parallel to each other is maintained. Thereby, the upper surface of the upper movable unit 151 maintains a horizontal position. This allows the hip seat 131 installed on the upper movable unit 151 to maintain a horizontal position.

[0050] FIG. 7 is a diagram illustrating usage modes in which a user uses the chair 100 having the swing motion function of FIG. 1.

[0051] Referring to the drawing (and FIG. 1), the user may swing the hips to the right side RS or the left side LS while sitting on the seat module 130.

[0052] Thereby, the swing module 150 performs the swing operation, and the seat module 130 is moved to the right side RS or the left side LS. During this movement, the core parts (waist, hips, pelvis, etc.) of the user's body swing to the left and right, while the upper part (head, chest, etc.) and the lower part (foot, etc.) remain upright.

[0053] In addition, as the seat module 130 swings from

the standby position to the right side RS or the left side LS, the seat module 130 moves along a trajectory SET of the swing motion to ascend from the floor. The seat module 130 maintains the horizontal position as it rises.

5 Accordingly, the user's body is not inclined as a whole.

[0054] Further, when the user stops swinging the hips, the swing module 150 returns to the standby position due to gravity.

10 **[0055]** FIG. 8 is a conceptual diagram illustrating motion of the user's waist according to use of the chair 100 having the swing motion function of FIG. 1.

[0056] Referring to this drawing, the seat module 130 may be displaced by the swing operation of the swing module 150 by approximately 70 mm to the left and right and thus swung in a range of 140 mm. In this case, upon reaching the points of the maximum left/right displacement of 70 mm, the seat module 130 may be raised by about 18 mm.

15 **[0057]** In this process, the user's waist may be tilted by up to about 15° to the left/right. As a result, the waist swings to the left and right in the range of 30°. Accordingly, the issue of the stiff state of the waist that is held without the left/right swing while the user is sitting on the seat module 130 may be addressed.

20 **[0058]** Specifically, the user may swing their hips, sides, pelvis, thighs, waist, intestinal organs and the like together with the seat module 130 by swinging their hips to both sides RS and LS. Such swing motion of the user is mainly caused by swinging of the hips and waist to the left and right.

25 **[0059]** Accordingly, the user's chest, shoulders, head, and the like move relatively little. In addition, since the main moving parts such as the hips are covered by the desk, it may be hardly revealed to others that the swinging motion is being performed.

30 **[0060]** FIG. 9 is a conceptual diagram illustrating motion of the user's pelvis according to use of the chair 100 having the swing motion function of FIG. 1.

35 **[0061]** Referring to this drawing, when the seat module 130 is displaced to the left or right by the action of the swing module 150, the user's thighs, specifically the user's pelvis, is rotated inward and outward in a range of about 20°.

40 **[0062]** By opening and closing of the pelvis, the pelvis may be prevented from being twisted as compared with the case where the user is sitting still on the seat module 130.

45 **[0063]** Hereinafter, another form of the swing module 150 will be described with reference to FIGS. 10 to 12.

50 **[0064]** FIG. 10 is an exploded perspective view of a swing module 250 of a chair 200 having a swing motion function according to a second embodiment of the present invention, and FIG. 11 is a partially assembled perspective view showing main parts around a lower fixed unit 255 of FIG. 10.

55 **[0065]** Referring to the drawings, the chair 200 having a swing motion function is substantially the same as the chair 100 having the swing motion function of the previ-

ous embodiment, but differs from the previous embodiment in configuration of the swing module 250. Specifically, the basic elements of the swing module 250, the upper movable unit 251, the lower fixed unit 255, and the link unit 258, are substantially the same as those of the swing module 150 of the previous embodiment. The swing module 250 may further include a stop unit 263 and a restriction unit 265 as compared with the swing module 150 of the previous embodiment. In addition, the seat module 230 has armrests 235 of a different type from the armrests of the seat module 130. Hereinafter, the swing module 250 and the like according to this embodiment will be described, focusing on differences from the previous embodiment.

[0066] First, the stop unit 263 is an element for stopping the swing operation between the upper movable unit 251 and the lower fixed unit 255. The stop unit 263 may include an operation lever 263a, an engagement piece 263b, and a catch piece 263c. The operation lever 263a is a rod extending in a substantially linear shape and may be rotatably inserted into the lower base 256 of the lower fixed unit 255. A part of the free end of the operation lever 263a may be bent for convenience of the user's operation. The engagement piece 263b is positioned on the upper surface side of the lower base 256 while being coupled to the operation lever 263a. An engagement portion, for example, an insertion groove 263b' may be formed in the engagement piece 263b. The catch piece 263c may be installed on the upper plate of the upper base 252 of the upper movable unit 251. The catch piece 263c may be formed by bending a part of the upper plate of the upper base 252 and may protrude toward the lower base 256. According to this configuration, when the user rotates the operation lever 263a, the engagement piece 263b is switched from a position at which the engagement piece lies on the lower base 256 to an upright position. In this process, the engagement piece 263c is fitted into the engagement portion 263b' of the engagement piece 263b. Thereby, when the upper base 256 of the upper movable unit 251 moves along the trajectory of the swing operation, the catch piece 263c does not move because it is engaged with the engagement piece 263b. As a result, the upper base 252 formed on the catch piece 263c is blocked from moving and is fixed in place. Thus, since the operation of the swing module 250 is stopped, the user is allowed to safely use the chair 200 even in a case where the user stands on the chair 200 (the seat module 230) to replace a bulb.

[0067] The restriction unit 265 is an element for restricting the range of the swing operation between the upper movable unit 251 and the lower fixed unit 255. The restriction unit 265 may have a first catch piece 265a and 265b and a second catch piece. The first catch piece 265a and 265b is a projection protruding from the upper surface of the lower base 256. In this embodiment, the first catch piece may be formed of two projections 265a and 265b at positions spaced apart from each other along the trajectory of the swing operation. The second catch

piece may be installed on the bottom surface of the upper base 252 of the upper movable unit 251 and disposed between the two projections 265a and 265b. As the second catch piece, the catch piece 263c described above may be used. In this case, the catch piece 263c is one member, but may be engaged with the engagement piece 263b when the engagement piece 263b is positioned upright and engaged with the first engagement piece 265a and 265b when the engagement piece 263b is laid down. According to such a configuration, while the user swings the hips to both sides, the catch piece 263c, which is the second catch piece, is caught by the two projections 265a and 265b of the first catch piece. Accordingly, the range of the swing motion of the upper movable unit 251 with respect to the lower fixed unit 255 may be limited. This may reduce user inconvenience caused according to the swing motion of the seat module 230 occurring when the chair 200 is moved by holding the seat module 230.

[0068] The armrests 235 of the seat module 230 may be provided to the swing module 250 rather than to the hip seat 131 (see FIG. 2). Specifically, the armrests 235 may be provided to the lower base 256 of the lower fixed unit 255. This configuration will be further described with reference to FIG. 12.

[0069] FIG. 12 is a partially exploded perspective view showing the main parts of FIG. 11 viewed from the bottom side.

[0070] Referring to the drawing, the lower base 256 may be provided with an installation groove 256a. The installation groove 256a may be formed so as to be exposed to the outside to secure the view of the operator. Specifically, the installation groove 256a may have a shape of a pipe that is cut in an axial direction thereof.

[0071] The armrests 235 are coupled to the lower base 256 while being placed in the installation groove 256a. Specifically, the armrest 235 may include a frame 235a and a fastening piece 235c. The frame 235a may be a hollow pipe body. The frame 235a may be shaped to extend in a lateral direction of the lower base 256, then extend upward, and then extend back toward the back seat 133 (see FIG. 1). An edge section of the frame 235a may be provided with a cutaway groove 235b. The cutaway groove 235b starts at one end of the frame 235a and extends in the edge section in the longitudinal direction of the frame 235a. The fastening piece 235c is fastened to a fastening groove 256b, which is formed in the installation groove 256a of the lower base 256. For this purpose, the fastening piece 235c may be arranged in a direction perpendicular to the extension direction of the installation groove 256a. When the frame 235a is moved in the longitudinal direction of the installation groove 256a, the cutaway groove 235b serves as a passage through which the fastening piece 235c is inserted. A washer 235d may be disposed between the head of the fastening piece 235c and the frame 235a. The washer 235d serves to enhance coupling between the fastening piece 235c and the frame 235a and may have a shape

corresponding to the outer surface of the frame 235a.

[0072] According to this configuration, the armrests 235 are installed on the lower fixed unit 255. Accordingly, even when the upper movable unit 251 and the hip seat 131 (see FIG. 1) are swung to the left and right by the swing operation, the user's arms may be fixedly supported on the armrests 235. Accordingly, even when the user makes the swinging motion using the chair 200 in the absence of a desk to place the arms on, the user's arms may not be shaken. Further, according to the installation structure of the armrests 235, the frame 235a can be detachably fastened with the fastening piece 235c without being weld to the lower base 256. In this case, coupling between the frame 235a and the lower base 256 can be stably maintained, and the armrests 235 can be easily replaced as needed.

[0073] Hereinafter, the coupling relationship between the upper movable unit 251 and the back seat 233 will be described with reference to FIG. 13.

[0074] FIG. 13 is an assembled perspective view illustrating a relationship between an upper movable unit 251 and a seat module 230 of the chair 200 having the swing motion function according to the second embodiment of the present invention.

[0075] Referring to the drawing, a fixing bracket 254 protrudes from the back of the upper base 252 of the upper movable unit 251. The fixing bracket 254 is positioned under the hip seat (not shown), which is placed on the upper base 152.

[0076] The fixing bracket 254 is coupled to a tension bar 234 protruding from the lower end of the back seat 233. The fixed frame 234 may be formed of a metal material or a plastic material having high strength.

[0077] As the tension bar 234 is coupled to the fixing bracket 254, the back seat 233 is coupled to the upper movable unit 251 of the swing module 250, not to the hip seat (not shown). As a result, the back seat 233 and the hip seat (not shown) may be coupled to the upper movable unit 251, and the armrests 235 may be coupled to the lower fixed unit 255 (see FIG. 10).

[0078] Thus, when the user leans backward, the back seat 233 may be tilted around the tension bar 234 due to the coupling between the tension bar 234 and the fixing bracket 254. Thereby, the user can lean against the back seat 233 to take a more comfortable posture.

[0079] The chair having the swing motion function and the swing module used therein are not limited to the configuration and operation of the embodiments described above. All or some of the embodiments may be selectively combined to make various modifications.

[Industrial Applicability]

[0080] The present invention is industrially applicable in the manufacturing field of a chair having a swing motion function and a swing module used therein.

Claims

1. A chair having a swing motion function, comprising:

a leg module configured to be supported on a floor;
a seat module disposed on the leg module and configured to support a user's body; and
a swing module configured to connect the leg module and the seat module and swing the seat module to both sides of the user with respect to the leg module according to side-to-side movement of the user sitting on the seat module, wherein the swing module comprises:

a lower fixed unit coupled to the leg module;
an upper movable unit coupled to the seat module; and
a link unit having a lower connection end rotatably connected to the lower fixed unit and an upper connection end rotatably connected to the upper movable unit, the link unit allowing the upper movable unit to perform a swing operation about the lower fixed unit.

2. The chair of claim 1, wherein the lower connection end is positioned closer to the seat module than the upper connection end, such that the upper movable unit is raised as the upper movable unit moves away from the leg module during the swing operation.

3. The chair of claim 1, wherein the link unit comprises a pair of sub-links arranged parallel to each other, the link unit allowing the upper movable unit to remain in a horizontal position during the swing operation.

4. The chair of claim 1, wherein the upper movable unit comprises:

an upper base coupled with the seat module; and
a wing extending from the upper base so as to bend, wherein the upper connection end is connected to the wing.

5. The chair of claim 4, wherein the wing comprises a pair of sub-wings opposed to each other, wherein the link unit comprises:

a pair of first sub-links arranged to face one of the pair of sub-wings; and
a pair of second sub-links disposed to face the other one of the pair of sub-wings.

6. The chair of claim 5, wherein the lower fixed unit

comprises:

a lower base coupled to the leg module; and
a pivot rod fixed to the lower base and rotatably
connected to one of the pair of first sub-links and
one of the pair of second sub-links. 5

7. The chair of claim 4, wherein the link unit further comprises:
a thrust bearing arranged for rotatable connection
between the wing and the upper connection end. 10

8. The chair of claim 1, wherein the swing module further comprises:
a stop unit configured to stop the swing operation
between the upper movable unit and the lower fixed
unit. 15

9. The chair of claim 8, wherein the stop unit comprises:
an operation lever installed on the lower fixed
unit and configured to be rotated;
an engagement piece provided to the operation
lever and having an engagement portion; and
a catch piece provided to the upper movable unit
and engaged with the engagement portion as
the operating lever is rotated. 20 25

10. The chair of claim 1, wherein the swing module further comprises:
a restriction unit configured to limit a range of the
swing operation between the upper movable unit and
the lower fixed unit. 30

11. The chair of claim 10, wherein the restriction unit comprises:
a first catch piece provided to the lower fixed
unit; and
a second catch piece provided to the upper movable
unit so as to be positioned on a movement
trajectory of the first catch piece according to
the swing operation, the second catch piece being
engaged with the first catch piece during the
swing operation. 35 40 45

12. The chair of claim 1, wherein the seat module comprises:
a hip seat coupled to the upper movable unit to
support hips of the user; and
an armrest disposed at a side of the hip seat and
installed on the lower fixed unit. 50

13. The chair of claim 1, wherein the seat module comprises:
a back seat having a tension bar protruding 55

downward and configured to support the user's
back,
wherein the upper movable unit comprises:
a fixing bracket coupled to the tension bar to
support tilting of the back seat.

14. A swing module used in a chair having a swing motion function, the swing module comprising:

a lower fixed unit configured to be coupled to a
leg module of the chair;
an upper movable unit configured to be coupled
to a seat module of the chair; and
a link unit having a lower connection end rotatably
connected to the lower fixed unit and an upper
connection end rotatably connected to the
upper movable unit, the link unit allowing the upper
movable unit to perform a swing operation
about the lower fixed unit,
wherein the lower connection end is positioned
farther from the leg module than the upper connection
end, and
wherein the link unit comprises a pair of sub-links
arranged parallel to each other, the link unit
allowing the upper movable unit to remain in a
horizontal position during the swing operation.

15. The swing module of claim 14, wherein the upper movable unit comprises:

an upper base coupled to the seat module; and
a pair of sub-wings extending from the upper
base so as to bend, the sub-wings being opposed
to each other,
wherein the link unit comprises:

a pair of first sub-links arranged to face one
of the pair of sub-wings; and
a pair of second sub-links disposed to face
another one of the pair of sub-wings,
wherein each of upper connection ends of
the pair of first sub-links is connected to one
of the pair of wings, and each of upper connection
ends of the pair of second sub-links is connected
to the other one of the pair of wings.

Fig. 1

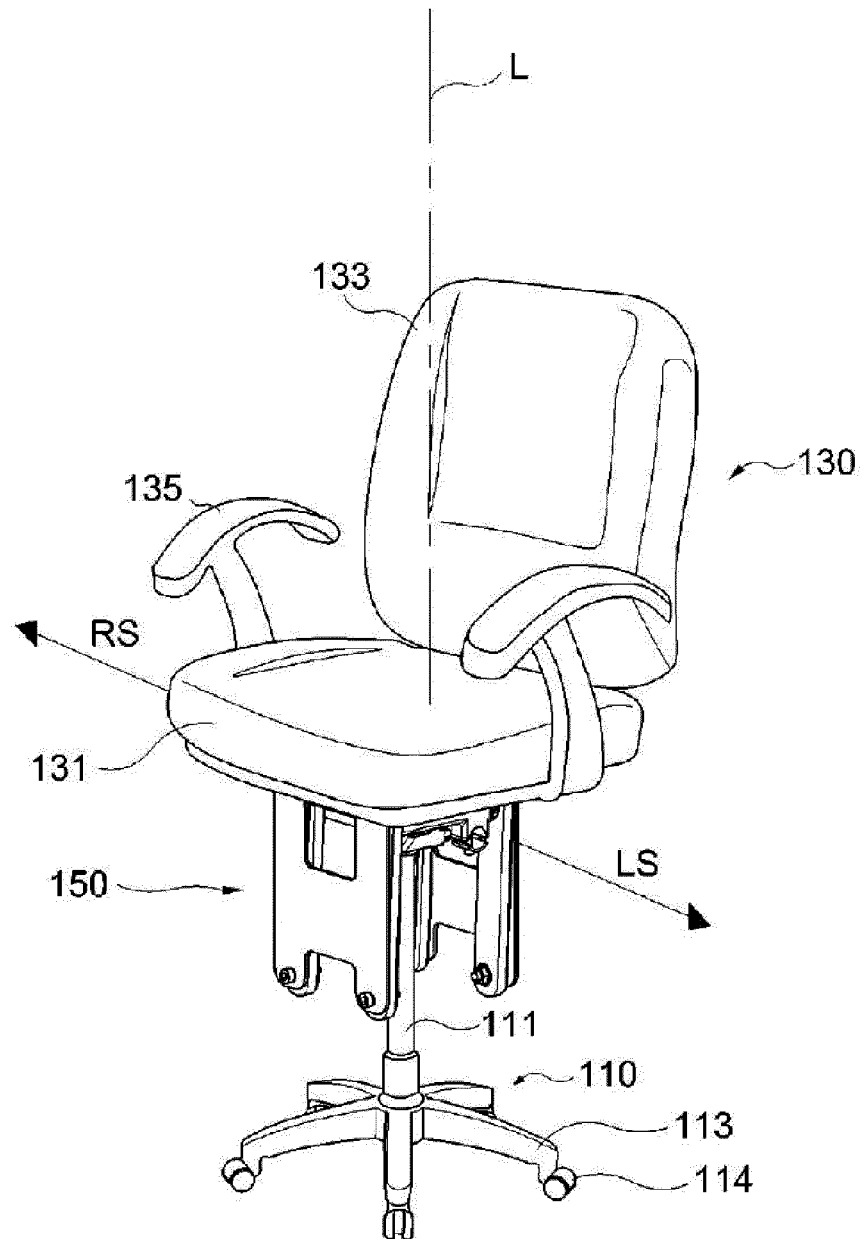


Fig. 2

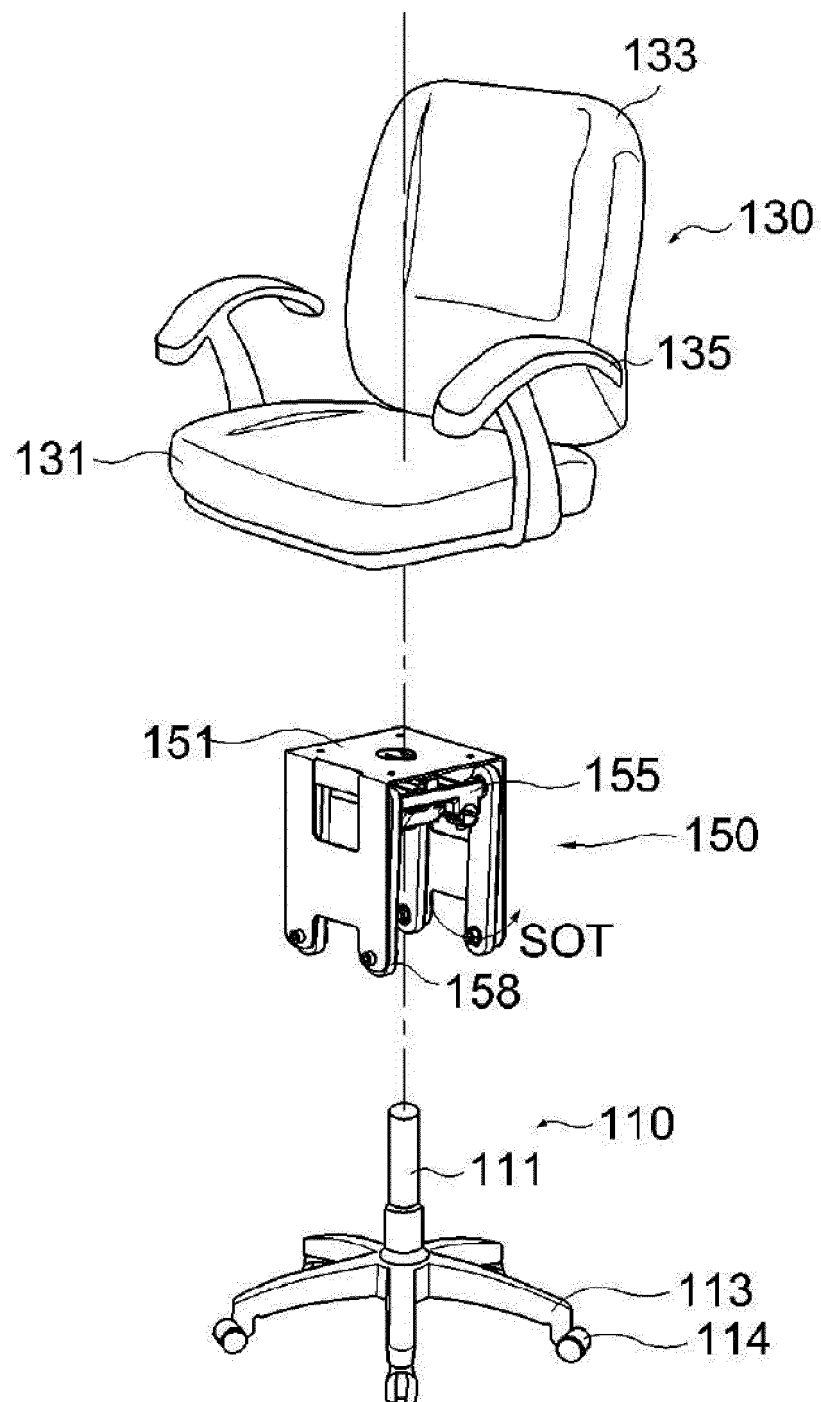


Fig. 3

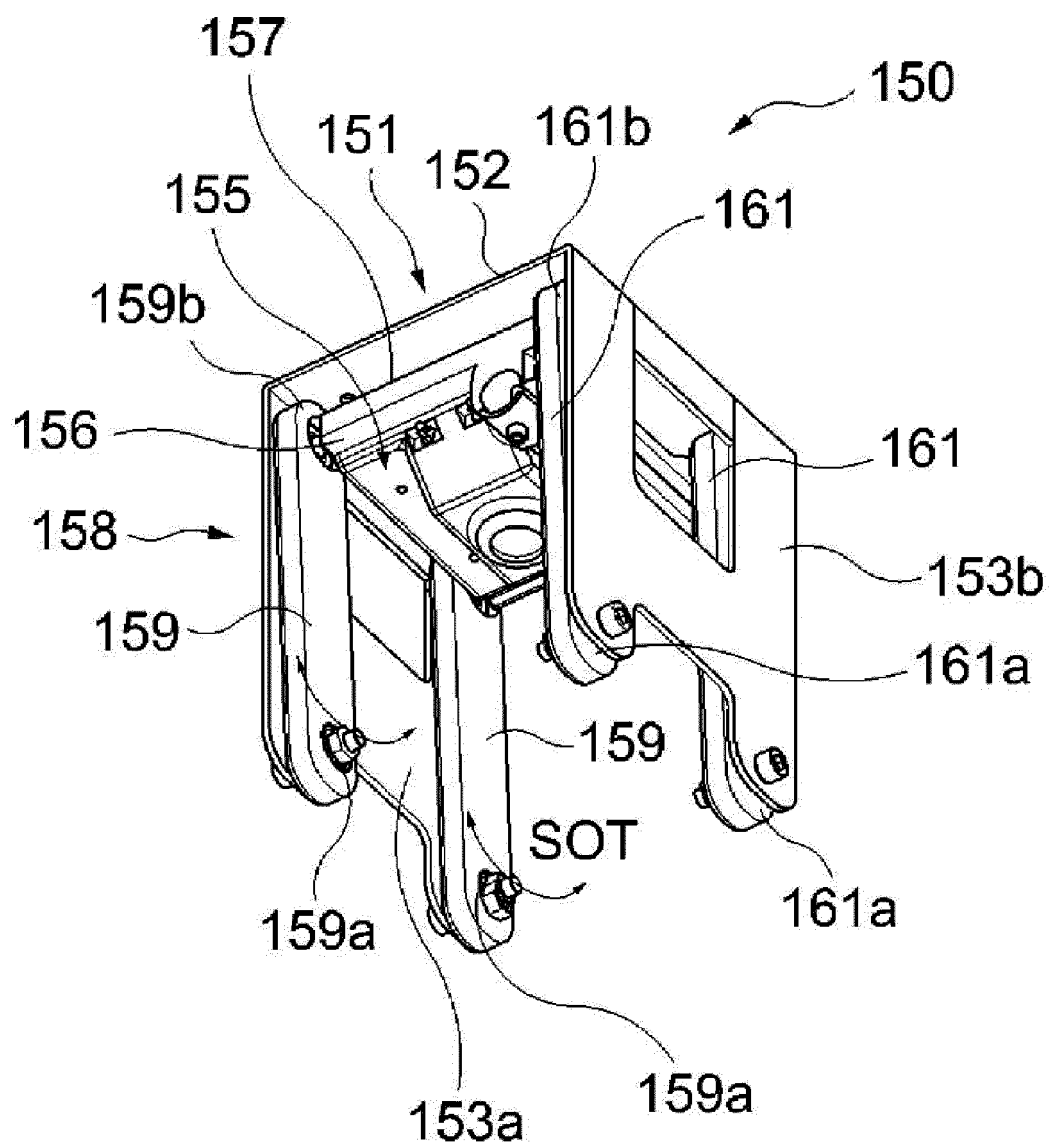


Fig. 4

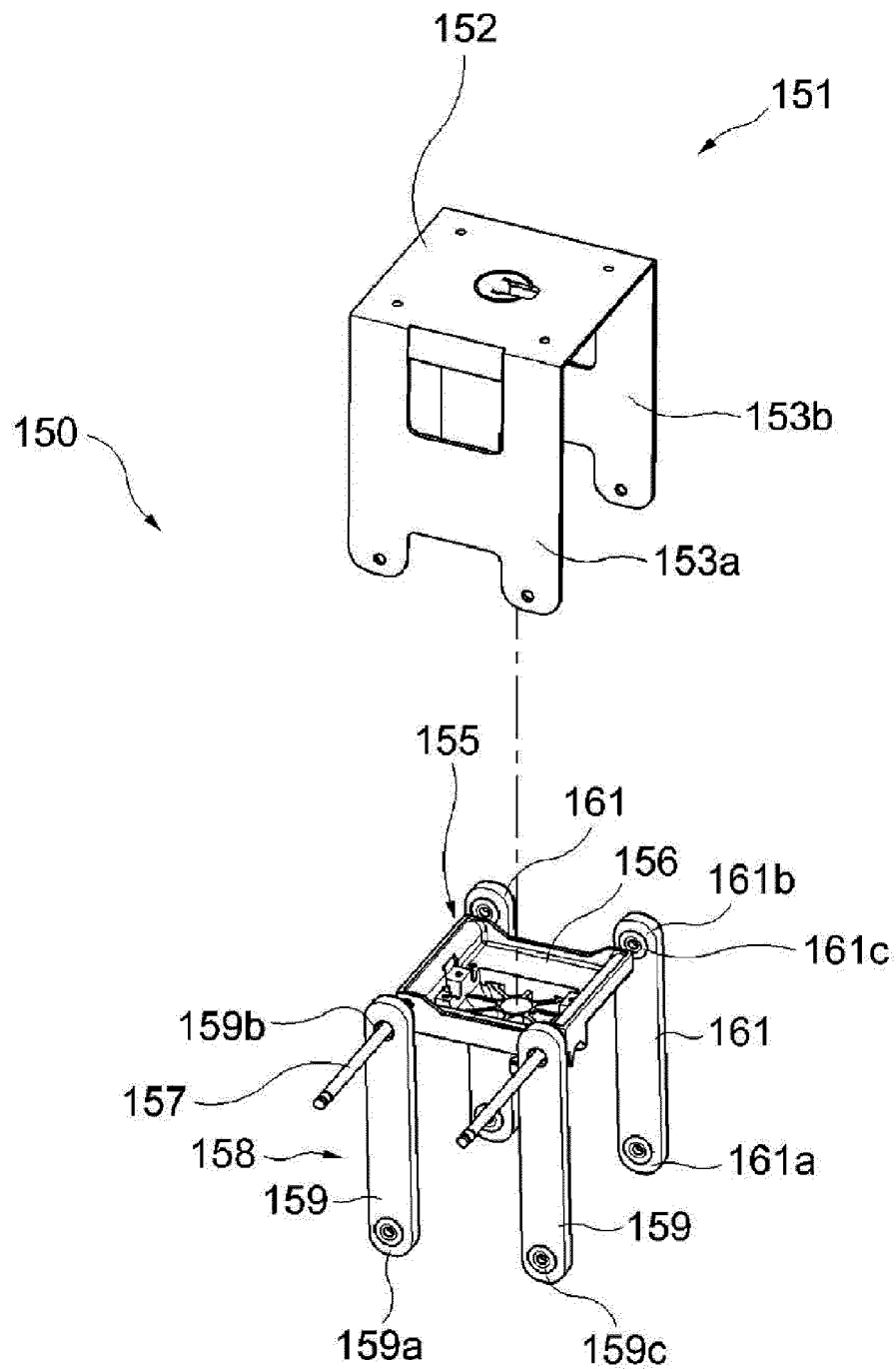


Fig. 5

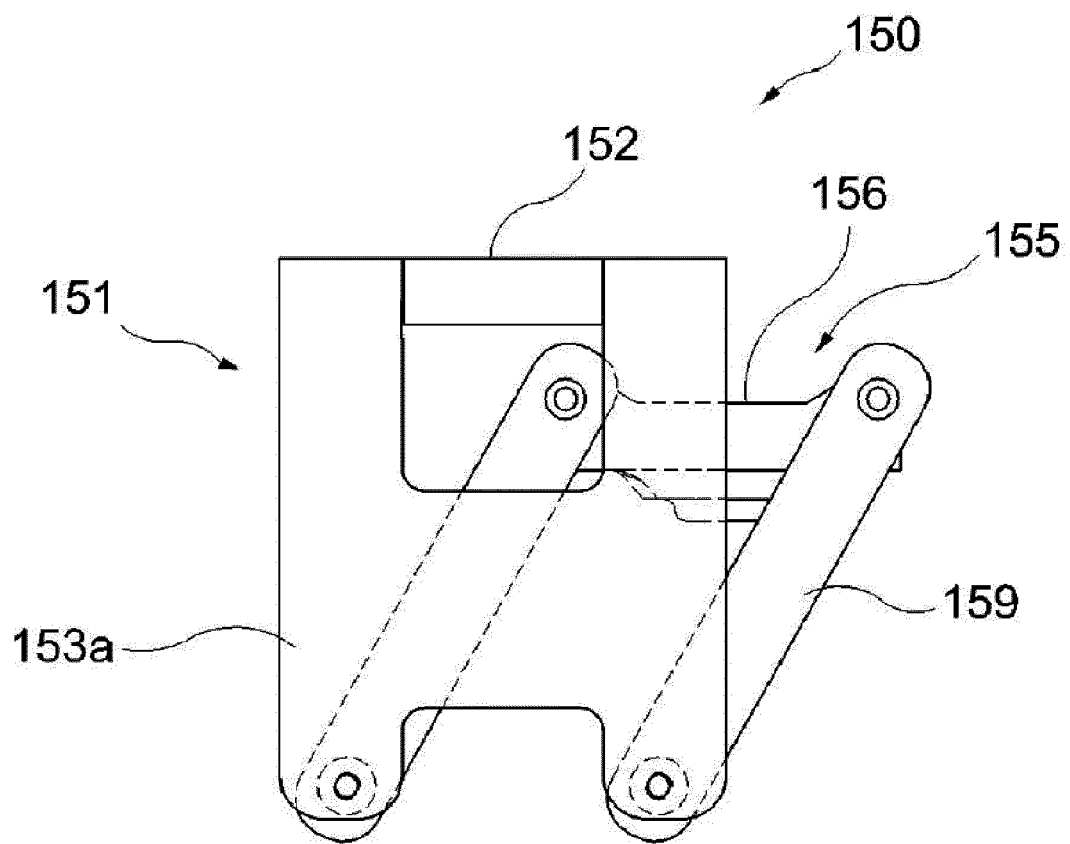


Fig. 6

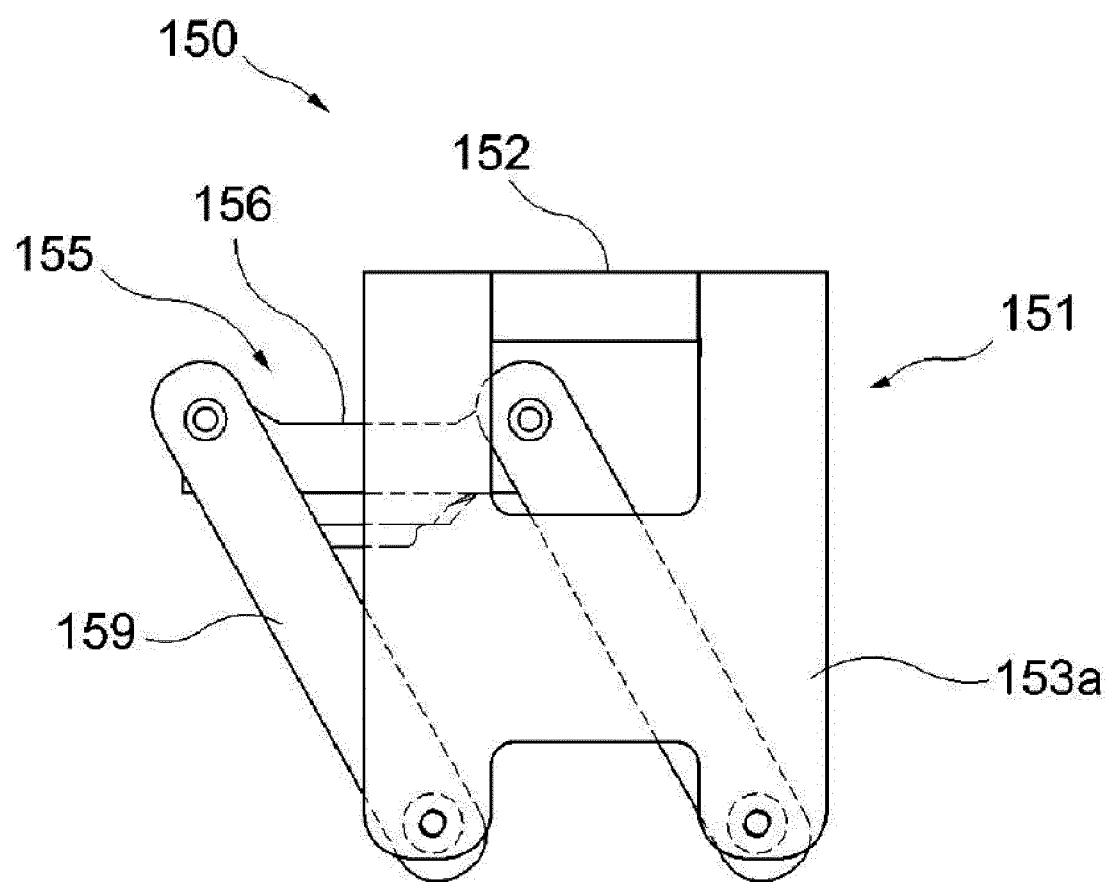


Fig. 7

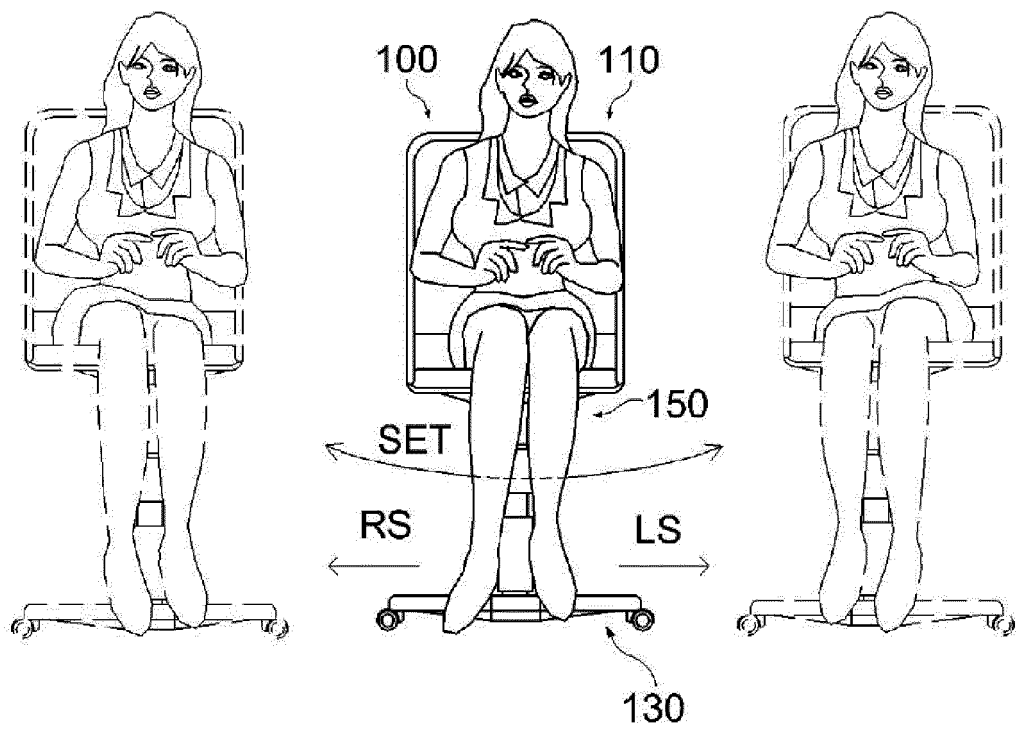


Fig. 8

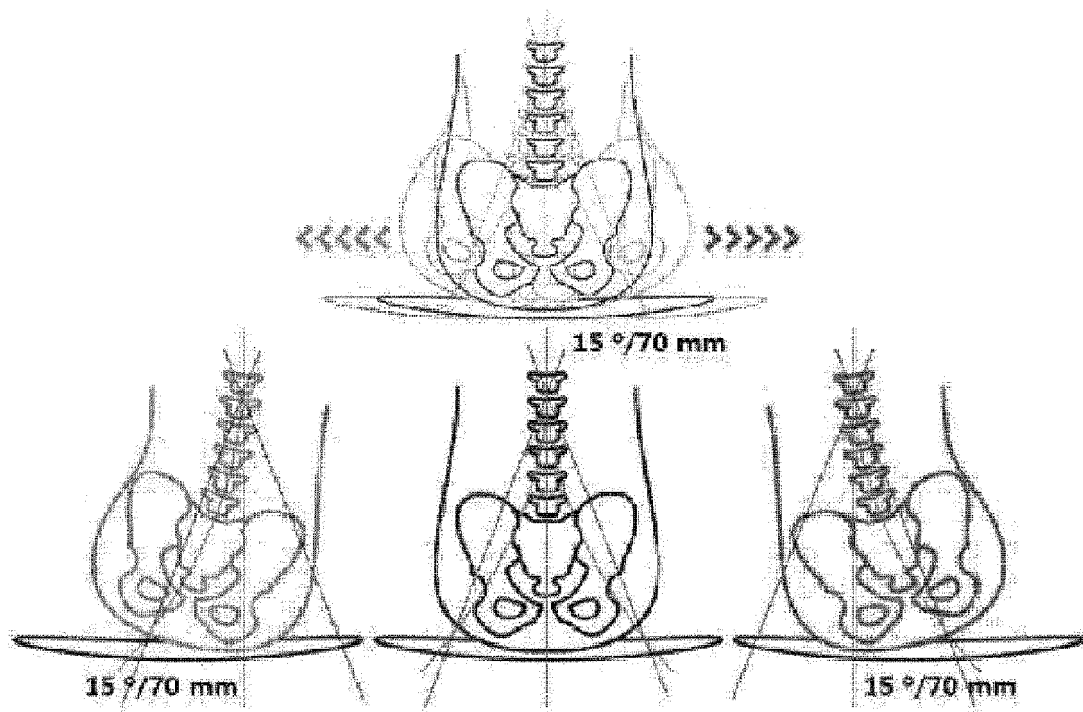


Fig. 9

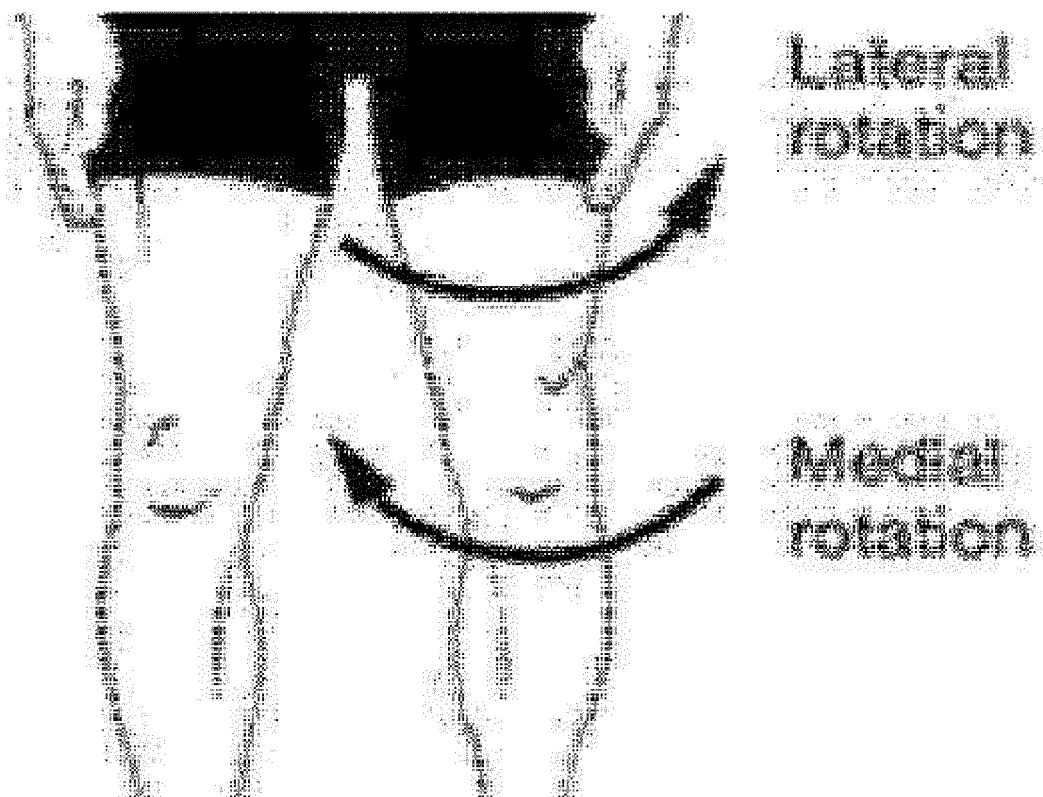


Fig. 10

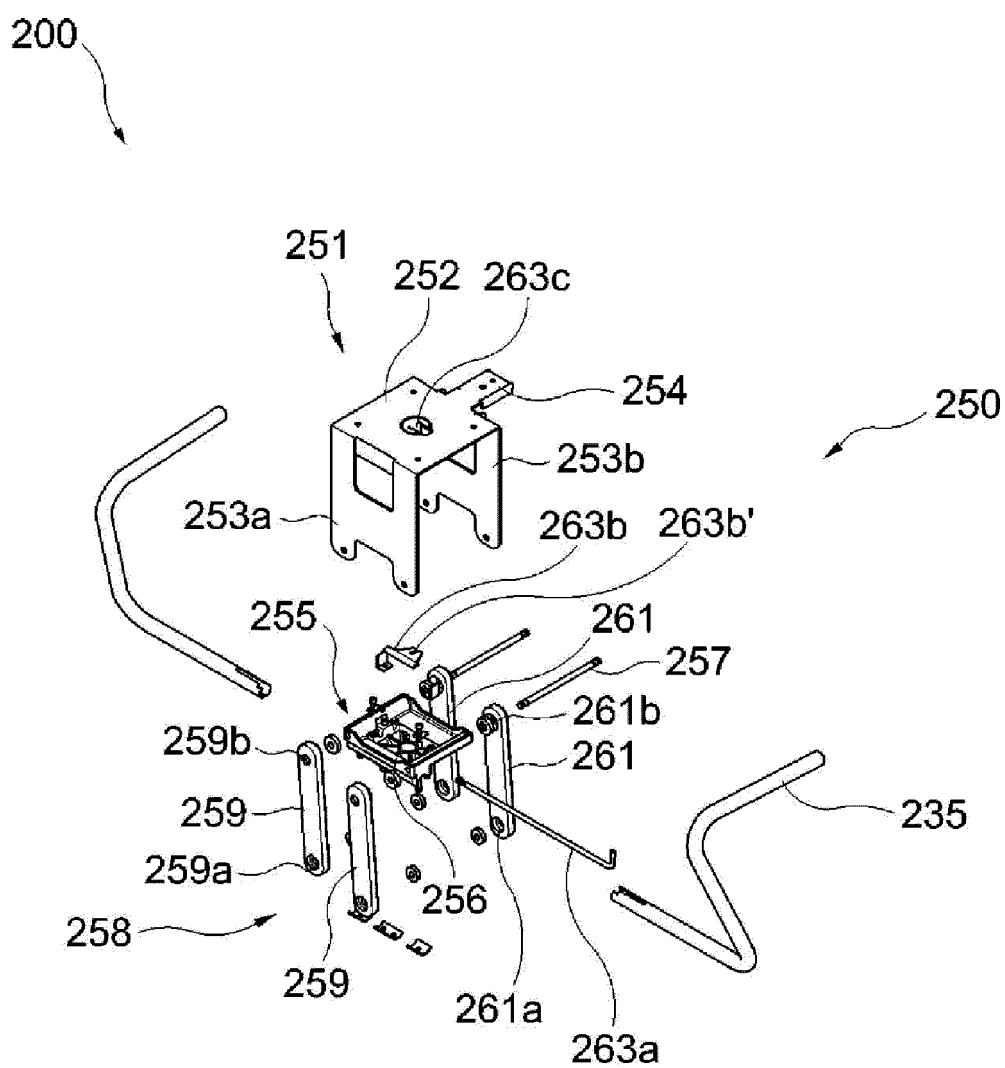


Fig. 11

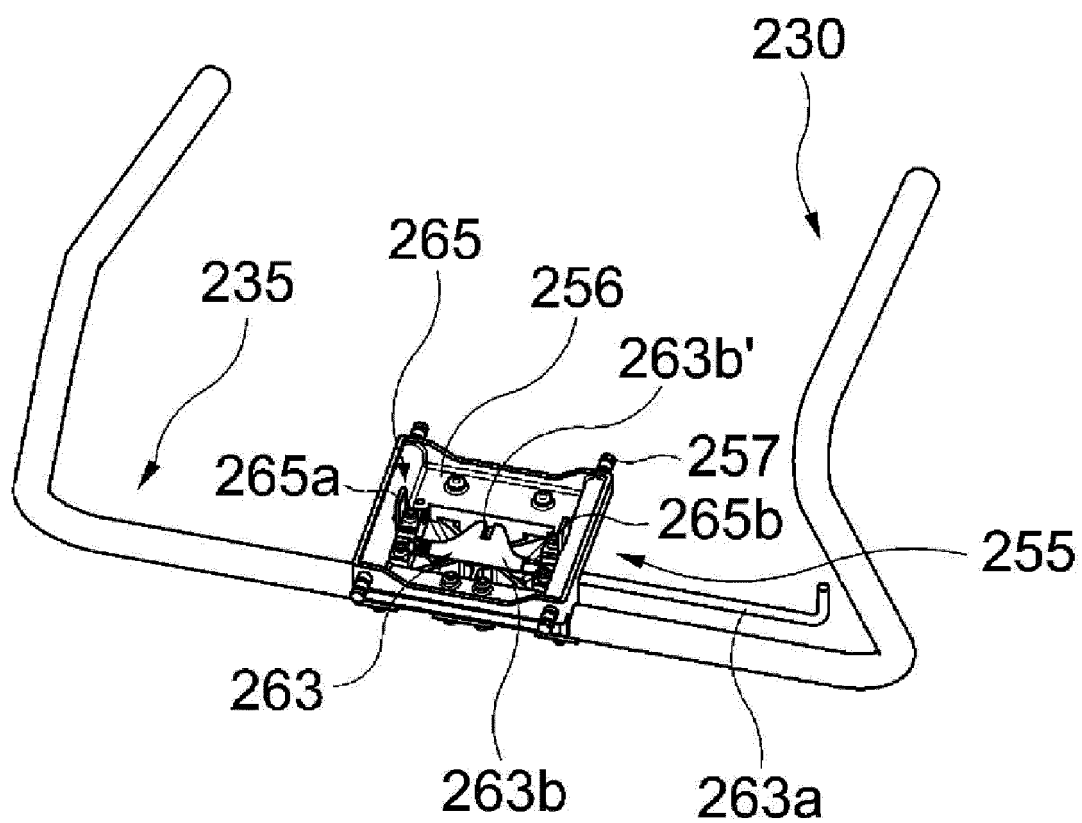


Fig. 12

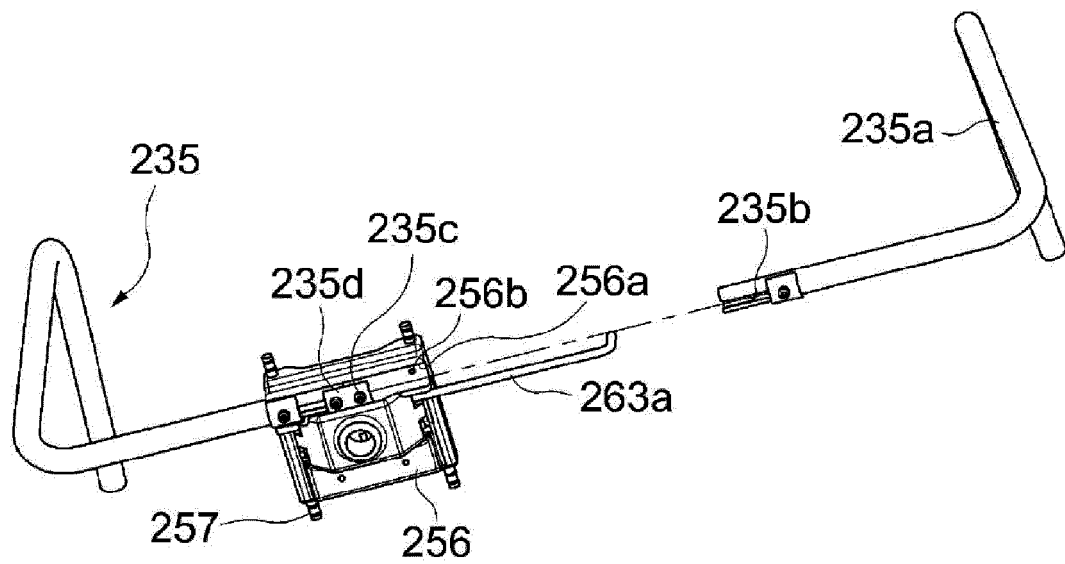
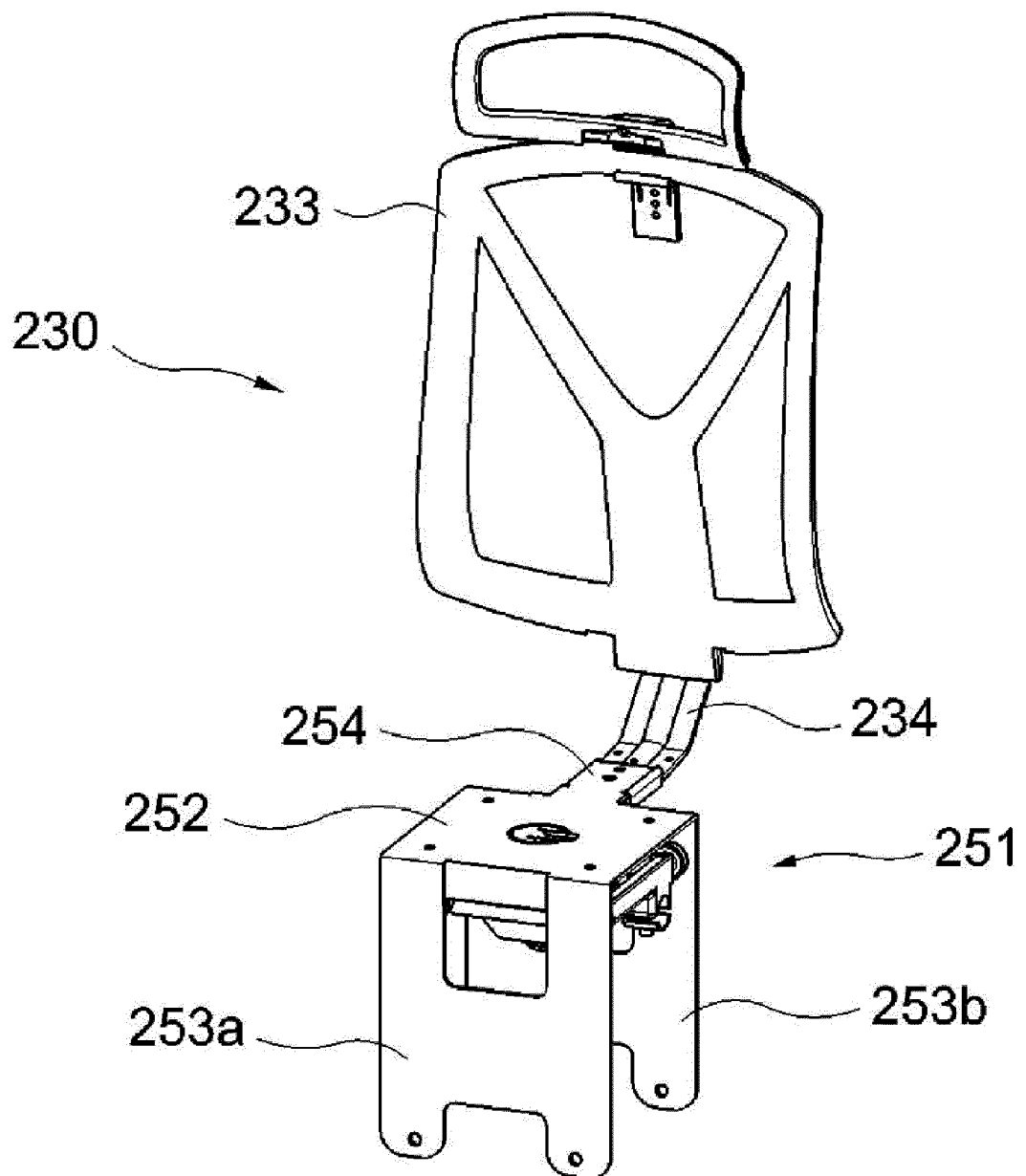


Fig. 13



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2017/012288

A. CLASSIFICATION OF SUBJECT MATTER

A63B 21/00(2006.01)i, A63B 23/04(2006.01)i, A63B 23/035(2006.01)i, A47C 7/02(2006.01)i, A47C 7/62(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)

A63B 21/00; A47C 7/00; A47C 9/10; A63B 23/02; A47C 7/02; A47C 3/02; A61H 39/04; A63B 23/00; A63B 22/00; A63B 23/04; A63B 23/035; A47C 7/62

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean Utility models and applications for Utility models: IPC as above
Japanese Utility models and applications for Utility models: IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS (KIPO internal) & Keywords: swing, chair, link

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 201019304 Y (DU, Yalun) 13 February 2008 See pages 4-5 and figures 1-5.	14-15
Y		1-13
Y	KR 10-1623738 B1 (SIM, Hyon) 24 May 2016 See paragraphs [0015], [0032]-[0035], [0050], claims 1-2 and figure 1.	1-13
A	KR 10-2014-0003896 A (KO, Yu-Min et al.) 10 January 2014 See claims 1-2 and figures 1-5.	1-15
A	KR 10-2012-0009488 A (FITWORX, LLC.) 01 February 2012 See claims 1-5 and figures 1-6.	1-15
A	KR 10-1314969 B1 (PARK, Ki Jo) 04 October 2013 See claims 3-5 and figures 1-8.	1-15

☐ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

* Special categories of cited documents:	"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
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"E" earlier application or patent but published on or after the international filing date	"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
"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)	"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
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

13 MARCH 2018 (13.03.2018)

Date of mailing of the international search report

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Authorized officer

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/KR2017/012288

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