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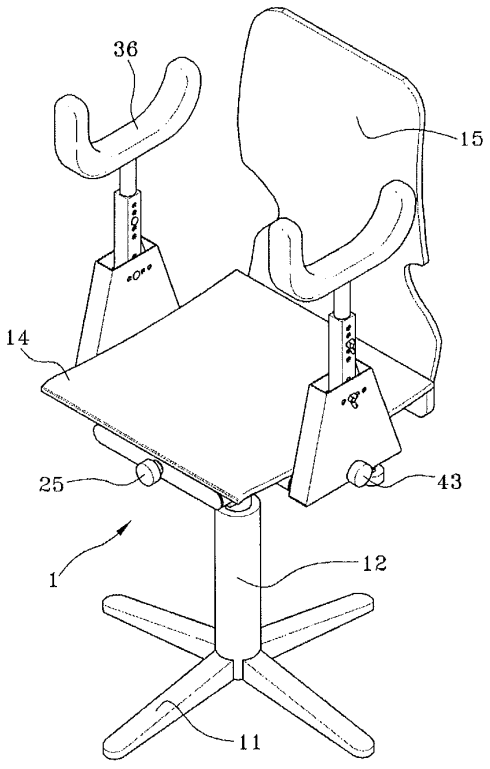
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# (54) CHAIR FOR PROTECTING SPINE AND BACK

(57) Provided is a chair including a base 11 to be disposed on a floor surface, a vertical support 12 to be vertically inserted into a top portion of the base 11, a supporting panel 13 provided on a top of the vertical support 12, a sitting panel 14 provided on a top surface of the support panel 13 and on which a posterior region sat on by a user rests, and a back panel 15 to be vertically inserted into a rear portion of the sitting panel 14 and to be in close contact with a back region of the user.

**FIG. 1**




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## Description

### Technical Field

**[0001]** Embodiments of the present invention relate to a chair for protecting a spine and a lumbar region, and more particularly, to a chair for protecting a spine and a lumbar region that is developed to protect a lumbar region and correct a posture of a user working while sitting on a chair for a long time or a user directed to avoid placing a strain on a spine, despite the development of various chairs that help a user to sit in a comfortable posture.

### Background Art

**[0002]** In general, a chair is manufactured to help a user sit in a comfortable posture while eating or working. However, with the development of society, the number of workers spending working time sitting on a chair for about 1/3 of a day is increasing.

**[0003]** In particular, a user professionally working using a computer gazes at a monitor while using a keyboard for a long time. Thus, the user may experience severe fatigue after work, and strain a spine and a lumbar region due to a bad posture.

**[0004]** To solve such issues, a variety of elaborate, ergonomic chairs have been studied and developed. However, many of such chairs are structurally configured to support only a back region and a lower body, in particular, a posterior region on which a user sits. Thus, a greatest portion of a physical weight of the user may be intensively applied to a lumbar region of the user.

**[0005]** Accordingly, the physical weight may not be properly distributed and thus, the lumbar region of the user may be strained, causing a lumbar disease. A patient with a spinal disease such as spinal stenosis may be almost unable to use such a general chair.

**[0006]** Related prior arts are as follows.

(Patent Document 1) (Patent Document 1) Korean Patent Registration No. 10-0371610-0000 (January 27, 2003)

(Patent Document 2) (Patent Document 2) Korean Patent Registration No. 10-0367074-0000 (December 20, 2002)

(Patent Document 3) (Patent Document 3) Korean Utility Model Publication No. 20-2001-0001083 (January 15, 2001)

(Patent Document 4) (Patent Document 4) Korean Utility Model Registration No. 20-0390006-0000 (July 7, 2005)

### Disclosure of Invention

### Technical Goals

**[0007]** To solve the aforementioned issue, an aspect of the present invention provides a chair for optimally protecting a spine and a lumbar region that may be suitable for a body of a user by easily adjusting a depth to a back of the chair, and widths and positions of portions to be disposed under both armpits to support shoulders depending on a condition and a state of the body of the user.

### Technical solutions

**[0008]** According to an aspect of the present invention, there is provided a chair including a base to be disposed on a floor surface, a vertical support to be vertically inserted into a top portion of the base, a supporting panel provided on a top of the vertical support, a sitting panel provided on a top surface of the support panel and on which a posterior region sat on by a user rests, and a back panel to be vertically inserted into a rear portion of the sitting panel and to be in close contact with a back region of the user, the chair further including:

a back position adjusting portion including a pair of first guide pipes disposed between the supporting panel and the sitting panel to extend to be parallel in front and rear directions, a pair of first guide rods horizontally extending frontward to be inserted into the first guide pipes at a lower end of the back panel, a horizontally moving bar horizontally extending frontward between the first guide rods, and of which an end portion is perforated in front and rear directions and internally threaded, a finish plate extending to be long in left and right directions to cover a front including a space between the pair of first guide pipes, and a back position adjusting screw to penetrate through the finish plate, of which a head portion is to be rotatably fixed, and to be externally threaded to be fastened with the horizontally moving bar;

a pair of shoulder support height and position adjusting portions respectively including a bracket provided in a shape of a box with an open top surface, on which several front and rear position adjusting holes are provided adjacent to an upper end thereof to be perforated in left and right directions, and on which a first screw hole is provided on a bottom surface thereof to be perforated from a rear portion to an upper portion, a front and rear sliding rail of which one side is rotatably fixed adjacent to an inner front lower end of the bracket, extending backward while drawing a concave upward curve, of which an end portion is bent vertically downward and then bent horizontally frontward, and on which a through-hole is provided on a lower surface thereof to be perforated upward, a height adjusting screw provided to be fastened with the first screw hole from a lower portion to an upper portion, to penetrate through the through-hole, and of which an end portion is to be rotatably fixed by means of two fixing rings disposed in recesses formed adjacent to an upper portion and a lower portion of the through-hole along an outer circumferential surface thereof, a first vertical pipe

on which a roller is disposed at a lower end thereof to rotate along the front and rear sliding rail, on which a fixing long hole is disposed at a center thereof to extend to be long in a longitudinal direction and to be perforated in left and right directions, to be fixed by means of a first fixing bolt to penetrate through one of the front and rear position adjusting holes and the fixing long hole and a first wingnut with wings to be fastened with the first fixing bolt, and on which several first height adjusting holes are provided to be perforated in left and right directions at predetermined intervals from an upper portion to a lower portion thereof, a second vertical pipe of which a lower end is to be inserted into the first vertical pipe, on which several second height adjusting holes are provided to be perforated in left and right directions at predetermined intervals from the lower end to an upper portion thereof, and to be fixed by means of a second fixing bolt to penetrate through one of the first height adjusting holes and one of the second height adjusting holes and a second wingnut with wings to be fastened with the second fixing bolt, and a shoulder support to be fixed to an upper end of the second vertical pipe, extending in front and rear directions to be disposed under an armpit, and of which a front portion and a rear portion are provided in upwardly bent shapes; and

a shoulder support width adjusting portion including a pair of second guide pipes disposed between the back position adjusting portion and the sitting panel to extend to be parallel in left and right directions, a pair of second guide rods horizontally extending to be inserted into the second guide pipes at a lower end of the bracket, a pair of nuts disposed between the pair of second guide pipes to be fixed to the supporting panel, and a first shoulder support width adjusting screw to penetrate through the bracket, of which a head portion is to be rotatably fixed, and of which an end portion is to be fastened with the nuts.

**[0009]** The shoulder support width adjusting portion may include a pair of second guide pipes disposed between the back position adjusting portion and the sitting panel to extend to be parallel in left and right directions, a pair of second guide rods horizontally extending to be inserted into the second guide pipes at a lower end of the bracket, a four-joint link assembly to rotate by means of hinges provided in front, rear, left, and right directions, of which left and right end portions are fixed to both brackets, in which a second screw hole and a third screw hole are provided to be perforated in front and rear directions at front and rear end portions, and disposed in a space between the pair of second guide pipes, and a second shoulder support width adjusting screw to penetrate through the second guide pipes from a front-central portion to a rear portion of the second guide pipes to be rotatably fixed, on which threads are provided in opposite directions from a central point of a length thereof toward both sides to be fastened with the second screw hole and the third screw hole, and provided to increase and decrease a distance between the second screw hole and the third screw hole based on a direction of rotation.

Advantageous Effects of the Invention

**[0010]** As described above, a chair according to an embodiment of the present invention may enable a back and a pair of shoulder supports thereof to be disposed at positions most suitable for a body condition of a user who sits thereon by adjusting a position of the back thereof in front and rear directions to be suitable for the body of the user, and easily adjusting a distance between the shoulder supports to be disposed under both armpits to support shoulders, heights of the shoulder supports, and front and rear positions of the shoulder supports and thus, may be easily applicable to a case of having a spinal problem, and requiring correction and avoidance of placing a strain on a spine and a lumbar region.

Brief Description of Drawings

**[0011]**

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

FIG. 2 is an exploded perspective view according to an embodiment of the present invention.

FIGS. 3 and 4 are views illustrating an operation of a shoulder support height and position adjusting portion according to an embodiment of the present invention.

FIG. 5 is a cross-sectional side view illustrating an operation of a back position adjusting portion according to an embodiment of the present invention.

FIG. 6 is a cross-sectional front view illustrating an operation of a shoulder support width adjusting portion according to an embodiment of the present invention.

FIG. 7 is an exploded perspective view according to another embodiment of the present invention.

FIGS. 8 and 9 are cross-sectional top views illustrating an operation of a shoulder support width adjusting portion according to another embodiment of the present invention.

Best Mode for Carrying Out the Invention

**[0012]** Detailed descriptions will be provided with reference to the accompanying drawings to help those skilled in the art to easily understand and implement the configuration of the present invention.

**[0013]** FIG. 1 is a perspective view according to an embodiment of the present invention, FIG. 2 is an exploded perspective view according to an embodiment of the present invention, and FIGS. 3 and 4 are views illustrating an operation of a shoulder support height and po-

sition adjusting portion according to an embodiment of the present invention. A chair 1 includes a base 11 to be disposed on a floor surface, a vertical support 12 to be vertically inserted into a top portion of the base 11, a supporting panel 13 provided on a top of the vertical support 12, a sitting panel 14 provided on a top surface of the support panel 13 and on which a posterior region sat on by a user rests, and a back panel 15 to be vertically inserted into a rear portion of the sitting panel 14 and to be in close contact with a back region of the user.

**[0014]** A pair of shoulder support height and position adjusting portions 3 respectively include a bracket 31 provided in a shape of a box with an open top surface, on which several front and rear position adjusting holes 311 are provided adjacent to an upper end thereof to be perforated in left and right directions, and on which a first screw hole 312 is provided on a bottom surface thereof to be perforated from a rear portion to an upper portion, a front and rear sliding rail 32 of which one side is rotatably fixed adjacent to an inner front lower end of the bracket 31, extending backward while drawing a concave upward curve, of which an end portion is bent vertically downward and then bent horizontally frontward, and on which a through-hole 321 is provided on a lower surface thereof to be perforated upward, a height adjusting screw 33 provided to be fastened with the first screw hole 312 from a lower portion to an upper portion, to penetrate through the through-hole 321, and of which an end portion is to be rotatably fixed by means of two fixing rings 331 disposed in recesses formed adjacent to an upper portion and a lower portion of the through-hole 321 along an outer circumferential surface thereof, a first vertical pipe 34 on which a roller 341 is disposed at a lower end thereof to rotate along the front and rear sliding rail 32, on which a fixing long hole 342 is disposed at a center thereof to extend to be long in a longitudinal direction and to be perforated in left and right directions, to be fixed by means of a first fixing bolt 343 to penetrate through one of the front and rear position adjusting holes 311 and the fixing long hole 342 and a first wingnut 344 with wings to be fastened with the first fixing bolt 343, and on which several first height adjusting holes 345 are provided to be perforated in left and right directions at predetermined intervals from an upper portion to a lower portion thereof, a second vertical pipe 35 of which a lower end is to be inserted into the first vertical pipe 34, on which several second height adjusting holes 351 are provided to be perforated in left and right directions at predetermined intervals from the lower end to an upper portion thereof, and to be fixed by means of a second fixing bolt 352 to penetrate through one of the first height adjusting holes 345 and one of the second height adjusting holes 351 and a second wingnut 353 with wings to be fastened with the second fixing bolt 352, and a shoulder support 36 to be fixed to an upper end of the second vertical pipe 35, extending in front and rear directions to be disposed under an armpit, and of which a front portion and a rear portion are provided in upwardly bent shapes.

**[0015]** Herein, a height of the shoulder support 36 may be easily adjusted by means of the first vertical pipe 34 and the second vertical pipe 35. In addition to the foregoing configuration, various methods applied to various height-adjustable chairs or desks may be applicable. To provide a cushion to the shoulder support 36, a spring or an air shock absorber may be additionally provided.

**[0016]** The front and rear position adjusting holes 311 may be provided to adjust a front and rear position of the shoulder support 36 based on a position at which the first vertical pipe 34 is to be fastened.

**[0017]** In this example, when the user moves back and forth sitting on the chair 1, the shoulder support 36 may be rotatably move along a path of the front and rear sliding rail 32 in response to the movement of the user. To adjust the rotation path, the path of the front and rear sliding rail 32 may be adjusted by means of the height adjusting screw 33. Since a distance between one of the front and rear position adjusting holes 311 through which the first vertical pipe 34 is fastened and the front and rear sliding rail 32 is not uniform, the fixing long hole 342 may be provided to enable satisfactory fastening and rotation irrespective of a change in the distance.

**[0018]** In general, due to a body structure, with respect to a back and forth motion of the shoulder support 36, the height of the shoulder support 36 may be adjusted to be lowest when the user leans back and forward, and may be adjusted to be greatest when the user sits up straight. In case of spinal and lumbar correction, the first wingnut 344 may be strongly fastened to fix the shoulder support 36.

**[0019]** FIG. 5 is a cross-sectional side view illustrating an operation of a back position adjusting portion according to an embodiment of the present invention. A back position adjusting portion 2 includes a pair of first guide pipes 21 disposed between the supporting panel 13 and the sitting panel 14 to extend to be parallel in front and rear directions, a pair of first guide rods 22 horizontally extending frontward to be inserted into the first guide pipes 21 at a lower end of the back panel 15, a horizontally moving bar 23 horizontally extending frontward between the first guide rods 22, and of which an end portion is perforated in front and rear directions and internally threaded, a finish plate 24 extending to be long in left and right directions to cover a front including a space between the pair of first guide pipes 21, and a back position adjusting screw 25 to penetrate through the finish plate 24, of which a head portion is to be rotatably fixed, and to be externally threaded to be fastened with the horizontally moving bar 23.

**[0020]** In this example, the back position adjusting screw 25 may be rotatably fixed in a structure identical to the structure in which the height adjusting screw 33 is rotatably fixed to the through-hole 321 by means of the fixing rings 331. By rotating the back position adjusting screw 25, the back panel 15 may move back and forth to be suitable for a body of a user.

**[0021]** FIG. 6 is a cross-sectional front view illustrating

an operation of a shoulder support width adjusting portion according to an embodiment of the present invention. A shoulder support width adjusting portion 4 includes a pair of second guide pipes 41 disposed between the back position adjusting portion 2 and the sitting panel 14 to extend to be parallel in left and right directions, a pair of second guide rods 42 horizontally extending to be inserted into the second guide pipes 41 at a lower end of the bracket 31, a pair of nuts 43 disposed between the pair of second guide pipes 41 to be fixed to the supporting panel 13, and a first shoulder support width adjusting screw 44 to penetrate through the bracket 31, of which a head portion is to be rotatably fixed, and of which an end portion is to be fastened with the nuts 43.

**[0022]** The foregoing configuration may be the same as the adjusting operation of the back position adjusting portion 2 described above. The configuration is suggested to enable a user to sit on a chair while disposing the shoulder support 36 under an armpit in a most comfortable posture to be suitable for a body of a user.

**[0023]** FIG. 7 is an exploded perspective view according to another embodiment of the present invention, and FIGS. 8 and 9 are cross-sectional top views illustrating an operation of a shoulder support width adjusting portion according to another embodiment of the present invention. The shoulder support width adjusting portion 4 includes a pair of second guide pipes 41 disposed between the back position adjusting portion 2 and the sitting panel 14 to extend to be parallel in left and right directions, a pair of second guide rods 42 horizontally extending to be inserted into the second guide pipes 41 at a lower end of the bracket 31, a four-joint link assembly 45 to rotate by means of hinges provided in front, rear, left, and right directions, of which left and right end portions are fixed to both brackets 31, in which a second screw hole 451 and a third screw hole 452 are provided to be perforated in front and rear directions at front and rear end portions, and disposed in a space between the pair of second guide pipes 41, and a second shoulder support width adjusting screw 46 to penetrate through the second guide pipes 41 from a front-central portion to a rear portion of the second guide pipes 41 to be rotatably fixed, on which threads are provided in opposite directions from a central point of a length thereof toward both sides to be fastened with the second screw hole 451 and the third screw hole 452, and provided to increase and decrease a distance between the second screw hole 451 and the third screw hole 452 based on a direction of rotation.

**[0024]** The present embodiment is provided to alleviate an inconvenience of the preceding embodiment in that when two first shoulder support width adjusting screws 44 are provided, respective support height and position adjusting portions 3 disposed in left and right directions are to be adjusted separately.

**[0025]** The shoulder support width adjusting portion 4 includes the second shoulder support width adjusting screw 46 provided to be threaded on both sides in different directions, similar to a turnbuckle, and the four-joint link assembly 45 provided in a form of a rhombus being symmetric in up, down, left, and right directions when viewed on a plane, and may adjust a distance between the shoulder support height and position adjusting portions 3 by means of the single second shoulder support width adjusting screw 46 based on a principle of operation in which a distance between left and right vertices decreases in response to an increase in a distance between front and rear vertices, and the distance between the left and right vertices increases in response to a decrease in the distance between the front and rear vertices.

## Claims

1. A chair for protecting a spine and a lumbar region, the chair comprising a base 11 to be disposed on a floor surface, a vertical support 12 to be vertically inserted into a top portion of the base 11, a supporting panel 13 provided on a top of the vertical support 12, a sitting panel 14 provided on a top surface of the support panel 13 and on which a posterior region sat on by a user rests, and a back panel 15 to be vertically inserted into a rear portion of the sitting panel 14 and to be in close contact with a back region of the user, the chair further comprising:

   a back position adjusting portion 2 comprising a pair of first guide pipes 21 disposed between the supporting panel 13 and the sitting panel 14 to extend to be parallel in front and rear directions, a pair of first guide rods 22 horizontally extending frontward to be inserted into the first guide pipes 21 at a lower end of the back panel 15, a horizontally moving bar 23 horizontally extending frontward between the first guide rods 22, and of which an end portion is perforated in front and rear directions and internally threaded, a finish plate 24 extending to be long in left and right directions to cover a front comprising a space between the pair of first guide pipes 21, and a back position adjusting screw 25 to penetrate through the finish plate 24, of which a head portion is to be rotatably fixed, and to be externally threaded to be fastened with the horizontally moving bar 23;
   a pair of shoulder support height and position adjusting portions 3 respectively comprising a bracket 31 provided in a shape of a box with an open top surface, on which several front and rear position adjusting holes 311 are provided adjacent to an upper end thereof to be perforated in left and right directions, and on which a first screw hole 312 is provided on a bottom surface thereof to be perforated from a rear portion to an upper portion, a front and rear sliding rail 32 of which one side is rotatably fixed adjacent to an inner front lower end of the bracket 31, ex-

tending backward while drawing a concave upward curve, of which an end portion is bent vertically downward and then bent horizontally frontward, and on which a through-hole 321 is provided on a lower surface thereof to be perforated upward, a height adjusting screw 33 provided to be fastened with the first screw hole 312 from a lower portion to an upper portion, to penetrate through the through-hole 321, and of which an end portion is to be rotatably fixed by means of two fixing rings 331 disposed in recesses formed adjacent to an upper portion and a lower portion of the through-hole 321 along an outer circumferential surface thereof, a first vertical pipe 34 on which a roller 341 is disposed at a lower end thereof to rotate along the front and rear sliding rail 32, on which a fixing long hole 342 is disposed at a center thereof to extend to be long in a longitudinal direction and to be perforated in left and right directions, to be fixed by means of a first fixing bolt 343 to penetrate through one of the front and rear position adjusting holes 311 and the fixing long hole 342 and a first wingnut 344 with wings to be fastened with the first fixing bolt 343, and on which several first height adjusting holes 345 are provided to be perforated in left and right directions at predetermined intervals from an upper portion to a lower portion thereof, a second vertical pipe 35 of which a lower end is to be inserted into the first vertical pipe 34, on which several second height adjusting holes 351 are provided to be perforated in left and right directions at predetermined intervals from the lower end to an upper portion thereof, and to be fixed by means of a second fixing bolt 352 to penetrate through one of the first height adjusting holes 345 and one of the second height adjusting holes 351 and a second wingnut 353 with wings to be fastened with the second fixing bolt 352, and a shoulder support 36 to be fixed to an upper end of the second vertical pipe 35, extending in front and rear directions to be disposed under an armpit, and of which a front portion and a rear portion are provided in upwardly bent shapes; and

a shoulder support width adjusting portion 4 comprising a pair of second guide pipes 41 disposed between the back position adjusting portion 2 and the sitting panel 14 to extend to be parallel in left and right directions, a pair of second guide rods 42 horizontally extending to be inserted into the second guide pipes 41 at a lower end of the bracket 31, a pair of nuts 43 disposed between the pair of second guide pipes 41 to be fixed to the supporting panel 13, and a first shoulder support width adjusting screw 44 to penetrate through the bracket 31, of which a head portion is to be rotatably fixed, and of which an end portion is to be fastened with the nuts 43.

**2.** The chair of claim 1, wherein the shoulder support width adjusting portion 4 comprises a pair of second guide pipes 41 disposed between the back position adjusting portion 2 and the sitting panel 14 to extend to be parallel in left and right directions, a pair of second guide rods 42 horizontally extending to be inserted into the second guide pipes 41 at a lower end of the bracket 31, a four-joint link assembly 45 to rotate by means of hinges provided in front, rear, left, and right directions, of which left and right end portions are fixed to both brackets 31, in which a second screw hole 451 and a third screw hole 452 are provided to be perforated in front and rear directions at front and rear end portions, and disposed in a space between the pair of second guide pipes 41, and a second shoulder support width adjusting screw 46 to penetrate through the second guide pipes 41 from a front-central portion to a rear portion of the second guide pipes 41 to be rotatably fixed, on which threads are provided in opposite directions from a central point of a length thereof toward both sides to be fastened with the second screw hole 451 and the third screw hole 452, and provided to increase and decrease a distance between the second screw hole 451 and the third screw hole 452 based on a direction of rotation.

FIG. 1

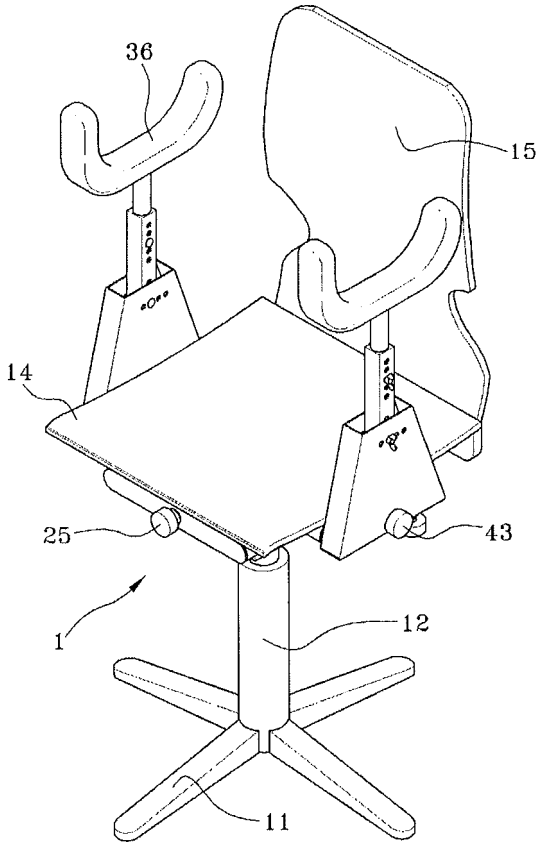


FIG. 2

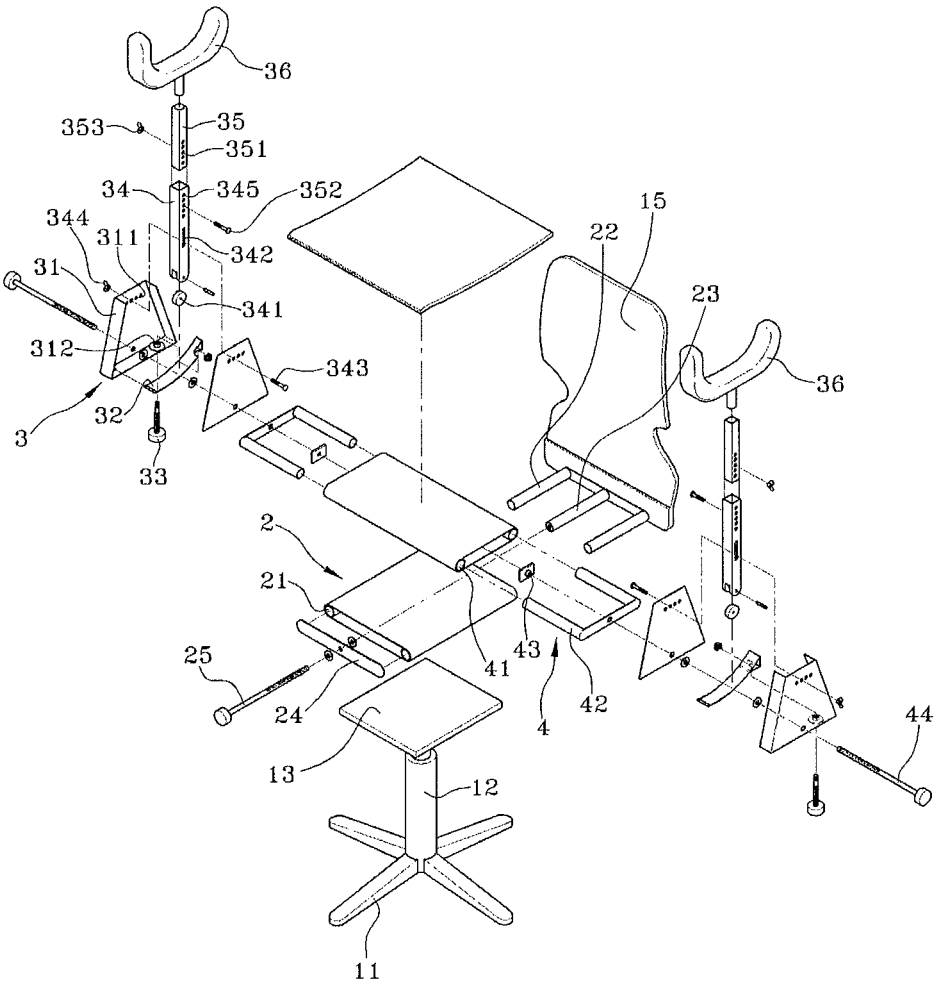

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FIG. 3

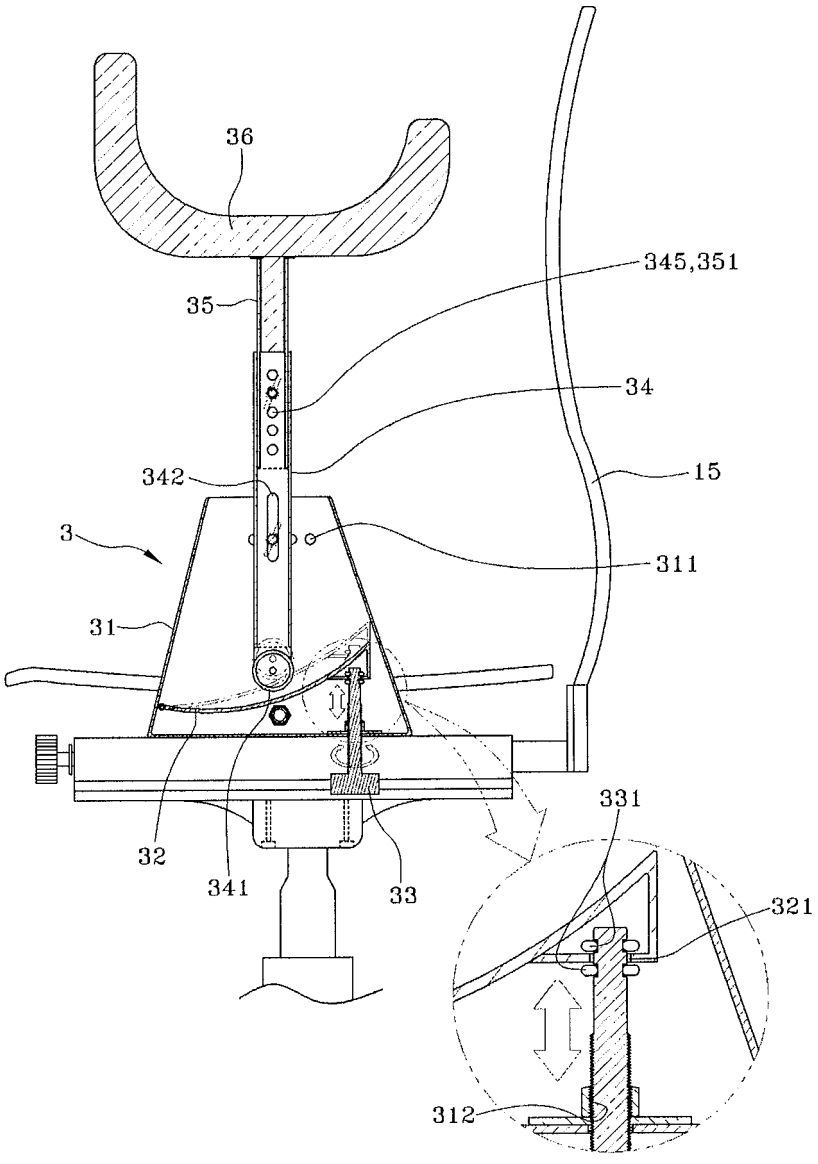


FIG. 4

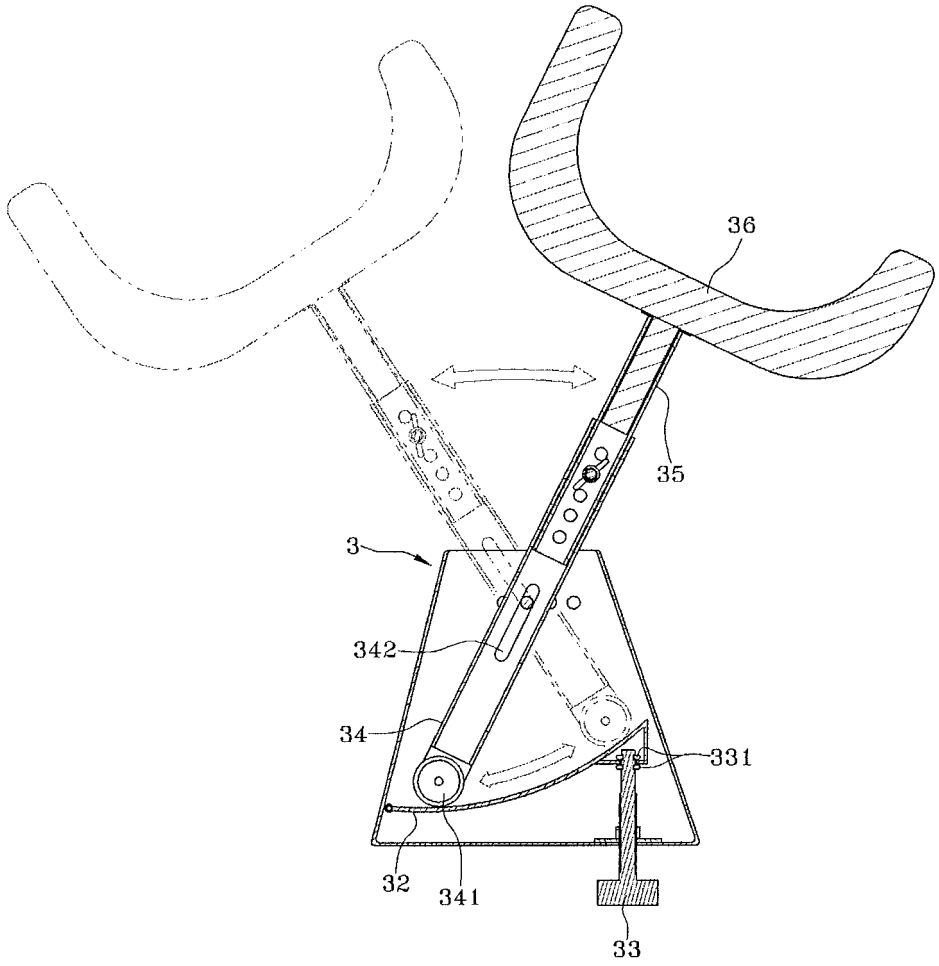


FIG. 5

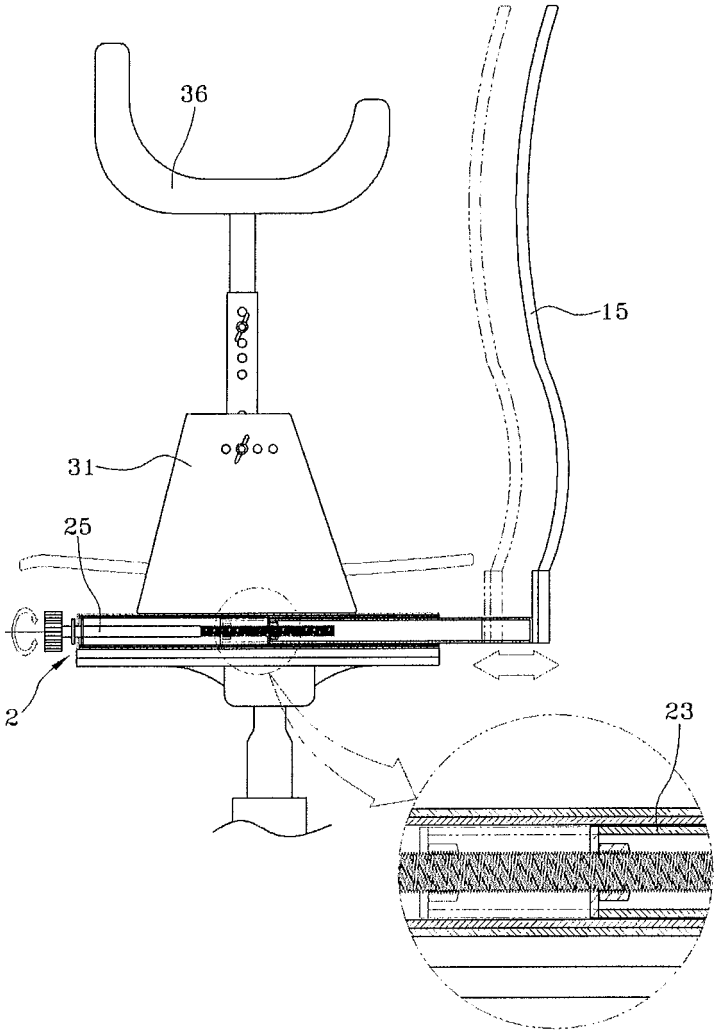


FIG. 6

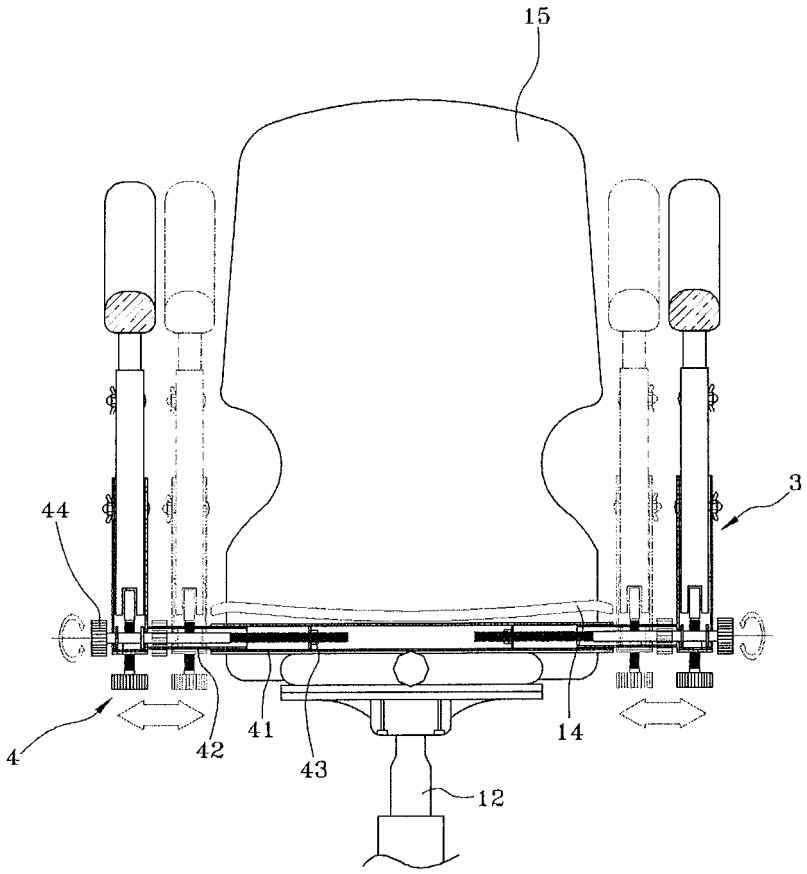
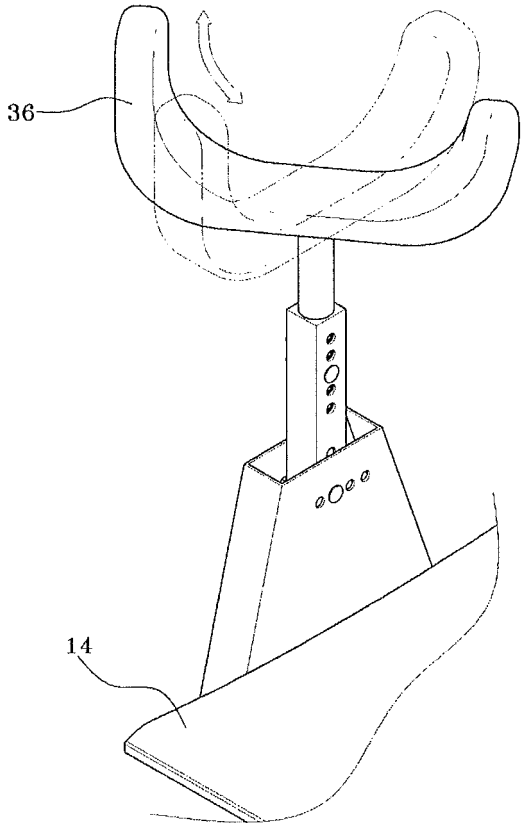


FIG. 7



# FIG. 8

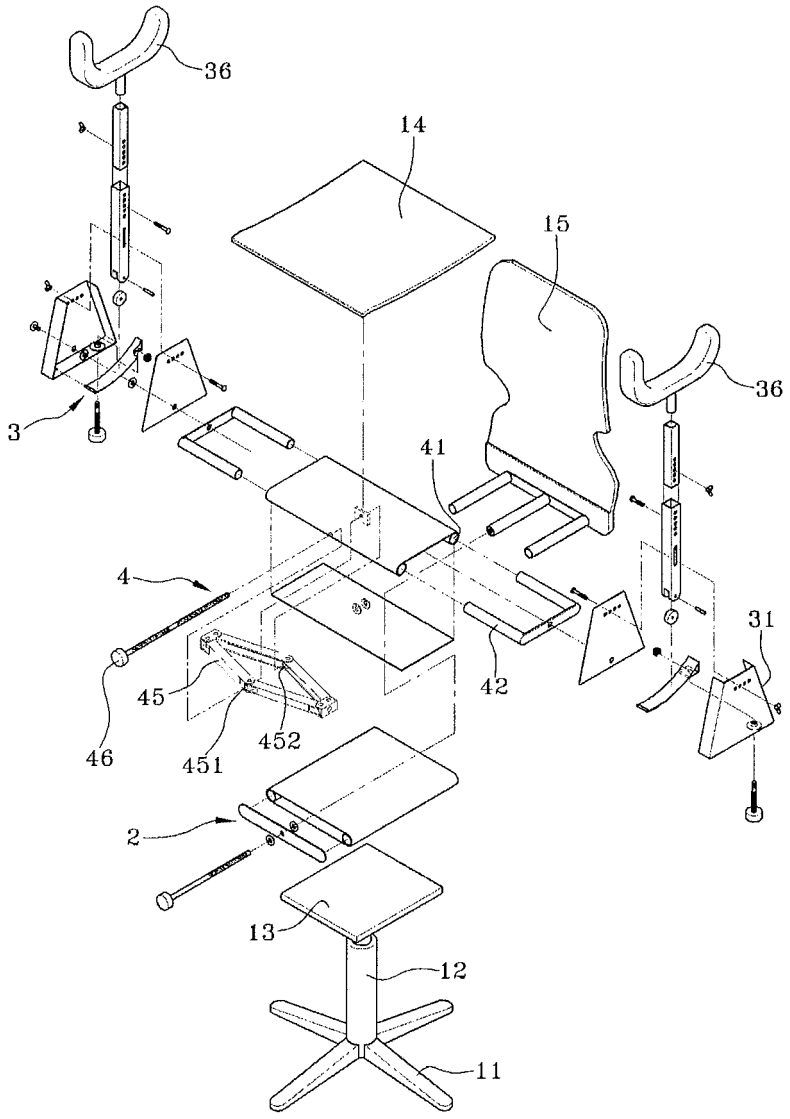


FIG. 9

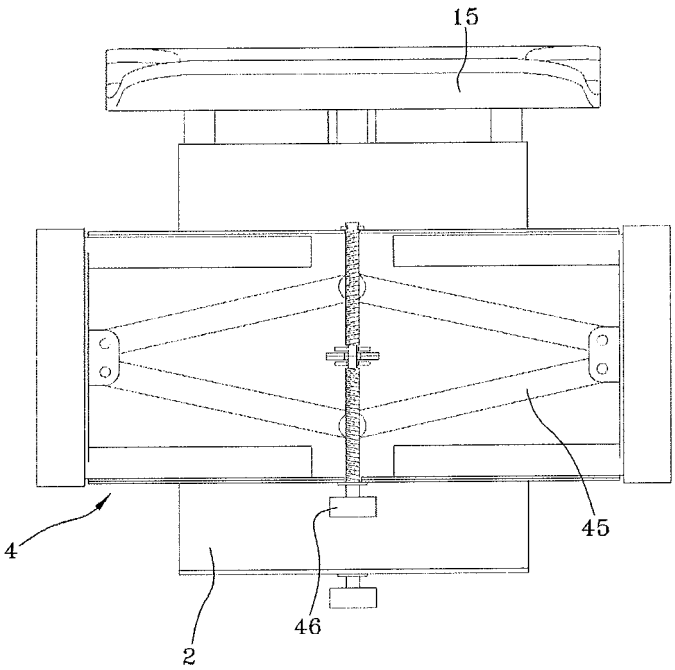
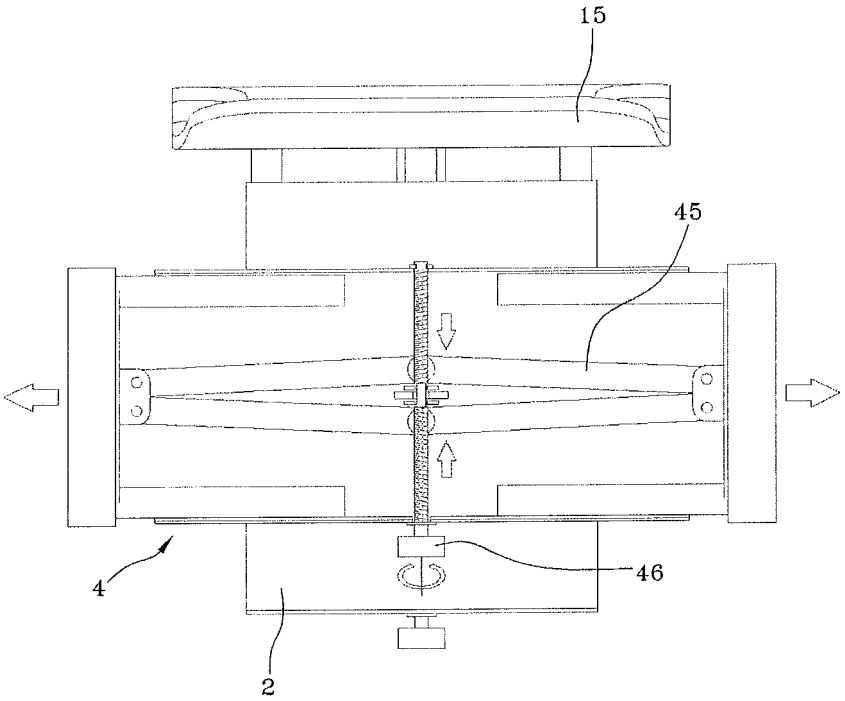


FIG. 10



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2014/007387

A. CLASSIFICATION OF SUBJECT MATTER

*A47C 7/54(2006.01)i, A47C 9/00(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)

A47C 7/54; B62M 1/14; A45B 3/00; A47C 7/44; A47C 9/00

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: shoulder support, armpit, chair, height adjustment, adjust width

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| A | US 2005-0104319 A1 (WING, Thomas W.) 19 May 2005<br>See claims 1, 3-14, 18, 20-32, abstract and figures 1-11. | 1,2 |
| A | US 05411044 A (ANDOLFI, Alexander S.) 02 May 1995<br>See claims 1-16, abstract and figures 1-22. | 1,2 |
| A | KR 20-0329547 Y1 (YU, Chi Ho et al.) 10 October 2003<br>See claim 1, abstract and figures 1-4. | 1,2 |
| A | KR 20-0275894 Y1 (PARK, Gi Sang) 16 May 2002<br>See claim 1, abstract and figures 1-5. | 1,2 |

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

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