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(54) **CHAIR WITH A HEAD AND NECK SUPPORT STRUCTURE**

**Publication Classification**

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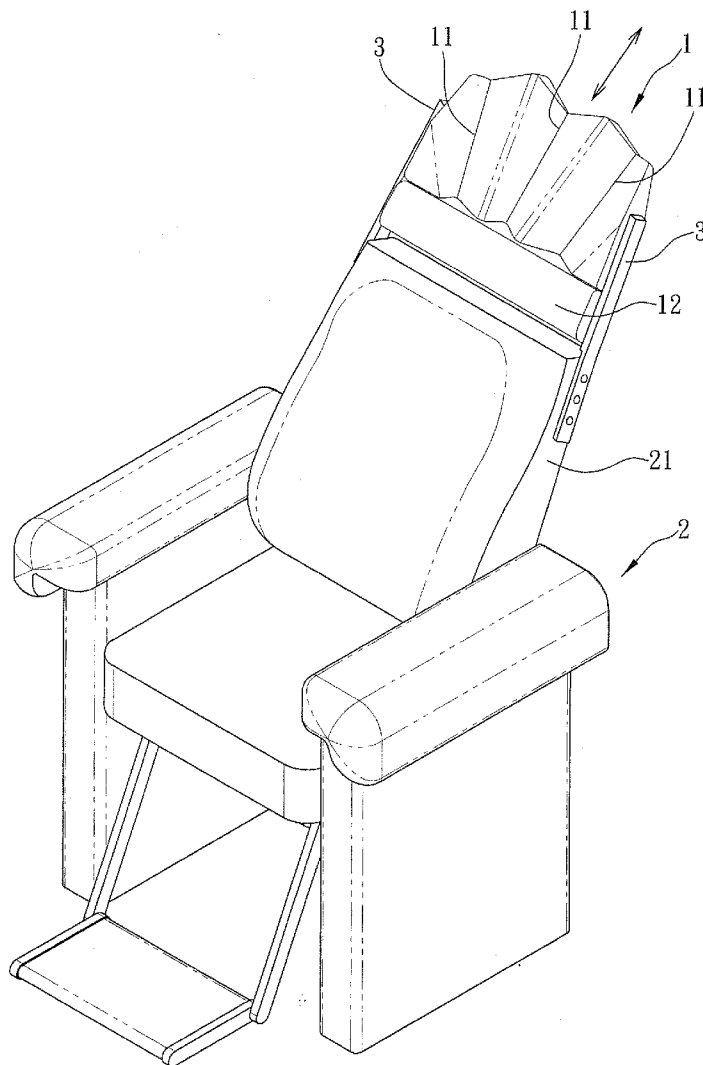
(52) **U.S. Cl.**  
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(57) **ABSTRACT**

A chair includes a backrest, and a head and neck support structure arranged at the top side of the backrest for supporting the head and neck of a person resting on the backrest. The head and neck support includes a neck support portion shaped like a convex bar and transversely arranged at the top side of the backrest, and a plurality of radial V-grooves radially upwardly extended from the top side of the neck support portion and inclining upwardly backwardly from the neck support portion in a smooth manner.

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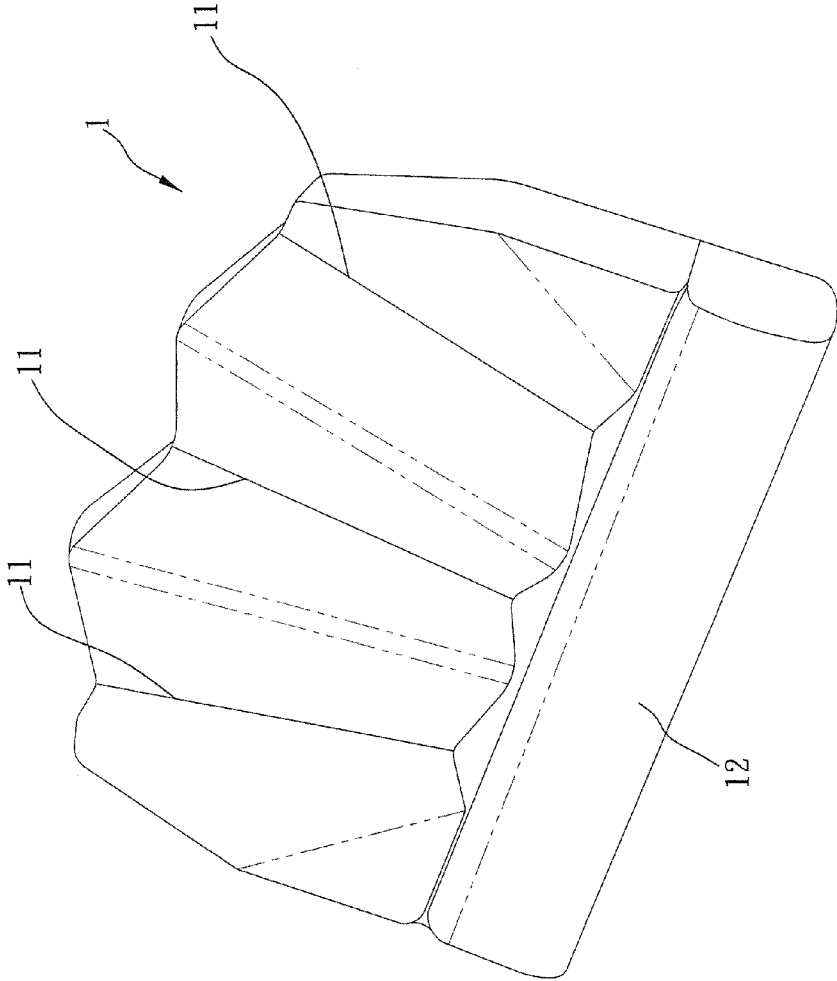


FIG. 1

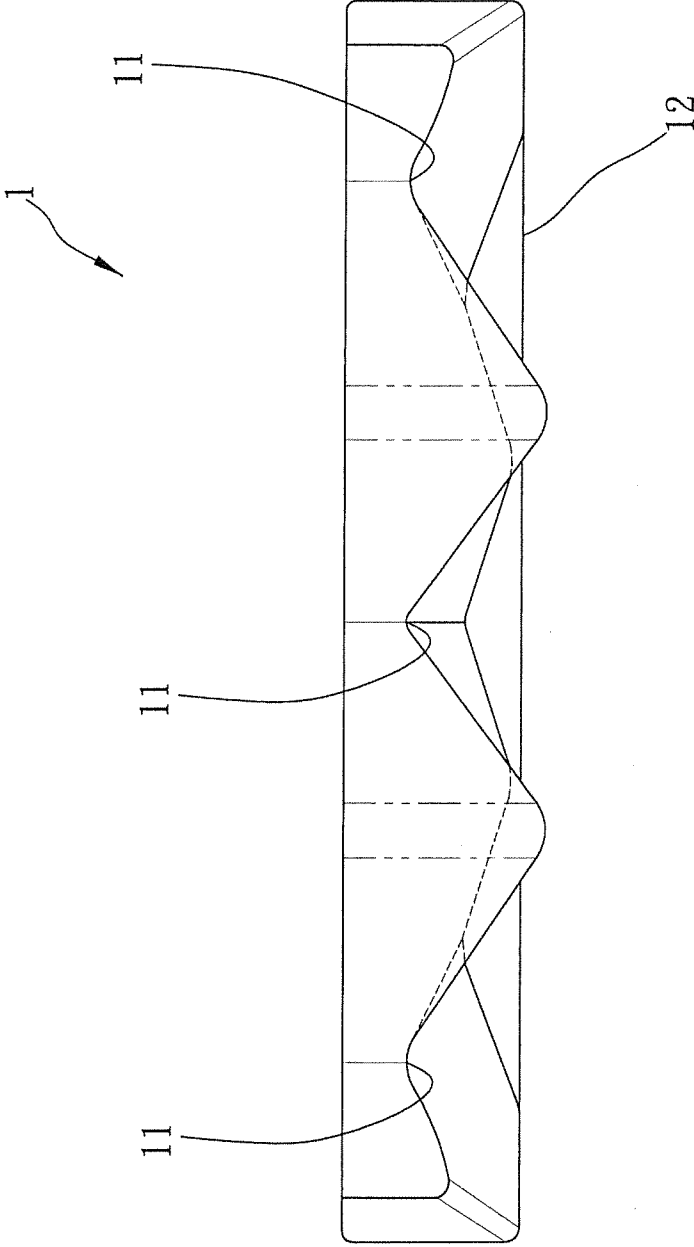


FIG. 2

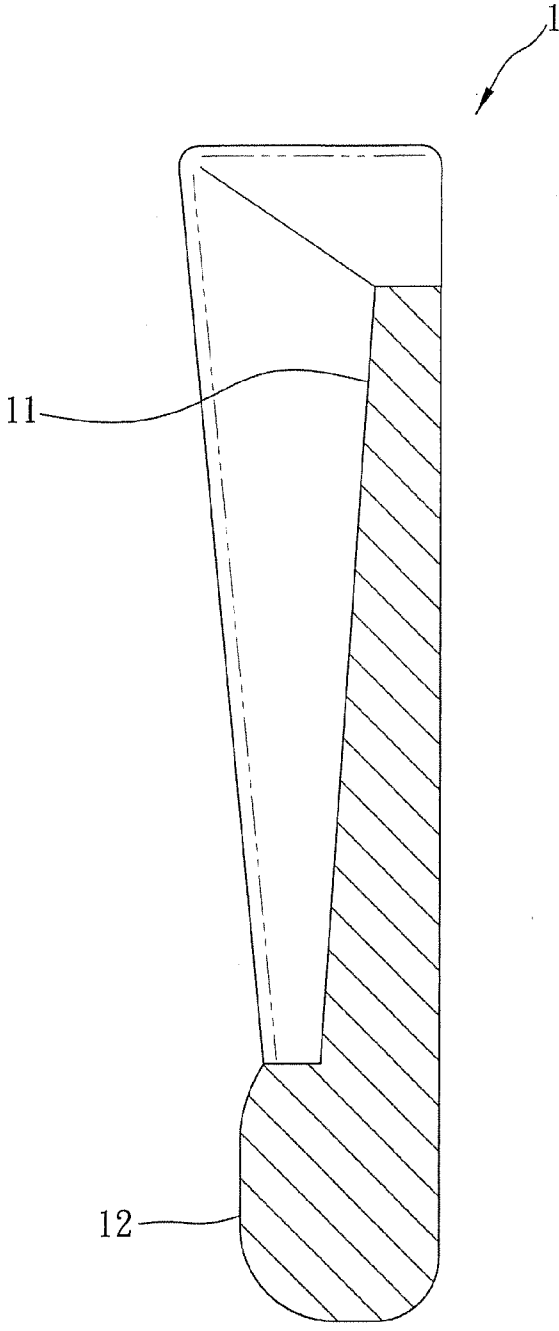


FIG. 3

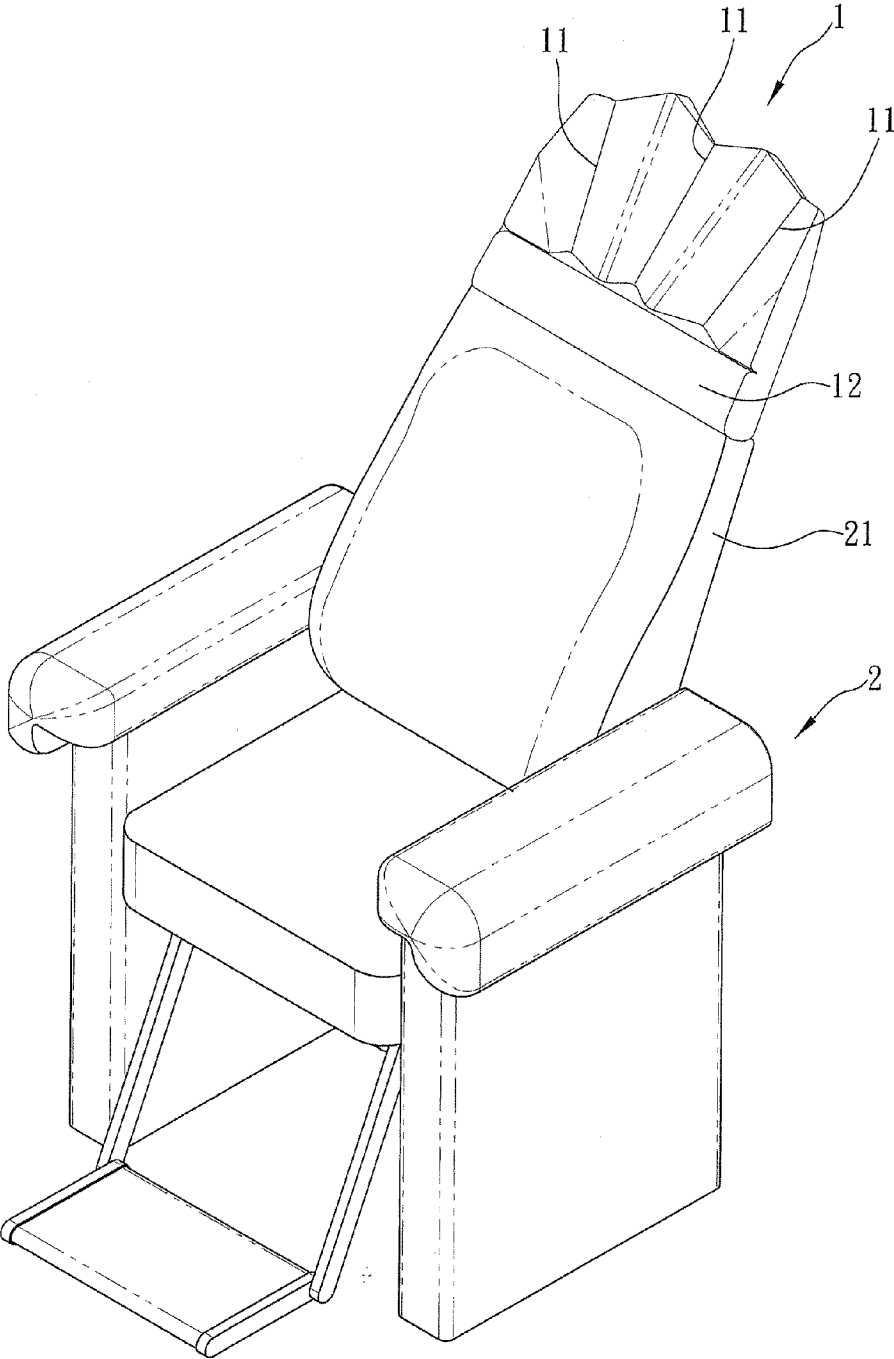


FIG. 4

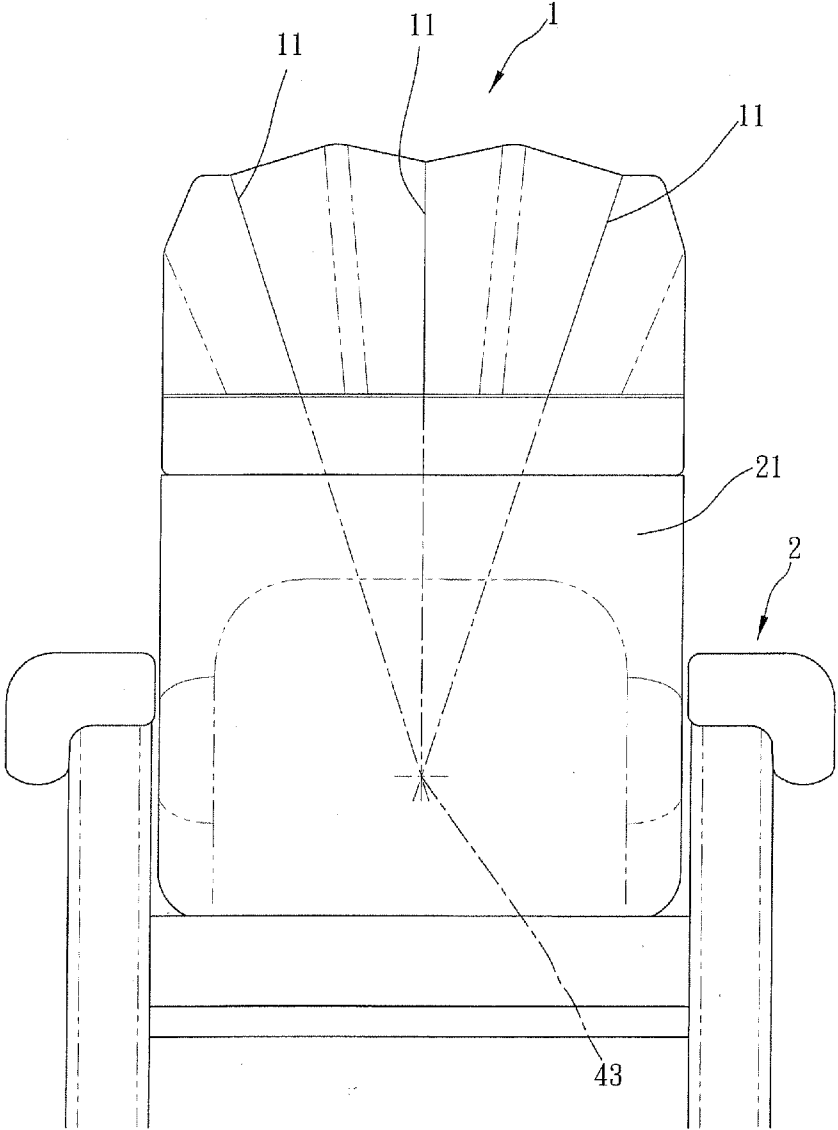


FIG. 5

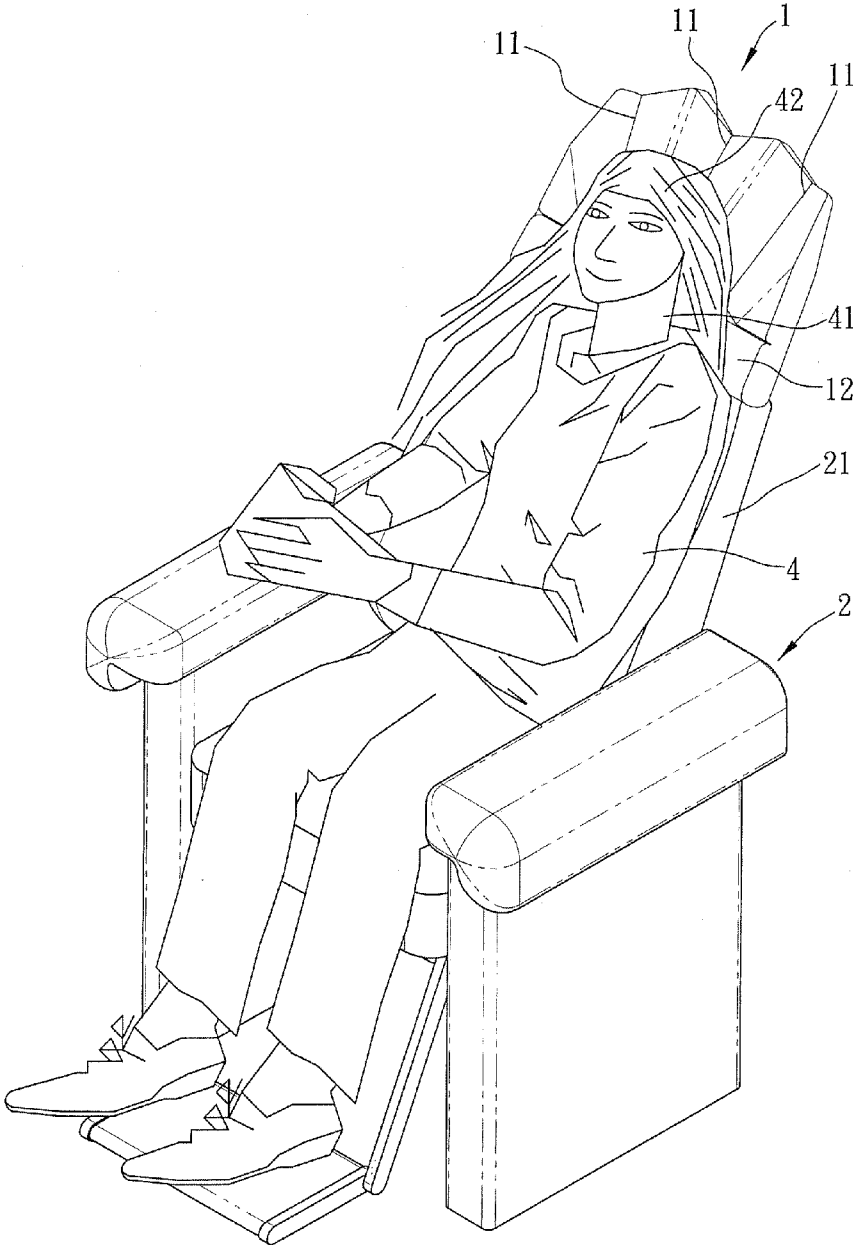


FIG. 6

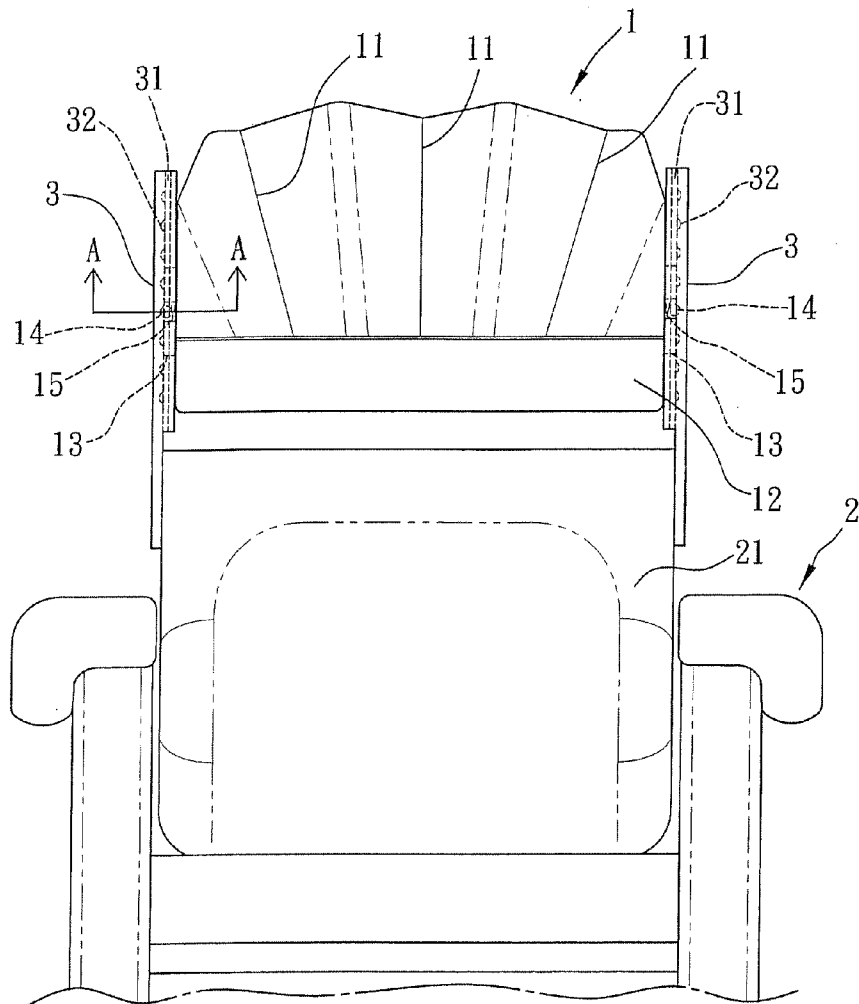


FIG. 7

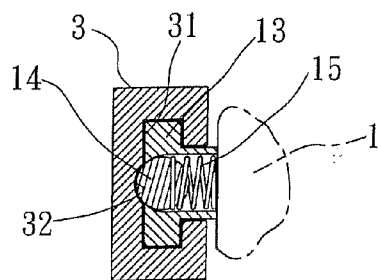


FIG. 8



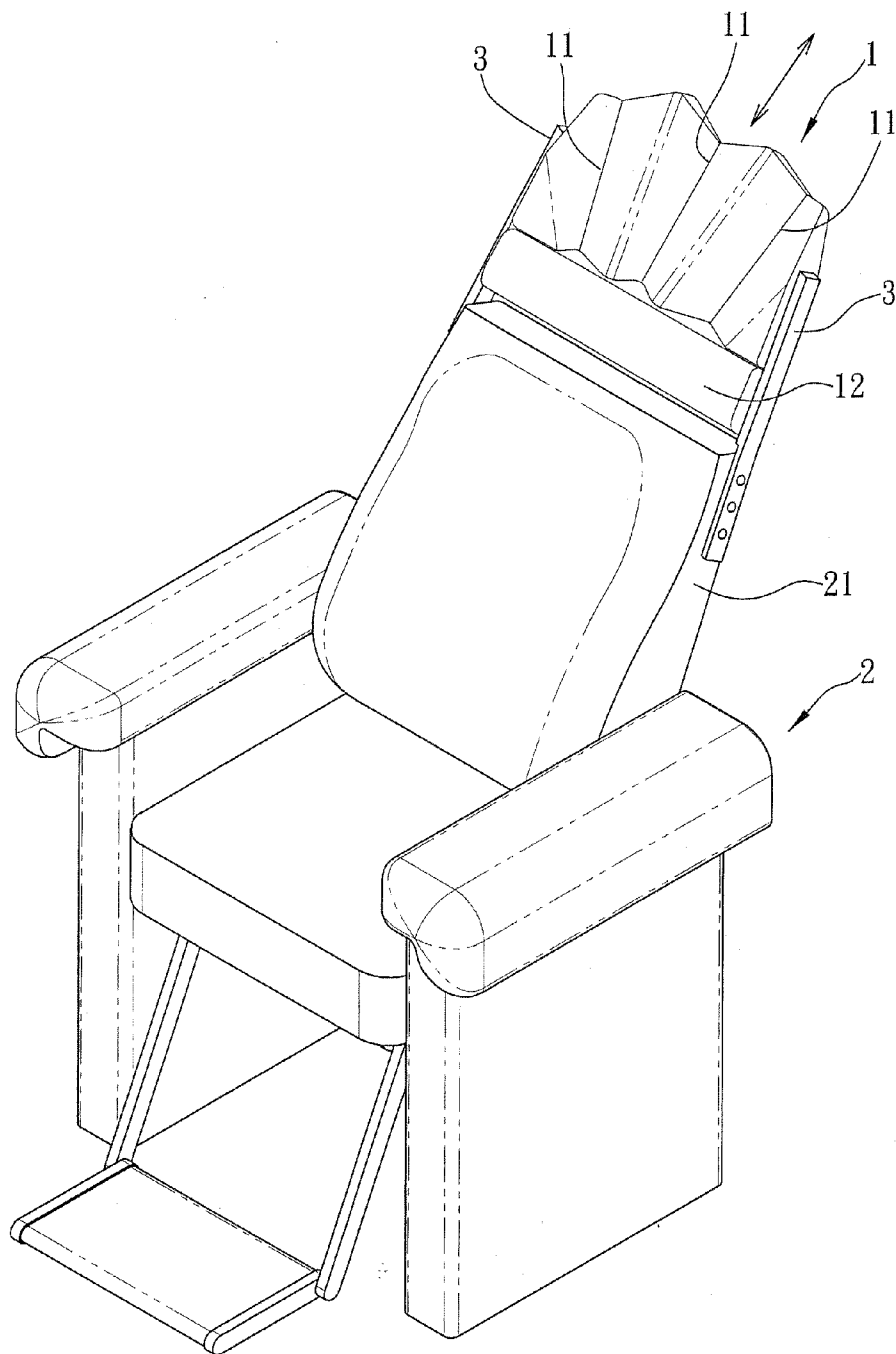


FIG. 9

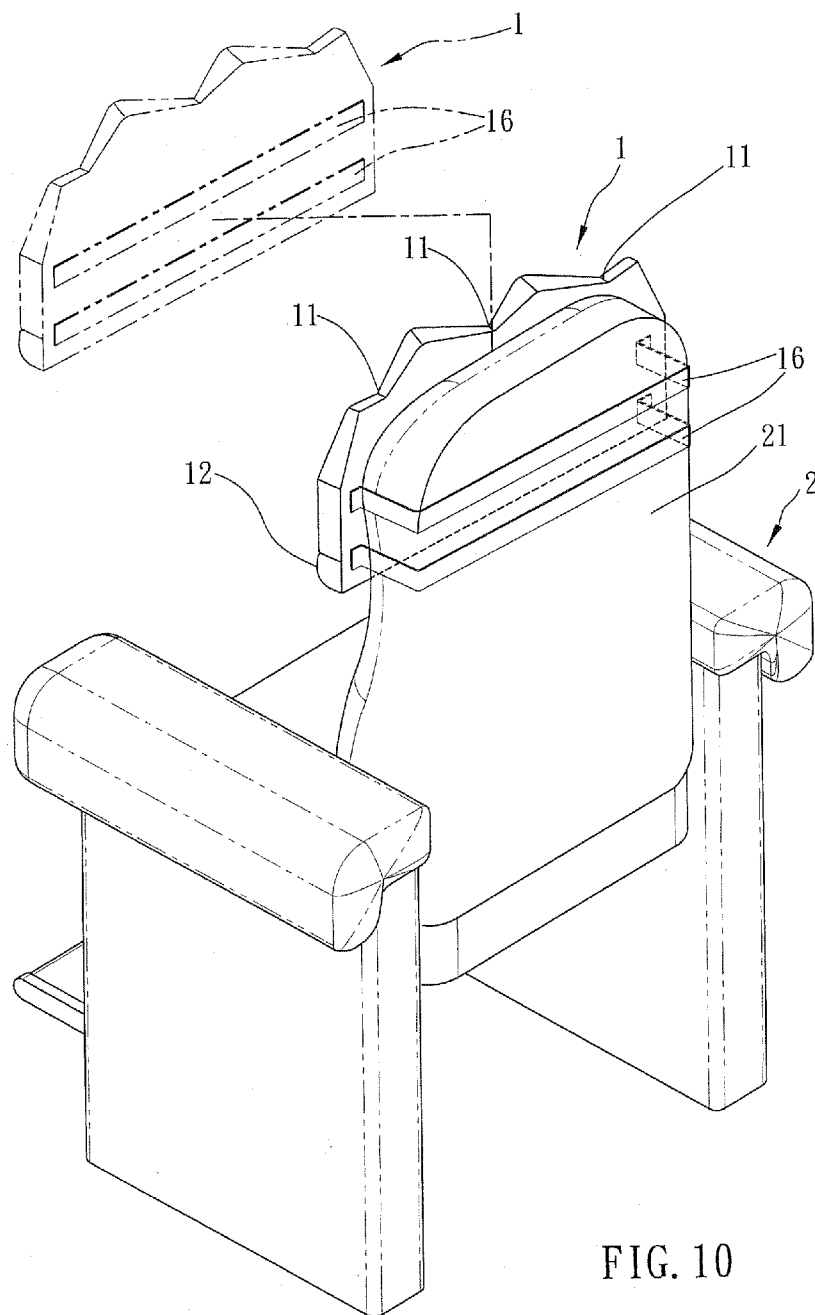


FIG. 10

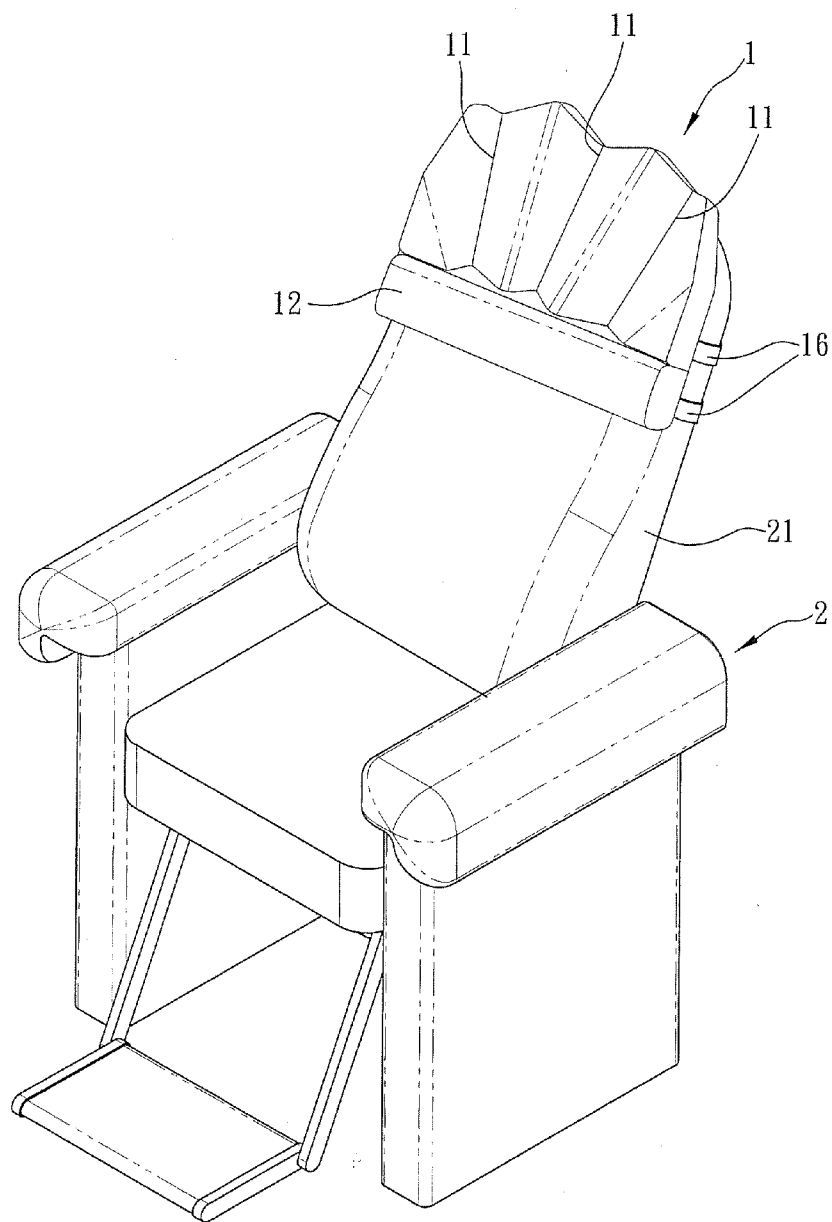


FIG. 11

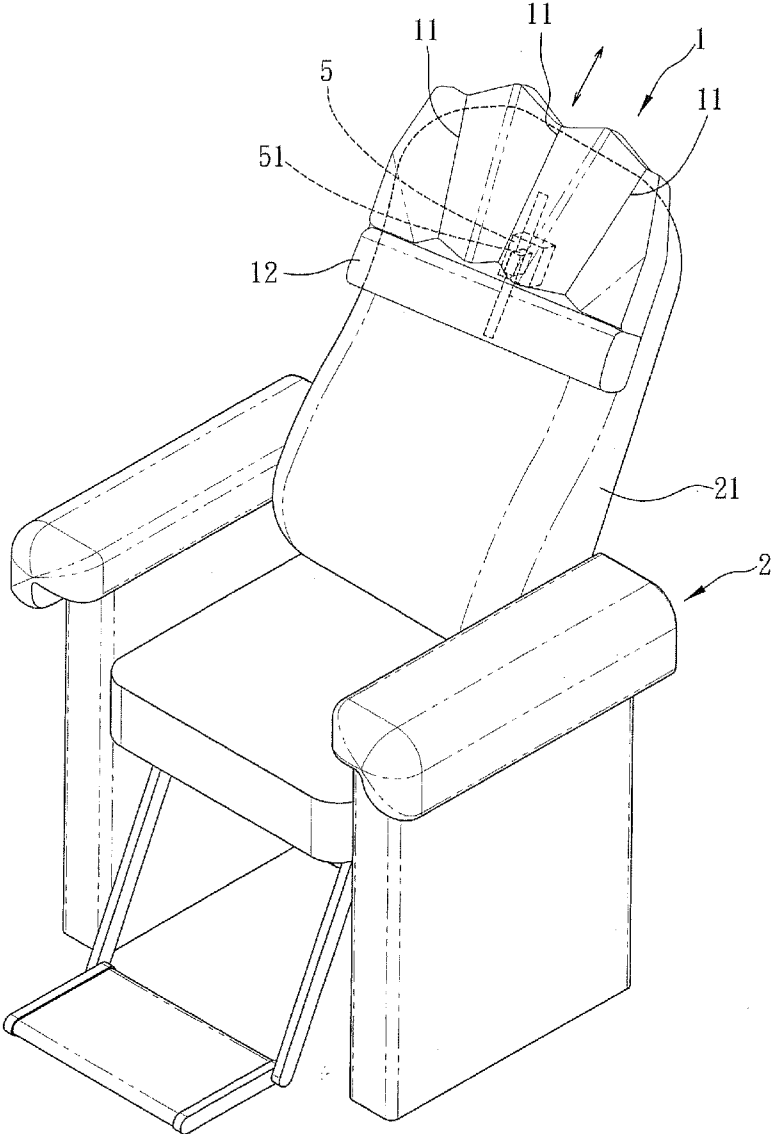


FIG. 12

## CHAIR WITH A HEAD AND NECK SUPPORT STRUCTURE

### BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to chairs and more particularly, to a chair with a head and neck support structure defining a neck support portion shaped like a convex bar and transversely arranged at the top side of the backrest for supporting the user's neck and a plurality of radial V-grooves radially upwardly extended from the top side of the neck support portion and inclining upwardly backwardly from the neck support portion in a smooth manner for supporting the user's head.

[0003] 2. Description of the Related Art

[0004] Many different designs of ergonomic chairs are commercially available. A chair of this kind shall be orthopedically engineered for sitting comfort without hurt. However, most commercial ergonomic chairs emphasize the curved backrest design to support the user's waist and back and the arrangement of a headpiece or headrest at the top side of the curved backrest to support the user's head. However, when the user rested the head on the headrest, the headrest imparts a forward pressure to user's head, causing a stress concentrated on the user's neck. Thus, the user's head and neck will feel pain after sitting for a long period of time. This problem becomes more serious when taking a bus, airplane, cruiser or any other transportation vehicle for a long trip. It is an important service of a transportation company to help passengers relax their body in an enclosed space during a long trip. Further, the headpiece or headrest of a conventional vehicle chair cannot support the user's head in different directions subject oscillation during steering of the transportation vehicle.

### SUMMARY OF THE INVENTION

[0005] The present invention has been accomplished under the circumstances in view. It is one object of the present invention to provide a chair, which is provided with a head and neck support structure at the top side of the backrest for supporting the head and neck of the user resting on the backrest comfortably for a long period of time without causing pain.

[0006] To achieve this and other objects of the present invention, a chair comprises a backrest, and a head and neck support structure arranged at the top side of the backrest for supporting the head and neck of a person resting on the backrest. The head and neck support includes a neck support portion shaped like a convex bar and transversely arranged at the top side of the backrest, and a plurality of radial V-grooves radially upwardly extended from the top side of the neck support portion and inclining upwardly backwardly from the neck support portion in a smooth manner.

[0007] Further, subject to the design of the radial V-grooves, the user's head can be comfortably supported on the head and neck support structure for a long period of time, avoiding concentration of stress and pain.

[0008] Further, subject to the design of the neck support portion and the radial V-grooves, the head and neck of the user resting on the backrest in either a forward facing position or lateral facing position can be well supported, assuring sitting comfort and avoiding neck pain.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 is a perspective view of a head and neck support structure for chair in accordance with the present invention.

[0010] FIG. 2 is a top view of the head and neck support structure shown in FIG. 1.

[0011] FIG. 3 is a sectional view of the head and neck support structure shown in FIG. 1.

[0012] FIG. 4 is a perspective view of a chair with a head and neck support structure in accordance with a first embodiment of the present invention.

[0013] FIG. 5 is a schematic drawing explaining the relationship of the radial V-grooves relative to the lumbar position point.

[0014] FIG. 6 is a schematic applied view of the first embodiment of the present invention.

[0015] FIG. 7 is a front view of a chair with a head and neck support structure in accordance with a second embodiment of the present invention.

[0016] FIG. 8 is a sectional view in an enlarged scale taken along line A-A of FIG. 7.

[0017] FIG. 9 is a perspective view of the chair with a head and neck support structure in accordance with the second embodiment of the present invention.

[0018] FIG. 10 illustrates a front view of a chair with a head and neck support structure in accordance with a third embodiment of the present invention.

[0019] FIG. 11 is an oblique front view of the chair with a head and neck support structure in accordance with the third embodiment of the present invention.

[0020] FIG. 12 is a perspective view of a chair with a head and neck support structure in accordance with a fourth embodiment of the present invention.

### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0021] Referring to FIGS. 1-6, a chair with a head and neck support structure in accordance with a first embodiment of the present invention is shown. The chair 2 comprises a backrest 21, and a head and neck support structure 1 arranged at the top side of a backrest 21. The head and neck support structure 1 comprises a neck support portion 12 shaped like a convex bar and transversely arranged at the top side of the backrest 21, and a plurality of radial V-grooves 11 radially upwardly extended from the top side of the neck support portion 12. Further, the radial V-grooves 11 incline upwardly backwardly in a smooth manner. Thus, when a user 4 rests the neck 41 and the head 42 on the head and neck support structure 1, the head 42 is well supported on the upper part of the head and neck support structure 1 around the radial V-grooves 11, and the neck 41 is well supported on the neck support portion 12. Subject to the design of the radial V-grooves 11, the head and neck support structure 1 does not render any forward pressure to the head 42 of the user 4, avoiding stress concentration and assuring optimal sitting comfort.

[0022] Further, the radial V-grooves 11 extend radially from a center point corresponding to the lumbar position point 43.

[0023] Therefore, when the user 4 is sitting on the chair 2 with the whole back or either lateral side of the body rested on the backrest 21, the head 42 can be well rested in the radial V-grooves 11, and at the same time, and the neck 41 can be well supported on the neck support portion 12, assuring opti-

mal sitting comfort. Further, the number of the radial V-grooves 11 is preferably 3, and backwardly inclined angle of every radial V-groove 11 is preferably 15° angle.

[0024] The head and neck support structure 1 can be directly affixed to the top side of the backrest of a chair. Alternatively, the head and neck support structure 1 can be vertically adjustably mounted at the backrest of a chair, as shown in FIGS. 7-9. According to this second embodiment, two side rails 3 are respectively affixed to two opposite lateral sides of the backrest 21 of the chair 2 and protruding over the top side of the backrest 21. Each side rail 3 defines therein a longitudinal sliding groove 31, and a plurality of recessed locating portions 32 longitudinally spaced in the longitudinal sliding groove 31. The head and neck support structure 1 is slidably coupled between the two side rails 3 above the backrest 21 of the chair 2, comprising two slides 13 respectively coupled to the longitudinal sliding grooves 31 of the two side rails 3, two spring members 15 respectively affixed to the slides 13, and two positioning balls 14 respectively supported on the spring members 15 for selectively engaging in the recessed locating portions 32 to lock the head and neck support structure 1 to the backrest 21 of the chair 2 in one of a series of positions (see FIG. 8).

[0025] FIGS. 10 and 11 illustrate a chair 2 with a head and neck support structure 1 in accordance with a third embodiment of the present invention. According to this third embodiment, the head and neck support structure 1 comprises at least one, for example, two binding belts 16 arranged at the back side thereof. By means of the binding belts 16, the head and neck support structure 1 can be conveniently and detachably fastened to the backrest 21 of a chair 2 at the desired elevation.

[0026] FIG. 12 illustrates a chair 2 with a head and neck support structure 1 in accordance with a fourth embodiment of the present invention. According to this fourth embodiment, an electric lifting mechanism 5 is mounted in the backrest 21 of the chair 2, comprising a lift rod 51 affixed to the head and neck support structure 1 and driven to move the head and neck support structure 1 vertically relative to the backrest 21 of the chair 2.

[0027] In conclusion, the invention provides a chair with a head and neck support structure, wherein the head and neck support structure comprises a neck support portion shaped like a convex bar and transversely arranged at the top side of the backrest for supporting the user's neck, and a plurality of radial V-grooves radially upwardly extended from the top side of the neck support portion for supporting the user's head and holding the user's head comfortably in position against oscillation.

[0028] Although particular embodiments of the invention have been described in detail for purposes of illustration, various modifications and enhancements may be made without departing from the spirit and scope of the invention. Accordingly, the invention is not to be limited except as by the appended claims.

What the invention claimed is:

1. A chair comprising a backrest, and a head and neck support structure arranged at a top side of said backrest for supporting the head and neck of a person resting on said backrest, wherein said head and neck support comprises a neck support portion shaped like a convex bar and trans-

versely arranged at the top side of said backrest, and a plurality of radial V-grooves radially upwardly extended from a top side of said neck support portion, said radial V-grooves inclining upwardly backwardly from said neck support portion.

2. The chair as claimed in claim 1, wherein said radial V-grooves extend radially from a center point corresponding to the lumbar position point.

3. The chair as claimed in claim 1, wherein the number of said radial V-grooves is 3.

4. The chair as claimed in claim 1, wherein said radial V-grooves incline at 15° angle.

5. The chair as claimed in claim 1, wherein said head and neck support structure comprises at least one binding belt disposed at a back side thereof adapted for detachably fastening said head and neck support structure to said backrest at the desired elevation.

6. A chair comprising:

a backrest for supporting the user's back;

two side rails respectively affixed to two opposite lateral sides of said backrest and protruding over a top side of said backrest, each said side rail defining therein a longitudinal sliding groove;

a head and neck support structure slidably coupled between said two side rails above said backrest, said head and neck support structure comprising a neck support portion shaped like a convex bar and transversely arranged at the top side of said backrest, a plurality of radial V-grooves radially upwardly extended from a top side of said neck support portion, said radial V-grooves inclining upwardly backwardly from said neck support portion, two slides respectively coupled to the longitudinal sliding grooves of said two side rails; and

positioning means for locking said head and neck support structure to said side rails.

7. The chair as claimed in claim 6, wherein said positioning means comprises a plurality of recessed locating portions respectively formed in the longitudinal sliding groove in each of said two side rails at different elevations, two spring members respectively affixed to said slides, and two positioning balls respectively supported on said spring members for selectively engaging in said recessed locating portions to lock said head and neck support structure to said side rails.

8. A chair comprising:

a backrest for supporting the user's back;

an electric lifting mechanism mounted in said backrest; and

a head and neck support structure slidably coupled to said electric lifting mechanism and movable up and down relative to said backrest by said electric lifting mechanism, said head and neck support structure comprising a neck support portion shaped like a convex bar and transversely arranged at the top side of said backrest, a plurality of radial V-grooves radially upwardly extended from a top side of said neck support portion, said radial V-grooves inclining upwardly backwardly from said neck support portion, two slides respectively coupled to the longitudinal sliding grooves of said two side rails.

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