



(11)

EP 4 555 899 A1

(12)

EUROPEAN PATENT APPLICATION
published in accordance with Art. 153(4) EPC

(43) Date of publication:
21.05.2025 Bulletin 2025/21

(51) International Patent Classification (IPC):
A47C 7/38 ^(2006.01) **A47C 1/036** ^(2006.01)

(21) Application number: **23839844.0**

(52) Cooperative Patent Classification (CPC):
A47C 1/036; A47C 7/38

(22) Date of filing: **29.06.2023**

(86) International application number:
PCT/KR2023/009077

(87) International publication number:
WO 2024/014750 (18.01.2024 Gazette 2024/03)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
KH MA MD TN

(71) Applicant: **Sidiz Inc.**
Pyeongtaek-si, Gyeonggi-do 17843 (KR)

(72) Inventor: **YOON, Dae Ho**
Seoul 05807 (KR)

(74) Representative: **Impuls legal PartG mbB**
Goethestraße 21
80336 München (DE)

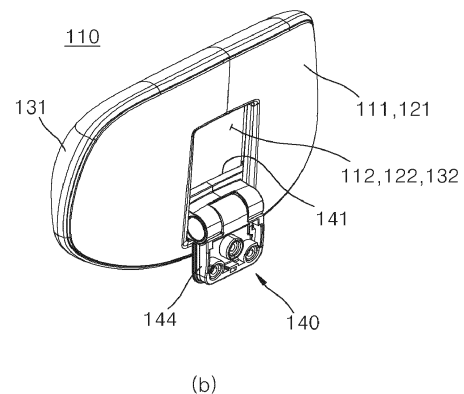
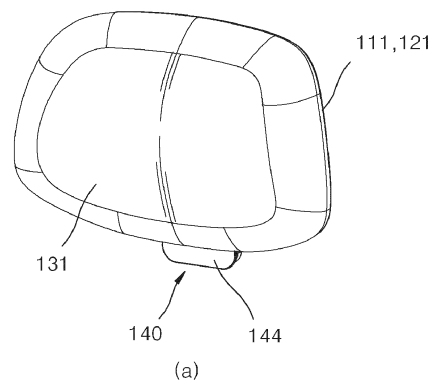
(30) Priority: **12.07.2022 KR 20220085830**

(54) **HEIGHT CONTROL APPARATUS FOR HEADREST AND CHAIR COMPRISING SAME**

(57) The present invention relates to a height control apparatus for a headrest and a chair comprising same, in particular, comprises: an installation portion which is recessed in the rear surface of a headrest body toward the front direction; support members provided at left and right end portions of the installation portion; a height-adjusting guide block which is inserted between the rear surface of the headrest body, which corresponds to the installation portion, and the support members; and frictional force generators which are coupled to the front surfaces of a pair of guide protrusion ends corresponding to the left and right end portions of the height-adjusting guide block, and come into contact with the rear surface of the headrest body, which corresponds to the installation portion, so as to generate the frictional force corresponding to the reaction against the initial actuating force provided by a user. Thus, there are advantages of improving user convenience and preventing the generation of operating noise.

[FIG. 3]

110



EP 4 555 899 A1

Description

[Technical Field]

[0001] The present disclosure relates to a height control apparatus for a headrest and a chair including the same, and more specifically, to a height control apparatus for a headrest and a chair including the same, which can facilitate height control of a headrest and reduce operational trial and error by stably stopping the headrest at a position desired by a user.

[Background Art]

[0002] Generally, a headrest or a neckrest (hereinafter collectively referred to as "headrest") is coupled to an upper portion of a backrest of a chair to support a user's head or neck.

[0003] A user's posture when sitting on a chair can be classified into a work sitting posture and a resting sitting posture, and basically, the user takes a rest by changing an angle of the body, and the headrest serves to support the user's head or neck to maintain a more comfortable posture.

[0004] Most headrests for a chair are fixed to the backrest or have a structure having a height control function of controlling a height according to the user's body.

[0005] In particular, the height control function provides an advantage of improving user convenience by allowing the user to control the height of the headrest according to physical conditions and sitting postures of the seated person.

[0006] A representative chair having a height control function is disclosed in Korean Laid-Open Patent No. 10-2012-0134232 (published on December 12, 2012) (hereinafter referred to as "related art").

[0007] FIG. 1 is a perspective view illustrating an example of a height control apparatus for a headrest according to the related art, and FIG. 2 is a specific exploded perspective view of the height control apparatus for a headrest among components of FIG. 1.

[0008] As illustrated in FIGS. 1 and 2, a height control apparatus 70 (referred to as a "height control member" in the specification of the related art) for a headrest according to the related art is provided between a backrest 20 and a frame 30 provided to support a rear of the backrest 20, and a support member 40 moves upward and downward via an installation member 50 in which a movement hole 52 is formed to control a height of the headrest 10 mounted on the support member 40.

[0009] In particular, the height control apparatus 70 for a headrest according to the related art includes a catch groove member 72, elastic protrusions 74, accommodation members 78, and an elastic bracket 76. Here, disclosed is that the catch groove member 72 is formed to protrude to have a plurality of catch grooves 73 vertically at a front of the support member 40, and the hemispherical elastic protrusions 74 are elastically caught in the plurality of catch grooves 73 while the support member 40 moves vertically, thereby restricting the height.

rical elastic protrusions 74 are elastically caught in the plurality of catch grooves 73 while the support member 40 moves vertically, thereby restricting the height.

[0010] Here, the height control apparatus 70 for a headrest according to the related art has a mechanism in which, in a case in which a user controls a height of a headrest 10 according to his or her physical conditions (body type), when the user holds the headrest 10 and then applies a predetermined initial operating force, the elastic protrusions 74 elastically caught in one of the plurality of catch grooves 73 pass over an adjacent catch groove 73 and are caught in the catch groove 73 at a point where the initial operating force is released, thereby controlling the height.

[0011] However, the height control apparatus 70 for a headrest according to the related art operated by the mechanism needs to greatly set the initial operating force (or a stop frictional force) in that, after the height of the headrest is controlled according to the user's body, a predetermined stop frictional force is required to prevent the user's height control device for a headrest from moving downward when the user arbitrarily leans his or her head, while the initial operating force of the user, which is required for control the height, depends only on the elastic force generated by a spring 75 for elastically supporting the elastic protrusions 74.

[0012] Accordingly, when the user applies a relatively great initial operating force, there is a problem that the elastic protrusions 74 pass over several catch grooves 73 at once to make it difficult for the user to accurately control the height and several trial and errors are required to control the height according to the user.

[0013] In addition, to secure the smooth movement of the support member 40 that moves vertically to substantially control the height, the movement hole 52 of the installation member 50, which guides the upward and downward movement of the support member 40, needs to impart a certain amount of separation space between front and rear surfaces of the support member 40, and there is a problem that high-frequency noise is generated as a gap occurs between the front and rear surfaces of the support member 40 during the height control process by the user.

[0014] In particular, the frame 30 on which the installation member 50 is installed and an edge member 32 disposed at a front end of the frame 30 serve as a sound-box when noise is generated by the support member 40, resulting in a problem that the noise spreads more loudly.

[Technical Problem]

[0015] The present disclosure has been made in efforts to solve the above problems and is directed to providing a height control apparatus for a headrest and a chair including the same, which can enable height control without trial and error at a position desired by a user and prevent generation of operational noise.

[Technical Solution]

[0016] A height control apparatus for a headrest according to one embodiment of the present disclosure includes an installation part formed to be recessed forward on a back surface of a headrest main body, support members provided on both left and right end portions of the installation part, a height control guide block inserted between the back surface of the headrest main body, which corresponds to the installation part, and the support member, and a frictional force generator coupled to front surfaces of a pair of guide protrusions, which correspond to both left and right end portions of the height control guide block, and being in contact with the back surface of the headrest main body, which corresponds to the installation part, to generate a frictional force corresponding to a reaction force of an initial operating force provided by a user.

[0017] Here, a plurality of catch grooves may be formed to be vertically recessed continuously rearward in the front surface of the support member, and a haptic catch part caught by being elastically supported by the plurality of catch grooves may be provided on a rear surface of the height control guide block.

[0018] In addition, the frictional force generator may be formed of a flexible material.

[0019] In addition, the frictional force generator may be formed of a frictional material that generates a predetermined frictional force between the frictional force generator and the back surface of the headrest main body, which corresponds to the installation part.

[0020] In addition, the frictional force generator may be formed so that a front end has an amount of protrusion generating the frictional force on the back surface of the headrest main body, which corresponds to the installation part, from the front surface of the height control guide block.

[0021] In addition, the haptic catch part may include an elastic block installed by being inserted into a support groove formed in the back surface of the height control guide block, and a haptic roller which is elastically supported by a predetermined elastic force by the elastic block and of which a part of an outer circumferential surface protrudes to the outside of the support groove and is in contact with the catch groove of the support member, and the frictional force of the frictional force generator may be set considering an elastic force provided by the elastic block.

[0022] In addition, the height control apparatus may further include a rear cover panel which is coupled to a rear portion of the headrest main body and in which a through hole is formed so that a space corresponding to the installation part communicates rearward.

[0023] In addition, each of left and right inner ends of the through hole may be provided to have a separation distance in which the support member is capable of being hidden from the outside.

[0024] In addition, a separation distance between an

upper end of the installation part and an upper end of the support member may be formed to be greater than a vertical length of the pair of protrusions of the height control guide block.

[0025] In addition, the height control apparatus may further include a guide panel coupled to the back surface of the headrest main body, which corresponds to the installation part, and formed to guide a vertical movement of the height control guide block.

[0026] In addition, a length between both left and right ends of the guide panel may be provided to correspond to a separation distance of the pair of guide protrusions.

[0027] A chair according to one embodiment of the present disclosure may include the above-described height control apparatus for a headrest.

[Advantageous Effects]

[0028] According to the height control apparatus for a headrest and the chair including the same according to one embodiment of the present disclosure, it is possible to achieve various effects as follows.

[0029] First, by adding the frictional force generator operated by the reaction force against the initial operating force provided from the user to control the height of the headrest, it is possible to stop the headrest without trial and error at the position desired by the user, thereby improving user convenience.

[0030] Second, by removing the separation space between the front and rear ends of the height control guide block, it is possible to prevent the generation of high-frequency noise during control of the height.

[Description of Drawings]

[0031]

FIG. 1 is a perspective view illustrating an example of a height control apparatus for a headrest according to the related art.

FIG. 2 is a specific exploded perspective view illustrating the height control apparatus for a headrest among components of FIG. 1.

FIG. 3A is a front perspective view and FIG. 3B is a rear perspective view, which illustrate a height control apparatus for a headrest according to an embodiment of the present disclosure.

FIG. 4 is an exploded perspective view of each of FIGS. 3A and 3B.

FIGS. 5A and 5B are front and rear exploded perspective views illustrating the height control apparatus for a headrest for a rear surface of a headrest main body.

FIGS. 6A and 6B are partially cut exploded perspective views illustrating an installation order of the height control apparatus for an installation part of FIG. 5B.

FIG. 7 is an exploded perspective view illustrating an

installation state of a height control guide block among components of FIG. 3.

FIG. 8 is an exploded perspective view illustrating an installation state of an angle control rotation block among the components of FIG. 3.

FIGS. 9A and 9B are partially and entirely exploded perspective views for describing the coupled state of the height control guide block and the angle control rotation block among the components of FIG. 3.

FIGS. 10A and 10B are horizontal and vertical cross-sectional views for describing the coupled state of the height control guide block and the angle control rotation block among the components of FIG. 3.

FIG. 11 is a front view illustrating a headrest among the components of FIG. 3.

FIGS. 12A and 12B are a cross-sectional view and a cut perspective view along lines A-A and B-B in FIG. 11.

<Description of reference numerals>

[0032]

110: headrest 111: headrest main body
112: Installation part 114a, 114b: upper and lower hook catch holes
116: assembly screw 117: support member
117a: catch groove 118: movement limit hook part
119: insertion part 121: rear cover panel
122: through hole part 131: front cushion panel
132: matching groove 136: screw through hole
150: guide panel 160: frictional force generator
170: haptic catch part 171: elastic block
172: haptic roller

[Mode for Invention]

[0033] Hereinafter, a height control apparatus for a headrest and a chair including the same according to one embodiment of the present disclosure will be described in detail with reference to the accompanying drawings.

[0034] In adding reference numerals to components in each drawing, it should be noted that the same components have the same reference numerals as much as possible even when they are illustrated in different drawings. In addition, in describing embodiments of the present disclosure, the detailed description of related known configurations or functions will be omitted when it is determined that the detailed description obscures the understanding of the embodiments of the present disclosure.

[0035] Terms such as first, second, A, B, (a), and (b) may be used to describe components of the embodiments of the present disclosure. The terms are only for the purpose of distinguishing a component from another, and the nature, sequence, order, or the like of the corresponding component is not limited by the terms. In addition,

unless otherwise defined, all terms (including technical and scientific terms) used herein have the same meanings as those commonly understood by those skilled in the art to which the present disclosure pertains.

The terms defined in a generally used dictionary should be construed as meanings that match with the meanings of the terms from the context of the related technology and are not construed as an ideal or excessively formal meaning unless clearly defined in this application.

[0036] FIG. 3A is a front perspective view and FIG. 3B is a rear perspective view, which illustrate a height control apparatus for a headrest according to an embodiment of the present disclosure, and FIG. 4 is an exploded perspective view of each of FIGS. 3A and 3B.

[0037] As illustrated in FIGS. 3 and 4, a height control apparatus 140 for a headrest according to one embodiment of the present disclosure may be coupled to a headrest 110.

[0038] More specifically, as illustrated in FIGS. 3 and 4, the headrest 110 may be formed to a size that supports the back of a user's head or the back of the user's neck and may include a headrest main body 111 forming the entire frame, a rear cover panel 121 coupled to a back surface of the headrest main body 111, and a front cushion panel 131 coupled to a front surface of the headrest main body 111 and being in direct contact with the back of the user's head or the back of the user's neck.

[0039] An installation part 112 having a rectangular parallelepiped space that substantially extends vertically and is slim in a front-rear direction may be provided in a middle portion of the headrest main body 111.

[0040] The installation part 112 may be formed in a shape that protrudes forward from the headrest main body 111 and is concave forward from the rear of the headrest main body 111. In addition, the installation part 112 may be concavely formed in a shape of a quadrangular groove of which vertical length is substantially greater than a width in the left-right direction.

[0041] The height control apparatus 140 for a headrest according to the embodiment of the present disclosure, which will be described below, may be coupled to the installation part 112. A specific coupled state of the installation part 112 of the height control apparatus 140 for a headrest will be described in more detail below.

[0042] Support members 117 for preventing both end portions of the height control apparatus 140 for a headrest from being separated rearward may be installed at both left and right end portions of the installation part 112. More specifically, when the installation part 112 has a quadrangular groove shape that protrudes forward from the back surface of the headrest main body 111 as described above, the support member 117 may be fixed to the headrest main body 111 corresponding to each of left and right edge portions of the installation part 112, and the end portions facing each other in a width direction are provided to overlap each other inside the installation part 112 by a predetermined length, and thus the height control apparatus 140 for a headrest may be caught

rearward.

[0043] Here, the support member 117 may be set so that a height of an upper end thereof is a predetermined length smaller than a height of an upper end of the installation part 112. The height of the upper end of the support member 117 is set to be smaller than the height of the upper end of the installation part 112, and a gap that is not interfered by the support member 117 in the front-rear direction is provided between the above-described upper ends, and hereinafter, a space between the upper end of the support member 117 and the upper end of the installation part 112 is defined as an "insertion part 119." Accordingly, a separation distance between the upper end of the installation part 112 and the upper end of the support member 117 may be formed to be greater than a vertical length of a pair of guide protrusions 141a and 141b corresponding to both left and right end portions of a height control guide block 141 to be described below.

[0044] In this case, when installed by being inserted through the insertion part 119 defined as the space between the upper end of the support member 117 and the upper end of the installation part 112 and then moved a predetermined distance downward, the height control apparatus 140 for a headrest according to one embodiment of the present disclosure may have both end portions each caught by the support member 117 rearward to be prevented from being separated to the outside.

[0045] Here, the rear surface of the headrest main body 111, which corresponds to the insertion part 119, as a back surface of the installation part 112 may be provided with movement limit hook parts 118 on which upper ends of both end portions of the height control guide block 141 to be described below are caught.

[0046] The movement limit hook part 118 has a hook end formed to protrude rearward to serve to allow the height control guide block 141 to be inserted and coupled by at least forming a space greater than a thickness of the height control guide block 141 in the front-rear direction between the support members 117 by pressing the hook end when the height control guide block 141 to be described below is inserted and coupled by a predetermined insertion force through the insertion part 119.

[0047] In addition, the movement limit hook part 118 serves to prevent the height control guide block 141 from being arbitrarily removed through the insertion part 119 by the catching operation with the hook end of the movement limit hook part 118 restored to the original position after the height control guide block 141 is inserted into the installation part 112 and then moved a predetermined distance downward.

[0048] In addition, the movement limit hook part 118 may also serve as a limit stopper that limits the upward movement of the height control guide block 141 installed on the installation part 112.

[0049] The height control apparatus 140 for a headrest according to one embodiment of the present disclosure formed in such a configuration provides an advantage of enabling simple assembly using the movement limit hook

part 118 of the insertion part 119 without a separate assembly tool, such as a fastener, for installation of the headrest 110.

[0050] Meanwhile, as illustrated in FIGS. 3 and 4, the front cushion panel 131 may be disposed to cover the front of the headrest main body 111.

[0051] Here, the front cushion panel 131 may be formed as a cushion having a rear end surface formed of a solid plastic material and a front formed of a sponge material. A matching groove 132 matching the installation part 112 protruding forward from the headrest main body 111 may be formed in a rear surface of the front cushion panel 131.

[0052] Meanwhile, a rear cover panel 121 may be coupled to a rear portion of the headrest main body 111. The rear cover panel 121 may form a rear exterior of the headrest main body 111.

[0053] In addition, the rear cover panel 121 may be formed to have the rectangular through hole 122 cut so that the remaining portion of the height control apparatus 140 for a headrest according to one embodiment of the present disclosure installed on the installation part 112 of the headrest main body 111, which excludes a portion caught on the support member 117, passes through the rear cover panel 121 and is exposed rearward.

[0054] Here, after the rear cover panel 121 is coupled to the rear portion of the headrest main body 111, left and right inner ends of the through hole 122 may be provided to have a separation distance in which the support members 117 provided at both left and right end portions of the installation part 112 may be hidden from the outside when observed in the front-rear direction (i.e., directly forward).

[0055] The height control apparatus 140 for a headrest according to one embodiment of the present disclosure may be installed to be moved vertically along the through hole 122 by the operating force transferred by the height control behavior of the user in a state of being installed on the installation part 112 of the headrest main body 111 at the rear through the through hole 122 of the rear cover panel 121.

[0056] In this way, a space corresponding to the installation part 112 may be provided to completely communicate rearward by the through hole 122 of the rear cover panel 121, thereby preventing the installation part 112 from serving as a soundbox during operation.

[0057] The rear cover panel 121 may be hook-coupled to the rear portion of the headrest main body 111, and the front cushion panel 131 may be screw-coupled to a front portion of the headrest main body 111 via a plurality of assembly screws 116.

[0058] To hook-couple the rear cover panel 121 to the headrest main body 111, the headrest main body 111 may have an upper hook catch hole 114a and lower hook catch holes 114b provided at three places in a shape of triangular vertices, and a front surface of the rear cover panel 121 may have an upper catch hook 124a and lower catch hooks 124b provided at three places in the shape of triangular vertices.

[0059] The total three of the upper catch hook 124a and the lower catch hooks 124b may be caught after passing through the total three of the upper hook catch hole 114a and the lower hook catch holes 114b formed in the headrest main body 111 from the front to the rear so that the rear cover panel 121 is closely coupled to the rear portion of the headrest main body 111.

[0060] Meanwhile, for screw-coupling of the front cushion panel 131 to the headrest main body 111, a snap fitting hole 136 into which tree snaps 135 fastened to the front surface of the headrest main body 111 by an assembly screw 116 is accommodated and forcibly fitted may be provided at multiple places of the front cushion panel 131, and screw fastening bosses 126 fastened by the assembly screw 116 passing through the snap fitting hole 136 may be provided at multiple places of the front surface of the rear cover panel 121.

[0061] Before the front cushion panel 131 is coupled to the headrest main body 111, the plurality of assembly screws 116 pass through the screw through hole (no reference numeral) formed in the headrest main body 111, couple the tree snaps 135 to the front surface of the headrest main body 111, and then are each fastened to the screw fastening boss 126 of the rear cover panel 121.

[0062] Thereafter, the front cushion panel 131 is easily coupled to the front of the headrest main body 111 by the operation of bringing the front cushion panel 131 into close contact with the front of the headrest main body 111 so that the tree snap 135 is forcibly fitted into the snap fitting hole 136 provided in the back surface of the front cushion panel 131.

[0063] Here, when the height control apparatus 140 for a headrest according to one embodiment of the present disclosure is installed on the headrest 110, the user can easily attach and detach the front cushion panel 131 to and from the headrest main body 111 in a forcibly fitting manner without a separate assembly tool, such as a fastener, except when the tree snap 135 is installed, thereby improving user convenience.

[0064] FIGS. 5A and 5B are front and rear exploded perspective views illustrating the height control apparatus for a headrest for a rear surface of a headrest main body, and FIGS. 6A and 6B are partially cut exploded perspective views illustrating an installation order of the height control apparatus for an installation part of FIG. 5B.

[0065] Referring to FIGS. 5A to 6B, the process of installing the height control apparatus 140 for a headrest according to one embodiment of the present disclosure on the installation part 112 of the headrest main body 111 is schematically described as follows.

[0066] First, as illustrated in FIGS. 5A and 5B, the height control apparatus 140 for a headrest according to one embodiment of the present disclosure may be installed on the installation part 112, which is a space provided on the back surface of the headrest main body 111, and installed in advance before the rear cover panel 121 is coupled to the headrest main body 111.

[0067] Here, on the back surface of the headrest main body 111, which corresponds to the installation part 112, a guide panel 150 for guiding the vertical movement while preventing shaking of the height control guide block 141 to be described below in the left-right direction among the components of the height control apparatus 140 for a headrest according to one embodiment of the present disclosure may be installed in advance.

[0068] At both left and right sides of the installation part 112, guide slots 112h formed to extend vertically may be provided to be recessed forward, and guide installation ribs 150h each inserted into one of the pair of guide slots 112h to prevent the shaking in the left-right direction may be formed on the front surface of the guide panel 150.

[0069] A length (i.e., a length of a width) between both left and right ends of the guide panel 150 is preferably provided to correspond to a separation distance between the pair of guide protrusions 141a and 141b (see FIG. 9A) each protruding forward from one of both left and right ends of the height control guide block 141 to be described below.

[0070] A frictional force generator 160 to be described below is provided on the front surface of each of the pair of guide protrusions 141a and 141b of the height control guide block 141 so that, when moving vertically in the installation part 112, the height control apparatus 140 for a headrest according to one embodiment of the present disclosure moves while generating a predetermined frictional force at the portion corresponding to the front surface of the installation part 112, and in addition, each stepped surface (inner surface) forming the pair of guide protrusions 141a and 141b stably moves while being guided without the shaking in the left-right direction along both left and right ends of the guide panel 150.

[0071] Meanwhile, the height control apparatus 140 for a headrest according to one embodiment of the present disclosure may be easily installed by the operation of positioning the upper end of the support member 117 to be inserted through the space between the upper ends of the installation part 112 in a state in which the rear cover panel 121 is separated from the headrest main body 111 as illustrated in FIG. 6A and then being in close contact with the back surface of the headrest main body 111 forming the installation part 112 as illustrated in FIG. 6B.

[0072] Next, although not illustrated in the drawings, when the height control guide block 141 is moved downward in a state of being in close contact with the installation part 112, the height control guide block 141 may be moved downward through the space with the support member 117 as the movement limit hook part 118 is pressed.

[0073] FIG. 7 is an exploded perspective view illustrating an installation state of a height control guide block among components of FIG. 3, FIG. 8 is an exploded perspective view illustrating an installation state of an angle control rotation block among the components of FIG. 3, FIGS. 9A and 9B are partially and entirely exploded perspective views for describing the coupled state

of the height control guide block and the angle control rotation block among the components of FIG. 3, and FIGS. 10A and 10B are horizontal and vertical cross-sectional views for describing the coupled state of the height control guide block and the angle control rotation block among the components of FIG. 3.

[0074] As illustrated in FIGS. 7 to 10B, the height control apparatus 140 for a headrest according to one embodiment of the present disclosure may be coupled to the installation part 112 of the headrest 110.

[0075] As illustrated in FIGS. 7 and 8, the height control apparatus 140 for a headrest according to one embodiment of the present disclosure may include the height control guide block 141 coupled by being inserted into the installation part 112 and provided to relatively move vertically inside the installation part 112 when vertically moving to control the height of the headrest 110, and the angle control rotation block 144 to which the height control guide block 141 is connected to rotate about a left and right horizontal axis.

[0076] As illustrated in FIGS. 9A and 9B, the angle control rotation block 144 may include a hinge insertion end 144-1 to be hinge-coupled to the height control guide block 141, and a backrest coupling end 144-2 formed integrally with the hinge insertion end 144-1 and mediating coupling to a front end portion of the backrest among components of a chair (not illustrated).

[0077] Here, the back surface of the height control guide block 141 may be provided with a rotation coupling end 142 in which a hinge hole 142h into which a hinge rotation shaft 145 of the angle control rotation block 144 to be described below is inserted is formed.

[0078] More specifically, a pair of rotation coupling ends 142 may be provided to be spaced by a predetermined distance (central portion) from each other on both left and right end portions of the back surface of the height control guide block 141, which exclude the central portion, and the hinge insertion end 144-1 of the angle control rotation block 144 may be positioned between the pair of rotation coupling ends 142 spaced apart from each other for hinge connection.

[0079] In addition, a detachment prevention protrusion 143a provided in the form of a body portion of a flat head bolt 143 is formed to protrude toward the center of the hinge hole inside the hinge hole 142h of the rotation coupling end 142, and a C-ring 146 having an interference protrusion 146a formed to have a bent front end and interfere with the detachment prevention protrusion 143a may be interposed in the hinge rotation shaft 145.

[0080] Here, as illustrated in FIG. 9B, the flat head bolt 143 having the detachment prevention protrusion 143a may be a body portion fastened to be exposed from the front surface of the height control guide block 141 to the hinge hole 142h behind the height control guide block 141. The flat head bolt 143 may be fastened to a bolt through hole 142h-b formed to pass through the bolt through hole 142h-b in the front-back direction of the height control guide block 141.

[0081] Meanwhile, a ring fixing slit 142h-a into which the interference protrusion 146a of the C-ring 146 is seated by being inserted may be formed inside the hinge hole 142h of the rotation coupling end 142.

[0082] The interference protrusion 146a of the C-ring 146 may be inserted into the ring fixing slit 142h-a, which is interposed by being fitted into an outer circumferential surface of a ring interposition portion 145b among the components of the hinge rotation shaft 145 to be described below and provided to be open in the hinge hole 142h of the rotation coupling end 142 in each of left and right directions, in the insertion direction.

[0083] In this case, the interference protrusion 146a of the C-ring 146 inserted into the ring fixing slit 142h-a is caught in a direction opposite to the insertion direction of the C-ring 146 by the detachment prevention protrusion 143a provided in the form of the body portion of the flat head bolt 143, thereby preventing arbitrary detachment to the outside.

[0084] In addition, since the interference protrusion 146a of the C-ring 146 is fixed to the ring fixing slit 142ha, unlike the hinge rotation shaft 145 that maintains the state of being fixed to the angle control rotation block 144 when the user controls the angle of the headrest main body 111, the interference protrusion 146a is coupled to rotate in conjunction with the height control guide block 141.

[0085] Here, as an inner circumferential surface of the C-ring 146 generates a predetermined rotation frictional force with an outer circumferential surface of the ring interposition portion 145b of the hinge rotation shaft 145, when the user rotates the height control guide block 141 with respect to the angle control rotation block 144 in order to control the angle of the headrest main body 111, the rotation operation is allowed, and when the operating force of the user is removed, the stationary state at the corresponding position may be maintained.

[0086] In addition, as illustrated in FIGS. 9A and 9B, the front end portion of the hinge rotation shaft 145 may be fastened by passing through the hinge hole 142h of each of the pair of rotation coupling ends 142 from the outside, and then the hinge rotation shaft 145 may be fastened to be matched with a shaft coupling end 144-4 formed inside a fastening hole 144-3 of the hinge insertion end 144-1 of the angle control rotation block 144.

[0087] More specifically, the hinge rotation shaft 145 may include a shaft body 145a, the ring interposition portion 145b provided at an outer end portion of the shaft body 145a and having an outer circumferential surface with a circular cross section so that the C-ring 146 is interposed thereinto, and a shaft fixing portion 145c matching the shaft coupling end 144-4 of the hinge insertion end 144-1 as the front end portion of the shaft body 145a.

[0088] Here, the shaft fixing portion 145c is preferably moved in the insertion direction that is the left-right direction and fixedly matched with the shaft coupling end 144-4 and formed to have the outer surface with a

non-circular cross section to be prevented from being rotated in conjunction with the frictional force with the C-ring 146.

[0089] When the hinge rotation shaft 145 of the angle control rotation block 144 formed of such a configuration is inserted into the hinge hole 142h of the rotation coupling end 142 provided on the back surface of the height control guide block 141, the open hinge hole 142h of the rotation coupling end 142 may be shielded from the outside using a hinge cap 147.

[0090] In this way, in the height control apparatus 140 for a headrest according to one embodiment of the present disclosure, the height control guide block 141 may be designed so that the user may couple the hinge rotation shaft 145 to one open side of the hinge hole 142h of the rotation coupling end 142 without a separate tool, and prevent the C-ring 146 already coupled to the ring interposition portion 145b from being detached to the outside through the detachment prevention protrusion 143a of the flat head bolt 143 and also couple the hinge cap 147 in a forcibly fitting manner, thereby making it easier for the user to assemble.

[0091] Here, the height control guide block 141 may be disposed between a front surface in which a part including left and right ends of both left and right end portions forms the installation part 112 and the support member 117 provided to be spaced by a predetermined distance rearward from the front surface of the installation part 112 to be prevented from being detached rearward.

[0092] However, since the height control guide block 141 is a component that is fixed to a frame (not illustrated) forming the backrest (not illustrated) via the angle control rotation block 144, the meaning that the height control guide block 141 is prevented from being moved rearward by the support member 117 may be a concept also including the meaning that the headrest 110 is prevented from being detached forward with respect to the height control guide block 141.

[0093] FIG. 11 is a front view illustrating a headrest among the components of FIG. 3, and FIGS. 12A and 12B are a cross-sectional view and a cut perspective view along lines A-A and B-B in FIG. 11.

[0094] As illustrated in FIGS. 11 to 12B, a plurality of catch grooves 117a may be formed to be vertically arranged continuously and recessed rearward in a front surface of the support member 117.

[0095] In addition, a haptic catch part 170 caught to be elastically supported by the plurality of catch grooves 117a of the support member 117 may be provided on the back surface of each of both left and right end portions of the height control guide block 141.

[0096] As illustrated in FIG. 12A, the haptic catch part 170 may include an elastic block 171 installed by being inserted into a support groove 148 formed to be recessed forward in the back surfaces of both end portions of the height control guide block 141, and a haptic roller 172 of which a part of an outer circumferential surface protrudes to the outside of the support groove 148 and is in contact

with one of the plurality of catch grooves 117a of the support member 117 positioned therebehind by the elastic force of the elastic block 171.

[0097] When the user holds the headrest 110 and vertically moves the headrest 110 according to his or her body shape, the support member 117 moves vertically in conjunction with the headrest main body 111, and at this time, the haptic roller 172 of the haptic catch part 170 in a stationary state passes over the adjacent catch groove 117a in a direction opposite to the direction of the moving support member 117 and is caught and seated to be accommodated in the catch groove 117a when the initial operating force of the user is released.

[0098] In the height control apparatus 140 for a headrest according to one embodiment of the present disclosure, the haptic catch part 170 is illustrated and described as being disposed as a single haptic catch part at the central portion of each of both left and right end portions of the height control guide block 141, but is not necessarily limited to this number, and it is apparent that a plurality of haptic catch parts may also be provided so that two or more haptic rollers 172 may be caught in two or more catch grooves 117a at the same time in response to a design value of the initial operating force.

[0099] Here, an increase in the number of haptic catch parts 170 leads to an increase in the number of elastic blocks 171 that elastically support the haptic rollers 172, and an increase in the number of elastic blocks 171 means that the design value of the initial operating force applied by the user increases by the increased number, which can affect the design value of a static friction force of the frictional force generator 160 to be described below, which is designed to act in a direction opposite to the initial operating force.

[0100] More specifically, the height control apparatus 140 for a headrest according to one embodiment of the present disclosure may further include the frictional force generator 160 which is coupled to the front surfaces of the pair of guide protrusions 141a and 141b, which correspond to both end portions of the height control guide block 141, and of which a front surface is in contact with the back surface of the headrest main body 111, which corresponds to the installation part 112, as illustrated in FIG. 12B.

[0101] Here, the frictional force generator 160 is formed to have a cross section of a substantially "C" shape and may be formed of a flexible material. The flexible material is a material of which a shape is deformed when a predetermined external force is applied.

[0102] Meanwhile, the frictional force generator 160 may be formed of a frictional material that forms a predetermined frictional force with respect to the back surface of the headrest main body 111 (which means the back surface forming the installation part 112), which is in direct contact with the frictional force generator 160.

[0103] The frictional force generator 160 may be fitted into a fitting protrusion 149 formed on the front surfaces of both end portions of the height control guide block 141.

[0104] In addition, the front end of the frictional force generator 160 is preferably formed to protrude forward so that at least the front surface has a predetermined frictional force or more with respect to the back surface of the headrest main body 111 when the height control guide block 141 is installed by being inserted into the installation part 112. Here, the amount of forward protrusion of the frictional force generator 160 is preferably designed to generate the predetermined frictional force based on the front surfaces of the pair of guide protrusions 141a and 141b, which correspond to both end portions of the height control guide block 141.

[0105] The frictional force generated between the headrest main body 111 and the frictional force generator 160 is a static frictional force and may be a force that continuously acts as a predetermined reaction force on the headrest main body 111 when the headrest main body 111 is moved vertically by the initial operating force provided by the user through the headrest main body 111.

[0106] Accordingly, as the frictional force generator 160 acts as a predetermined reaction force from the moment when the user provides the initial operating force and the haptic roller 172 of the haptic catch part 170 passes over the catch groove 117a of the support member 117, even when the initial operating force is set large by the elastic force of the elastic block 171, the user may stop the headrest main body 111 at a desired height without trial and error.

[0107] In addition, since the frictional force generator 160 may serve to eliminate the separation distance of the height control guide block 141 in the front-rear direction, which is positioned between the support member 117 and the front surface corresponding to the installation part 112, it is possible to block the clearance (shaking) of the height control guide block 141 in the front-rear direction in advance, thereby preventing the generation of high-frequency noise.

[0108] Meanwhile, a chair (not illustrated) according to one embodiment of the present disclosure may include the height control apparatus 140 for a headrest according to one embodiment of the present disclosure configured as described above.

[0109] Here, in the height control apparatus 140 for a headrest, the angle control rotation block 144 is coupled to the frame provided at the upper end of the backrest (not illustrated) and the height control guide block 141 is connected to rotate with respect to the angle control rotation block 144 as described above. In addition, as described above, the height control apparatus 140 for a headrest is designed so that the user can easily assemble the same without a separate assembly tool, such as a separate fastener, when the height control guide block 141 is hinge-coupled to the angle control rotation block 144, thereby improving assembly convenience.

[0110] The height control apparatus for a headrest and the chair including the same according to one embodiment of the present disclosure has been described above in detail with reference to the accompanying drawings.

However, it is apparent that the embodiments of the present disclosure are not necessarily limited by the above-described embodiments, and various modifications and implementation within the equivalent scope are possible by those skilled in the art to which the present disclosure pertains. Therefore, the true scope of the present disclosure will be determined by the claims to be described below.

[Industrial applicability]

[0111] The present disclosure provides a height control apparatus for a headrest and a chair including the same, which can enable height control without trial and error at a position desired by a user and prevent generation of operational noise.

Claims

1. A height control apparatus for a headrest, comprising:

an installation part formed to be recessed forward on a back surface of a headrest main body; support members provided on both left and right end portions of the installation part;

a height control guide block inserted between the back surface of the headrest main body, which corresponds to the installation part, and the support member; and

a frictional force generator coupled to front surfaces of a pair of guide protrusions, which correspond to both left and right end portions of the height control guide block, and being in contact with the back surface of the headrest main body, which corresponds to the installation part, to generate a frictional force corresponding to a reaction force of an initial operating force provided by a user.

2. The height control apparatus of claim 1, wherein a plurality of catch grooves are formed to be vertically recessed continuously rearward in the front surface of the support member, and a haptic catch part caught by being elastically supported by the plurality of catch grooves is provided on a rear surface of the height control guide block.

3. The height control apparatus of claim 1, wherein the frictional force generator is formed of a flexible material.

4. The height control apparatus of claim 1, wherein the frictional force generator is formed of a frictional material that generates a predetermined frictional force between the frictional force generator and the back surface of the headrest main body, which

corresponds to the installation part.

5. The height control apparatus of claim 1, wherein the frictional force generator is formed so that a front end has an amount of protrusion generating the frictional force on the back surface of the headrest main body, which corresponds to the installation part, from the front surface of the height control guide block. 5

6. The height control apparatus of claim 2, wherein the haptic catch part includes: 10
 - an elastic block installed by being inserted into a support groove formed in the back surface of the height control guide block; and 15
 - a haptic roller which is elastically supported by a predetermined elastic force by the elastic block and of which a part of an outer circumferential surface protrudes to the outside of the support groove and is in contact with the catch groove of the support member, and 20
 - the frictional force of the frictional force generator is set considering an elastic force provided by the elastic block. 25

7. The height control apparatus of claim 1, further comprising a rear cover panel which is coupled to a rear portion of the headrest main body and in which a through hole is formed so that a space corresponding to the installation part communicates rearward. 30

8. The height control apparatus of claim 7, wherein each of left and right inner ends of the through hole is provided to have a separation distance in which the support member is capable of being hidden from the outside. 35

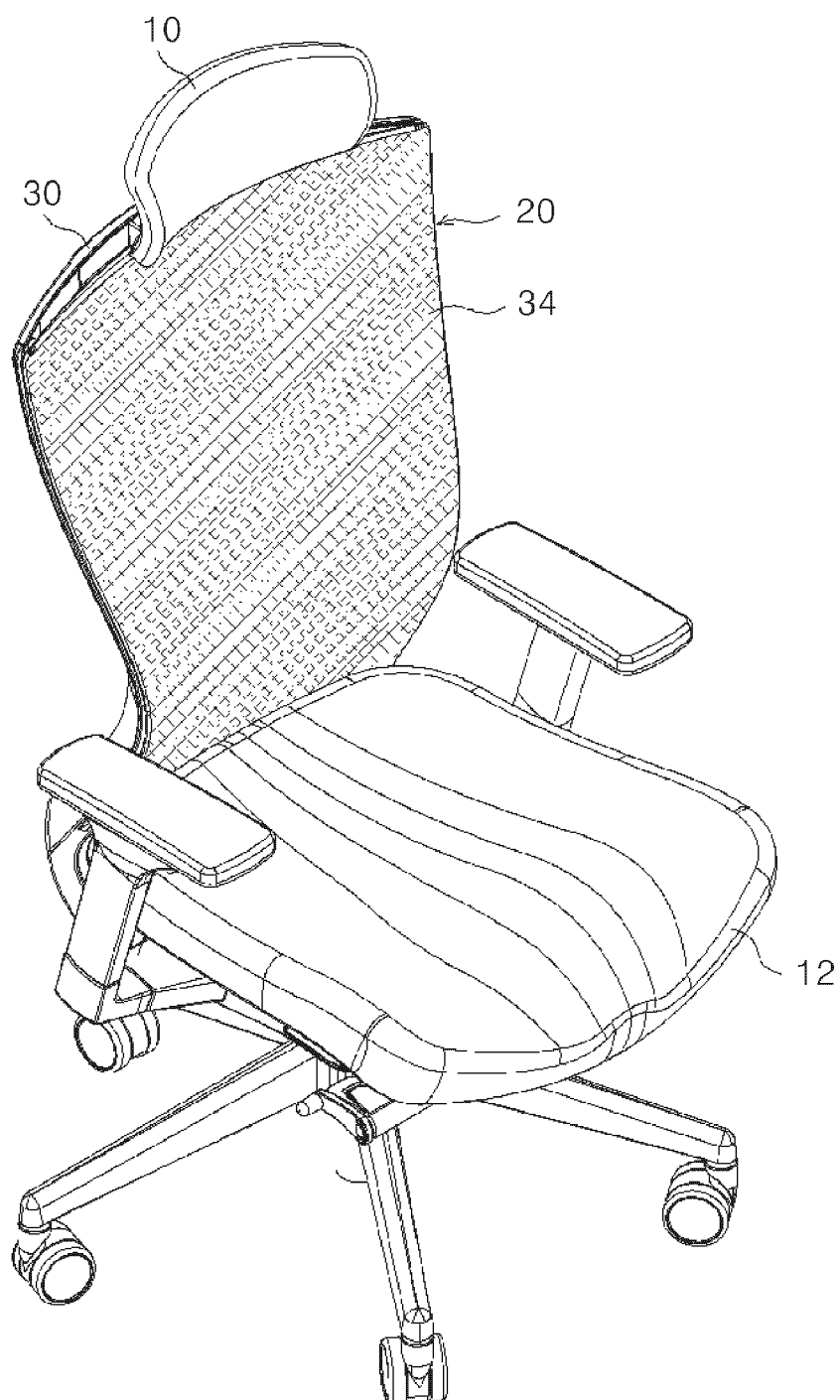
9. The height control apparatus of claim 1, wherein a separation distance between an upper end of the installation part and an upper end of the support member is formed to be greater than a vertical length of the pair of guide protrusions of the height control guide block. 40

10. The height control apparatus of claim 1, further comprising a guide panel coupled to the back surface of the headrest main body, which corresponds to the installation part, and formed to guide a vertical movement of the height control guide block. 45

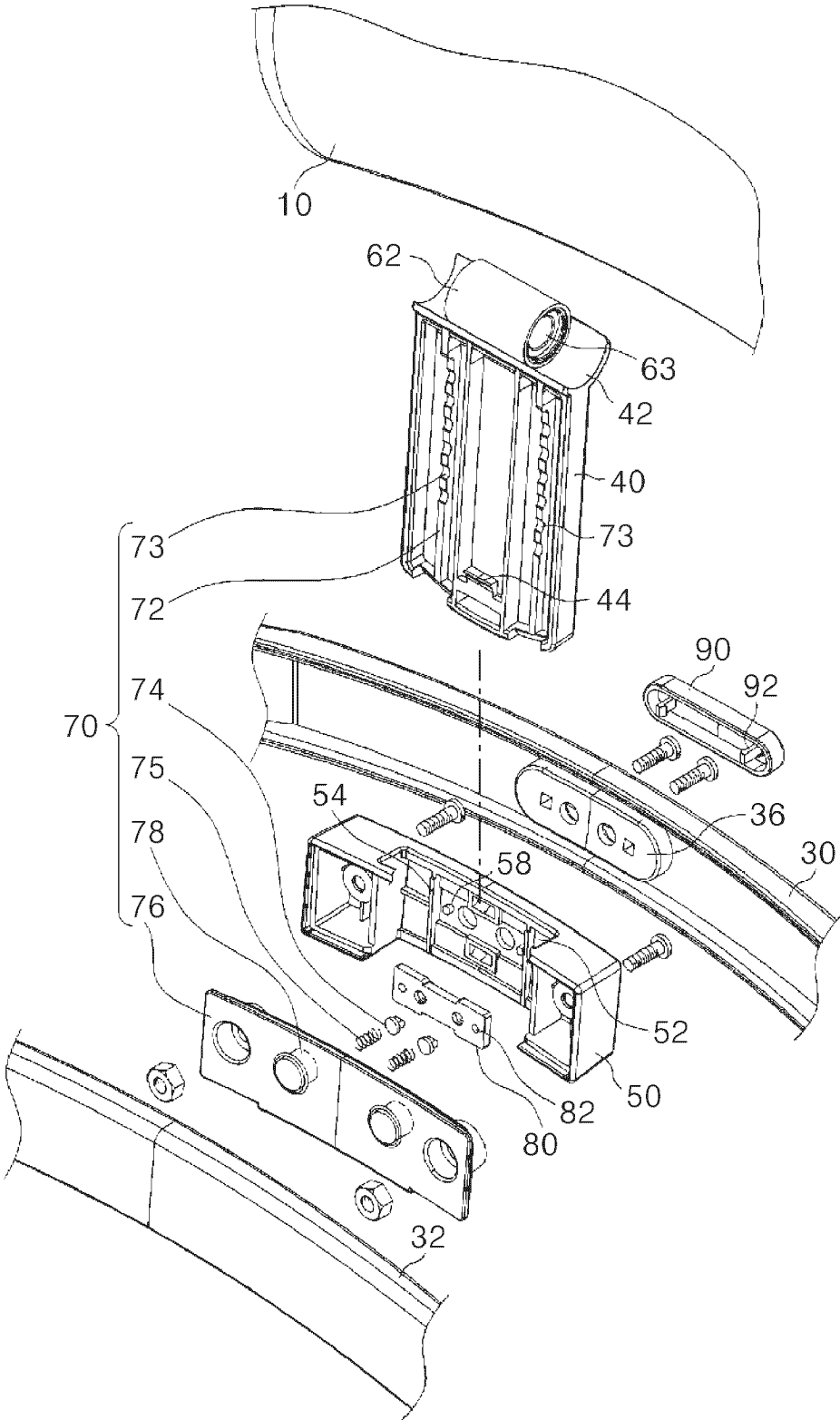
11. The height control apparatus of claim 10, wherein a length between both left and right ends of the guide panel is provided to correspond to a separation distance of the pair of guide protrusions. 50

12. A chair comprising the height control apparatus for a headrest of one of claims 1 to 11. 55

[FIG. 1]

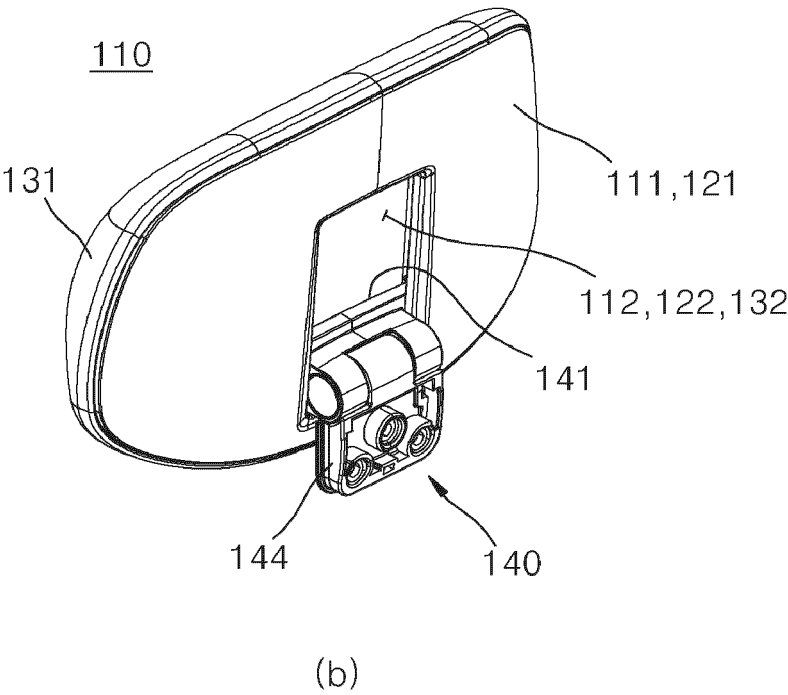
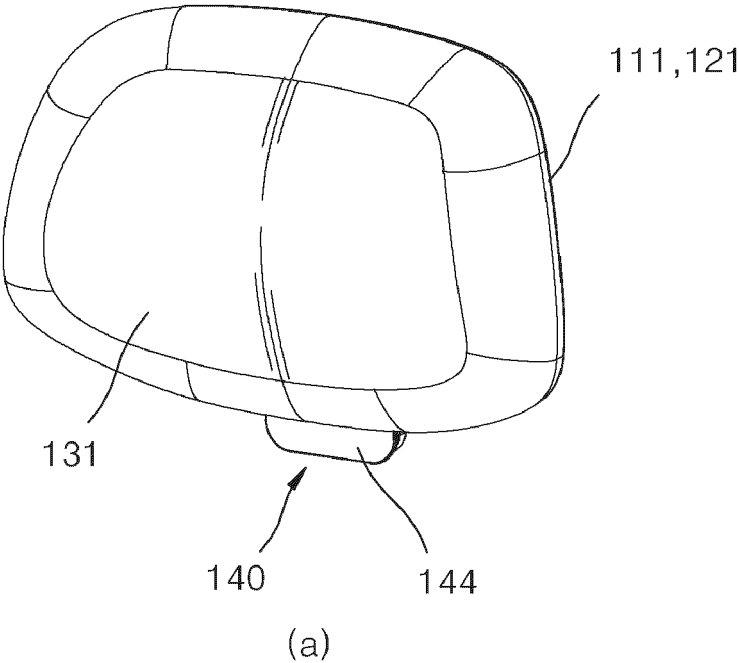


[FIG. 2]

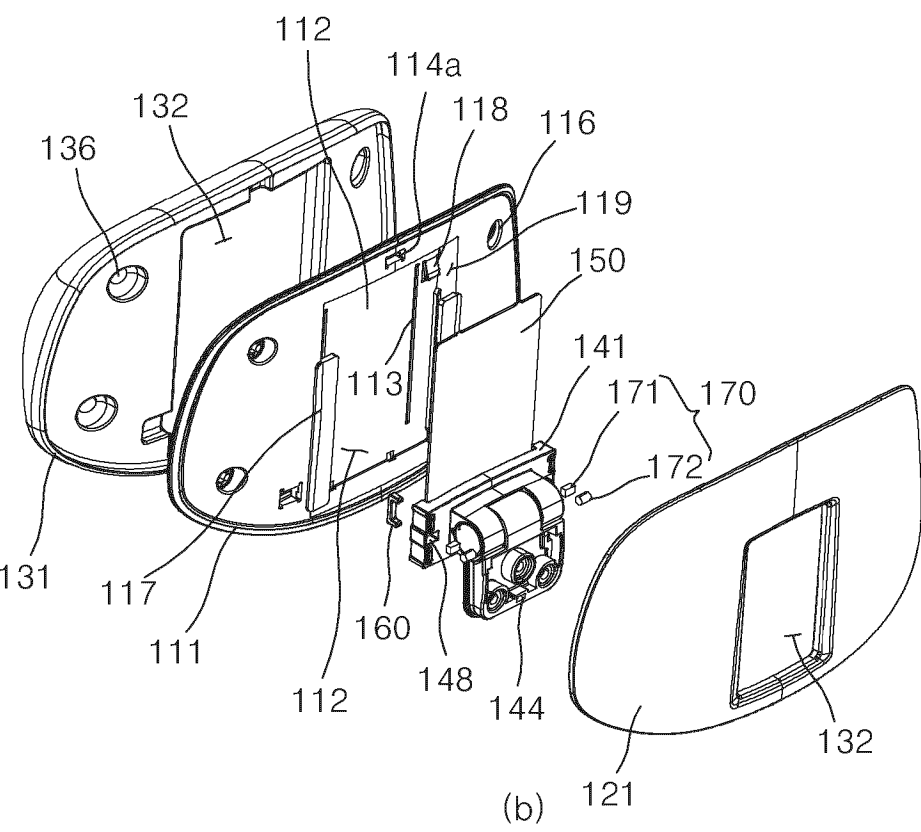
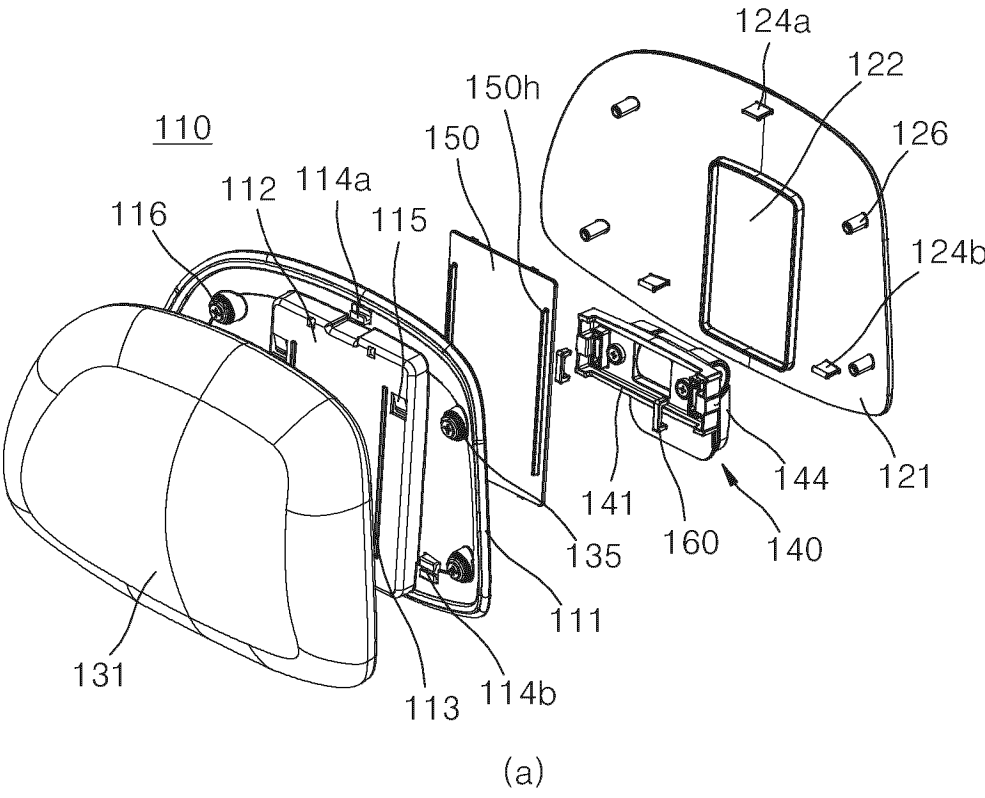


[FIG. 3]

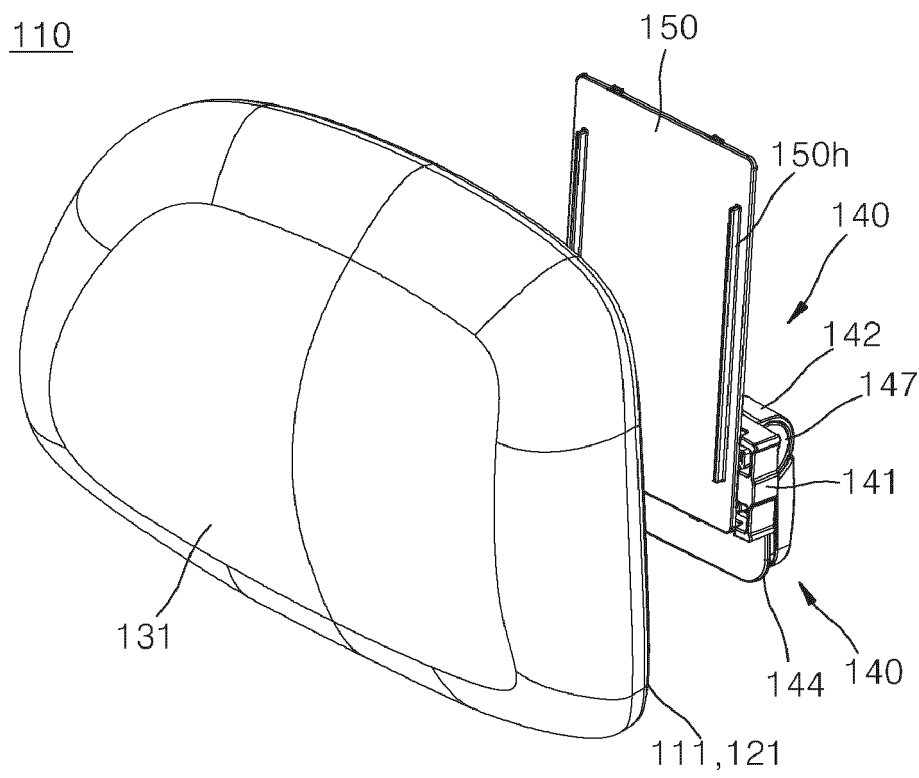
110



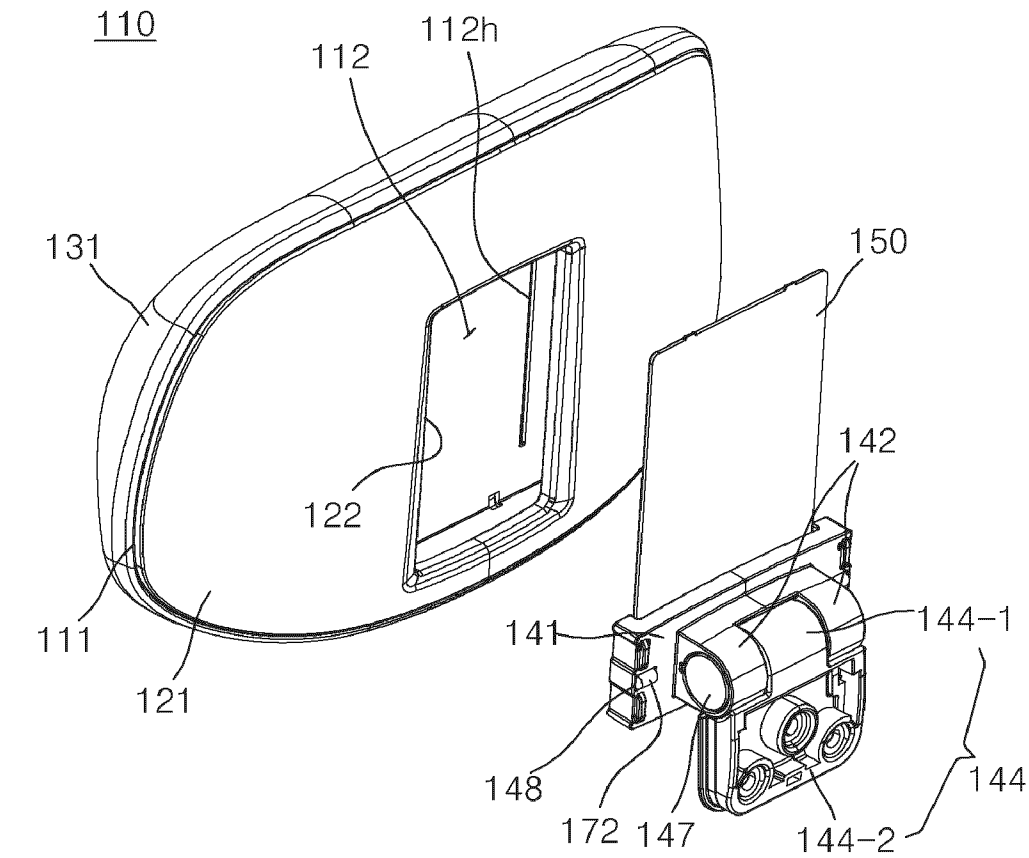
[FIG. 4]



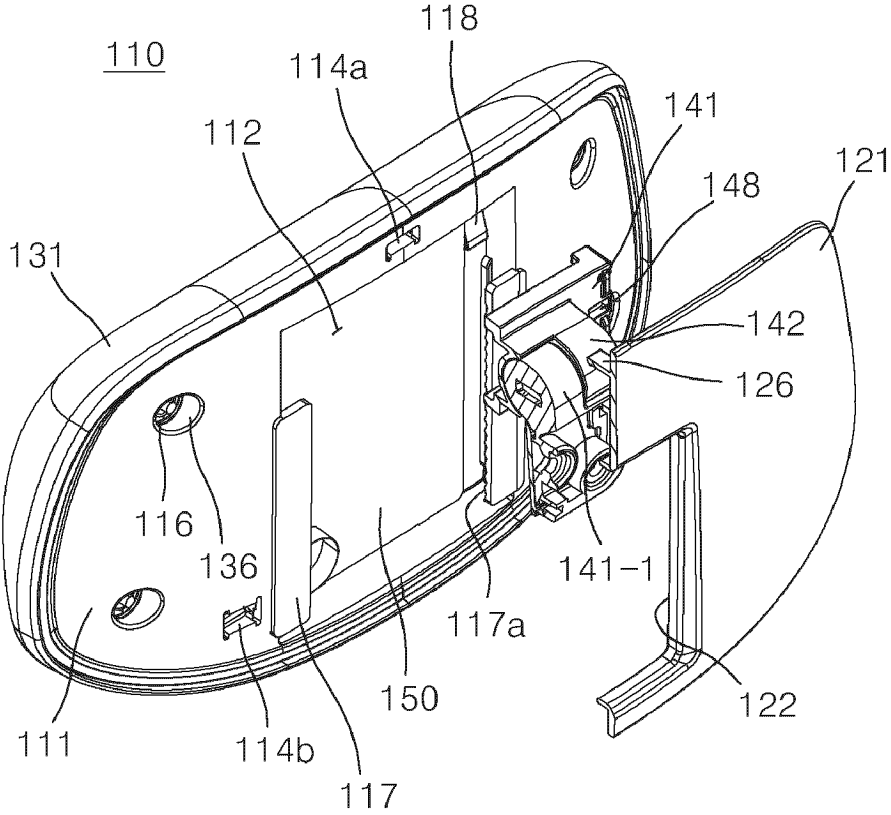
[FIG. 5A]



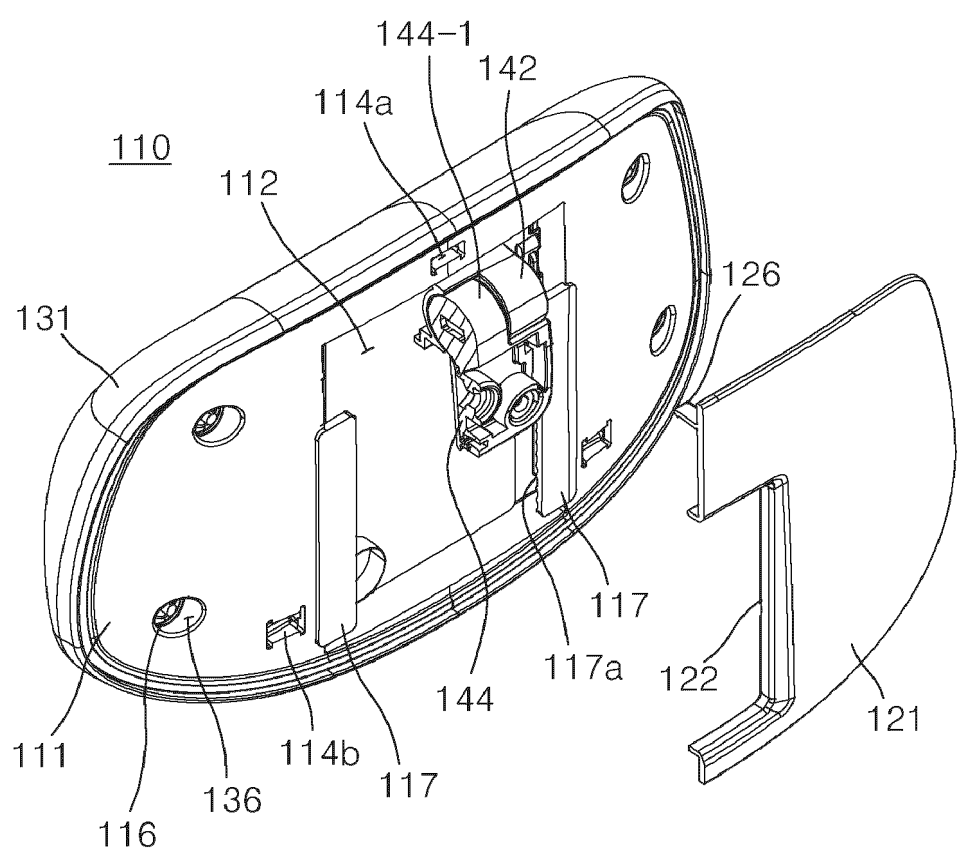
[FIG. 5B]



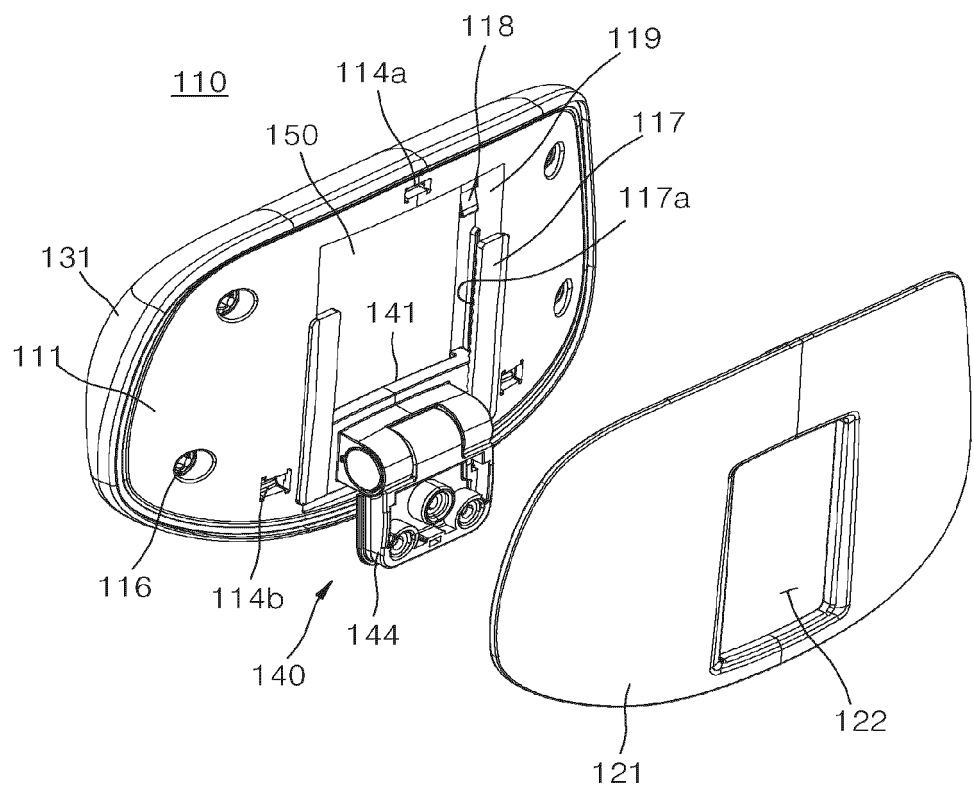
[FIG. 6A]



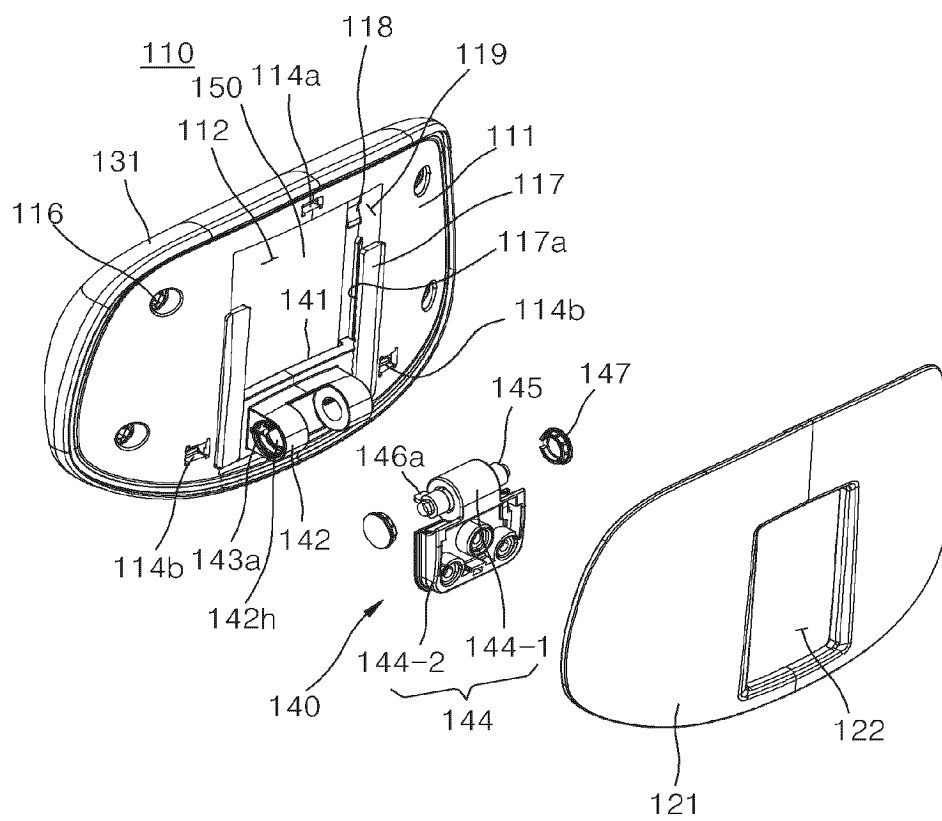
[FIG. 6B]



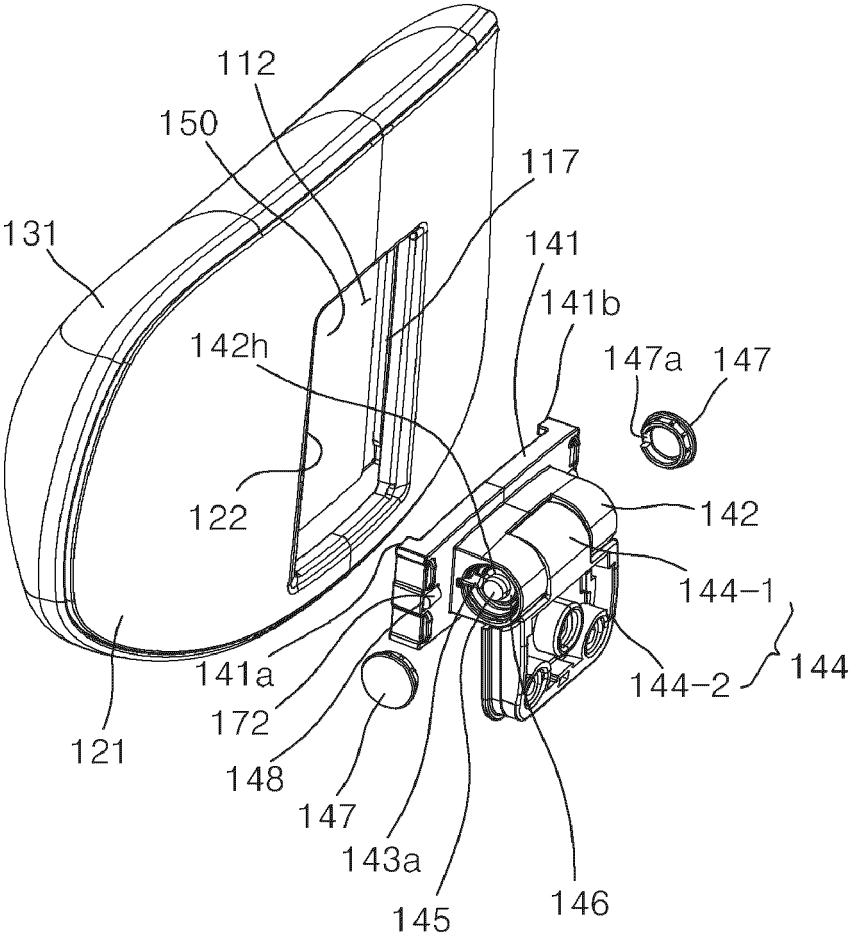
[FIG. 7]



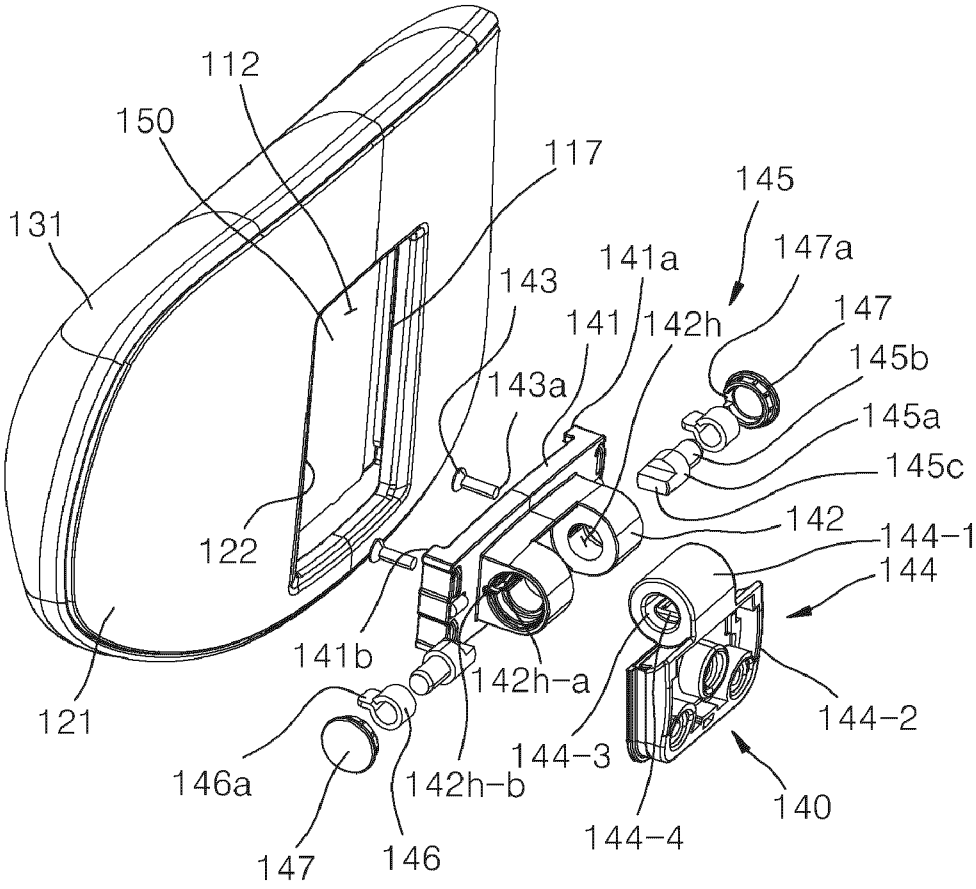
[FIG. 8]



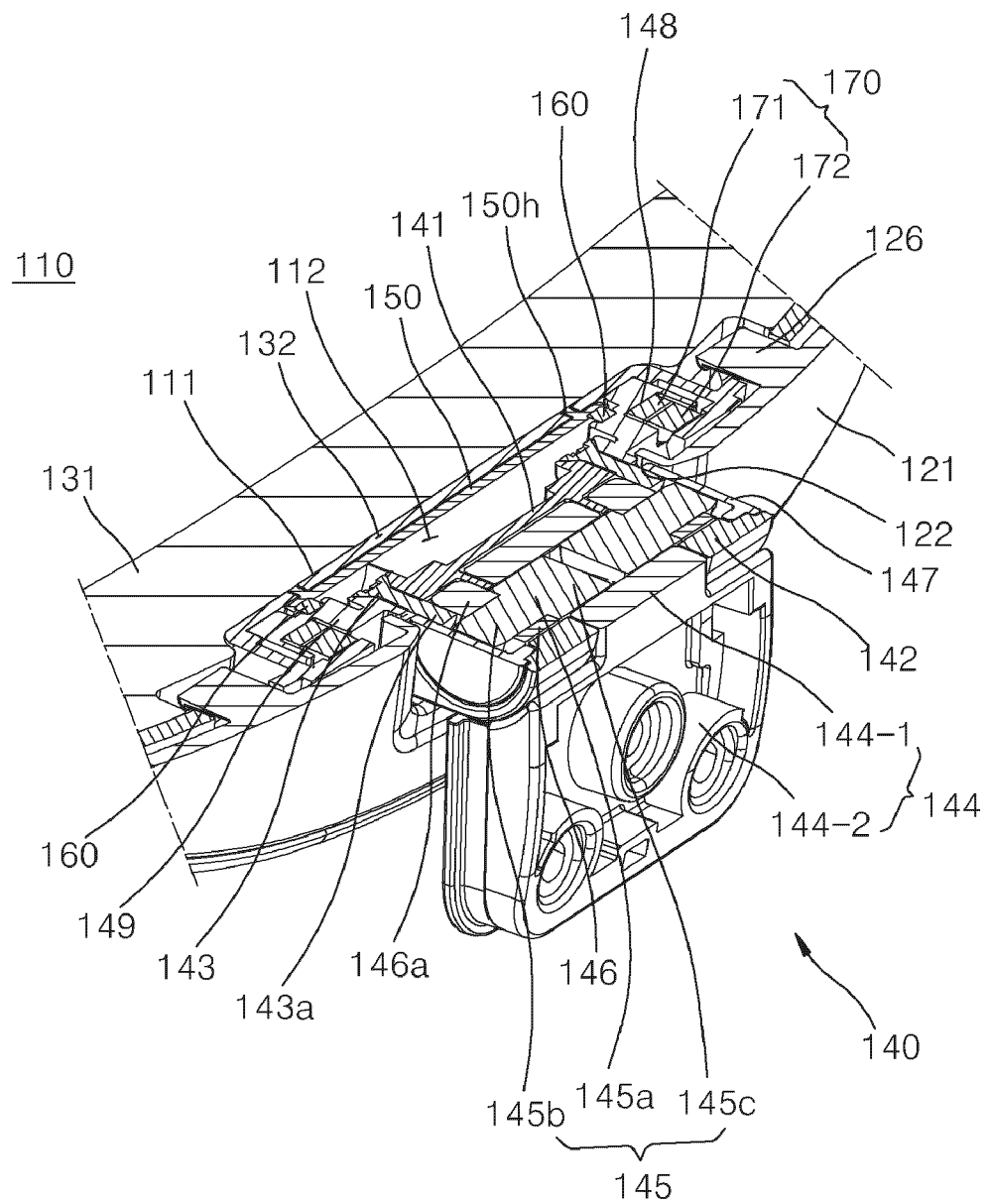
[FIG. 9A]



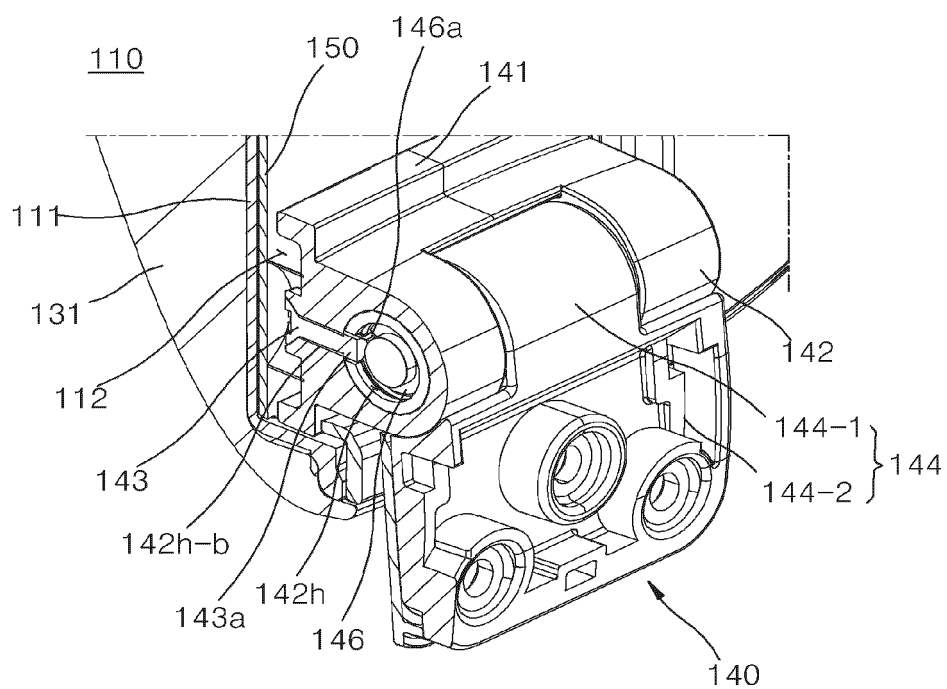
[FIG. 9B]



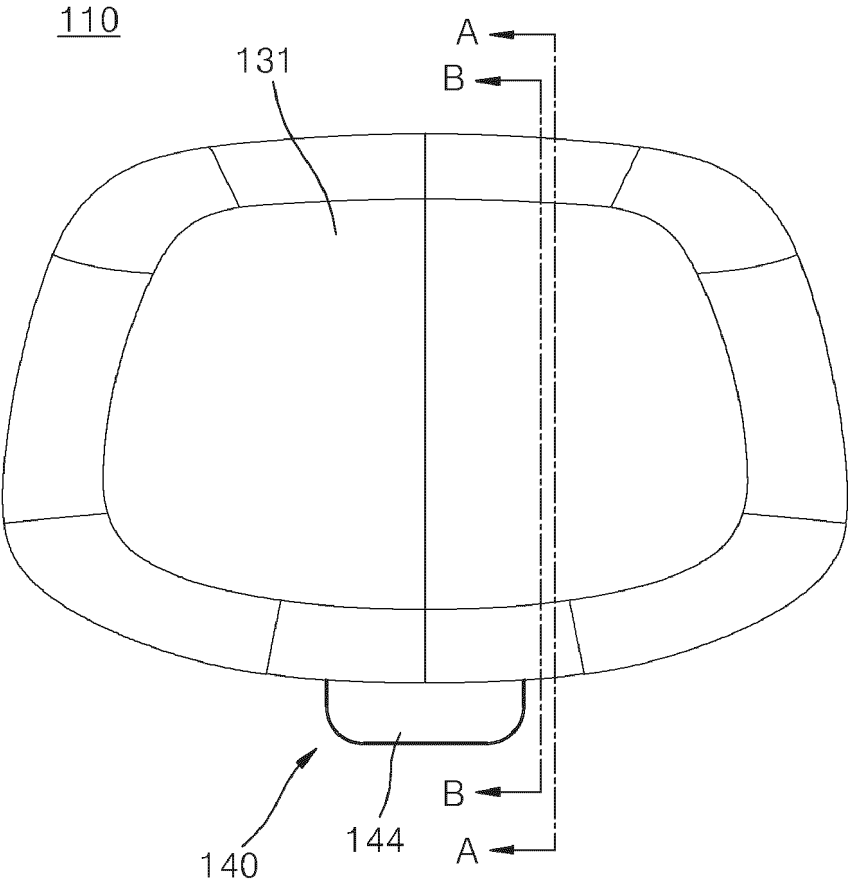
[FIG. 10A]



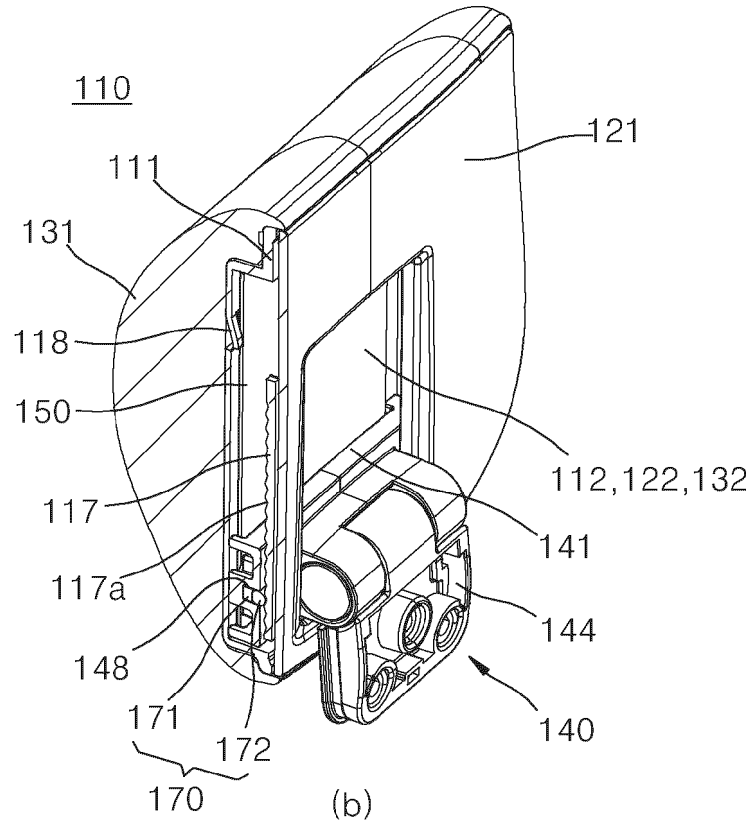
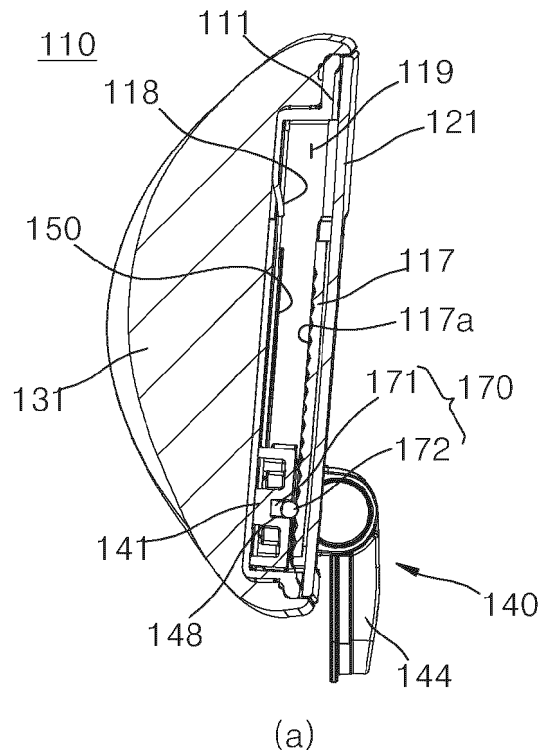
[FIG. 10B]



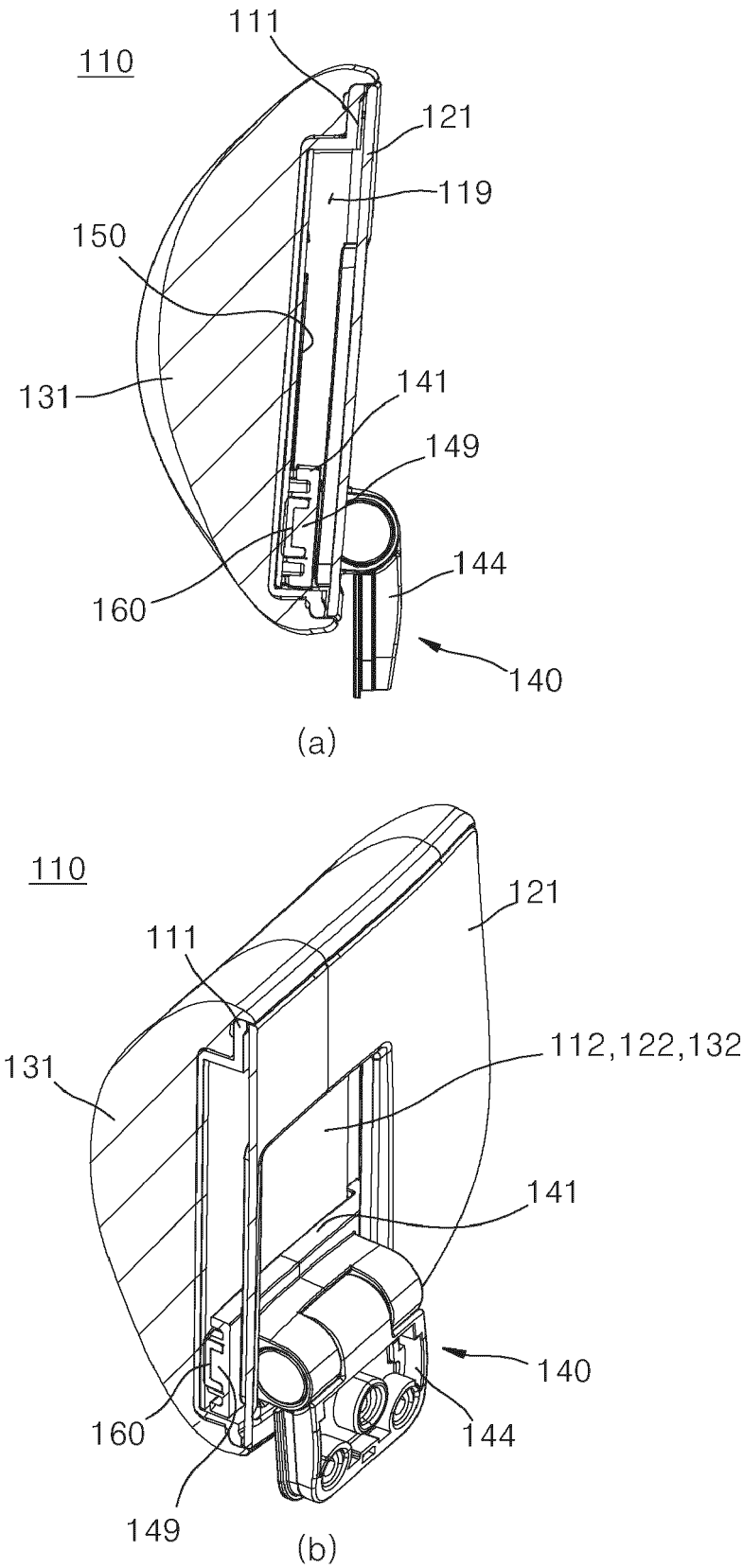
[FIG. 11]



[FIG. 12A]



[FIG. 12B]



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2023/009077

A. CLASSIFICATION OF SUBJECT MATTER

A47C 7/38(2006.01)i; A47C 1/036(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 7/38(2006.01); A47C 3/26(2006.01); A47C 7/36(2006.01); A61G 15/00(2006.01); B60N 2/48(2006.01);
F16B 12/10(2006.01)

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: 헤드레스트(headrest), 높이조절 장치(height adjustment device), 가이드블록(guide block), 마찰력 생성부(friction force generator), 걸림홈(locking groove)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KR 10-1103560 B1 (JEIL SETECH) 11 January 2012 (2012-01-11) See paragraphs [0035]-[0036] and [0042]-[0057] and figures 3-8 and 11.	1-8,10-12
Y		9
Y	KR 10-2053835 B1 (LEE, Jun Ku et al.) 09 December 2019 (2019-12-09) See paragraphs [0046]-[0048] and figures 4 and 6-7.	9
A	CN 201899153 U (FU, Jianhua) 20 July 2011 (2011-07-20) See claims 1-3 and figures 1-2.	1-12
A	US 7240966 B2 (STONE et al.) 10 July 2007 (2007-07-10) See column 6, line 38 - column 7, line 61 and figures 1-2.	1-12
A	KR 10-2009-0042890 A (LIM, Sang Soo) 04 May 2009 (2009-05-04) See claims 1-2 and figures 5a-5d.	1-12

☐ 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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"D" document cited by the applicant in the international application	"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
"E" earlier application or patent but published on or after the international filing date	"&" document member of the same patent family
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 26 September 2023	Date of mailing of the international search report 26 September 2023
Name and mailing address of the ISA/KR Korean Intellectual Property Office Government Complex-Daejeon Building 4, 189 Cheongsaro, Seo-gu, Daejeon 35208 Facsimile No. +82-42-481-8578	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 2022)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/KR2023/009077

5

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
KR	10-1103560	B1	11 January 2012	KR	10-2011-0027317	A	16 March 2011
KR	10-2053835	B1	09 December 2019	KR	10-2019-0101536	A	02 September 2019
CN	201899153	U	20 July 2011	None			
US	7240966	B2	10 July 2007	AT	319402	T	15 March 2006
				AU	2003-236489	A1	25 March 2004
				AU	2003-236489	B2	05 February 2009
				DE	60303846	T2	10 August 2006
				DE	60317945	T2	27 November 2008
				EP	1396246	A1	10 March 2004
				EP	1396246	B1	08 March 2006
				EP	1647252	A2	19 April 2006
				EP	1647252	A3	16 August 2006
				EP	1647252	B1	05 December 2007
				JP	2004-097812	A	02 April 2004
				JP	4035493	B2	23 January 2008
				US	2004-0046435	A1	11 March 2004
				US	2005-0184573	A1	25 August 2005
				US	6893096	B2	17 May 2005
KR	10-2009-0042890	A	04 May 2009	KR	10-1015416	B1	22 February 2011

Form PCT/ISA/210 (patent family annex) (July 2022)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- KR 1020120134232 [0006]