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(71) Applicant: **Ok, Jae Yun**
Gyeonggi-do 16822 (KR)

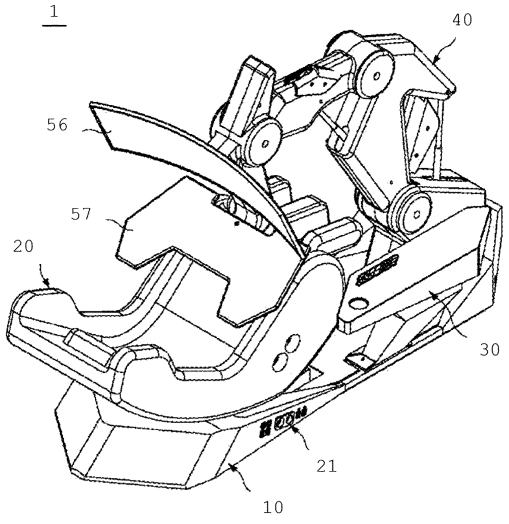
(72) Inventor: **Ok, Jae Yun**
Gyeonggi-do 16822 (KR)

(74) Representative: **BRP Renaud & Partner mbB**
Rechtsanwälte Patentanwälte
Steuerberater
Königstraße 28
70173 Stuttgart (DE)

(54) **FUNCTIONAL COMPLEX DESK SYSTEM**

(57) The present invention relates to a functional complex desk system comprising: an electromotive chair assembly as a seat on which a user sits; a monitor-equipped multi-joint table device which has a monitor and a main table arranged at one side of the monitor, and which movably support the monitor and the main table in a multi-joint manner; a user position tracking unit for tracking the optimal position that is appropriate for the body condition or posture of the user having sat on the electromotive chair assembly; and a system controller for automatically controlling the operation of the monitor-equipped multi-joint table device so that the monitor and the main table are arranged at optimal positions according to the modified posture of the user on the basis of the tracking signal of the user position tracking unit.

[FIG. 1]



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Description

[TECHNICAL FIELD]

[0001] The present invention relates to a functional complex desk system, and more particularly, to a functional complex desk system capable of tracking an optimal position suitable for a body condition or sitting posture of a user to automatically arrange a monitor or main table, so that various work environments including study can be optimally implemented.

[BACKGROUND ART]

[0002] Computers are widely used during doing personal or company work, doing sales in a business site, or enjoying games in a PC room. In view thereof, it can be said that the computer is positioned as the electronic device that is most closely related with people in modern society.

[0003] Accordingly, furniture companies have continuously researched and developed a complex desk (or desk system) configured to be equipped with a computer, particularly a monitor, and used together with a chair, and various products have been released on the market currently.

[0004] However, the computer-dedicated desk or system furniture equivalent thereto or a desk system currently released on the market is a kind of manual system in which a user sitting on a chair is required to set a position of a monitor or table in every detail to match a body condition or sitting posture of the user. For this reason, troublesomeness and inconvenience may be caused in use. It is required to develop the technology for the automatic system in that the optimal environment may be provided to the user when the setting is performed automatically.

[DISCLOSURE]

[TECHNICAL PROBLEM]

[0005] An object of the present invention is to provide a functional complex desk system capable of tracking an optimal position suitable for a body condition or sitting posture of a user to automatically arrange a monitor or main table, so that various work environments including study can be optimally implemented.

[TECHNICAL SOLUTION]

[0006] The above object implemented by a functional complex desk system including: an electromotive chair assembly a s a seat on which a user sits; a monitor-equipped multi-j oint table device having a monitor and a main table arran ged at one side of the monitor, and movably supporting th e monitor and the main table in a multi-joint manner; a u ser position tracking unit for tracking an optimal positi on suitable for a body condition or posture of the user s itting on the electromotive chair assembly; and a system controller for automatically controlling an operation of the monitor-equipped multi-joint table device, so that th e monitor and the main table are arranged at optimal posi tions according to a changed posture of the user based on a tracking signal of the user position tracking unit.

[0007] The user position tracking unit may be a sensor prov ided in the monitor-equipped multi-joint table device to track a face or eye of the user in real time and detect a distance between the monitor and the face or eye of the user, so as to transmit a tracking signal to the system c ontroller in real time.

[0008] The system controller may track the posture of the u ser through a predetermined real-time face-recognition or eye-tracking algorithm, and automatically control the op eration of the monitor-equipped multi-joint table device according to the changed posture only when the same postu re is maintained for a predetermined period of time.

[0009] The system may further include a voice recognition i nput unit connected to the system controller to input a v oice signal for the operation of the monitor-equipped mul ti-joint table device.

[0010] The system may further include a side table assembly arranged in a side region of the electromotive chair ass embly; and a system common base commonly mounted thereon with the electromotive chair assembly, the monitor-equipp ed multi-joint table device, and the side table assembly.

[0011] The side table assembly may include a side table pro vided with an input panel having a plurality of function buttons; and a plurality of side bridges having an upper part supporting the side table and a lower end fixed to t he system common base.

[0012] The electromotive chair assembly may include: an ele ctromotive chair body having a seat plate and a backrest; an electromotive foot support connected to the electromo tive chair body to support feet and legs; and a chair-mou nted driving unit provided on the system common base to s upport the electromotive chair body and drive the electro motive chair body and the electromotive foot support.

[0013] The monitor-equipped multi-joint table device may in clude: a fixed mount; a first rotating arm rotatably conn ected to the fixed mount by a first hinge; a first arm wi ng extending from one side of the first rotating arm; a f irst actuator connected to the fixed mount and the first arm wing to relatively rotate the first rotating arm with respect to the fixed mount about the first hinge as an a xial center; a second rotating arm relatively and rotatab ly connected to the first rotating arm by a second hinge; a second arm wing extending from one side of the second rotating arm; a second actuator connected to the first ro tating arm and the second arm wing to relatively rotate t he second rotating arm with respect to the first rotating arm about the second hinge as an axial center; a third r

otating arm relatively and rotatably connected to the sec ond rotating arm by a third hinge, and vertically coupled to the monitor and the main table at different positions ; a third arm wing extending from one side of the third r otating arm; and a third actuator connected to the second rotating arm and the third arm wing to relatively rotate the third rotating arm with respect to the second rotati ng arm about the third hinge as an axial center.

[0014] The monitor-equipped multi-joint table device may be disposed separately from the electromotive chair assembly so as to prevent the shaking of the electromotive chair assembly from being transferred to the monitor-equipped multi-joint table device.

[ADVANTAGEOUS EFFECTS]

[0015] According to the present invention, an optimal position suitable for a body condition or sitting posture of a user is tracked to automatically arrange a monitor or main table, so that various work environments including study can be optimally implemented.

[DESCRIPTION OF DRAWINGS]

[0016]

FIG. 1 is a perspective view of a functional complex desk system according to the first embodiment of the present invention.

FIG. 2 is a view showing FIG. 1 at another angle.

FIGS. 3 and 4 are a front view and a side view of FIG. 1, respectively.

FIG. 5 is a control block diagram of the functional complex desk system of FIG. 1.

FIG. 6 is a perspective view of a functional complex desk system according to the second embodiment of the present invention.

FIG. 7 is an operation state diagram of FIG. 6.

FIGS. 8 to 10 are side views showing each process of the operation state of the functional complex desk system of FIG. 6.

FIG. 11 is a control block diagram of the functional complex desk system of FIG. 6.

FIG. 12 is a side view of a functional complex desk system according to a third embodiment of the present invention.

FIG. 13 is a structural diagram of a bridge socket region of FIG. 12.

FIGS. 14 and 15 are side views showing the operation of a main table region of a functional complex desk system according to a fourth embodiment of the present invention.

FIG. 16 a side view of a functional complex desk system according to a fifth embodiment of the present invention.

[BEST MODE]

[Mode for Invention]

[0017] Advantages and features of the present invention, and methods for achieving the advantages and features will be apparent with reference to the embodiments described below in detail with the accompanying drawings.

[0018] However, the present invention is not limited to the embodiments disclosed as below and may be implemented in various different forms.

[0019] In the specification herein, the embodiments are provided to complete the disclosure of the present invention and clearly teach the scope of the invention to a person having ordinary skill in the art. In addition, the present invention will be defined only by the scope of claims.

[0020] Accordingly, in some embodiments, well-known components, well-known operations, and well-known techniques have not been specifically described in order to avoid obscuring the present invention.

[0021] The same reference numeral indicates the same element throughout the specification. In addition, the terms used (referred to) herein are for the purpose of describing the embodiments, and the present invention is not limited thereto.

[0022] In the specification herein, a singular form includes a plural form unless the context is particularly stated otherwise. In addition, components and operations (acts) referred to as 'include (or have)' do not exclude the presence or addition of one or more other components and operations.

[0023] Unless otherwise defined, all terms (including technical and scientific terms) used herein may be used in a sense commonly understood by those skilled in the art of the present invention.

[0024] In addition, terms defined in generally used dictionaries are not ideally or excessively interpreted unless defined otherwise.

[0025] Hereinafter, preferred embodiments of the present invention will be described with reference to the accompanying drawings.

[0026] FIG. 1 is a perspective view of a functional complex desk system according to the first embodiment of the present invention. FIG. 2 is a view showing FIG. 1 at another angle. FIGS. 3 and 4 are a front view and a side view of FIG. 1, respectively. FIG. 5 is a control block diagram of the functional complex desk system of FIG. 1.

[0027] Referring to the drawings, the functional complex desk system 1 according to an embodiment of the present invention may track an optimal position suitable for a body condition or sitting posture of a user to automatically arrange a monitor 56 or main table 57, so that various work environments including study can be optimally implemented.

[0028] Referring to the drawings, the functional complex desk system 1 according to an embodiment of the

present invention may include a system common base 10, an electromotive chair assembly 20, a side table assembly 30 and a monitor-equipped multi-joint table device 40.

[0029] Except for the side table assembly 30, the electromotive chair assembly 20 and the monitor-equipped multi-joint table device 40 are adjusted to various angles, that is, to the angle desired by the user, and particularly, automatically adjusted, so that the user can study, work, or play games in various postures in various environments. Accordingly, the convenience in use is highly improved.

[0030] The system common base commonly supports the electromotive chair assembly 20, the side table assembly 30, and the monitor-equipped multi-joint table device 40. In other words, the electromotive chair assembly 20, the side table assembly 30, and the monitor-equipped multi-joint table device 40 are mounted on the system common base 10, thereby being integrated into one body. In this case, the system can be kept compact and advantageous for moving.

[0031] The electromotive chair assembly 20 is mounted on one side of the system common base 10, and defines a seat for a user of the system of the present invention. The electromotive chair assembly 20 may have an angle arbitrarily varied by a chair button 21 therebelow. A massage function may be added to the electromotive chair assembly 20.

[0032] The side table assembly 30 refers to a structure arranged in a side region of the electromotive chair assembly 20 and coupled to the system common base 10. While the electromotive chair assembly 20 and the monitor-equipped multi-joint table device 40 are electromotive driven, the side table assembly 30 may be formed as a fixed structure.

[0033] The monitor-equipped multi-joint table device 40 refers to a type of articulated robot provided with a monitor 56 and a main table 57 disposed under the monitor 56 and movably supporting the monitor 56 and the main table 57. The monitor-equipped multi-joint table device 40 refers to a device arranged in a front region of the electromotive chair assembly 20 and coupled to the system common base 10.

[0034] In other words, the monitor-equipped multi-joint table device 40 is a set of robot, other than a simple table structure, is provided with the monitor 56 and the main table 57, and allows the monitor 56 and the main table 57 to be moved to a desired angle and position. Accordingly, the monitor 56 and the main table 57 are allowed to be automatically placed in an optimal position for the user sitting on the electromotive chair assembly 20.

[0035] For the reference, the monitor 56 may be a computer-built-in all-in-one monitor. In addition, the main table 57 may be mounted thereon with a keyboard, a mouse and the like for operating a computer. Reading books or taking notes is also available on the main table 57.

[0036] In the embodiment, the monitor-equipped multi-joint table device 40 may be disposed separately from the electromotive chair assembly 20 so as to prevent the shaking of the electromotive chair assembly 20 from being transferred to the monitor-equipped multi-joint table device 40. In other words, even when the user shakes a body while sitting on the electromotive chair assembly 20, the vibration is not transferred to the monitor-equipped multi-joint table device 40.

[0037] In addition, a user position tracking unit 81 and a system controller 70 are provided so that the monitor 56 and the main table 57 are automatically disposed in the optimal position for the user sitting on the electromotive chair assembly 20.

[0038] The user position tracking unit 81 serves to track an optimal position suitable for a body condition or posture of the user sitting on the electromotive chair assembly 20.

[0039] The above user position tracking unit 81 is provided in the monitor-equipped multi-joint table device 40, may be recognized through a sensor for tracking a face or eyes of the user in real time to measure an optimal distance of the user and transmitting the detected signal to the system controller 70 in real time, such as various distance measuring sensors using laser, infrared rays, ultrasonic wave and the like and a 3D scanning sensor.

[0040] In addition to the user position tracking unit 81, a voice recognition input unit 82 for inputting a voice signal for the operation of the monitor-equipped multi-joint table device 40 and connected to the system controller 70 may be further mounted.

[0041] The system controller 70 automatically controls the operation of the monitor-equipped multi-joint table device 40, such that the monitor 56 and the main table 57 are disposed in the optimal position according to a changed posture of the user based on the tracking signal of the user position tracking unit 81.

[0042] In particular, in the embodiment, the system controller 70 tracks the posture of the user through a predetermined real-time face-recognition or eye-tracking algorithm, and automatically controls the operation of the monitor-equipped multi-joint table device 40 according to the changed posture only when the same posture is maintained for a predetermined period of time. Regarding the operation of the operation of the monitor-equipped multi-joint table device 40 changed in real time, the posture of the user may be changed by a simple movement of the body or changed for other movements. When applied in real time, it may be changed to an unwanted angle or lead to an accident while moving.

[0043] The system controller 70 performing the above roles may include a central processing unit (CPU) 71, a memory 72, and a support circuit 73.

[0044] In the embodiment, the central processing unit 71 may be one of various computer processors industrially applicable to automatically control the operation of the monitor-equipped multi-joint table device 40 such that the monitor 56 and the main table 57 are disposed in the optimal position according to a changed posture of the user based on the tracking signal of the user position

tracking unit 81.

[0045] The memory 72 is connected to the central processing unit 71. The memory 72, which serves as a computer-readable recording medium, may be installed locally or remotely, and may be, for example, at least one readily available memory such as a random access memory (RAM), ROM, a floppy disk, hard disk, or any form of digital storage.

[0046] The support circuit 73 is combined with the central processing unit 71 to support the typical operation of the processor. The support circuit 73 may include a power supply, a clock circuit, an input/output circuit, a subsystem, and the like.

[0047] In the embodiment, the system controller 70 automatically controls the operation of the monitor-equipped multi-joint table device 40 such that the monitor 56 and the main table 57 are disposed in the optimal position according to a changed posture of the user based on the tracking signal of the user position tracking unit 81, in which the series of control processes and the like may be stored in the memory 72. Typically, software routines may be stored in the memory 72. In addition, the software routines may be stored or executed by another central processing unit (not shown).

[0048] Although the process according to the present invention has been described as being executed by the software routines, at least some of the processes of the present invention may be performed by hardware. As the above description, the processes of the present invention may be implemented in software executed on a computer system, implemented in hardware such as an integrated circuit, or implemented by a combination of software and hardware.

[0049] According to the embodiment acting as the above-described configuration, an optimal position suitable for a body condition or sitting posture of a user may be tracked to automatically arrange a monitor 56 or main table 57, so that various work environments including study can be optimally implemented.

[0050] In particular, in the present embodiment, the individual adjustment function of each joint part constituting the monitor-equipped multi-joint table device 40 is configured to allow positions of the monitor 56 or the main table 57 to correspond to all customized conditions of the user. In addition, each joint part may be basically set by the user face recognition and automatic distance adjustment function. If necessary, the user may individually fine-tune each joint by using a corresponding control button to set the position to an optimized posture of the user, and the optimized setting values may be stored through an input button having a memory function. The memory function is useful when multiple users are present, and it is advantageous in that specific setting values may be stored in the memory according to each individual preference and then used via command buttons if necessary.

[0051] FIG. 6 is a perspective view of a functional complex desk system according to the second embodiment of the present invention. FIG. 7 is an operation state diagram of FIG. 6. FIGS. 8 to 10 are side views showing each process of the operation state of the functional complex desk system of FIG. 6. FIG. 11 is a control block diagram of the functional complex desk system of FIG. 6.

[0052] Referring to the drawings, the functional complex desk system 100 according to an embodiment of the present invention may also include a system common base 110, an electromotive chair assembly 120, a side table assembly 130 and a monitor-equipped multi-joint table device 140.

[0053] In particular, except for the side table assembly 130, since the electromotive chair assembly 120 and the monitor-equipped multi-joint table device 140 are adjusted to various angles, that is, to the angle desired by the user, so that the user can study, work, or play games in various postures in various environments. Accordingly, the convenience in use is highly improved.

[0054] The system common base 110 commonly supports the electromotive chair assembly 120, the side table assembly 130, and the monitor-equipped multi-joint table device 140.

[0055] In other words, the electromotive chair assembly 120, the side table assembly 130, and the monitor-equipped multi-joint table device 140 are mounted on the system common base 110, thereby being integrated into one body. In this case, the system can be kept compact and advantageous for moving.

[0056] The electromotive chair assembly 120 is mounted on one side of the system common base 110, and defines a seat for a user of the system of the present invention.

[0057] The electromotive chair assembly 120 may include: an electromotive chair body 123 having a seat plate 121 and a backrest 122; an electromotive foot support 124 connected to the electromotive chair body 123 to support feet and legs; a chair-mounted driving unit 125 provided on the system common base 110 to support the electromotive chair body 123 and drive the electromotive chair body 123 and the electromotive foot support 124. The operation of the chair-mounted driving unit 125 may be controlled by a system controller 170 described later.

[0058] As the above description, since the electromotive chair body 123 and the electromotive foot support 124 may be operated, that is, rotated due to the electromotive structure of the chair-mounted driving unit 125, the sitting position may be adjusted to several angles. Further, the electromotive chair assembly 120 may be used even in an almost lying position.

[0059] For the reference, although not shown in the drawing, a massage function may be added to the electromotive chair body 123 and the electromotive foot support 124. In this case, the electromotive chair assembly 120 may be a complex device having an added massage function beyond the concept of a chair only.

[0060] The side table assembly 130 refers to a structure arranged in a side region of the electromotive chair assembly 120 and coupled to the system common base 110.

[0061] While the electromotive chair assembly 120 and the monitor-equipped multi-joint table device 140 are electromotive driven, the side table assembly 130 is formed as a fixed structure.

[0062] The side table assembly 130 may include a side table 131, and a plurality of side bridges 132 having an upper part supporting the side table 131 and a lower part fixed to the system common base 110.

[0063] A book or a cup for drinks may be placed on the side table 131, and the side table 131 is provided on one side thereof with an input panel 160.

[0064] In addition, the monitor-equipped multi-joint table device 140 refers to a device arranged in a front region of the electromotive chair assembly 120 and coupled to the system common base 110 to movably support a monitor 156 and a main table 157 disposed under the monitor 156.

[0065] In other words, the monitor-equipped multi-joint table device 140 is a set of robot, other than a simple table structure, is provided with the monitor 156 and the main table 157, and allows the monitor 156 and the main table 157 to be moved to a desired angle and position.

[0066] The monitor 156 may be a computer-built-in all-in-one monitor. In addition, the main table 157 may be mounted thereon with a keyboard, a mouse and the like for operating a computer. Reading books or taking notes is also available on the main table 157.

[0067] The monitor-equipped multi-joint table device 140 is provided with a fixed mount 141 fixed on the system common base 110, and has a multi-joint structure in which the following components are relatively and rotatably connected to the fixed mount 141. Accordingly, it is preferable for manipulating the monitor 156 and the main table 157 at a desired angle.

[0068] A first rotating arm 143 is connected to the fixed mount 141. The first rotating arm 143 is relatively and rotatably connected to the fixed mount 141 by a first hinge 142.

[0069] A first arm wing 144 extends and is coupled to one side of the first rotating arm 143. In addition, a first actuator 145 is coupled to the fixed mount 141 and the first arm wing 144. Due to the action of the first actuator 145, the first rotating arm 143 may be relatively rotated with respect to the fixed mount 141 about the first hinge 142 as an axial center.

[0070] A second rotating arm 147 is connected to the first rotating arm 143. The second rotating arm 147 is relatively and rotatably connected to the first rotating arm 143 by a second hinge 146.

[0071] A second arm wing 148 extends and is coupled to one side of the second rotating arm 147. In addition, a second actuator 149 is coupled to the first rotating arm 143 and the second arm wing 148. Due to the action of the second actuator 149, the second rotating arm 147 may be relatively rotated with respect to the first rotating arm 143 about the second hinge 146 as an axial center.

[0072] A third rotating arm 152 is connected to the second rotating arm 147. The third rotating arm 152 is also relatively and rotatably connected to the second rotating arm 147 by a third hinge 151. The monitor 156 and the main table 157 are vertically coupled to one side and the other side of the third rotating arm 152 at different positions, respectively.

[0073] A third arm wing 153 extends and is coupled to one side of the third rotating arm 152. In addition, a third actuator 154 is coupled to the second rotating arm 147 and the third arm wing 153. Due to the action of the third actuator 154, the third rotating arm 152 may be relatively rotated with respect to the second rotating arm 147 about the third 151 as an axial center.

[0074] Due to the above structures, that is, the action of the first actuator 145, the second actuator 149 and the third actuator 154, each of the first rotating arm 143, the second rotating arm 147, and the third rotating arm 152 may be relatively rotated with respect to the fixed mount 141 fixed in position, and accordingly, the monitor 156 and the main table 157 may be rotated to a desired angle.

[0075] In addition, in the embodiment, the functional complex desk system 100 is provided with an input panel 160 and a system controller 170 for controlling the system.

[0076] The input panel 160 has a plurality of function buttons 161 so as to operate the electromotive chair assembly 120 and the monitor-equipped multi-joint table device 140 at various angles and positions as shown in FIGS. 6 to 10 or not shown therein. Herein, it is described in terms of a button, but the button may include a touch.

[0077] The input panel 160 having the various function buttons 161 may be provided on one side of the side table 131. Accordingly, it is good for the user sitting or lying on the electromotive chair assembly 120 to operate the system.

[0078] The system controller 170 controls the operations of the electromotive chair assembly 120 and the monitor-equipped multi-joint table device 140 based on the input signal of the input panel 160. The system controller 170 performing the above roles may include a central processing unit (CPU) 171, a memory 172, and a support circuit 173.

[0079] Accordingly, the user sitting or lying on the electromotive chair assembly 120 presses the function buttons 161 of the input panel 160 provided on the side table 131 to adjust the angle of the electromotive chair assembly 120 or drive the monitor-equipped multi-joint table device 140, so that the monitor 156 and the main table 157 are placed in positions suitable for the user.

[0080] Accordingly, the user can study, work, or play games in various postures, so that the convenience in use can be highly improved and the efficiency of study or work can also be increased. In addition, it is good for playing games while preventing stiff shoulders or the like.

[0081] When the embodiments is applied, an optimal position suitable for a body condition or sitting posture of a user may be tracked to automatically arrange a monitor 156 or main table 157, so that various work environments including study can be optimally implemented.

[0082] FIG. 12 is a side view of a functional complex desk system according to a third embodiment of the present invention. FIG. 13 is a structural diagram of a bridge socket region of FIG. 12.

[0083] Referring to the drawings, the functional complex desk system 200 according to an embodiment of the present invention also has a system common base 210, and is configured such that the electromotive chair assembly 120, the side table assembly 230, and the monitor-equipped multi-joint table device 140 are commonly mounted on the system common base 210 for each position.

[0084] In addition, the side table assembly 230 includes a side table 131, and a plurality of side bridges 132 having an upper part supporting the side table 131 and a lower end fixed to the system common base 110.

[0085] In addition, in the above structure, a bridge socket 233 is accommodated in the system common base 210.

[0086] The bridge socket 233 may be provided on the system common base 210 by the number of side bridges 132 on both sides of the electromotive chair assembly 120 interposed therebetween.

[0087] As in the present embodiment, when the bridge sockets 233 are provided on the both sides of the electromotive chair assembly 120, the side table assembly 230 can be freely moved to the left or right of the electromotive chair assembly 120.

[0088] The application of the above bridge sockets 233 may have many advantages in that right-handed or left-handed people have the normal position and radius of using hands different from each other. In other words, it may be convenient for the right-handed people to place the side table assembly 230 on the right side of the electromotive chair assembly 120, and it may be convenient for the left-handed people to place the side table assembly 230 on the left side of the electromotive chair assembly 120.

[0089] In addition, unused ones among the bridge sockets 233 may be blocked by using a detachable socket stopper 235 as shown in FIG. 13, to prevent foreign substances from accumulating and prevent the external appearance from deteriorating.

[0090] When the embodiments is applied, the optimal position suitable for a body condition or sitting posture of a user can be tracked to automatically arrange a monitor 156 or main table 157, so that various work environments including study can be optimally implemented.

[0091] FIGS. 14 and 15 are side views showing the operation of a main table region of a functional complex desk system according to a fourth embodiment of the present invention.

[0092] Referring to the drawings, the functional complex desk system 300 according to an embodiment of the present invention also has a system common base 110, and is configured such that the electromotive chair assembly 120, the side table assembly 130, and the monitor-equipped multi-joint table device 340 are commonly mounted on the system common base 110 for each position.

[0093] In addition, the monitor-equipped multi-joint table device 340 is a structure for movably supporting a monitor 156 and a main table 357a.

[0094] As described above, the monitor 156 may be a computer-built-in all-in-one monitor. In addition, the main table 357a may be mounted thereon with a keyboard, a mouse and the like for operating a computer. Reading books or taking notes is also available on the main table 357a.

[0095] In addition, in the embodiment, an expandable sub-table 357b is slidably coupled to the main table 357a.

[0096] In other words, as shown in FIGS. 14 and 15, the sub-table 357b may protrude forward from the main table 357a when the sub-table 357b is pulled. In this case, the convenience in use may be increased in that a large area of the main table 357a and the sub-table 357b may be entirely used as the area for the table.

[0097] When the embodiments is applied, the optimal position suitable for a body condition or sitting posture of a user may be tracked to automatically arrange the monitor 156 or the main table 357a, so that various work environments including study can be optimally implemented.

[0098] FIG. 16 is a side view of a functional complex desk system according to a fifth embodiment of the present invention.

[0099] Referring to the drawing, the functional complex desk system 400 according to an embodiment of the present invention also has a system common base 110, and is configured such that the electromotive chair assembly 120, the side table assembly 130, and the monitor-equipped multi-joint table device 140 are commonly mounted on the system common base 110 for each position.

[0100] In addition, in the present embodiment, an electromotive rail 490 is provided on the system common base 110 on which the monitor-equipped multi-joint table device 140 is positioned. The monitor-equipped multi-joint table device 140 may be moved forward and backward in directions of arrows by the electromotive rail 490. When the above structure is applied, the system can be used for all men and women having different body sizes.

[0101] When the embodiments is applied, the optimal position suitable for a body condition or sitting posture of a user may be tracked to automatically arrange a monitor 156 or main table 157, so that various work environments including study can be optimally implemented.

[0102] The present invention is not limited to the above-mentioned embodiments. It will be apparent to a person having ordinary skill in the art that various deformations and modifications are available within the scope without departing from the spirit and scope of the present invention. Therefore, the deformations and modifications will be within the scope of the appended claims and their equivalents.

Claims

1. A functional complex desk system comprising:

   an electromotive chair assembly as a seat on which a user sits;
   a monitor-equipped multi-joint table device having a monitor and a main table arranged at one side of the monitor, and movably supporting the monitor and the main table in a multi-joint manner;
   a user position tracking unit for tracking an optimal position suitable for a body condition or posture of the user sitting on the electromotive chair assembly; and
   a system controller for automatically controlling an operation of the monitor-equipped multi-joint table device, so that the monitor and the main table are arranged at optimal positions according to a changed posture of the user based on a tracking signal of the user position tracking unit.

2. The functional complex desk system of claim 1, wherein the user position tracking unit includes a sensor provided in the monitor-equipped multi-joint table device to track a face or eye of the user in real time, detect a distance between the monitor and the face or eye of the user, and transmit a tracking signal to the system controller in real time.

3. The functional complex desk system of claim 2, wherein the system controller tracks the posture of the user through a predetermined real-time face-recognition or eye-tracking algorithm, and automatically controls the operation of the monitor-equipped multi-joint table device according to the changed posture only when the same posture is maintained for a predetermined period of time.

4. The functional complex desk system of claim 2, further comprising:
   a voice recognition input unit connected to the system controller to input a voice signal for the operation of the monitor-equipped multi-joint table device.

5. The functional complex desk system of claim 1, further comprising:

   a side table assembly arranged in a side region of the electromotive chair assembly; and
   a system common base commonly mounted thereon with the electromotive chair assembly, the monitor-equipped multi-joint table device, and the side table assembly.

6. The functional complex desk system of claim 5, wherein the side table assembly includes:

   a side table provided with an input panel having a plurality of function buttons; and
   a plurality of side bridges having an upper end supporting the side table and a lower end fixed to the system common base.

7. The functional complex desk system of claim 1, wherein the electromotive chair assembly includes:

   an electromotive chair body having a seat plate and a backrest;
   an electromotive foot support connected to the electromotive chair body to support feet and legs; and
   a chair-mounted driving unit provided on the system common base to support the electromotive chair body and drive the electromotive chair body and the electromotive foot support.

8. The functional complex desk system of claim 1, wherein the monitor-equipped multi-joint table device includes:
   a fixed mount;

   a first rotating arm rotatably connected to the fixed mount by a first hinge;

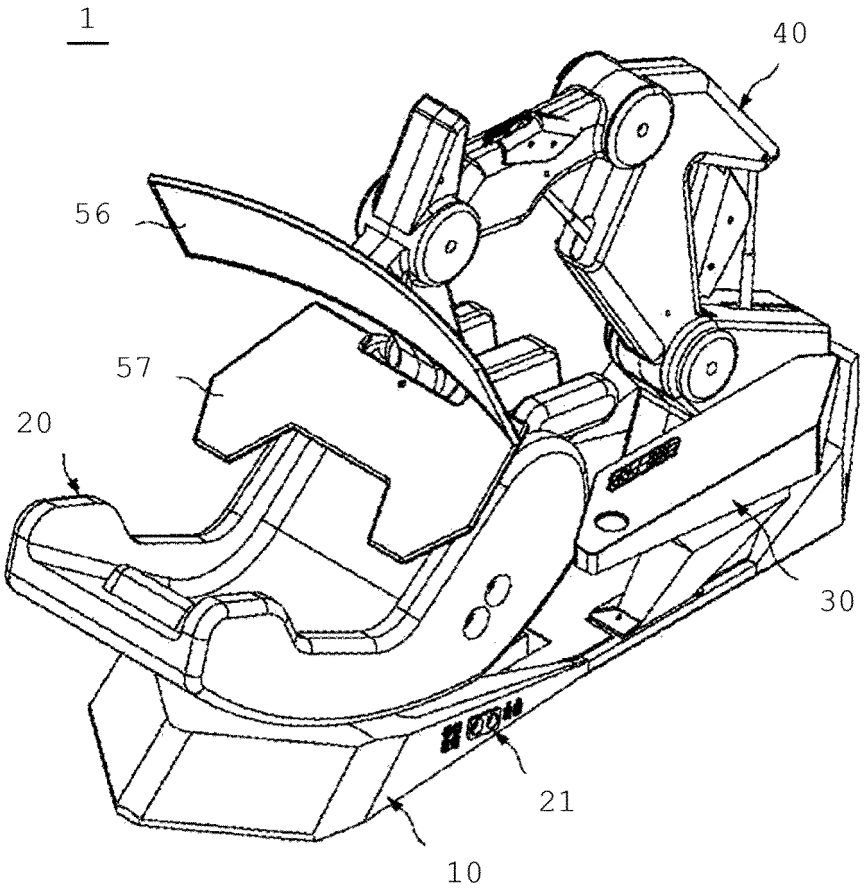
      a first arm wing extending from one side of the first rotating arm;
      a first actuator connected to the fixed mount and the first arm wing to relatively rotate the first rotating arm with respect to the fixed mount about the first hinge as an axial center;
      a second rotating arm relatively and rotatably connected to the first rotating arm by a second hinge;

   a second arm wing extending from one side of the second rotating arm;

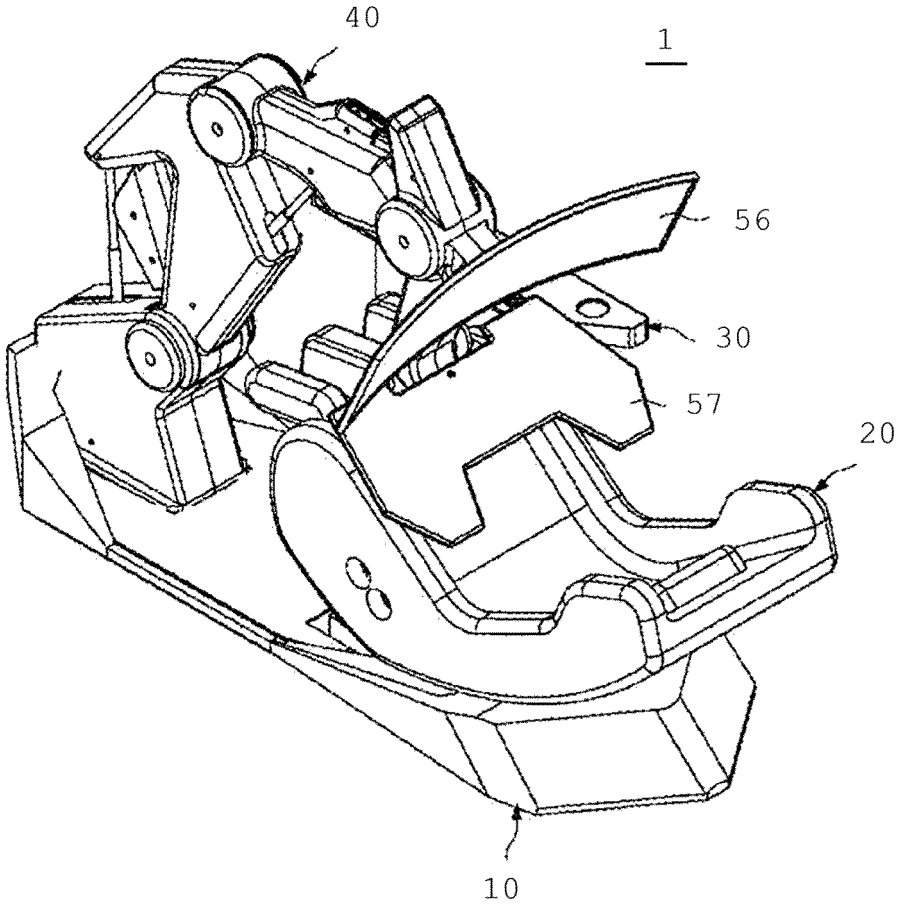
      a second actuator connected to the first rotating arm and the second arm wing to relatively rotate the second rotating arm with respect to the first rotating arm about the second hinge as an axial center;
      a third rotating arm relatively and rotatably connected to the second rotating arm by a third hinge and vertically coupled to the monitor and the main table at different positions;
      a third arm wing extending from one side of the third rotating arm; and
      a third actuator connected to the second rotating arm and the third arm wing to relatively rotate the third rotating arm with respect to the second rotating arm about the third hinge as an axial center.

9. The functional complex desk system of claim 1, wherein the monitor-equipped multi-joint table device is disposed separately from the electromotive chair assembly so as to prevent a shaking of the electromotive chair assembly from being transferred to the monitor-equipped multi-joint table device.

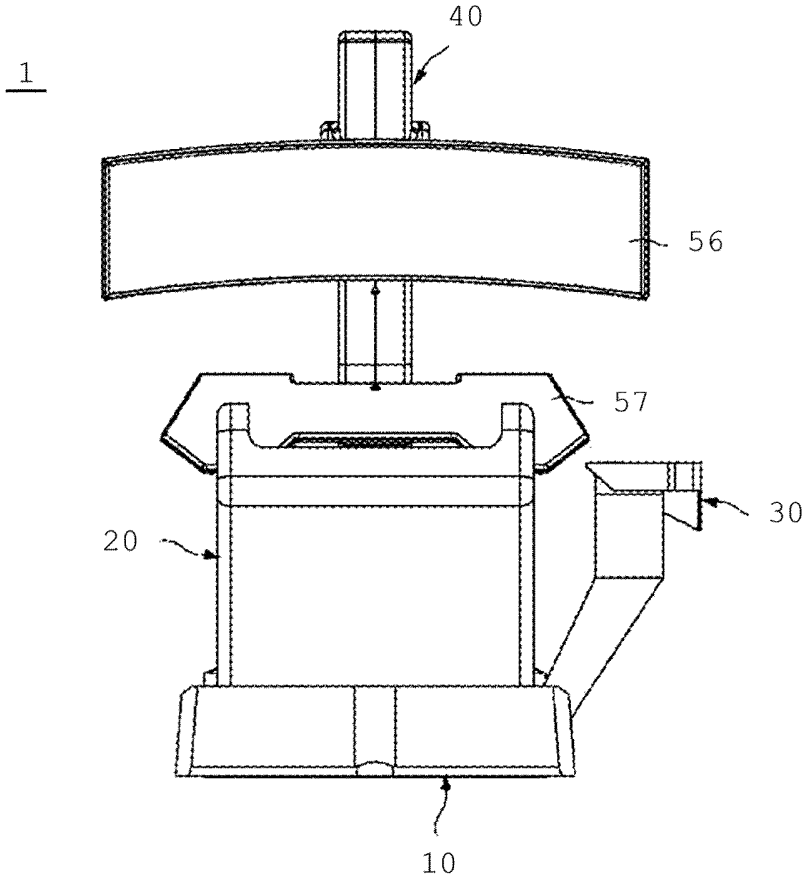
[FIG. 1]



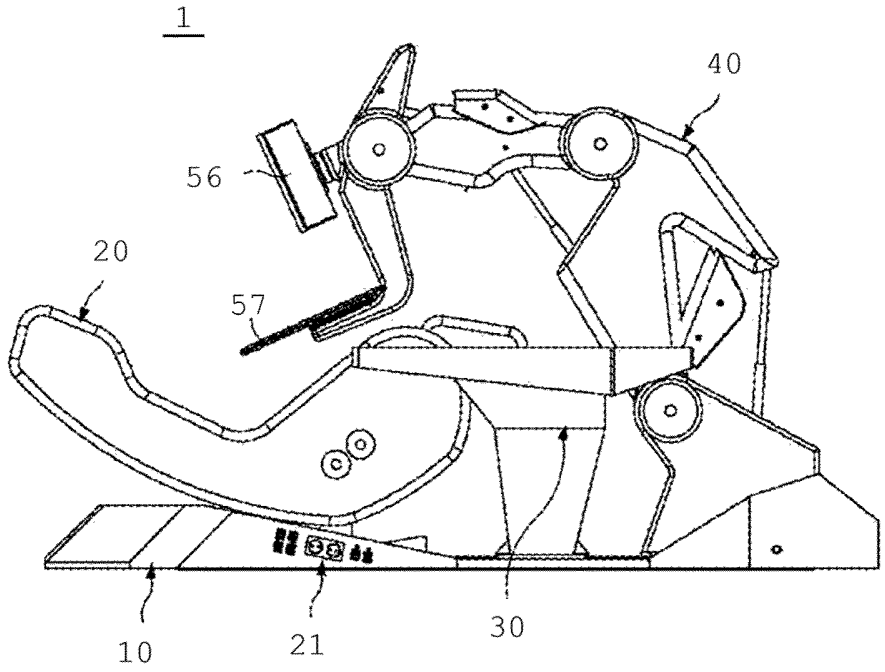
[FIG. 2]



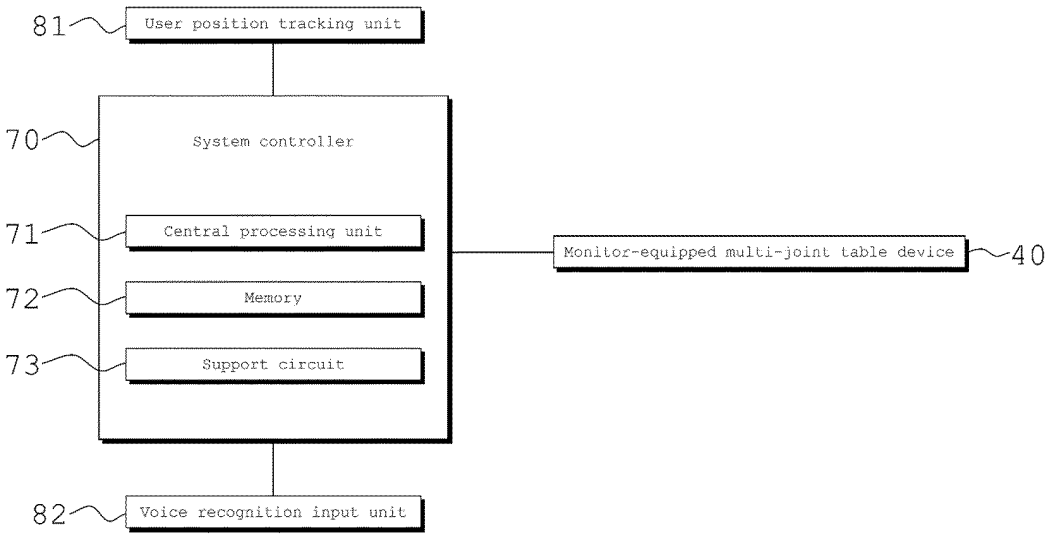
[FIG. 3]



[FIG. 4]



[FIG. 5]


81
User position tracking unit
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System controller
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Central processing unit
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Memory
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Support circuit
Monitor-equipped multi-joint table device
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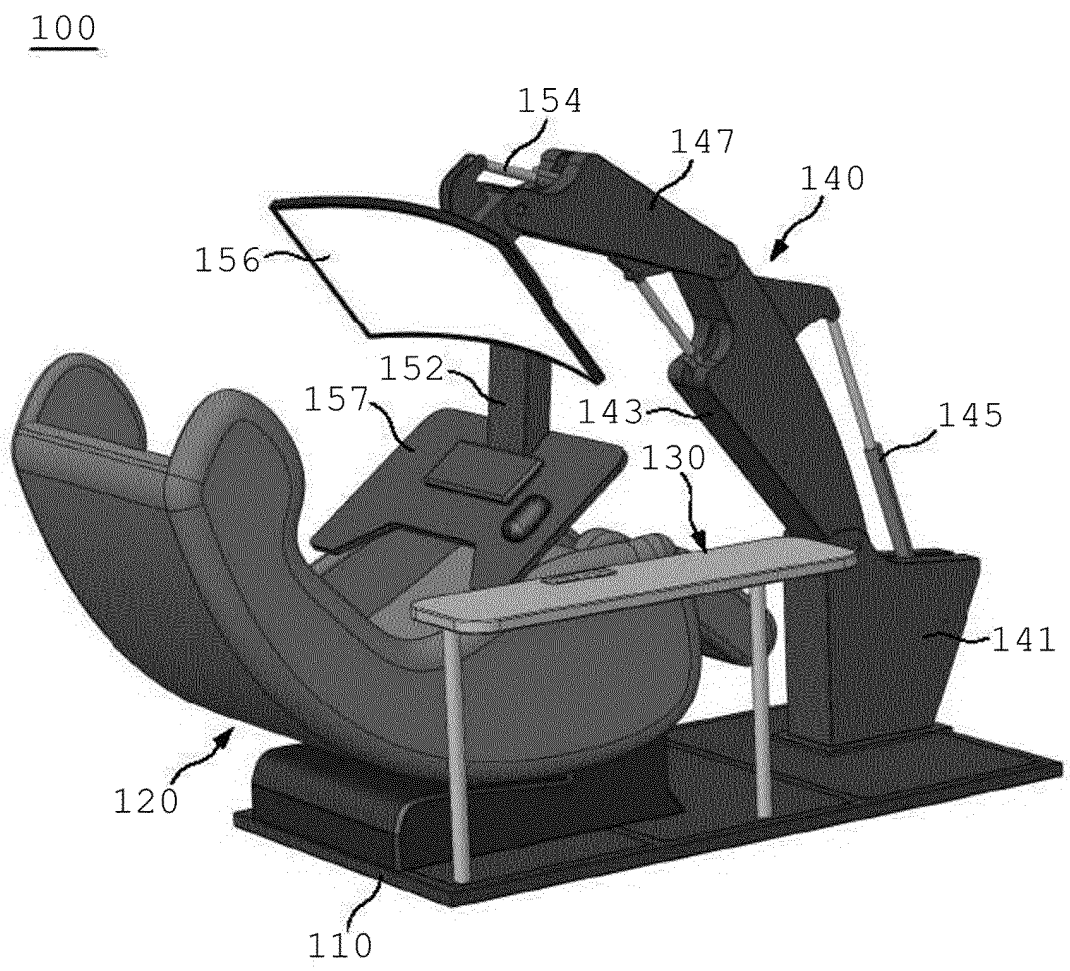
82
Voice recognition input unit

[FIG. 6]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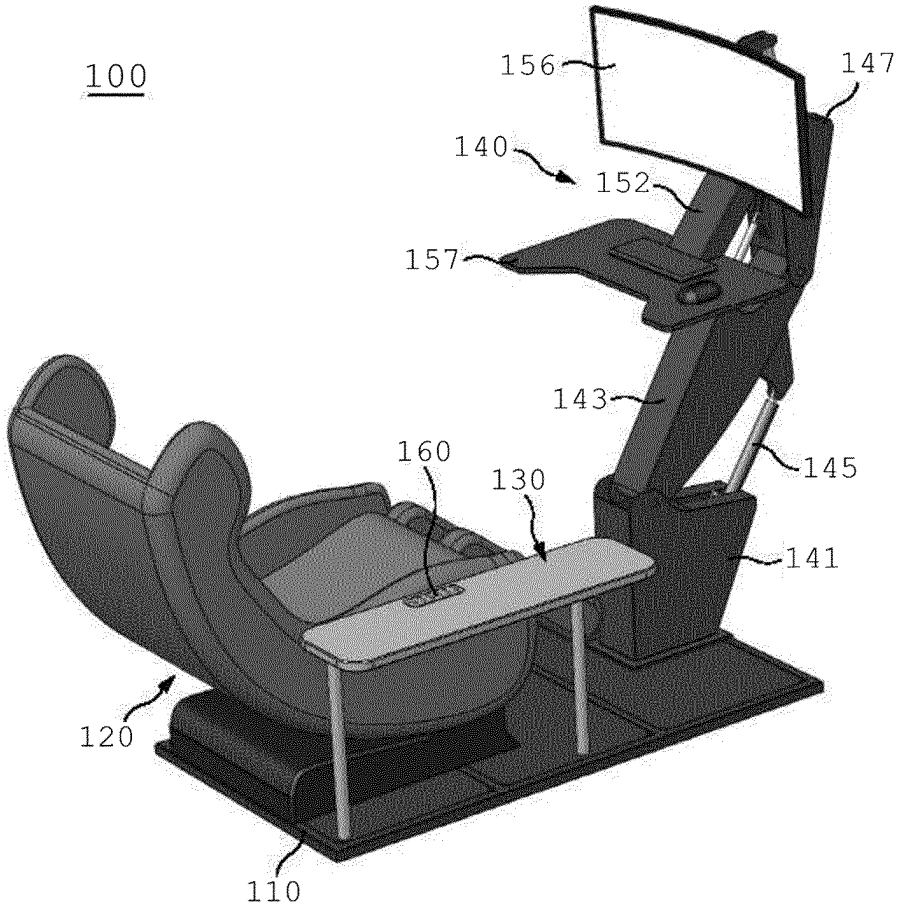
[FIG. 7]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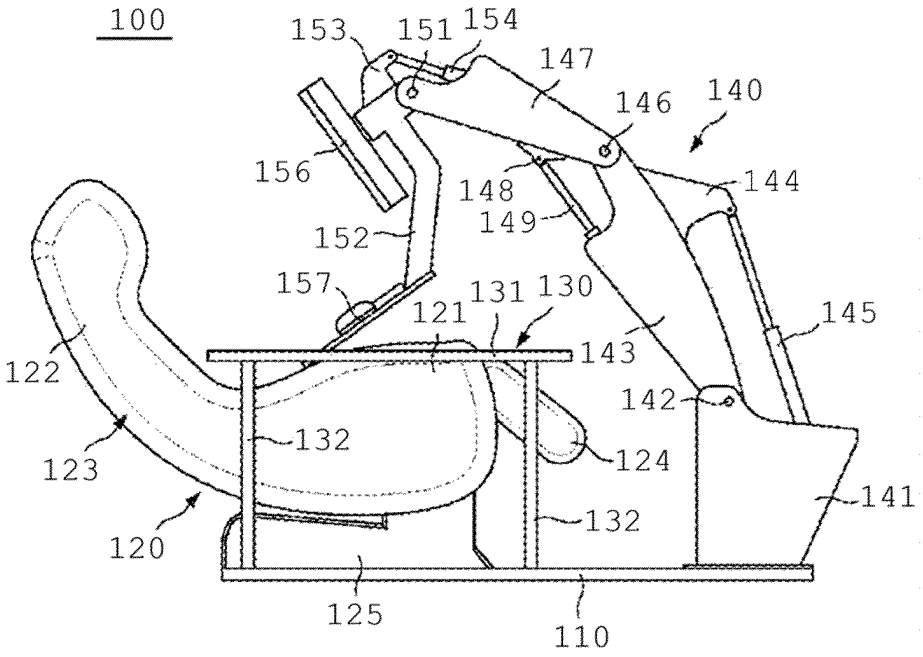
[FIG. 8]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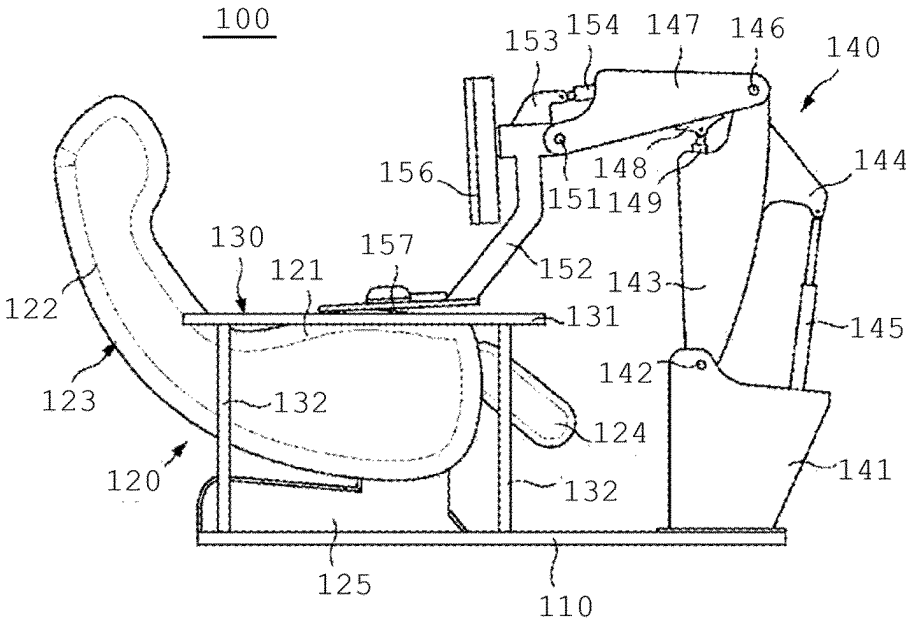
[FIG. 9]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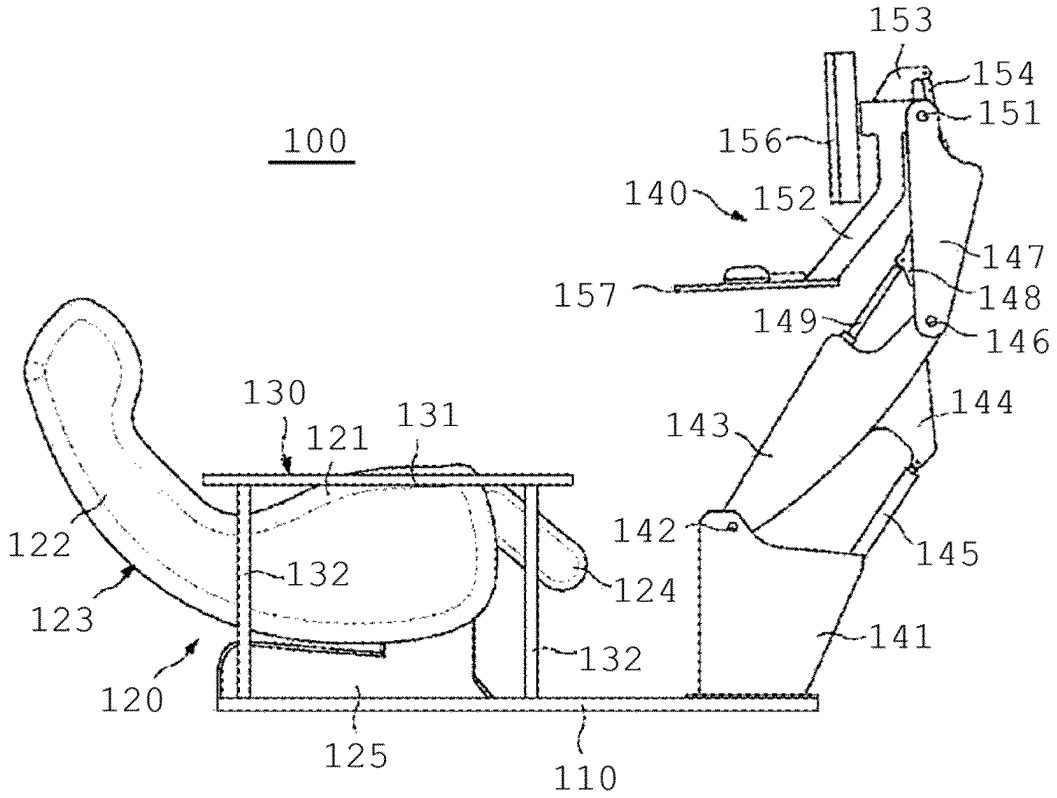
[FIG. 10]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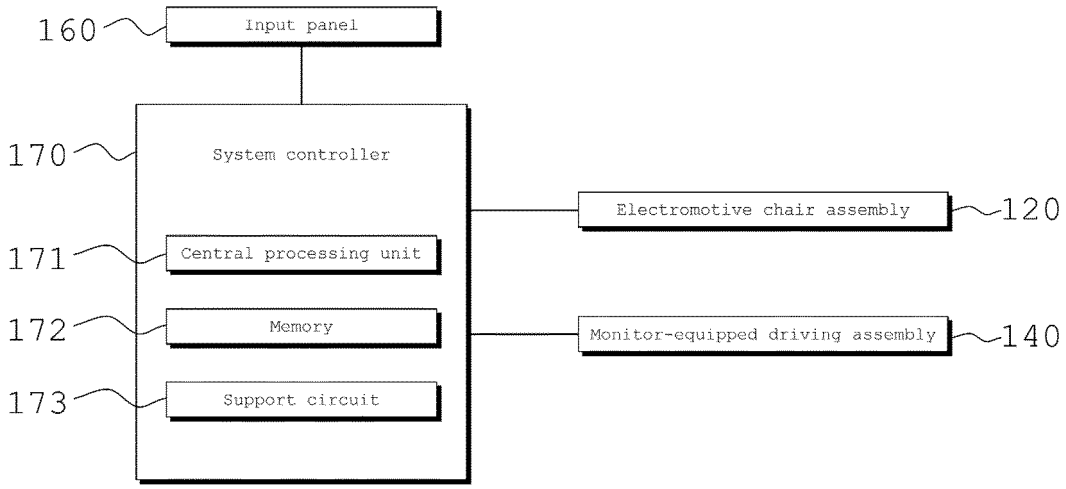
[FIG. 11]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Input panel
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System controller
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Central processing unit
172
Memory
173
Support circuit
Electromotive chair assembly
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Monitor-equipped driving assembly
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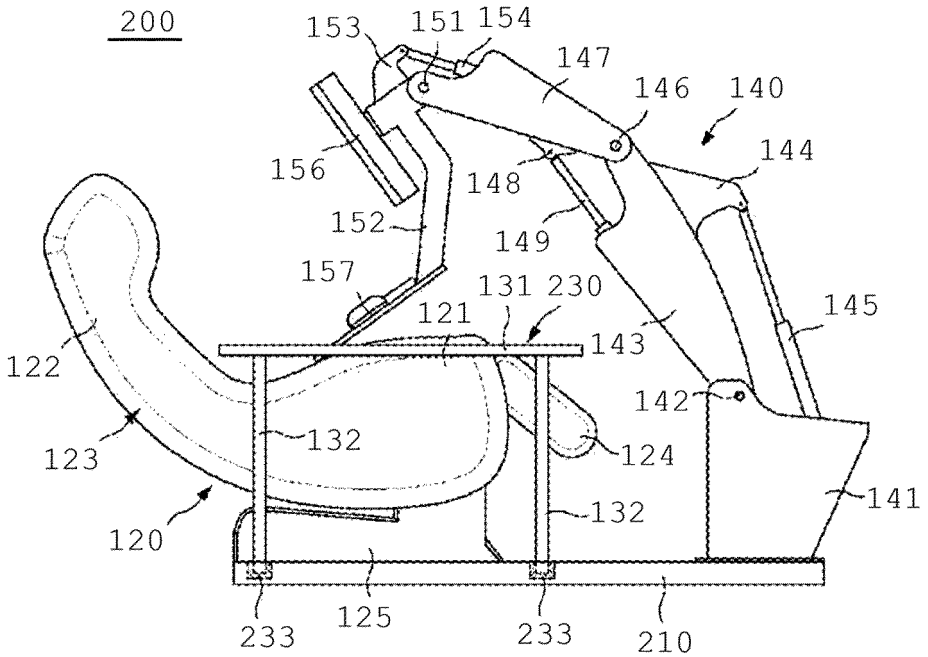
[FIG. 12]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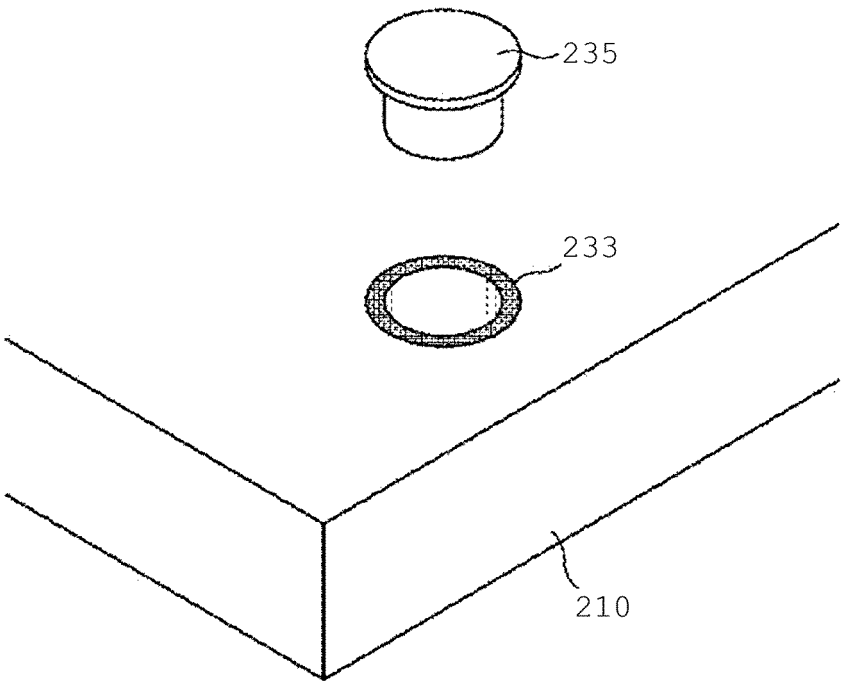
[FIG. 13]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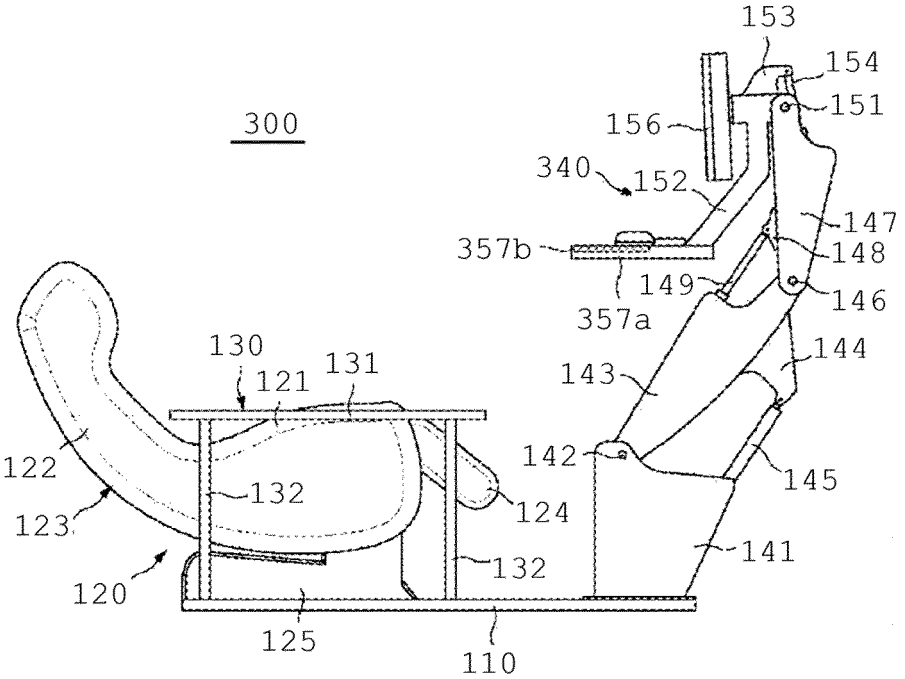
[FIG. 14]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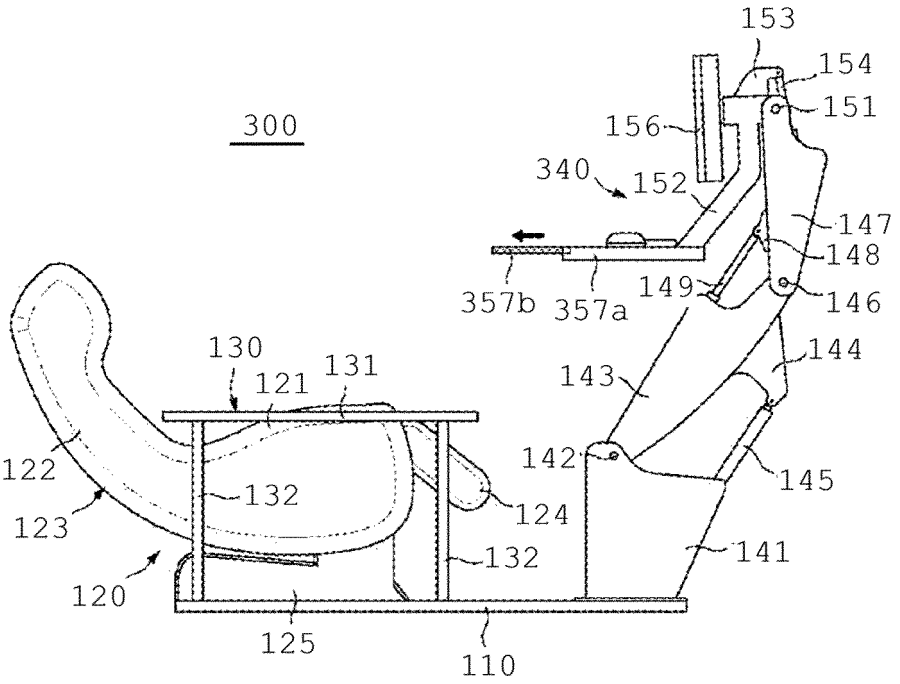
[FIG. 15]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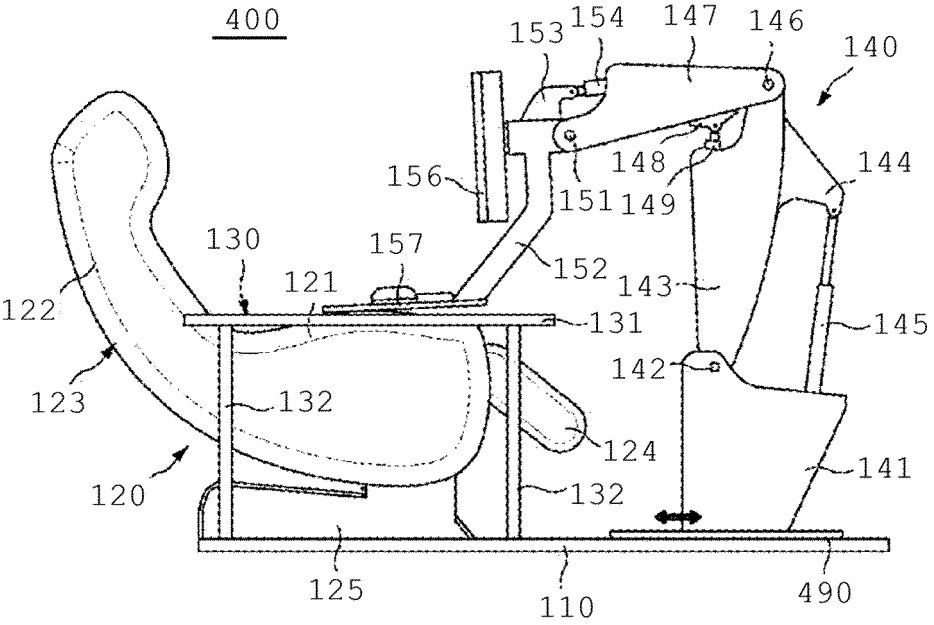
[FIG. 16]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INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2021/005900

A. CLASSIFICATION OF SUBJECT MATTER

A47B 21/03(2006.01)i; **A47B 13/08**(2006.01)i; **A47B 17/03**(2006.01)i; **A47B 21/06**(2006.01)i; **A47B 83/02**(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)

A47B 21/03(2006.01); A47B 13/08(2006.01); A47C 3/00(2006.01); A47C 3/02(2006.01); A61B 34/00(2016.01); A61B 34/35(2016.01); B25J 13/08(2006.01); B25J 9/06(2006.01); H04N 5/655(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: 복합 데스크 시스템(complex desk system), 체어 어셈블리(chair assembly), 모니터(monitor), 메인 테이블(main table), 컨트롤러(controller), 센서(sensor)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KR 10-2019-0043140 A (VERB SURGICAL INC.) 25 April 2019 (2019-04-25) See paragraphs [0022]-[0109] and figures 2a-6.	1-2,4
Y		3,5-9
Y	KR 10-2006-0071044 A (DAEWOO ELECTRONICS CORPORATION) 26 June 2006 (2006-06-26) See claim 5 and figure 4.	3
Y	KR 10-1794234 B1 (CHO, Se Hee) 07 November 2017 (2017-11-07) See paragraphs [0074]-[0076] and [0108]-[0109] and figures 7-14 and 22.	5-7,9
Y	JP 4634541 B2 (PANASONIC CORPORATION) 16 February 2011 (2011-02-16) See paragraphs [0036]-[0044] and figures 2-3.	8
A	KR 10-0995197 B1 (KIM, Jae Ho) 17 November 2010 (2010-11-17) See claim 1 and figure 1.	1-9

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

* Special categories of cited documents:
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"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
17 August 2021	**18 August 2021**
Name and mailing address of the ISA/KR **Korean Intellectual Property Office** **Government Complex-Daejeon Building 4, 189 Cheongsa-ro, Seo-gu, Daejeon 35208** Facsimile No. **+82-42-481-8578**	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 2019)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/KR2021/005900

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Form PCT/ISA/210 (patent family annex) (July 2019)