

DESCRIPTION

Title of Invention: CHAIR-TYPE MASSAGER

Technical Field

[0001] The present invention relates to a chair-type massager, and more particularly, to a safety mechanism installed in a chair-type massager.

Background Art

[0002] For example, Patent Literature 1 discloses a massage chair machine comprising: a treatment mechanism including a treatment arm with a treatment element; and a push-out member located closer to the base end of the treatment arm than the treatment element, and positioned below the treatment element. In this construction, when the treatment mechanism undesirably descends in a strong state where the treatment arm is erected substantially perpendicularly with respect to the treatment mechanism, the push-out member pushes the shoulder of a person to be treated. That is, this massage chair machine is designed to mechanically prevent the body of a to-be-treated person from being caught, or pinched in the treatment element.

Prior Art Reference

Citation List

[0003]

Patent Literature 1: Japanese Unexamined Patent

Publication JP-A 2009-56019

Summary of Invention

Technical Problem

[0004] As described above, Patent Literature 1 discloses the technology of mechanically preventing the catching, or pinching action of the treatment element against the to-be-treated person. Unfortunately, various disadvantages that massage chair machines might pose are not limited to user discomfort and inconvenience. For example, most massage chair machines have a reclinable backrest to provide comfortable massage to users. Moreover, some developed massage chair machines comprise a backrest and a seat that are capable of unitary reclining motion, just like rising and falling motion of a rocking cradle.

[0005] In such a massage chair machine, as shown in FIGS. 2A and 2B, when the seat and the backrest operate in an unitary reclining mode, armrests disposed one at each side of the seat move backward while being lifted. Upon release of the reclining mode, each armrest moves forward while descending. During this forward and downward movement of the armrest, as shown in FIG. 2B, if an object, or specifically an obstacle is present below the armrest, the obstacle is caught in the armrest. Such a catching affects the obstacle in itself, and also causes damage to the massage chair machine.

[0006] To date there have been demands for the technology to detect and prevent a certain obstacle, which is an object

not involving a user, from being caught between a massage chair machine, or more particularly an armrest mounted on a side of the machine, and a floor surface. However, in reality, such a technology has not been developed. The technology disclosed in Patent Literature 1 has also not provided any solution to such a catching problem.

With this in view, an object of the present invention is to provide a massager of reclinable chair type having a safety mechanism to prevent the occurrence of catching between an armrest part of the massager and a floor surface at the time of release of a reclining mode.

Solution to Problem

[0007] In order to fulfill the above object, the present invention adopts the following technical means.

A massager embodying the present invention comprises: a seat part; an armrest part disposed at each of the sides of the seat part; a backrest part disposed on the rear of the seat part; a massage system disposed in at least one of the seat part, the armrest part, and the backrest part; and catching detection means. The armrest part mounted on the seat part is configured to move from below upward in a reclining mode, and move from above downward upon release of the reclining mode. The catching detection means detects the occurrence of catching between the armrest part and a floor surface at the time of release of the reclining mode.

[0008] In the present invention, it is preferable that the

catching detection means is configured to detect a lifting condition of the armrest part, which results from the occurrence of catching between the armrest part and the floor surface, and detect, based on the detection result, that the catching has occurred.

In the present invention, it is preferable that the catching detection means includes a detection switch disposed in the seat part or in the armrest part, and a detector, disposed in the armrest part or in the seat part, for operating the detection switch.

[0009] In the present invention, it is preferable that the massager includes a controller to control a reclining condition of the seat part and the backrest part, and that the controller exercises control to stop reclining operation and associated operation thereof when the catching detection means detects the occurrence of catching.

In the present invention, it is preferable that the massager includes a controller to control a reclining condition of the seat part and the backrest part, and that the controller exercises control to permit reclining operation and associated operation only within a predetermined range acceptable even after the catching detection means detects the occurrence of catching, and then stop the reclining operation and the associated operation following the completion of the predetermined range of operation.

Advantageous Effects of Invention

[0010] The present invention provides a reclinable chair-type massager capable of preventing the occurrence of catching between an armrest of the massager and a floor surface at the time of release of a reclining mode.

Brief Description of Drawings

[0011]

FIG. 1 is a perspective front view showing a chair-type massager equipped with a safety mechanism embodying the present invention.

FIG. 2A is a view showing the chair-type massager in a reclining position, with the safety mechanism embodying the present invention in an operating condition.

FIG. 2B is a view showing the chair-type massager which is moving from the reclining position to a non-reclining position, with the safety mechanism embodying the present invention in an operating condition.

FIG. 3 is a perspective front view showing a seat part and armrest parts of the chair-type massager.

FIG. 4 is a perspective front view showing the seat part and one armrest part in a disassembled state in the chair-type massager.

FIG. 5 is a perspective front view showing the seat part and one armrest part in a disassembled state in the chair-type massager, with a top constituting the seat part omitted.

FIG. 6 is a perspective side view showing the seat part

of the chair-type massager, with the left-hand armrest omitted.

FIG. 7 is an exploded perspective view of catching detection means.

FIG. 8 is an exploded perspective view of the catching detection means.

Description of Embodiments

[0012] An embodiment of a massager pursuant to the present invention will now be described with reference to the drawings. A massager 1 in chair form, being simply called a chair-type massager 1, exemplifies the massager embodying the present invention.

The chair-type massager 1 shown in FIG. 1 comprises: a seat part 2 configured to support user's buttocks from below; a backrest part 3 disposed on the rear of the seat part 2; and left-hand and right-hand armrest parts 7 disposed one at each side of the seat part 2. The massager 1 according to this embodiment further includes a footrest 4 situated forward of the seat part 2.

[0013] As shown in FIGs. 1, 2A, 2B, 3, etc., the seat part 2 is provided at its bottom with a leg body 5 that allows the massager 1 to be set on a floor surface F. The leg body 5 supports the seat part 2 at a predetermined height.

The backrest part 3 has a lower end portion attached to the rear of the seat part 2 or the rear of the leg body 5. Thus, in the chair-type massager 1 according to this embodiment, the

seat part 2 and the backrest part 3 are capable of unitary reclining motion, just like rocking motion of a cradle. A position-adjusting mechanism, such as a linear actuator, disposed inside the leg body 5 imparts reclining motion to the seat part 2 and the backrest part 3.

[0014] The backrest part 3 is internally provided with a back massage system, not shown, mounted for up-and-down movement. The back massage system performs massaging operation to provide back massage such as kneading and tapping massage or vibratory massage.

The backrest part 3 may be provided at its sides with side massage systems. For a user leaning on the backrest part 3, each side massage system applies pressing massage to the arm and the shoulder of the user from their lateral sides by using, for example, an air-bag assembly which is alternately inflated and deflated repeatedly in a predetermined rhythm.

[0015] As shown in FIGs. 1, 3, etc., the armrest parts 7 are fixedly disposed one at each side of the seat part 2. Each armrest part 7 has an upper portion formed with a space dimensioned to be large enough for the resting of user's arm. Inside the space is disposed a pneumatically inflatable air-bag assembly, not shown, capable of applying pressing massage to user's arm put in the space.

The footrest 4 is configured to support or massage the legs of the user sitting in the seat part 2. The footrest 4

is formed with a pair of left-hand and right-hand holding recesses 6 that respectively receive the left and right legs of the user. The left-hand and right-hand holding recesses 6 each have opposed inner faces incorporating a foot massage system, not shown. The foot massage system comprises a pair of left-hand and right-hand kneading plates. With the leg of the user inserted between the left-hand and right-hand kneading plates, the kneading plates move toward and away from each other repeatedly in a predetermined rhythm, thereby pressing the leg of the user from both sides for massage.

[0016] In addition, as seen from FIGs. 1, 2A, 2B, etc., the armrest part 7 of this embodiment is tear-shaped in side view, and has a lowermost end portion shaped for proximity to the floor surface F. That is, the widened tear-shaped armrest part 7 is mounted so as to cover the seat part 2 and the backrest part 3 laterally. This arrangement blocks the lateral view of the user sitting in the seat part 2, thereby allowing the user to have massage in a relaxed state of mind in an isolated place.

[0017] The armrest parts 7 are fixedly disposed one at each side of the seat part 2 (the specifics thereof will be described later). Thus, the armrest parts 7, together with the seat part 2, move backward while moving from below upward in a reclining mode, and move forward while moving from above downward upon release of the reclining mode.

The chair-type massager 1 embodying the present invention

differs in the following points from a conventional chair-type massager 1.

[0018] As shown in FIGs. 2A and 2B, the seat part 2 and the backrest part 3 are mounted at a predetermined angle with respect to each other. In the reclining mode, the seat part 2 and the backrest part 3, while being operatively connected with each other, move such that the backrest part 3 falls backward, with the predetermined angle maintained, that is; the parts move from the state shown in FIG. 2B to the state shown in FIG. 2A. On the other hand, upon release of the reclining mode, the seat part 2 and the backrest part 3, while being operatively connected with each other, move such that the backrest part 3 rises forward, with the predetermined angle maintained, that is; the parts move from the state shown in FIG. 2A to the state shown in FIG. 2B. Moreover, in the reclining mode, the armrest parts 7, together with the seat part 2, move backward while moving from below upward, that is; the parts move from the state shown in FIG. 2B to the state shown in FIG. 2A. On the other hand, upon release of the reclining mode, the armrest parts 7, together with the seat part 2, move forward while moving from above downward, that is; the parts move from the state shown in FIG. 2A to the state shown in FIG. 2B. At this time, if an object, or specifically an obstacle is present below the armrest part 7, the obstacle is caught in the armrest part 7. Such a catching action affects the obstacle in itself, and also causes damage to the chair-type

massager 1.

[0019] Thus, the chair-type massager 1 according to this embodiment includes a safety mechanism configured to detect that a certain obstacle, which is an object not involving the user, is caught, or pinched between the armrest part 7 and the floor surface F, and to stop reclining operation upon detecting the occurrence of catching. The safety mechanism comprises: means 20 for detecting the described occurrence of catching or pinching, being simply called catching detection means 20; and a controller, not shown, configured to control reclining operation on the basis of the result of detection provided by the catching detection means 20.

[0020] The details of the safety mechanism will be given below.

The mounting of the armrest parts 7 on the seat part 2 will be described first prior to detailing the safety mechanism.

In FIGs. 4 and 5, there is shown how the mounting is to be accomplished. FIG. 4 is a view showing the constituent parts including a top 15 bonded to the top surface of the seat part 2. FIG. 5 is a view showing the parts with the top 15 omitted. Moreover, FIG. 6 is a view showing engaging members for engagement with the armrest part 7, and the catching detection means 20. The engaging members are disposed on a side of a frame portion of the seat part 2.

[0021] As shown in FIG. 6, on the outer wall of the side

of the upper frame portion of the seat part 2, there are formed two engaging members located toward the front and the rear, respectively, of the frame portion. Engagement of the engaging members with the armrest part 7 enables the armrest part 7 and the seat part 2 to be integrally secured to each other. Each of the engaging members includes a laterally extending bracket-like overhang 16. The overhang 16 has a centrally located through hole 17 formed therethrough in a vertical direction. Moreover, the overhang 16 is provided at its base-end side, or specifically its side contiguous to the frame portion, with a slot 18 extending in a front-rear direction. A pawl member 19, which will be described later, engages in the slot 18.

[0022] Between the two overhangs 16 arranged in the front-rear direction, expressed differently, at the central area of the side of the frame portion in the front-rear direction, there is disposed the catching detection means 20. The specifics of the configuration of the catching detection means 20 will hereafter be described.

The overhangs 16 and the catching detection means 20 are provided both on the left side of the upper frame portion and on the right side of the upper frame portion. The left-hand overhangs 16 secure the left-hand armrest part 7 to the seat part 2, and the right-hand overhangs 16 secure the right-hand armrest part 7 to the seat part 2. The left-hand catching detection means 20 detects the occurrence of catching between

the lower end of the left-hand armrest part 7 and the floor surface F, and the right-hand catching detection means 20 detects the occurrence of catching between the lower end of the right-hand armrest part 7 and the floor surface F.

[0023] As shown in FIGs. 4 and 5, the armrest part 7 is provided at its inner side surface, or specifically its surface which faces the user, with members 21 to be engaged with the corresponding overhangs 16 described above, being simply called engaged members 21. On the inner side surface of the armrest part 7, the engaged members 21 are positioned in a one-to-one correspondence with the overhangs 16, that is; spaced by a predetermined distance apart in the front-rear direction. The engaged members 21 each include a projection 22 protruding from the inner side surface of the armrest part 7, and a pin-shaped engagement rod 23 downstanding from the projection 22. The engagement rod 23 is inserted from above through the through hole 17 located centrally of the overhang 16, thereby permitting the mounting of the armrest part 7 on the seat part 2. There is also provided a component 24 in piece form, being simply called a mounting piece 24, extending downward from the projection 22. The mounting piece 24 is pivotally supported at its intermediate portion in the vertical direction for rotation about an axis directed in the front-rear direction. The mounting piece 24 has a lower end bent outwardly in a width direction to provide the pawl member 19. The lower end of the mounting piece 24 is

fitted from above into the slot 18 formed in the base-end side of the overhang 16, so that the pawl member 19 of the mounting piece 24 fits in the overhang 16, or specifically fits within the slot 18. This enables the armrest part 7 to be secured to the seat part 2 without fail. The lower end of the mounting piece 24 is disengaged from the overhang 16 by pushing the upper end of the mounting piece 24 outward in the width direction, which results in disengagement between the armrest part 7 and the seat part 2.

[0024] It is noted that slight play is present in the engagement of the engaged member 21 with the overhang 16. This allows the armrest part 7 to move slightly by a distance of about a few millimeters in the vertical direction relative to the seat part 2. The play is a key factor in the detection of the occurrence of catching.

As shown in FIG. 6, at the central area of the side of the upper frame portion of the seat part 2 in the front-rear direction, there is disposed the catching detection means 20. The catching detection means 20 has a top surface flush with the top 15 constituting the seat part 2. The top surface is formed with a detection hole 25 which is, just like the slot 18, oriented in the front-rear direction. The armrest part 7 is provided at its inner wall with a detection piece 26 formed in a hanging fashion (refer to FIGs. 3 and 4). With the detection piece 26 inserted in the detection hole 25, a detection switch

27 disposed within the catching detection means 20 is pressed down to bring about a state of conduction. This permits detection of proper fitting of the armrest part 7 to the seat part 2.

[0025] FIGS. 7 and 8 are exploded perspective views of the detection switch 27.

As shown in these figures, the detection switch 27 includes one electrode 28 and the other electrode 29. The one electrode 28 comprises a pair of flat plate-shaped electrodes 28 arranged in the front-rear direction. The other electrode 29, which is disposed above the one electrode 28, is formed of a flat plate-shaped electrode bent into a convex configuration as seen in side view. An open-bottomed rectangular cap body 30 is disposed above the other electrode 29 so as to cover the other electrode 29. Spring members 31 are disposed between the cap body 30 and a surface where the one electrode 28 is placed. In addition, between the one electrode 28 and the other electrode 29 are disposed spring members 31. Before the armrest part 7 is assembled to the seat part 2, the spring members 31 allow the other electrode 29 to be spaced above the one electrode 28, thereby keeping the one electrode 28 and the other electrode 29 out of contact with each other. Then, when the detection piece 26 is inserted through the slot 18 provided in the top surface of the catching detection means 20, the cap body 30 is pressed down, thereby causing the other electrode 29 to move down into contact with the other electrode 29. Thus, after the

armrest part 7 is assembled to the seat part 2, the detection switch 27 is in a continuous state of conduction.

[0026] As shown in FIG. 2B, when catching occurs between the lower end of the armrest part 7 and the floor surface F at the time of release of the reclining mode, the armrest part 7 is slightly lifted, thereby causing the detection piece 26 to move upward away from the detection switch. Consequently, the other electrode 29 is lifted away from the one electrode 28, so that the one electrode 28 and the other electrode 29 become out of contact with each other, thereby bringing the detection switch into the OFF position. Finding this "OFF" state leads to the detection of the occurrence of catching in the armrest part 7.

[0027] Thus, a condition where the detection switch is ON corresponds to a normal operating state, whereas a condition where the detection switch is OFF corresponds to an abnormal operating state where catching has occurred. This allows the worst situation, such as the occurrence of catching, to be detected without fail even when detecting operation cannot be achieved properly due to a break in the detection switch, for example.

The following describes the mode of operating the catching detection means 20 thus far described, and the catching-detecting operation involved.

[0028] In the assembled chair-type massager 1 according

to this embodiment, the seat part 2 has, at its right and left sides, the right-hand armrest part 7 and the left-hand armrest part 7, respectively. Specifically, the seat part 2 and the armrest parts 7 are integrated into one body by fitting, from above, the engagement rod 23 disposed on the inner side wall of the armrest part 7 into the through hole 17 formed in the overhang 16 of the seat part 2. In order to prevent easy disconnection between the integral parts, at the overhang 16, the lower end of the mounting piece 24 is fitted from above into the slot 18 formed in the base-end side of the overhang 16, so that the turned portion of the mounting piece 24 is engaged with the overhang 16, or specifically engaged within the slot 18. Although the armrest part 7 and the seat part 2 are disengaged from each other when the lower end of the mounting piece 24 is disconnected from the overhang 16 by pushing the upper end of the mounting piece 24 outward in the width direction, there is little chance that the armrest part 7 already assembled to the seat part 2 is disengaged from the seat part 2.

[0029] When the armrest part 7 is mounted on the seat part 2, the detection piece 26, which serves as a detector (refer to FIGs. 3 and 4), formed in a hanging fashion on the inner wall of the armrest part 7 is inserted into the detection hole 25. Consequently, the detection switch 27 disposed within the catching detection means 20 is pressed down to bring about a state of conduction.

As shown in FIGs. 2A and 2B, in the chair-type massager 1, the seat part 2 and the backrest part 3 are mounted at a predetermined angle with respect to each other. In the reclining mode, the seat part 2 and the backrest part 3, while being operatively connected with each other, move such that the backrest part 3 falls backward, with the predetermined angle maintained, that is; the parts move from the state shown in FIG. 2B to the state shown in FIG. 2A. On the other hand, upon release of the reclining mode, the seat part 2 and the backrest part 3, while being operatively connected with each other, move such that the backrest part 3 rises forward, with the predetermined angle maintained, that is; the parts move from the state shown in FIG. 2A to the state shown in FIG. 2B. Moreover, in the reclining mode, the armrest parts 7, together with the seat part 2, move backward while moving from below upward, that is; the parts move from the state shown in FIG. 2B to the state shown in FIG. 2A. On the other hand, upon release of the reclining mode, the armrest parts 7, together with the seat part 2, move forward while moving from above downward, that is; the parts move from the state shown in FIG. 2A to the state shown in FIG. 2B. At this time, if an object, or specifically an obstacle is present below the armrest part 7, the obstacle is caught in the armrest part 7. The occurrence of such a catching causes the armrest part 7 to be lifted, though slightly, with respect to the seat part 2. This lifting motion causes the detection piece 26 to move upward,

thereby bringing both electrodes, namely the one electrode 28 and the other electrode 29, of the detection sensor out of contact with each other to bring about the OFF state. Finding the OFF state leads to the detection of catching in the armrest part 7.

[0030] When the catching detection means 20 detects the occurrence of catching in the armrest part 7, a signal to announce the occurrence of catching, that is; a signal indicative of the OFF state of the detection sensor, is issued to the controller that controls the reclining condition of the seat part 2 and the backrest part 3. In response to this signal, the controller acknowledges the occurrence of an unexpected catching trouble, and exercises control to stop reclining operation and associated operation, including the operation of the massage system.

[0031] When the operation of the backrest part 3, etc. is stopped in response to a catching-announcing signal while the backrest part 3 is not in a fully raised position, in other words, in the middle of the reclining movement, then the user lying on the back may not be able to rise from the lying posture. In order to avoid such a new unexpected situation, it is highly desirable to design the controller to permit the reclining operation and the associated operation only within a predetermined range acceptable even after the catching detection means 20 detects the occurrence of catching. For example, the controller is configured to keep control of the reclining

operation, etc. for only a few seconds after the detection of catching, as well as to adjust the reclining angle only to a predetermined degree during the reclining release operation after the detection of catching.

[0032] As described heretofore, the chair-type massager 1 according to this embodiment includes the armrest parts 7 configured to move from below upward in the reclining mode, and move from above downward upon the release of the reclining mode, and also includes the catching detection means configured to detect the occurrence of catching between the armrest part 7 and the floor surface F. Thus constructed, the chair-type massager 1 is capable of preventing the occurrence of catching between the armrest part 7 and the floor surface F without fail at the time of the release of the reclining mode.

[0033] It should be understood that the embodiment as disclosed herein is considered in all respects as illustrative only and not restrictive. In particular, for such matters as not explicitly specified in the disclosure of the embodiment, e.g. working conditions, operating conditions, and the dimensions, weights, etc. of the structural components, those that do not depart from the practical range to be normally complied with by persons skilled in the art and that conform to matters of common knowledge among the skilled persons are adopted herein.

Reference Signs List

[0034]

1	Chair-type massager
2	Seat part
3	Backrest part
4	Footrest
5	Leg body
6	Holding recess
7	Armrest part
15	Top
16	Overhang
17	Through hole
18	Slot
19	Pawl member
20	Catching detection means
21	Engaged member
22	Projection
23	Engagement rod
24	Mounting piece
25	Detection hole
26	Detection piece (Detector)
27	Detection switch
28	One electrode
29	The other electrode
30	Cap body
31	Spring member
F	Floor surface

CLAIMS

1. A chair-type massager, comprising:
 - a seat part;
 - an armrest part disposed at each of sides of the seat part;
 - a backrest part disposed on a rear of the seat part;
 - a massage system disposed in at least one of the seat part, the armrest part, and the backrest part; and
 - catching detection means,the armrest part mounted on the seat part being configured to move from below upward in a reclining mode, and move from above downward upon release of the reclining mode,
 - the catching detection means detecting an occurrence of catching between the armrest part and a floor surface at a time of release of the reclining mode.
2. The chair-type massager according to claim 1, wherein
 - the catching detection means is configured to detect a lifting condition of the armrest part, which results from the occurrence of catching between the armrest part and the floor surface, and detect, based on a result of the detection, that the catching has occurred.
3. The chair-type massager according to claim 2, wherein
 - the catching detection means includes

a detection switch disposed in the seat part or in the armrest part, and

a detector to operate the detection switch, the detector being disposed in the armrest part or in the seat part.

4. The chair-type massager according to any one of claims 1 to 3, further comprising:

a controller to control a reclining condition of the seat part and the backrest part, wherein

the controller exercises control to stop reclining operation and associated operation thereof when the catching detection means detects the occurrence of catching.

5. The chair-type massager according to any one of claims 1 to 3, further comprising:

a controller to control a reclining condition of the seat part and the backrest part, wherein

the controller exercises control to permit reclining operation and associated operation only within a predetermined range acceptable even after the catching detection means detects the occurrence of catching, and then stop the reclining operation and the associated operation following a completion of the predetermined range of operation.