RECLINING CHAIR AND HARDWARE THEREFOR

Joseph Bontempi, West Nyack, N.Y., and Alex J. Katz, West Orange, N.J., assignors, by mesne assignments, to Anton Lorenz, Ocean Ridge, Fla.

Filed Apr. 16, 1958, Ser. No. 729,008

15 Claims. (Cl. 155—107)

This invention relates to reclining chairs and hardware thereof. It is particularly related to a reclining chair provided with a head-rest.

An object of this invention is to provide a chair of the character described, having means to move the head-rest from an inoperative, retracted position below the upper end of the back-rest, to an operative extended position above the back-rest responsive to movement of the chair from upright toward reclining position, and to move the head-rest from operative position above the back-rest to inoperative position below the upper end of the back-rest, responsive to movement of the back-rest from reclining toward upright position.

Another object of the invention is to provide a chair of the character described, in which the movement of the head-rest takes place in the first minor portion only of movement of the back-rest from upright to fully reclinable position, and in the last minor portion only of movement of the back-rest from fully reclining to upright position, whereby the head-rest will be in operative extended position while the chair is both in fully reclined condition, and also in positively reclinable position or in position for watching television.

Still another object of this invention is to provide a strong, rugged and durable reclining chair construction of the character described, which shall be relatively inexpensive to manufacture, smooth and positive in operation, and yet practical, efficient and comfortable in use.

Other objects of this invention will in part be obvious and in part hereinafter pointed out. The invention accordingly consists in the features of construction, combination of elements, and arrangements of parts, which will be exemplified in the construction hereinafter described, and of which the scope of invention will be indicated in the appended claims.

In the accompanying drawings in which is shown various illustrative embodiments of this invention:

Fig. 1 is a perspective view of a chair embodying the invention in upright position, with the head-rest in retracted inoperative position;

Fig. 2 is a view similar to Fig. 1, but showing the chair in reclined position with the head-rest extended in position for watching television;

Fig. 3 is a rear perspective view of the frame for the back rest of the chair of Fig. 1 and illustrating the mechanism for controlling movement of the head-rest responsive to movement of the back-rest and seat of the chair, and showing the head-rest in extended position;

Fig. 4 is a side elevational view of the supporting frame and chair seat and back frames, and illustrating the retracted, inoperative or non-use position of the head-rest;

Fig. 4a is a perspective view of a detail of the head-rest control mechanism in its position of Fig. 4;

Fig. 5 is a cross-sectional view taken on line 5—5 of Fig. 4;

Fig. 6 is a view similar to Fig. 4 but showing the reclinable position of the chair with the head-rest extended;

Fig. 6a is a perspective view of the detail of Fig. 4a and showing the same in its position of Fig. 6; and

Fig. 7 is a cross-sectional view taken on line 7—7 of Fig. 6.

Referring now in detail to the drawing, 10 designates a reclining chair embodying the invention.

Said chair comprises a supporting frame 11 having side walls 12, front legs 13, rear legs 14, and a back wall 15. The chair further comprises a rigid seat and back-rest unit 16. Said unit comprises a seat frame 17 rigidly fixed at its rear end to the lower end of the back-rest frame 18.

The seat frame may comprise side walls 19 connected at their front ends by walls 20 and 21, and at their rear ends by a bottom wall 22 projecting rearwardly of said frame. The back-rest frame 18 may comprise side walls 24 connected by an intermediate transverse rear bar 25 and an upper front transverse bar 26.

The seat and back-rest frames as well as the supporting frame 11 may be upholstered and finished and decorated in any suitable manner.

When the chair is in upright position, as shown in Fig. 4, the seat is tilted somewhat upwardly and forwardly and the back-rest is tilted upwardly and rearwardly.

Means is provided for pivotally connecting the seat and back-rest unit 16 to the supporting frame 11. To this end there is fixed to each side walls 19, a bracket 30 to which is fixed an arm 31 extending downwardly. Arms 31 are pivoted to side walls 12 on aligned pivot pins 32.

In the upright position of the chair, wall 22 is located in spaced relation near the level of the upper end of wall 15 of the supporting frame. Said wall 15 is formed with an inner upwardly and rearwardly central beveled recessed surface 15a, for the purpose hereinafter appearing.

Interconnected to the back-rest frame 18 is a head-rest frame 41. Said head-rest frame comprises a pair of parallel side walls 42 connected by a lower rear transverse rod 43 and an upper forward transverse bar 44. The head-rest frame 41 may be upholstered and finished in any suitable manner.

Attached to the inner surface of end walls 42 are metal bars 46. Attached to the rear surface of transverse members 26 of the back-rest frame are a pair of angle brackets 50 each having an outwardly extending flange 51 screwed to said member, and rearwardly extending parallel flanges 52. Pivotto flanges 52 at the lower ends thereof as at 53, are arms 54.

Pivoted at their inner ends to the outer ends of arms 54, as at 55, are levers 56, the outer end of which are pivotally connected as at 57 to the lower ends of bars 46, as shown in Fig. 6.

Pivoted to the upper ends of flanges 52, as at 58, are the inner ends of levers 59 crossing and interpivoted, as at 60, to levers 56. The upper ends of levers 59 are pivoted, as at 61, to links 62 which are in turn pivoted to the upper ends of bars 46, as at 63.

It will now be understood that the head-rest frame can be swung from the position of Fig. 4, behind the back-rest, facing rearwardly, and extending down from the upper end thereof, to the position of Figs. 3 and 6, where the head-rest is extended upwardly from the upper end of the back-rest, facing forwardly, in spaced relation above the upper end of the back-rest, and disposed somewhat forwardly of said back-rest. The head-rest swings through an angle of 180° and moves forwardly when swung from retracted non-use or inoperative position, to extended, operative or in-use position. The movement of the head-rest is in reverse to that described when moved from the position of Figs. 3 and 6 to the position of Fig. 4.

Means is provided to automatically move the head-rest from the retracted to the extended position in re-
spontaneous movement of the seat-back-rest unit from inclined toward upright position, and from retracted to extended position, in response to movement of the unit from upright toward reclining position. To this end there is fixed to the inner side of wall 16 at the center thereof, an angle shaped bracket 70 having a flange 71 inclined upwardly and forwardly and provided with an offset pin 71 at its upper end, located above said wall and forwardly thereof.

Fixed to the upper side of wall 22 of unit 16, is an arm 73 having an upwardly extending end 74 to which is pivoted, as at 75, a control latch 76. Latch 76 is in the shape of a bell crank lever having a rearwardly extending arm 77 and an upwardly and rearwardly extending arm 78. Arm 77 has at its rear end an upwardly extending finger 79. At the inner side of the junction between arms 77, 78 is a round notch 80. Arm 78 has a rear edge 81. Between edge 81 and finger 79 is a passage 82 communicating at its lower end with notch 80.

Pivoted to the upper end of finger 79 as at 85 is the lower end of an elongated link 86 which extends upwardly from the lower end of cross member 25. The upper end of link 86 is pivoted as at 87 to an arm 88 pivoted as at 89 to a bracket 90 fixed to the central rear face of cross-bar 26. In the position of Fig. 6 link 86 is received in recess 15A.

Arm 88 is formed with a horizontal through opening 91 through which passes a horizontal rod 92. Pivoted to the rear midportion of flange 52 as at 93, are curved arms 94. Pivots 93 and 94 are in horizontal alignment. The ends of rod 92 are fixed to intermediate portions of arms 94 as at 95. Arms 94 curve upwardly and rearwardly and then downwardly from pivots 93 and terminate in downwardly extending arms 96 connected by links 97 to intermediate portions of arms 94.

When the chair is upright (Fig. 4), pin 71 is in notch 80, thereby retaining latch 76 in downwardly moving position. In such position link 86 has been pulled down, having pulled down arm 88 and hence having swung rod 92 down to swing curved arms 94 in a counterclockwise direction, thereby swinging arm 54 in a counterclockwise direction and causing the head-rest to be retained in downwardly and rearwardly swung position below the upper end of the back-rest and at the rear thereof.

Upon moving the chair from upright toward reclining position, during the first minor part of such movement (about first quarter of such movement) fixed pin 71 will swing latch 76 upwardly (clockwise looking at Fig. 4) to push link 86 up and rotate curved arms clockwise or upwardly, thereby swinging arms 54 up to swing the head-rest frame to the extended, in-use position of Figs. 3 and 6.

As soon as pin 71 is out of notch 80, it will move through passage 82 and along the rear edge 81 of the latch 76, without further moving the latch or the head-rest. The latch edge 81 is of such length that the pin 71 will not move thereafter so that the latch cannot move beneath said pin. Thus, the head-rest comes up during the first 25% or 30% of the total movement of the chair from upright to fully reclined position and remains up during the rest of the movement.

As the chair is moved from fully reclined position, pin 71 moves down, along the rear edge of latch 76 without affecting the latch or the head-rest. However, when pin 71 enters passage 82 and reaches arm 77, the latch starts to be swung down to retract the head-rest, and this occurs during the last 25% or 30% of the movement, from fully reclined to upright position.

Thus the head-rest remains in use during fully reclined position and in the partially raised position usually used while watching television.

A foot-rest 100 may be provided and it may be projected and retracted in any suitable well known manner.

Although the back-rest and seat are rigid, the invention may be embodied in construction in which the back-rest and seat have relative movement.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiments above set forth, it is to be understood that the matter set forth above or shown in the accompanying drawings is merely illustrative and is not to be interpreted in a limiting sense, the scope of the invention being delineated in the appended claims.

We claim: 1. In combination, a supporting frame, a chair back-rest, means to connect said back-rest to said supporting frame for movement relative to said supporting frame, a head-rest, linkage means mounting the head-rest on the back-rest and comprising an arm pivotally mounted on said back-rest, a lever pivoted at one end to the free end of said arm and at its other end to the upper portion of said head-rest, a second arm pivotally mounted at one end on said back-rest at a point above the pivotal mount of said arm on said back-rest and crossing and being interlocked to said first lever, and a link pivoted at one end to the free end of said second lever and being pivotally connected at its other end to said head-rest at a point located below the pivotal connection of said first lever to said head-rest, whereby said head-rest may move up in back of the back-rest facing downwardly and extending down from the upper end of the back-rest, to a position above the upper end of the back-rest extending upwardly and facing forwardly at the front side of the back-rest, and actuating means responsive to movement of said back-rest relative to said supporting frame in one direction and operatively connected to the linkage for actuating the latter and moving said head-rest from one of its positions to the other, said actuating means being responsive to movement of said back-rest relative to the supporting frame in an opposite direction for moving said head-rest from its other position to its said one of said positions.

2. The combination of claim 1, said means including means to cause such movement of said head-rest relative to said back-rest during a minor portion only of said back-rest relative to said supporting frame.

3. The combination of claim 1, said means comprising cooperating means on said supporting frame and arm for moving said arm upon moving said back-rest relative to said supporting frame.

4. The combination of claim 2, comprising a second arm pivoted to said back-rest, a link connecting said arm with said first mentioned pivoted arm, a latch pivoted relative to said back-rest, link means connecting said latch with said second arm, and fixed means on said supporting frame for pivotally moving said latch responsive to movement of said back-rest relative to said supporting frame.

5. The combination of claim 2, said means comprising a second arm pivoted to said back-rest and connected to said first arm by a link, a latch pivoted to said back-rest, said latch having a notch at its rear side, and an arm below said notch extending rearwardly from said notch, link means connecting said arm of said latch with said second arm, and a bracket fixed on said frame having a pin received in said notch.

6. The combination of claim 5, said latch having a rear edge extending upwardly from said notch adapted to be engaged by said pin after said pin has moved out of said notch, and being of such length that the pin will not move therebeyond.

7. In combination, a pair of brackets adapted to be attached to the upper end of a back-rest, similar arms pivoted on aligned pivot points to said brackets, similar
levers pivoted to said arms, similar levers pivoted to said brackets and crossing and being interposed to said first lever, the said brackets being pivoted to said levers, bars adapted to be attached to a head-rest, and pivoted to said links and first levers, similar arms pivoted to said brackets and interconnected by a cross rod, similar links interconnecting said second mentioned arms to said first arms respectively, another bracket between said pair of brackets and adapted to be attached to said back-rest, another lever pivoted to said other bracket in alignment with the pivotal points of said second arms, and connected to said rod, still another bracket adapted to be fixed relative to the lower end of the back-rest, a latch pivoted to said last bracket, and a link connecting said later with said other lever.

8. The combination of claim 7, in combination with a bracket adapted to be attached to a supporting frame for said back-rest and having a pin, and said latch having a rearwardly opening notch adapted to receive said pin.

9. The combination of claim 8, said latch having a rear edge above said notch adapted to be engaged by said pin.

10. The combination of claim 8, in combination with a bracket adapted to be fixed to a seat rigid with said back-rest, and provided with means to pivotally connect to the supporting frame.

11. In a reclining chair having a support frame and a rigid seat and back-rest unit mounted on said support frame for movement between an upright position and a rearwardly-titled position; a head-rest, and means mounting said head-rest on said back-rest for movement between a retracted position and an extended position, said mounting means comprising a first link pivotally connected to the upper end of the head-rest in the retracted position and said support frame pivotally connected to the head-rest at a point spaced below the pivotal connection of the first link to the head-rest, a third link pivotally connected at one end to the second link and pivotally mounted at its other end on the back-rest, and a fourth link pivotally connected at one end to the first link and pivotally mounted at its other end on the back-rest at a point below the pivotal mount of the third link on said back-rest, the first link crossing over an intermediate portion of the third link and being pivotally connected thereto at its crossing-over point, and drive means mounted on the body-supporting unit and support frame and connected to one of the third and fourth links for pivoting the same about its pivotal mount on the back-rest in response to rearward movement of the unit toward its rearwardly-titled position, whereby to extend the mounting means and move the head-rest from its retracted position to its extended position.

14. In a reclining chair having a support frame and a rigid seat and back-rest unit mounted on said support frame for movement between an upright position and a rearwardly-titled position; a head-rest, and means mounting said head rest on said back-rest for movement between a retracted position and an extended position, a raised extended position, and an extended inverted position and drive means coupled to said head-rest linkage means for actuating the latter in response to movement of said seat and back-rest unit, said drive means including a double arm lever pivotally mounted on said unit and carried thereby, said lever having an upward arm and a rearwardly extending arm, a fixed element mounted on said support frame to the rear of said lever and engaging the upward arm of said lever for pivoting the upward arm forwardly and the rearwardly-extending arm upwardly when the unit is moved rearwardly toward its tilted position relative to the support frame, and coupling means connecting the rearwardly-extending arm of said lever to said head-rest linkage means for actuating the latter to move the head-rest to its extended position when said upward lever arm is pivoted forwardly, said upward lever arm having a planar rear surface and said coupling means comprising a follower positioned to ride along said rear surface and sized to be received in said slot in the upper right position of the body-supporting unit.

15. An assembly according to claim 14 in which said drive means includes a double-arm lever pivotally mounted on the seat and back-rest unit and carried thereby, a fixed element on said support frame engaging one arm of said double-arm lever and arranged to pivot the lever on said unit when the unit is moved rearwardly relative to the support frame, and coupling means connecting the other arm of said lever to said head-rest linkage means, said coupling means comprising a crank member carried by the back-rest and connected to the head-rest linkage means for actuating said linkage means to move the head-rest when the crank member is turned, and means operatively connecting said other arm of the lever to said crank member.

References Cited in the file of this patent

UNITED STATES PATENTS

242,733 Yeling ........................ June 7, 1981
2,843,183 Luckhardt ........................ July 15, 1958
2,843,184 Lorence ........................ July 15, 1958

FOREIGN PATENTS

979,923 France .......................... Dec. 13, 1950