HEAD-REST AND CONTROL

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The present invention relates generally to an improved reclining chair, and in particular to a head-rest and control arrangement for such reclining chair wherein the head-rest is automatically displaced to an extended head-supporting position relative to the back-rest in response to reclining movement of the chair.

It is generally known to construct a reclining chair which includes a support and body-supporting means having a back-rest movably mounted on the support such that the back-rest may be moved into various reclined positions under the control of the chair occupant. Such reclining chairs may incorporate a head-rest positioned adjacent the upper end of the back-rest, and preferably stored within the outline of the back-rest such that the head-rest may be extended or elevated relative to the back-rest to provide a more comfortable and adequate support for the head of the chair occupant. With such an extensible head-rest, the back-rest may be made somewhat shorter for esthetic and designed reasons, yet the chair occupant may be comfortably accommodated when in the various reclining positions by the additional support of the head-rest.

BROADLY, it is an object of the present invention to provide an improved head-rest and control arrangement for a reclining chair wherein the head-rest is automatically extended as a function of the reclining movement of the back-rest of the chair.

Of recent times there has been developed a "double-movement" recliner type of reclining chair which includes a movable back-rest, seat and leg-rest and a coordinating linkage arranged such that during a first phase of the reclining movement the seat and back-rest are moved to an intermediate tilted or semi-reclined position, with substantially no angular change between the seat and back-rest, and during a second phase of the reclining movement the seat and back-rest are moved into various reclined positions, with a progressive increase in the included angle between the seat and back-rest. The leg-rest is operated to move to its elevated leg-supporting position in response to the first phase of the reclining movement such that the leg-rest is in its proper position to support the legs of the chair occupant throughout the second phase of the reclining movement. For such double-movement chair, and for rester type multiple-position chairs having a unitary seat and back-rest, the head-rest and its control arrangement should be designed to bring the head-rest into the extended head-supporting position during the first phase of the reclining movement such that the head-rest is positioned to support the head of the chair occupant at the end of the first phase of the reclining movement and when the chair is in the semi-reclined or intermediate tilted position appropriate for television viewing, reading or the like. Further, the head-rest should remain substantially stationary and in the extended head-supporting position during the second phase of the reclining movement such that the chair occupant does not experience a change of support at the back of the head which would occur if there were relative movement between the head-rest and the back-rest during the second motion phase.

It is a further object of the present invention to provide a head-rest and control suitable for use in a double-movement type of reclining chair. Specifically, it is within the contemplation of the present invention to provide an improved head-rest and control which is effective in response to the first phase or portion of the reclining movement of a chair to translate the head-rest from its stored position to its extended position to thereby provide an adequate support for the head of the chair occupant, with the head-rest remaining in its extended position during a second phase or further portion of the reclining movement of the chair.

In accordance with an illustrative embodiment demonstrating features and advantages of the present invention there is provided a reclining chair of the double-movement type which includes a support and a back-rest and seat mounted on the support for inclining and reclining movement respectively through first and second motion phases, a head-rest, and means mounting the head-rest for movement from a stored position relative to the back-rest to an extended head-supporting position relative thereto. Actuating means are operatively connected to the head-rest for moving the head-rest to the extended position during the first motion phase and for maintaining the head-rest in the extended position during the second motion phase, with the actuating means including an actuating member operatively connected to the mounting member for the head-rest and pivotally mounted pivotally to the back-rest at the pivotal mount which moves relative to the back-rest in response to its reclining movement of the chair. Constraining means are operatively connected to the support and have a pivot connection to the actuating member guided to move relative to the pivotal mount during the first motion phase to impart a turning movement to the actuating member which is effective to move the head-rest to the extended head-supporting position. The constraining means is arranged such that there is no turning movement of the actuating member during the second motion phase whereby the head-rest remains in the extended head-supporting position. Although the instant head-rest is primarily intended to be employed in a chair of the double-movement type, as the description proceeds it will become apparent that the control is also suitable for the usual reclining chair of the recliner or rester type wherein it may be desirable to provide for the automatic extension of the head-rest and for rester type multiple-position chairs having a unitary seat and back-rest.

The above brief description, as well as further objects, features, and advantages of the present invention will be more fully appreciated by reference to the following detailed description of several illustrative embodiments according to the present invention, when taken in conjunction with the accompanying drawing wherein:

FIG. 1 is an elevational view, with parts broken away for clarity, of a portion of a reclining chair of the double-movement type incorporating my improved head-rest and control arrangement shown in the upright or sitting position;

FIG. 2 is an elevational view similar to FIG. 1, showing the reclining chair at the end of the first motion phase and in the intermediate tilted or semi-reclined position, with the head-rest in the extended head-supporting position;

FIG. 3 is an elevational view showing the reclining chair in the fully reclined position at the end of the second motion phase, with the head-rest remaining in the extended head-supporting position;

FIG. 4 is an elevational view, with parts broken away for clarity of a portion of a reclining chair of the double-movement type with a modified head-rest and control arrangement in accordance with the present invention, shown in the upright sitting position;

FIG. 5 is an elevational view similar to FIG. 4, but showing the reclining chair in the intermediate tilted or semi-reclined position at the end of the first motion phase,
with the head-rest in the extended head-supporting position; and

FIG. 6 is an elevational view similar to FIG. 5, but showing the reclining chair in the fully-reclined position at the end of the second motion phase, with the head-rest remaining in the extended head-supporting position.

Referring now specifically to FIGS. 1 to 3 of the drawing, there is partially shown a reclining chair, of generally known construction and designated by the reference numeral 10, which incorporates my improved head-rest and control arrangement. For a detailed description of the construction of the reclining chair 10, reference may be made to my copending application Serial No. 760,334, filed September 11, 1958, and entitled Reclining Chair and Leg-Rest Control. In the interest of simplicity and clarity the instant description will deal with the head-rest and control arrangement, with only brief reference being made to the remaining construction of the chair. Generally, the chair 10 incorporates a support 12 upon which is movably mounted a body-supporting unit including a movable back-rest 14 and a movable seat 16. The back-rest 14 is pivoted adjacent its lower end on the chair frame 18 at a back-rest pivot 18. The seat 16 carries rearwardly directed rigid hangers 20 which provide a seat pivot 22 on the back-rest 14 at a point spaced above the back-rest pivot 18 and in position to move through a rearward and downward arcuate path about the back-rest pivot 18. The seat 16 is rearwardly connected to the back-rest 14 at the pivot 24 in a connecting link 26 which inclines the seat 16 and elevates the leg-rest, as detailed in said copending application.

The coordination of the components of the illustrative double-motion chair which is subject to a latitude of variation and change is substantially as follows:

When the chair occupant is seated therein and leans against the back-rest 14, the back-rest turns about the back-rest pivot 18 and a rearward pull is imparted to the connecting link 26 which inclines the seat 16 and elevates the leg-rest such that the reclining chair may be initially moved from the normal sitting position as illustrated in FIG. 1 to an intermediate tilted or semi-reclined position as illustrated in FIG. 2 wherein there is substantially no change in the angle between the back-rest 14 and the seat 16 which are tilted back as a unit, with the leg-rest moving to an elevated leg-supporting position. Further, in response to continued rearward movement of the back-rest, the chair may be moved from the intermediate tilted or semi-reclined position of FIG. 2 to the fully-reclined position illustrated in FIG. 3 wherein the angle between seat and back-rest increases, with the leg-rest remaining in the elevated leg-supporting position.

In accordance with the present invention, a head-rest 30 is disposed in a stored or retracted position between the opposite sides 14a, 14b of the back-rest 14 intermediate the forward and rearward cross-branches 14c, 14d. The head-rest 30 is disposed with its upper face substantially coplanar or coextensive with the upper face of the back-rest, with the head-rest bridging the slot or opening formed in the back-rest 14 and bounded by the opposite sides 14a, 14b and cross-branches 14c, 14d thereof. The head-rest 30 is mounted for extensible and retractile movement by a mounting member or link 32 which extends substantially lengthwise of the back-rest 14 and has its upper end rigidly connected to the head-rest 30.

Guide means are operatively connected between the mounting member or link 32 and the back-rest 14 such that the head-rest 30 moves along a generally upward path from the retracted or stored position illustrated in FIG. 1 to the extended head-supporting position illustrated in FIGS. 2 and 3. In this embodiment the guide means includes a guide plate 34 having an elongated guide slot 34a formed therein, which is fixed to the adjacent side of the back-rest 14, with a pin 36 being carried by the mounting member 32 and guidingly engaged within the slot 34a. The pin and slot guiding means is arranged such that the pin 36 is at the lowermost end

of slot 34a to establish the stored or retracted position for the head-rest 30, with its upper face substantially coplanar with the upper face of the back-rest 14. The guide slot 34a extends substantially lengthwise and upwardly relative to the back-rest and is of a length and contour to guide the head-rest 30 upwardly and forwardly to the head-supporting position illustrated in FIGS. 2 and 3 wherein the front or supporting surface of the head-rest 30 is properly oriented relative to the front or supporting surface of the back-rest 14 to serve the head-supporting function.

A combined guiding and actuating linkage is operatively connected to the chair frame or support 12, to the back-rest 14, and to the mounting member 32 and cooperates with the pin and slot interconnection of FIG. 1 to guide the head-rest 30 to move along a prescribed course and is operatively to displace the head-rest 30 from the stored or retracted position to the extended head-supporting position in response to the first phase of reclining movement. The combined guiding and actuating linkage includes an actuating member 38b in the form of a double-acting arm 38c, whereby the pivotally mounted pin 36 engagingly engages the slot 34a to establish the stored or retracted position for the head-rest 30, with its upper face substantially coplanar with the upper face of the back-rest 14. The guide slot 34a extends substantially lengthwise and upwardly relative to the back-rest and is of a length and contour to guide the head-rest 30 upwardly and forwardly to the head-supporting position illustrated in FIGS. 2 and 3 wherein the front or supporting surface of the head-rest 30 is properly oriented relative to the front or supporting surface of the back-rest 14 to serve the head-supporting function.

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A combined guiding and actuating linkage is operatively connected to the chair frame or support 12, to the back-rest 14, and to the mounting member 32 and cooperates with the pin and slot interconnection of FIG. 1 to guide the head-rest 30 to move along a prescribed course and is operatively to displace the head-rest 30 from the stored or retracted position to the extended head-supporting position in response to the first phase of reclining movement. The combined guiding and actuating linkage includes an actuating member 38b in the form of a double-acting arm 38c, whereby the pivotally mounted pin 36 engagingly engages the slot 34a to establish the stored or retracted position for the head-rest 30, with its upper face substantially coplanar with the upper face of the back-rest 14. The guide slot 34a extends substantially lengthwise and upwardly relative to the back-rest and is of a length and contour to guide the head-rest 30 upwardly and forwardly to the head-supporting position illustrated in FIGS. 2 and 3 wherein the front or supporting surface of the head-rest 30 is properly oriented relative to the front or supporting surface of the back-rest 14 to serve the head-supporting function.
of the guideway section 44b upwardly and rearwardly relative to the stationary pivot 46. The guideway section 44b allows the back-rest and head-rest to move rearwardly as a unit away from the relative displacement between the back-rest and head-rest from the semi-reclined or intermediate tilted position of FIG. 2 to the fully reclined position of FIG. 3 such that the requisite increase in the angular relationship between the back-rest 14 and seat 16 may be achieved without changing the relative position of the head-rest 30 to the back-rest 14. When the stationary pivot 46 is contacted by the forward extremity of the guideway section 44b, the head-rest control linkage establishes the end of the second motion phase of the chair, with the requisite angular relationship between the back-rest 14 and the seat 16 and with the head-rest 30 remaining in the extended head-supporting position.

A typical sequence of operations will now be described in detail to facilitate a more thorough understanding of the present invention:

When the chair occupant is seated in the reclining chair and leans against the back-rest 14, the back-rest moves rearwardly, turning about the back-rest pivot 18 and displacing the pivotal mount 40 for the actuating member 38 through an upwardly and rearwardly directed arc away from the stationary pivot 46. The joint effect of the movement of the pivotal mount 40, the guiding action of the pin and slot guiding means 34, 36, and the guiding action of the pin and slot guiding means 44, 46 is to cause the head-rest 30 to move to the extended head-supporting position. During such movement the head-rest 30 is accurately guided in its translation relative to the back-rest 14 in accordance with the dimensioning and geometry of the linkages and the respective guiding means. At the time when the actuating lever 38 is displaced to a position wherein the stationary pivot 46 is at the juncture of the guideway sections 44a, 44b, the first phase of the movement of the reclining chair is terminated with the back-rest 14 and seat 16 displaced to a rearwardly tilted position and with the head-rest 30 extended. As detailed in the mentioned copending application, the leg-rest is moved to the elevated leg-supporting position in response to such first phase of the reclining movement incident to the rearwardly directed pull on the connecting link 26. When the chair occupant leans further against the back-rest 14, the back-rest continues to turn about the back-rest pivot 18. During such second phase of the reclining movement, the actuating lever 38 is moved rearwardly with the back-rest 14 but there is no turning force imparted thereto due to the design of the guideway section 44b which allows for the lost motion travel of the back-rest 14 and head-rest 30 as a unit, with the head-rest remaining substantially stationary and in the extended head-supporting position. When the forward extremity of the guideway section 44b contacts the stationary pivot 46, the end of the second motion phase is established and the several components of the reclining chair are oriented relative to each other to accommodate the chair occupant in a complete relaxation position. When the chair occupant desires to restore the chair to the intermediate tilted position illustrated in FIG. 2 and then to the upright sitting position of FIG. 1, the occupant merely exerts a downward pressure against the leg-rest which causes the chair to move in the reversed direction through its motion phases.

Referring now specifically to FIGS. 4 to 6 of the drawings, there is partially shown a further reclining chair of generally known construction and designated by the reference numeral 110, which incorporates a further head-rest 116 and a seat 116. The rack-rest 114 is pivoted adjacent its lower end on the chair frame 112 at a back-rest pivot 118. The seat 116 carries rearwardly directed rigid hangers 120, which via a mounting fixture plate 121 provides a seat pivot 122 on the back-rest 114 at a position spaced above the back-rest pivot 118 and in position to move through a rearward and downward arc about the back-rest pivot 118. Operatively connected to the back-rest 114 via the fixture plate 121 at the pivot 124 is a connecting link 126 which inclines the seat 116 and elevates the leg-rest as detailed in a said copending application.

In accordance with this embodiment of the present invention, a head-rest 130 is disposed in a stored or retracted position between the opposite sides 114a, 114b of the back-rest 114 intermediate the forward and rearward cross-braces 114c, 114d. The head-rest 130 is guided by its upper face substantially coplanar or coextensive with the upper face of the back-rest 114 and bridging the slot or opening bounded by the opposite sides 114a, 114b and cross-braces 114c, 114d thereof. The head-rest is mounted for extensile and retractile movement by a mounting member or link 132 which extends substantially lengthwise of the back-rest 114 and has its upper end rigidly connected to the head-rest 130.

Guide means are operatively connected between the mounting member or link 132 and the back-rest 114 such that the head-rest 130 moves along a generally upward path from the retracted or stored position as shown in FIG. 4 to the extended head-supporting position illustrated in FIGS. 5 and 6. In this embodiment the guide means includes a guide link 134 having a pivotal connection 135 at one end to the back-rest 114 and a pivotal connection 136 at the other end to the mounting member 132. The guide link 134 is disposed in a down wardly inclining position (see FIG. 4) to establish the stored or retracted position for the head-rest 130 with its upper face coplanar with the upper face of the back-rest 114. The guide link 134 swings upwardly relative to the back-rest 114 about the pivotal connection 135 when the head-rest 130 upwardly and forwardly into the head-supporting position illustrated in FIGS. 5 and 6 wherein the front or supporting surface of the head-rest is properly oriented relative to the front or supporting surface of the back-rest to serve the head-supporting function.

A combined guiding and actuating linkage is operatively connected to the chair frame or support 112, to the back-rest 114, and to the mounting member 132 and cooperates with the guiding link 134 to constrain the head-rest 130 to move along a prescribed course and is operative to displace the head-rest 130 from the retracted or retracted position to the extended head-supporting position in response to the first phase of reclining movement. The combined guiding and actuating linkage includes an actuating member 138 in the form of a double-arm lever pivotally mounted intermediate its ends on the back-rest 114 at a pivotal mount 140 such that the pivotal mount moves in a prescribed arcuate path about the back-rest pivot 118 in response to reclining movement. The downwardly and rearwardly extending arm 138a of the double-arm actuating lever 138 (see FIG. 4) has a pivotal connection 142 to the lower end of the mounting member 132 such that turning movement of the actuating lever about its pivotal mount 140 on the back-rest 114 in the counter-clockwise direction moves the head-rest 130 from the retracted position (see FIG. 4) to the extended head-supporting position (see FIGS. 5 and 6). Means are operatively connected to the other arm 138b of the actuating lever 138 and to the support or chair frame 112 which are effective to guide a portion of the arm 138b along a prescribed path or course such that the requisite counter-clockwise turning movement is imparted to the arm 138b of the double-arm lever 138 to move the head-rest 130 to the extended position during the first phase of the reclining movement. In this embodiment the arm 138b is formed with an arcuate guideway 144. Guidingly engaged within the guideway 144 is a pivot 146 which is carried on a further guiding link 145 having a pivotal mount 147 on the support. Stop means 149, 151
are fixed to the support 112 at opposite sides of the guiding link 145 to limit the swinging movement thereof. The guiding link 145 and pivotal connection 146 constrain the arm 138 of the lever 138 to move in a path relative to the pivotal mount 140 such that joint effect of the movement of the pivotal mount 140 and of the constraint on the arm 138 is to turn the arm 138z through an upward arc which is effective to impart an upward thrust to the mounting member 132 to displace the head-rest 130 into the extended head-supporting position. Specifically, in response to the reclining movement of the back-rest 114 about the back-rest pivot 118, the pivotal mount 140 moves through an upward and rearwardly directed arc, as may be appreciated by progressively inspecting FIGS. 4 and 5. Simultaneously, link 145 rocks rearwardly from its limit position against the stop 149 to move the pivotal connection 146 through a rearward and downward arc to guide the arm 138z such that the requisite turning movement is imparted to the lever 138. The stop 151 is located such that the requisite extension is imparted to the head-rest 130 while the relationship is established between the back-rest 114 and the seat 116 which corresponds to the semi-reclined or intermediate tilted position illustrated in FIG. 5. The guideway 144 is of a curvature on a radius about the back-rest pivot 118 (see FIG. 5) such that during the second phase of the reclining movement that is a last motion of the guideway 144 relative to the pivot 146 which remains stationary, with no turning movement being imparted to the actuating lever 138 during the translation of the guideway 144 upwardly and rearwardly relative to the pivot 146. The guideway 144 allows the back-rest and head-rest to move rearwardly as a unit, with no relative displacement between the back-rest and head-rest from the semi-reclined or intermediate tilted position of FIG. 5 to the fully reclined position of FIG. 6 such that the requisite increase in the angular relationship between the back-rest 114 and the seat 116 may be achieved without changing the relative position of the head-rest 130 in relation to the back-rest 114. When the pivot 146 is contacted by the forward extremity of the guideway 144, the head-rest control linkage establishes the end of the second motion phase of the chair, with the requisite angular relationship between the back-rest 114 and the seat 116 and with the head-rest 130 remaining in the extended head-supporting position.

A latitude of modification, change and substitution is intended in the foregoing disclosure and in some instances some features of the invention will be employed without a corresponding use of other features. Accordingly it is appropriate that the appended claims be construed broadly and in a manner consistent with the spirit and scope of the invention herein.

I claim:

1. In a reclining chair, a support, a back-rest mounted on said support at a back-rest pivot for reclining movement, a head-rest normally disposed in a stored position within said back-rest, and means operatively connected to said head-rest and operable in response to said reclining movement to move said head-rest to an extended position, said means including a mounting member operatively connected to said head-rest, guiding means connected between said head-rest and said back-rest, and combined guiding and actuating means connected to said support, back-rest and head-rest and cooperating with said first named guiding means for guiding said head-rest to move along a prescribed course and for moving said head-rest to said extended position in response to said reclining movement, said combined guiding and actuating means including a double-arm lever mounted on said back-rest pivot for rearward turning movement at a pivotal mount spaced above said back-rest pivot and which moves upwardly and rearwardly relative to said support in response to said reclining movement, means pivotally connecting one arm of said lever to said mounting member such that said rearward turning movement of said head-rest moves said head-rest to said extended position, and means operatively connected to said support such that the conjoint effect of the movement of the pivotal mount of said head-rest and of said other arm of said lever is to impart a turning movement to said lever which moves said head-rest to said extended position.

2. In a reclining chair, a support, a back-rest mounted on said support at a back-rest pivot for reclining movement, a head-rest normally disposed in a stored position within said back-rest, and means operatively connected to said head-rest, guiding means connected between said head-rest and said back-rest, and combined guiding and actuating means connected to said support, back-rest and head-rest and cooperating with said first named guiding means for guiding said head-rest to move along a prescribed course and for moving said head-rest to said extended position in response to said reclining movement, said combined guiding and actuating means including a double-arm lever mounted on said back-rest pivot for rearward turning movement at a pivotal mount spaced above said back-rest pivot and which moves upwardly and rearwardly relative to said support in response to said reclining movement, means pivotally connecting one arm of said lever to said mounting member such that said rearward turning movement of said head-rest moves said head-rest to said extended position, and means operatively connected to said support such that the conjoint effect of the movement of the pivotal mount of said head-rest and of said other arm of said lever is to impart a turning movement to said lever which moves said head-rest to said extended position.

3. In a reclining chair, a support, a back-rest mounted on said support at a back-rest pivot for reclining movement, a head-rest normally disposed in a stored position within said back-rest, and means operatively connected to said head-rest and operable in response to said reclining movement to move said head-rest to an extended position, said means including a mounting member operatively connected to said head-rest, guiding means including a fixed pivot pin on said support
means providing a slot in said other arm of said lever guidedly engaged by said fixed pivot pin.

5. In a reclining chair according to claim 3, said last named means including a constraining link pivotally mounted on said support, and pivotal connection between said constraining link and said other arm of said lever guided to move through a downward and rearward arc by said constraining link in response to said reclining movement.

6. In a reclining chair of the double-movement type including a support and back-rest mounted on said support for reclining and inclining movement respectively through first and second motion phases, a head-rest, means mounting said head-rest for movement from a stored position relative to said back-rest to an extended position relative thereto, and actuating means operatively connected to said head-rest for moving said head-rest to said extended position during said first motion phase and for maintaining said head-rest in said extended position during said second motion phase, said actuating means including an actuating member operatively connected to the mounting means for said head-rest, means pivotally mounting said actuating member on said back-rest at a pivotal mount which mount is pivoted and moved in response to said reclining movement, and constraining means operatively connected to said support and including a pivotal connection to said actuating member, said means guiding said pivotal connection to move relative to said pivotal mount during said first motion phase for imparting a turning movement to said actuating member which is effective to move said head-rest to said extended position, said constraining means including a lost motion connection to said actuating member arranged such that there is no turning movement of said actuating member during said second motion phase whereby said head-rest remains in said extended position.

7. In a reclining chair of the double-movement type including a support and a back-rest mounted on said support at a back-rest pivot for reclining movement, the improvement comprising a head-rest normally disposed in a stored position within said back-rest, and means operatively connected to said head-rest and operable in response to a first portion of said reclining movement to move said head-rest to an extended position relative to said back-rest, said means including a mounting member operatively connected to said head-rest, and combined guiding and actuating means connected to said support, including said mounting member for guiding said head-rest to move along a prescribed course and for moving said head-rest to said extended position in response to said first portion of said reclining movement, said combined guiding and actuating means including an actuating member mounted on said back-rest at a pivotal mount which moves along an arc about said back-rest pivot in response to said reclining movement, means pivotally connecting said actuating member to said mounting member such that turning movement of said actuating member relative to said back-rest moves said head-rest to said extended position, and means operatively connected to said actuating member and to said support and arranged to displace a portion of said actuating member relative to said back-rest pivot such that turning movement is imparted to said actuating member during said first portion of said reclining movement which moves said head-rest to said extended position, said last named means providing a lost motion connection to said portion of said actuating member during a further portion of said reclining movement such that said head-rest remains in said extended position.

8. In a reclining chair of the multiple movement type including a support and back-rest mounted on said support at a back-rest pivot for reclining movement, the improvement comprising a head-rest normally disposed in a stored position within said back-rest, and means operatively connected to said head-rest and operable in response to a first phase of said reclining movement to move said head-rest to an extended position relative to said back-rest, said means including an actuating member mounted on said back-rest at a pivotal mount for turning movement relative to said back-rest in response to said reclining movement, means operatively connecting said actuating member to said head-rest such that said turning movement of said actuating member relative to said back-rest moves said head-rest to said extended position, and constraining means operatively connecting said actuating member to said head-rest during said first phase of said reclining movement such that turning movement is imparted to said actuating member during said first phase of said reclining movement which moves said head-rest to said extended position, said constraining means including connecting said actuating member to said head-rest during said first phase of said reclining movement such that there is no turning movement of said actuating member relative to said back-rest and said head-rest remains in said extended position.

9. In a reclining chair of the multiple movement type including a support and a back-rest mounted on said support at a back-rest pivot for reclining movement, the improvement comprising a head-rest normally disposed in a stored position within said back-rest, and means operatively connected to said head-rest and operable in response to a first phase of said reclining movement to move said head-rest to an extended position relative to said back-rest, said means including an actuating member mounted on said back-rest at a pivotal mount for turning movement relative to said back-rest in response to said reclining movement, means operatively connecting said actuating member to said head-rest during said first phase of said reclining movement which moves said head-rest to said extended position, said constraining means including connecting said actuating member to said head-rest during said first phase of said reclining movement such that there is no turning movement of said actuating member relative to said back-rest and said head-rest remains in said extended position.
straining means including a guiding link pivotally mounted on said support and having a pin and slot connection to said actuating member, said pin remaining at one end of said slot during said first phase of said reclining movement and said guiding link pivoting about its pivotal mount to move said actuating member relative to said back-rest for imparting said turning movement to said actuating member, and means for blocking the pivotal mount of said guiding link at the end of said first phase of reclining movement, said pin translating toward the other end of said slot during a second phase of said reclining movement and providing a lost motion travel of said actuating member relative to the blocked guiding link such that said head-rest remains stationary and in said extended position.

11. In a reclining chair of the multiple movement type including a support, a back-rest, and means mounting said back-rest on said support for reclining movement, the improvement comprising a head-rest normally disposed in a stored position in relation to said back-rest, and means operatively connected to said head-rest and operable in response to a first phase of said reclining movement to move said head-rest to an extended position relative to said back-rest, said means including an actuating member, means mounting said actuating member on said back-rest for movement relative to said back-rest in response to said reclining movement, means operatively connecting said actuating member to said head-rest such that said movement of said actuating member relative to said back-rest moves said head-rest to said extended position, and constraining means operatively connected to said actuating member and to said support and arranged to move said actuating member relative to said back-rest during said first phase of said reclining movement such that movement is imparted to said actuating member during said first phase of said reclining movement which moves said head-rest to said extended position, said constraining means including a lost motion connection to said actuating member operative during a second phase of said reclining movement such that there is substantially no movement of said actuating member relative to said back-rest and said head-rest remains in said extended position.

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<tr>
<td>2,843,184</td>
<td>Lorenz</td>
<td>July 15, 1958</td>
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<tr>
<td>2,884,992</td>
<td>Spound et al.</td>
<td>May 5, 1959</td>
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