Oct. 2, 1962 P. S. FLETCHER 3,056,629

RECLINING CHAIR OF THE MULTIPLE POSITION TYPE

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FIG. 1

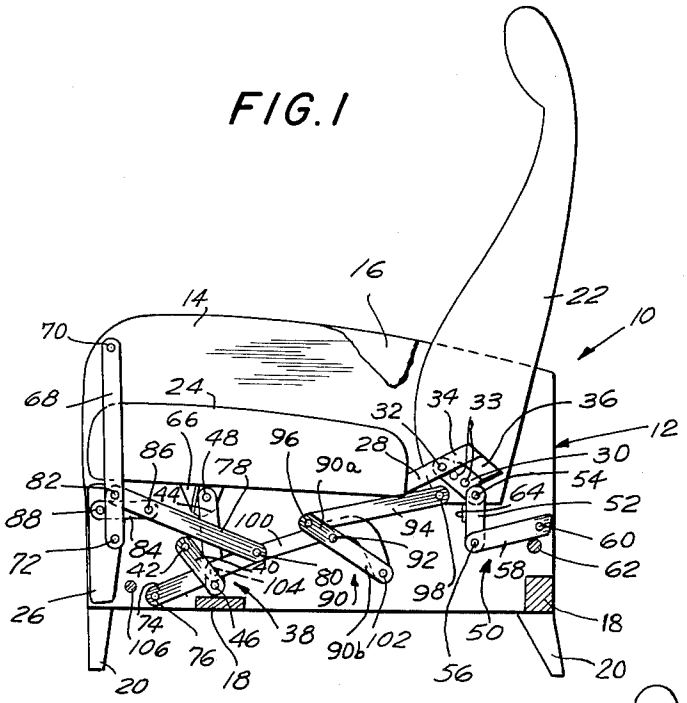

FIG. 2

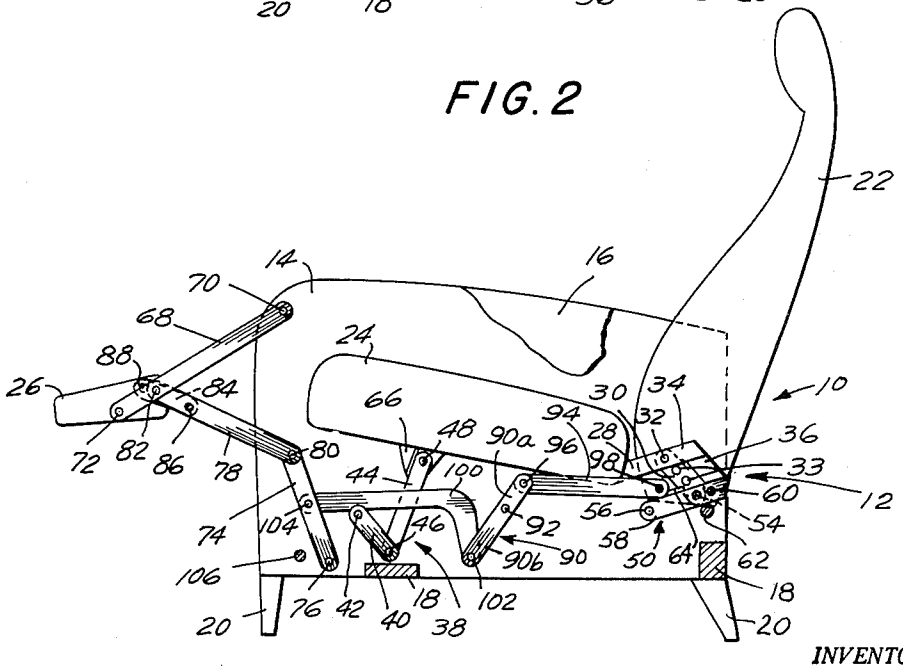

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FIG. 3

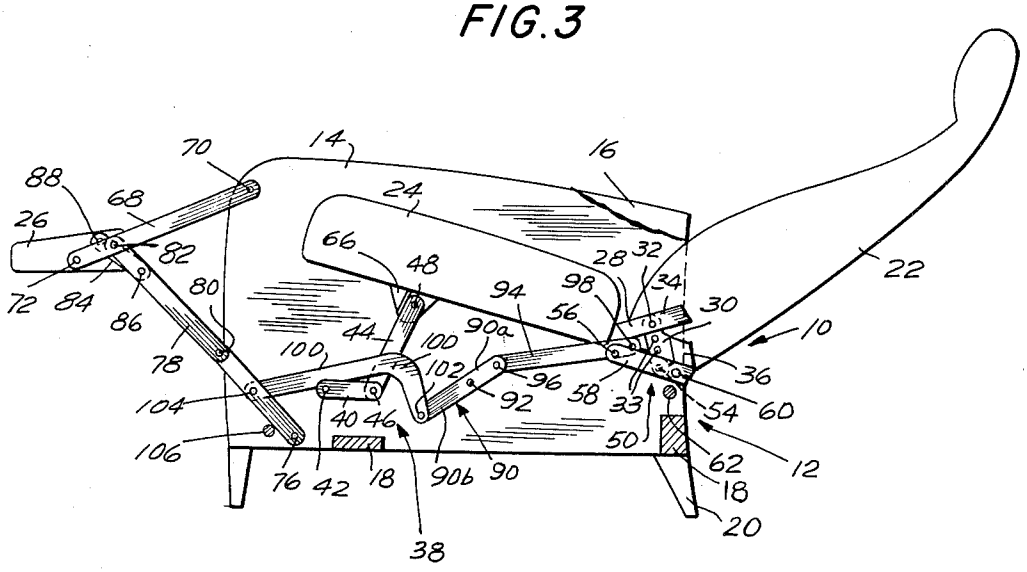

FIG. 4

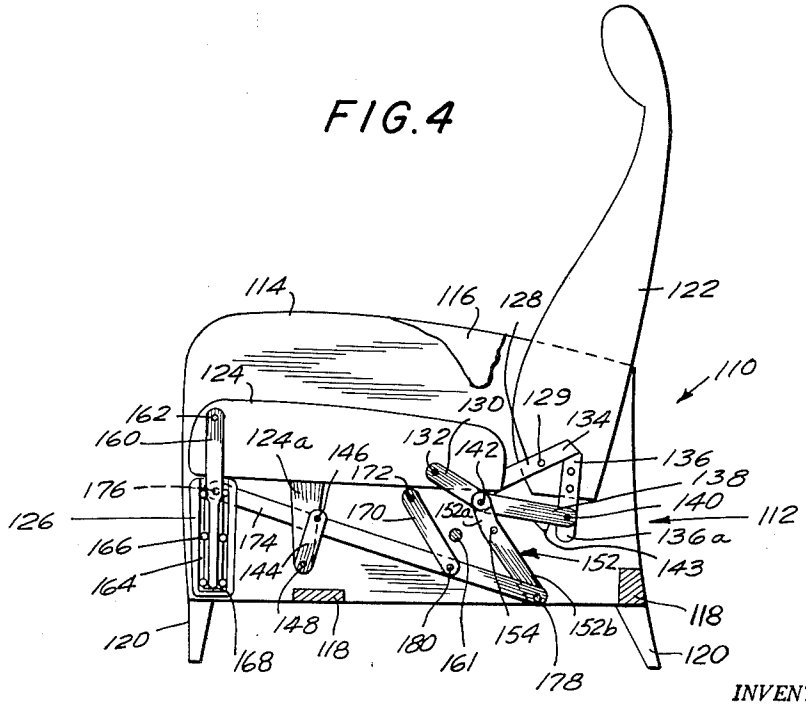

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FIG. 5

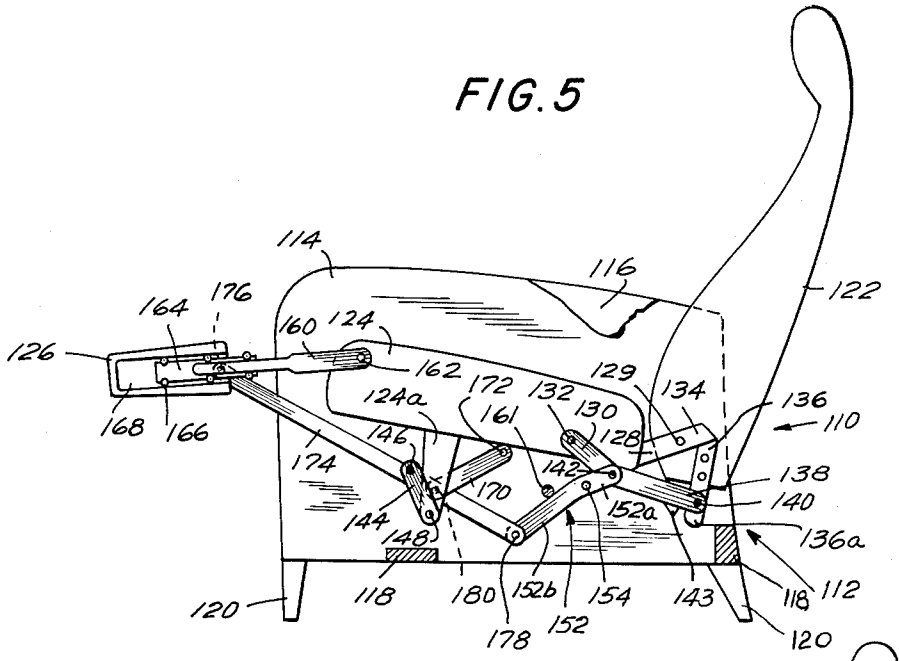
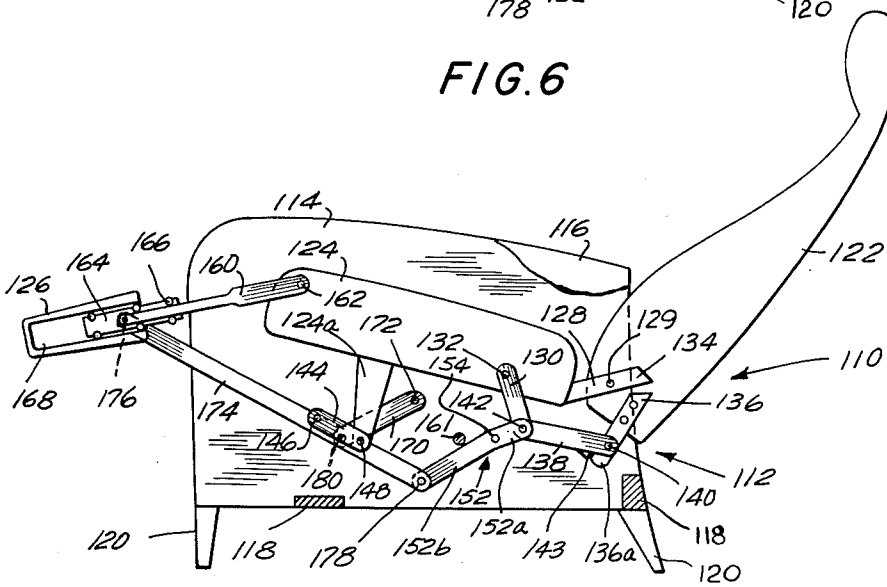


FIG. 6



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3,056,629

RECLINING CHAIR OF THE MULTIPLE POSITION TYPE

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Filed Sept. 10, 1959, Ser. No. 839,102
6 Claims. (Cl. 297—316)

The present invention relates generally to reclining chairs, and in particular to an improved reclining chair of the type including body-supporting means having a movable back-rest and a movable seat which are coordinated with each other to include several distinct phases of chair movement.

The well known reclining chair comprises a support, body-supporting means including a back-rest and seat movably mounted on the support, and a leg-rest mounted beneath the seat and movable into various elevated leg-supported positions incident to the chair movement. Heretofore there have been two distinct types of reclining chair, those constructed with a unitary back-rest and seat mounted on a support for movement into various tilted positions and those constructed with a movable back-rest and movable seat and mounted on the support for reclining and inclining movement respectively. Chairs of the type incorporating a unitary back-rest and seat were found to be most suitable for accommodating the chair occupant in a tilted back position, but in a sitting attitude, with the occupant's legs supported on the elevated leg-rest. Chairs of the type incorporating a movable back-rest and movable seat were found to be most suitable for accommodating the chair occupant in a complete and full relaxation position, with the occupant's legs supported on the elevated leg-rest, in that the angle between the back-rest and seat increased in response to the reclining movement of the chair.

Of recent times there has been introduced an improved double or multiple movement reclining chair which exhibits attributes of both types of chairs which have been heretofore sold, to wit, those suitable for accommodating the chair occupant in a tilted back attitude and those suitable for accommodating the chair occupant in a fully reclined or complete relaxation attitude. Provision is made in such chairs of the double movement type for a first movement phase from a sitting position to an intermediate tilted sitting position during which there is substantially no angular displacement between the back-rest and seat, with the leg-rest moving to an elevated leg-supporting position and for a second movement phase from the intermediate tilted position to a fully reclined position during which the angle between the seat and back-rest opens up with the leg-rest remaining in an elevated leg-supporting position.

Broadly, it is an object of the present invention to provide an improved reclining chair of the multiple movement type. Specifically, it is within the contemplation of the present invention to provide improved and simplified reclining chair having two distince phases of movement.

In accordance with an illustrative embodiment demonstrating features of the present invention, there is provided a reclining chair which comprises a support and body-supporting means including a seat and back-rest adapted to move from a sitting position through a first movement phase to an intermediate tilted position and through a second movement phase to a reclining position. A second movement guide link is pivotally connected to the seat at a seat pivot and extends rearwardly therefrom. First connecting means operatively connect the back-rest to the second movement guide link and blocking means are operatively connected between the seat and back-rest and arranged to establish a prescribed angular relationship therebetween during the first movement phase and to preclude movement of the seat and back-rest toward each other. The blocking means is further arranged to permit movement of the seat and back-rest away from each other during the second movement phase to increase the angular relationship therebetween to establish a reclining position. Front guiding means are pivotally mounted on the support at a first pivotal mount and pivotally connected to the seat at a first pivotal connection. Rear guiding means including a rear guiding link are pivotally connected to said second movement guide link and second connecting means pivotally mounting the rear guiding link on the support. At least one of the two connecting means includes means providing an effective center for angular movement of the back-rest during the second movement phase which is spaced rearwardly of said seat pivot. Advantageously the effective center for angular movement of the back-rest can be placed to realize improved balance characteristics; and if required, the effective center may be an imaginary pivot outside of the physical limits of the chair frame or support.

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 presently preferred illustrative embodiments in accordance with the present invention, when taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a side elevational view, with parts broken away and sectioned, showing a reclining chair of the double movement type embodying features of the present invention, with the chair shown in the upright or sitting position;

FIG. 2 is a side elevational view similar to FIG. 1, but showing the reclining chair in an intermediate tilted position, with the leg-rest moved to an elevated leg-supporting position;

FIG. 3 is a side elevational view, similar to FIG. 2, but showing the reclining chair in a fully reclined position wherein the back-rest and seat have been angularly displaced relative to each other to establish a complete relaxation position for the chair occupant, with the leg-rest being disposed in an elevated leg-supporting position;

FIG. 4 is a side elevational view, with parts broken away and sectioned, showing a reclining chair of the double movement type embodying features of the present invention, with the chair shown in the upright or sitting position;

FIG. 5 is a side elevational view similar to FIG. 4, but showing the reclining chair in an intermediate tilted position, with the leg-rest moved to an elevated leg-supporting position; and,

FIG. 6 is a side elevational view, similar to FIG. 5, but showing the reclining chair in a fully reclined position wherein the back-rest and seat have been angularly displaced relative to each other to establish a complete relaxation position for the chair occupant, with the leg-rest being disposed in an elevated leg-supporting position.

Referring now specifically to FIGS. 1 to 3 of the drawings, there is shown a first embodiment of a reclining chair demonstrating features of the present invention, generally designated by the reference numeral **10**, which includes a support or frame **12** having opposite side walls **14**, **16** interconnected by suitable cross braces **18** and supported on depending legs **20**.

Body-supporting means including a back-rest **22** and a seat **24** are movably mounted on the support **12** for reclining and inclining movement respectively for a first movement phase from the sitting position illustrated in FIG. 1 to the intermediate tilted position illustrated in

FIG. 2 and for a second movement phase from the intermediate tilted position illustrated in FIG. 2 through a series of reclining positions to a fully reclined or complete relaxation position illustrated in FIG. 3.

Disposed beneath the forward end of the seat 24 is the leg-rest 26 which is mounted for movement from a stored or retracted position as shown in FIG. 1 to elevated leg-supporting positions, as shown in FIGS. 2 and 3. As will be described, the leg-rest 26 is coordinated to the back-rest 22 and the seat 24 for movement into an elevated leg-supporting position in response to the first movement phase of the chair, with the leg-rest 26 remaining substantially in the elevated leg-supporting position as the chair moves from the intermediate tilted position of FIG. 2 to the fully reclined position of FIG. 3.

In this illustrative embodiment, the seat 24 carries a rearwardly directed rigid hanger arm 28. Extending rearwardly and downwardly from the hanger arm 28 is a second movement guide link 30 which has its upper and forward end pivotally connected to the hanger 28 at a seat pivot 32. The second movement guide link 30 is rigidly connected to the back-rest by a first connecting means, such as bolts or rivets 33.

Blocking means are operatively connected between the seat 24 and the back-rest 22 and are arranged to establish a prescribed angular relationship therebetween during the first movement phase and to preclude movement of the seat 24 and the back-rest 22 toward each other. In this illustrative embodiment, the hanger 28 includes an integral blocking arm 34 which projects rearwardly of the seat pivot 32 and engages a stationary blocking plate 36 integral with the link 30 and projecting rearwardly therefrom. As seen in FIGS. 1 and 2, the blocking arm 34 and blocking plate 36 are in abutment with each other when the seat 24 and the back-rest 22 are disposed in the requisite angular relationship for the sitting and intermediate tilted positions. As may be appreciated by progressively inspecting FIGS. 2 and 3, the blocking arm 34 and blocking plate 36 permit relative movement of the seat 24 and back-rest 22 away from each other during the second movement phase to increase the angular relationship therebetween to establish the proper relationship between the seat and back-rest for the reclining position, illustrated in FIG. 3.

A front guiding means, generally designated by the reference number 38, is operatively connected between the support 12 and the seat 24 which guiding means is operative during the first and second movement phases of the chair. In this illustrative embodiment, the front guiding means includes a first link 40 extending rearwardly and downwardly from its upper end to its lower end and having a pivotal mount 42 at its upper end on the support 12. Extending upwardly from the lower end of the first link 40 is a second link 44 which has a pivotal connection 46 at its lower end to the first link 40 and a pivotal connection 48 at its upper end to the seat 24. The links 40, 44 are arranged such that the intermediate pivotal connection 46 rests on the cross brace 18 serving as a stop, with the link 44 turning in the clockwise direction about the pivotal connection 46 serving as a stationary pivotal mount during the first movement phase, and with the link 40 turning in the counterclockwise direction about the stationary pivotal mount 42 during the second movement phase.

A rear guide means, generally designated by the reference numeral 50, is operatively connected between the second movement guide link 30 and the support 12 for guiding the rearward portion of the body-supporting means during the first and second movement phases. In this illustrative embodiment, the rear guiding means includes a rear guiding link 52 which has a direct pivotal connection 54 at its upper end to the second movement guide link 30 which in turn is rigid with the back-rest 22. The lower end of the rear guiding link 52 has a pivotal connection 56 to one end of a mounting link 58. The

mounting link 58 has a pivotal mount 60 at its other end to the support 12 adjacent the rearward end of the adjacent side frame 16. A stop 62 is provided below and in abutment with the mounting link 58 to establish a stationary position for the mounting link 58 during the first movement phase, as may be appreciated by progressively inspecting FIGS. 1 and 2, such that the pivotal connection 56 of the rear guiding link 52 on the mounting link 58 serves as a stationary pivotal mount for the rear guiding link 52 during the first movement phase. During the first movement phase and in the intermediate tilted position of FIG. 2, the rear guiding link 52 is swung in the clockwise direction about the pivotal mount 56 to a position in alignment with and behind the mounting link 58. A stop 64 is provided on the rear guiding link 52 which abuts the mounting link 58 in the intermediate tilted position of FIG. 2 such that relative movement between the rear guiding link 52 and the mounting link 58 is precluded, with the pivotal mount 60 of the mounting link 58 providing an effective center for angular movement of the back-rest 22 during the second movement phase, as may be appreciated by progressively inspecting FIGS. 2 and 3.

Provision is made for blocking relative movement between the link 44 of the front guide means 38 and the seat 24 at the end of the first movement phase and for blocking turning movement of the rear guiding link 52 about its pivotal mount 54. Specifically, the seat 24 carries a depending stop 66 in the region of the pivotal connection 48 which stop becomes coextensive with the adjacent end portion of the link 44 in the intermediate tilted position and for all intents and purposes renders the link 44 rigid with the seat 24 during the second movement phase.

The first movement phase guiding linkage includes the link 44 of the front guiding means, the portion of the seat 24 and the link 30 intermediate the pivotal connection 48 and the pivotal connection 54, and the rear guiding link 52 as the movable links thereof and the portion of the support 12 intermediate the pivotal connection 46 and the pivotal connection 56 as the stationary link thereof. In this connection, it should be recalled that the blocking means 34, 36 renders the seat 24 and the back-rest 22 rigid with each other during the first movement phase.

The second movement phase guiding linkage includes the link 40 of the front guiding means 38 as one movable link thereof, a further movable link provided intermediate the pivotal connection 46 and the seat pivot 32, and a still further movable link provided intermediate the seat pivot 32 and the pivotal mount 60, with a stationary link being provided intermediate the pivotal mount 42 and the pivotal mount 60.

In this illustrative embodiment, the leg-rest 26 is mounted for movement from the retracted position of FIG. 1 to the elevated leg-supporting position illustrated in FIGS. 2 and 3 by a leg-rest mounting linkage including a first mounting link 68 which has a pivotal mount 70 at its upper end on the support 12 and a pivotal connection 72 at its lower end to the leg-rest 26 and a second mounting link 74 which has a pivotal mount 76 at its lower end on the support 12 at a point spaced below the pivotal mount 70. The mounting link 74 is coupled to the mounting link 68 and to the leg-rest 26 by a first connecting link 78 which has a pivotal connection 80 at its rearward end to the upper end of the mounting link 74 and a pivotal connection 82 at its forward end to the mounting link 68 at a point spaced from the pivotal connection 72 to the leg-rest and a further connecting link 84 which has a pivotal connection 86 at its rearward end to the connecting link 78 at a point spaced rearwardly of the pivotal connection 82 and a pivotal connection 88 at its forward end to the leg-rest 26 at a point spaced from the pivotal connection 72.

The leg-rest mounting linkage thus described is actuated from the back-rest 22 via a double-arm actuating lever 90

which has a pivotal mount 92 intermediate its ends on the support. The arm 90*a* of the double-arm lever 90 is coupled to the back-rest 22 by a connecting link 94 which has a pivotal connection 96 at its forward end to the arm 90*a* and a pivotal connection 98 at its rearward end to the back-rest 22. The arm 90*b* of the double-arm lever 90 is coupled to the mounting link 74 via a further connecting link 100 which has a pivotal connection 102 at its rearward end to the arm 90*b* and a pivotal connection 104 at its forward end to the mounting link 74 intermediate the ends thereof. Accordingly, in response to the rearward movement of the back-rest 22 during both the first and second movement phases, a rearwardly directed thrust is imparted via the connecting link 94 to the arm 90*a* of the double-arm actuating lever 90 which swings the arm 90*b* thereof in the clockwise direction about the pivotal mount 92. Such clockwise movement imparts a forward thrust via the connecting link 100 to the mounting link 74 which turns the mounting link 68 in the clockwise direction about the pivotal mount 70 thereby moving the leg-rest from the stored position to the several elevated leg-supporting positions.

For a better understanding of this illustrative embodiment of the present invention, reference will be made to a typical sequence of operations:

When the chair occupant is seated in the chair 10 and leans against the back-rest 22, the body-supporting unit 22, 24 is displaced rearwardly and downwardly relative to the support, with no angular displacement between the back-rest 22 and the seat 24. During such initial or first movement phase, the forward portion of the seat 24 is guided by the link 44 of the front guiding means or linkage 38 which turns in the clockwise direction about the pivotal connection 46 serving as a pivotal mount. The rearward portion of the seat and the back-rest which is rigid therewith are guided by the rear guiding link 52 which likewise turns in the clockwise direction about its pivotal connection 56. Incident to such rearward movement of the body-supporting means, the requisite turning movement is imparted to the double-arm actuating lever 90 and the leg-rest 26 moves to the elevated leg-supporting position. The end of the first movement phase is established when the link 44 abuts the stop 66 and when substantially simultaneously the stop 64 on the rear guiding link 52 abuts the mounting link 58. At such time, and as illustrated in FIG. 2, the link 44 becomes unitary with the seat 24 and together define a single movable link for the second movement phase intermediate the pivotal connection 46 and the seat pivot 32. When the stop 64 on the rear guiding link 52 abuts the mounting link 58 and the stop 36 on the back-rest 22 abuts the mounting link 58, the links 54, 58 become unitary with the back-rest for all intents and purposes and thereafter the pivotal mount 60 for the mounting link 58 serves as an effective center for angular movement of the back-rest 22 during the second movement phase. When the chair occupant exerts continued pressure with the chair in the intermediate tilted or semi-reclined position of FIG. 2, the back-rest 22 begins to turn about the stationary pivotal mount 60, with the seat 24 being guided by the link 40 which turns in the counterclockwise direction about the pivotal mount 42. As may be appreciated by progressively inspecting FIGS. 2 and 3, the action of the front guiding means 38 is to guide the seat 24 generally upwardly with approximately the same inclination, while the back-rest 22 is turning about the pivotal mount 60 such that the included angle between the back-rest and seat opens up to establish the fully reclined position of FIG. 3. The second movement phase continues until such time as the second movement phase linkage is blocked, for example by the contact of the leg-rest mounting link 74 with a stop 106. It will be appreciated that during the second movement phase a relatively small rearward thrust is imparted to the connecting link 94 which results in a small turning movement of the actuating lever 90 such that the leg-rest 26 is somewhat further elevated, as may be appreciated by comparing the relative position of the links 74, 78 in the FIG. 2 and FIG. 3 respectively. When the chair occupant desires to restore the chair to the upright sitting position illustrated in FIG. 1, the occupant leans forwardly such that the back-rest, seat and leg-rest move through the reverse sequence of movement with the chair first moving into the intermediate tilted position of FIG. 2 and then being returned to the upright or sitting position illustrated in FIG. 1.

Referring now specifically to FIGS. 4 to 6 of the drawings there is shown a further embodiment of a reclining chair demonstrating features of the present invention, generally designated by the reference numeral 110, which includes a support or frame 112 having opposite side walls 114, 116 interconnected by suitable cross braces 118 and supported on depending legs 120.

Body-supporting means including a back-rest 122 and a seat 124 are movably mounted on the support 112 for reclining and inclining movement respectively for a first movement phase from the sitting position illustrated in FIG. 4 to the intermediate tilted position illustrated in FIG. 5 and for a second movement phase from the intermediate tilted position illustrated in FIG. 5 through a series of reclining positions to a fully reclined or complete relaxation position illustrated in FIG. 6.

Disposed beneath the forward end of the seat 124 is the leg-rest 126 which is mounted for movement from a stored or retracted position as shown in FIG. 4 to elevated leg-supporting positions, as shown in FIGS. 5 and 6. As will be described, the leg-rest 126 is coordinated to the back-rest 122 and the seat 124 for movement into an elevated leg-supporting position in response to the first movement phase of the chair, with the leg-rest 126 remaining substantially in the elevated leg-supportng position as the chair moves from the intermediate tilted position of FIG. 5 to the fully reclined position of FIG. 6.

In this illustrative embodiment, a second movement guide link 130 is arranged adjacent the rearward end of the seat 124 and has a pivotal connection 132 at its upper and forward end to the seat 124 at a seat pivot spaced forwardly of a rigid hanger arm 128, the latter projecting rearwardly from the seat 124 and has a pivotal connection 129 to the back-rest 122. Blocking means are operatively connected between the seat 124 and the back-rest 122 and are arranged to establish a prescribed angular relationship therebetween during the first movement phase and to block movement of the seat and back-rest toward each other during the first and second movement phases. Specifically, the hanger arm 128 includes an integral rearward blocking arm 134 which projects rearwardly of the pivotal connection 129 and engages a stationary blocking plate 136 secured to or integral with the back-rest 122. As seen in FIGS. 4 and 5, the blocking arm 134 and the blocking plate 136 are in abutment with each other when the seat and back-rest are disposed in their requisite angular relationship for the sitting and intermediate tilted position; and as may be appreciated by progressively inspecting FIGS. 5 and 6, the blocking means permits relative movement of the seat 124 and the back-rest 122 away from each other during the seocnd movement phase to increase the angular relationship therebetween to establish the reclining position illustrated in FIG. 6. The connecting means which effectively mounts the back-rest 122 on the second movement guiding link 130 is completed by a connecting link 138 which extends between the blocking plate 136 and the lower and rearward end of the second movement guiding link 130 and has a pivotal connection 140 at its rearward end to the plate 136 and a pivotal connection 142 at its forward end to the lower and rearward end of the link 130. It will thus be appreciated that the back-rest 122 is mounted on the second movement guide link 130 by a four-bar connecting linkage which includes the connecting link 138 as a first movable link thereof, the second movement guiding link 130 inter-

mediate the pivots 132, 142 as a second movable link thereof, the portion of the seat 124 and its hanger arm 128 intermediate the pivots 132, 129 as a third movable link thereof, and a portion of the back-rest and the plate 136 rigid therewith intermediate the pivots 129, 140 as the fourth movable link thereof.

Provision is made for blocking the relative movement of the links of the four-bar linkage when the body-supporting means is moved into the reclining position illustrated in FIG. 6. In this illustrative embodiment the blocking means takes the form of the stop 143 integral with or secured to the connecting link 138 in position to abut a depending extension 136*a* of the plate 136, as shown in FIG. 6.

A front guiding means is operatively connected between the support 112 and the seat 124 which front guiding means is operative during the first and second movement phases of the chair. In this illustrative embodiment, the front guiding means includes a link 144 extending forwardly and downwardly from its upper end to its lower end and having a pivotal mount 146 at its upper end on the support 112. Extending downwardly from the seat 124 is a rigid depending extension 124*a* which has a pivotal connection 148 at its lower end to the lower end of the link 144. The link 144 turns in the counterclockwise direction about the pivotal mount 146 during the first and second movement phases.

A rear guiding means is operatively connected between the link 130 and the support 112 for guiding the rearward portion of the body-supporting means during the first movement phase, with the rear guiding means remaining stationary relative to the support during the second movement phase. In this illustrative embodiment, the rear guiding means includes a double-arm lever 152 which has a pivotal mount 154 intermediate its ends on the support. The upwardly extending arm 152*a* of the double-arm lever 152 has a pivotal connection 142 at its upper end to the lower and rearward end of the second movement guide link 130 which is coupled to the back-rest 122 via the four-bar connecting linkage. Provision is made for blocking turning movement of the lever 152 about its pivotal mount 154 after the first movement phase. Specifically, a stop 160 is located rearwardly of the rear guiding link 152*a* to abut the same in the intermediate tilted position of FIG. 5 to preclude further clockwise movement of the link 152*a* after the first movement phase.

It will be appreciated that the first movement guiding linkage includes a first movable link provided by the front guiding link 144, a second movable link intermediate the pivotal connections 148, 142 (it being recalled that there is no relative movement between the back-rest 122 and the seat 124 during the first movement phase and that the links of the four-bar connecting linkage remain stationary relative to each other), and a third movable link intermediate the pivotal connection 142 and the pivotal mount 154, with a stationary link being provided intermediate the pivotal mount 146 and the pivotal mount 154.

The second movement guiding linkage includes a four-bar linkage having as movable links thereof the front guiding link 144, the link provided intermediate the pivotal connection 148 and the pivotal connection 132, and the second movement guide link 130, and a stationary link provided intermediate the pivotal mount 146 and the pivotal connection 142, it being recalled that the rear guiding link 152*a* remains stationary during the second movement phase. The second movement guiding link 130 is also part of the second four-bar linkage which mounts the back-rest 122 for angular movement relative to the support about an instantaneous center of rotation disposed rearwardly of and below the seat pivot 132, with the second four-bar linkage including a link intermediate the seat pivot 132 and the pivotal connection 129, a further link intermediate the pivotal connection 129 and the pivotal connection 140, and the connecting link 138. By appropriate design of the four-bar connecting linkage which mounts the back-rest for angular movement during the second movement phase, it is possible to establish an effective center of rotation for the back-rest to achieve good balance characteristics, thus enabling the attainment of such desirable characteristics without the need of a relatively deep chair frame and the attendant esthetic problems.

In this illustrative embodiment the leg-rest 126 is mounted for movement from the retracted position of FIG. 4 to the elevated leg-supporting positions illustrated in FIGS. 5 and 6 by a mounting link or arm 160 which has a pivotal mount 162 at its upper end on the seat 124. The lower end of the mounting arm 162 is confined within a trolley member 164 by appropriate bearings 166, the bearings being engaged within a track or guideway 168 formed within the leg-rest 126. Appropriate stops, not shown are associated with the trolley member 164 which with the mounting arm 160 provides an adjustable length coupling between the seat 124 and the leg-rest 126. The leg-rest 126 is coupled to the back-rest 122 by a coordinating linkage including a guiding link 170 which has a pivotal mount 172 at its upper end on the support and a coupling or connecting link 174 which extends between the leg-rest 126, the guiding link 170, and the arm 152*b* of the double-arm lever 152. The connecting link 174 has a pivotal connection 176 at its forward end to the mounting arm 160, a pivotal connection 178 at its rearward end to the arm 152*b*, and a pivotal connection 180 intermediate its ends to the lower end of the guiding link 170. Accordingly, in response to the rearward turning movement of the rear guiding link 152*a*, a forward thrust is imparted via the respective connecting link 174 and the guiding link 170 to the leg-rest 126 for moving the same to the elevated leg-supporting position. The arm 152*b* remains stationary during the second movement phase and accordingly the leg-rest actuating linkage is effectively blocked.

For a better understanding of this illustrative embodiment of the present invention, reference will be made to a typical sequence of operations:

When the chair occupant is seated in the chair 110 and leans against the back-rest, the body-supporting means 122, 124 is displaced rearwardly and downwardly relative to the support with no angular displacement between the back-rest 122 and the seat 124. During such initial or first movement phase, the forward portion of the seat 124 is guided by the link 144 which turns in the counterclockwise direction about the pivotal mount 146, with the rearward portion of the seat and the back-rest which is temporarily rigid therewith being guided by the rear guiding link 152*a* which turns in the clockwise direction about its pivotal mount 154. Incident to such rearward movement of the body-supporting means, the requisite turning movement is imparted via the double-arm actuating lever 152 to the leg-rest mounting linkage and the leg-rest moves to the elevated leg-supporting position. The end of the first movement phase is established when the rear guiding link 152*a* abuts the stop 161. At such time and as illustrated in FIG. 5, the link 152*a* becomes unitary with the support for all intents and purposes and thereafter the pivotal connection 142 to the second movement guiding link 130 serves as a relatively stationary mount during the second movement phase. When the chair occupant exerts continued pressure with the chair in the intermediate tilted position of FIG. 5, the back-rest 122 begins to turn about an instantaneous center of rotation to the rear and below the seat pivot 132, with the seat 124 being guided by the link 144 which continues turning in the counterclockwise direction about the pivotal mount 146. As may be appreciated by progressively inspecting FIGS. 5 and 6 the action of the front guiding means is to guide the seat generally upwardly at approximately the same inclination while the back-rest is

turning about its effective center of rotation such that the included angle between the back-rest and seat opens up to establish the fully reclined position of FIG. 6. The second movement phase continues until such time as the second movement phase linkage is blocked, for example by the contact of the stop **143** on the connecting link with the extension **136***a* of the plate **136**. When the chair occupant desires to restore the chair to the upright sitting position illustrated in FIG. 4, the occupant leans forwardly such that the back-rest, seat and leg-rest move through the reverse sequence of movement with the chair first moving into the intermediate tilted position of FIG. 5 and then being returned to the upright or sitting position illustrated in FIG. 4.

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.

What I claim is:

1. A reclining chair comprising a support, body-supporting means including a seat and back-rest adapted to move from a sitting position through a first movement phase to an intermediate tilted position and through a second movement phase to a reclining position, a second movement guide link pivotally connected to said seat at a seat pivot and extending rearwardly therefrom, first connecting means operatively connecting said back-rest to said second movement guide link, blocking means operatively connected between said seat and back-rest and arranged to establish a prescribed angular relationship therebetween during said first movement phase and to preclude movement of said seat and back-rest toward each other, said blocking means being further arranged to permit movement of said seat and back-rest away from each other during said second movement phase to increase the angular relationship therebetween to establish a reclining position, front guiding means pivotally mounted on said support at a first pivotal mount and pivotally connected to said seat at a first pivotal connection, rear guiding means including a rear guiding link pivotally connected to said second movement guide link, second connecting means pivotally mounting said rear guiding link on said support, at least one of said two connecting means including means providing an effective center for angular movement of said back-rest during said second movement phase which is spaced rearwardly of said seat pivot.

2. A reclining chair comprising a support, body-supporting means including a seat and back-rest adapted to move from a sitting position through a first movement phase to an intermediate tilted position and through a second movement phase to a reclining position, a second movement guide link pivotally connected to said seat at a seat pivot and extending rearwardly therefrom, first connecting means operatively connecting said back-rest to said second movement guide link, blocking means operatively connected between said seat and back-rest and arranged to establish a prescribed angular relationship therebetween during said first movement phase and to preclude movement of said seat and back-rest toward each other, said blocking means being further arranged to permit movement of said seat and back-rest away from each other during said second movement phase to increase the angular relationship therebetween to establish a reclining position, front guiding means pivotally mounted on said support at a first pivotal mount and pivotally connected to said seat at a first pivotal connection, rear guiding means including a rear guiding link pivotally connected to said second movement guide link, second connecting means pivotally mounting said rear guiding link on said support, at least one of said two connecting means including means providing an effective center for angular movement of said back-rest during said second movement phase which is spaced rearwardly of said seat pivot, said second connecting means including a mounting link pivotally connected to said rear guiding link and having a pivotal mount on said support serving as said effective center.

3. A reclining chair comprising a support, body supporting means including a seat and back-rest adapted to move from a sitting position through a first movement phase to an intermediate tilted position and through a second movement phase to a reclining position, a second movement guide link pivotally connected to said seat at a seat pivot and extending rearwardly therefrom, first connecting means operatively connecting said back-rest to said second movement guide link, blocking means operatively connected between said seat and back-rest and arranged to establish a prescribed angular relationship therebetween during said first movement phase and to preclude movement of said seat and back-rest toward each other, said blocking means being further arranged to permit movement of said seat and back-rest away from each other during said second movement phase to increase the angular relationship therebetween to establish a reclining position, front guiding means pivotally mounted on said support at a first pivotal mount and pivotally connected to said seat at a first pivotal connection, rear guiding means including a rear guiding link pivotally connected to said second movement guide link, second connecting means pivotally mounting said rear guiding link on said support, at least one of said two connecting means including means providing an effective center for angular movement of said back-rest during said second movement phase which is spaced rearwardly of said seat pivot, said first connecting means including a connecting link pivotally connected to said back-rest and operatively connected to said second movement guide link to form a four-bar linkage including a portion of said seat, a portion of said back-rest, said connecting link and said second movement guide link as links thereof, said four-bar linkage providing an imaginary pivot for said back-rest serving as said effective center.

4. In a reclining chair, a support, body-supporting means including a seat and back-rest adapted to move from a sitting position through a first movement phase to an intermediate tilted position and through a second movement phase to a reclining position, a second movement guide link pivotally connected to said seat at a seat pivot and extending rearwardly therefrom, first connecting means operatively connecting said back-rest to said second movement guide link, front guiding means pivotally mounted on said support at a first pivotal mount and pivotally connected to said seat at a first pivotal connection, rear guiding means including a rear guiding link pivotally connected to said second movement guide link, second connecting means pivotally mounting said rear guiding link on said support, at least one of said two connecting means including means providing an effective center for angular movement of said back-rest during said second movement phase which is spaced rearwardly of said seat pivot.

5. In a reclining chair, a support, body-supporting means including a seat and back-rest adapted to move from a sitting position through a first movement phase to an intermediate tilted position and through a second movement phase to a reclining position, a second movement guide link pivotally connected to said seat at a seat pivot and extending rearwardly therefrom, means rigidly connecting said back-rest to said second movement guide link, front guiding means pivotally mounted on said support at a first pivotal mount and pivotally connected to said seat at a first pivotal connection, rear guiding means including a rear guiding link pivotally connected to said second movement guide link, and a mounting link pivotally mounting said rear guiding link on said support and providing an effective center for angular movement of

said back-rest during said second movement phase which is spaced rearwardly of said seat pivot.

6. In a reclining chair, a support, body-supporting means including a seat and back-rest adapted to move from a sitting position through a first movement phase to an intermediate tilted position and through a second movement phase to a reclining position, a second movement guide link pivotally connected to said seat at a seat pivot and extending rearwardly therefrom, connecting means operatively connecting said back-rest to said second movement guide link, front guiding means pivotally mounted on said support at a first pivotal mount and pivotally connected to said seat at a first pivotal connection, rear guiding means including a rear guiding link pivotally connected to said second movement guide link and pivotally mounted on said support, said first connecting means providing an effective center for angular movement of said back-rest during said second movement phase

which is spaced rearwardly of said seat pivot and including a connecting link pivotally connected to said back-rest and operatively connected to said second movement guide link to form a four-bar linkage including a portion of said seat, a portion of said back-rest, said connecting link and said second movement guide links as links thereof, said four-bar linkage providing an imaginary pivot for said back-rest serving as said effective center.

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