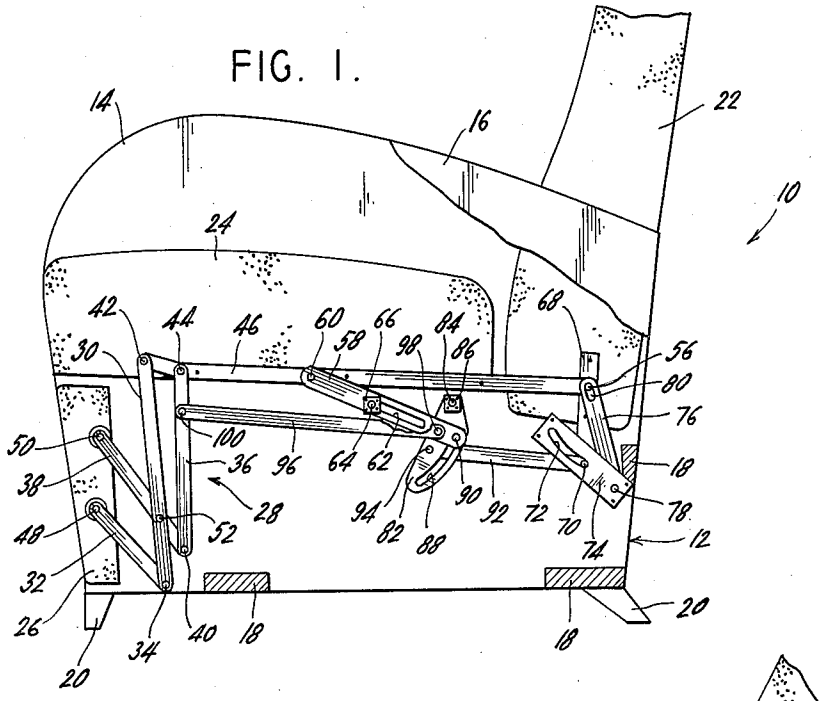
Sept. 17, 1963 F. F. SCHLIEPHACKE 3,104,128

RECLINING CHAIR OF THE MULTIPLE POSITION TYPE

Filed June 13, 1960 2 Sheets-Sheet 1

FIG. 1.



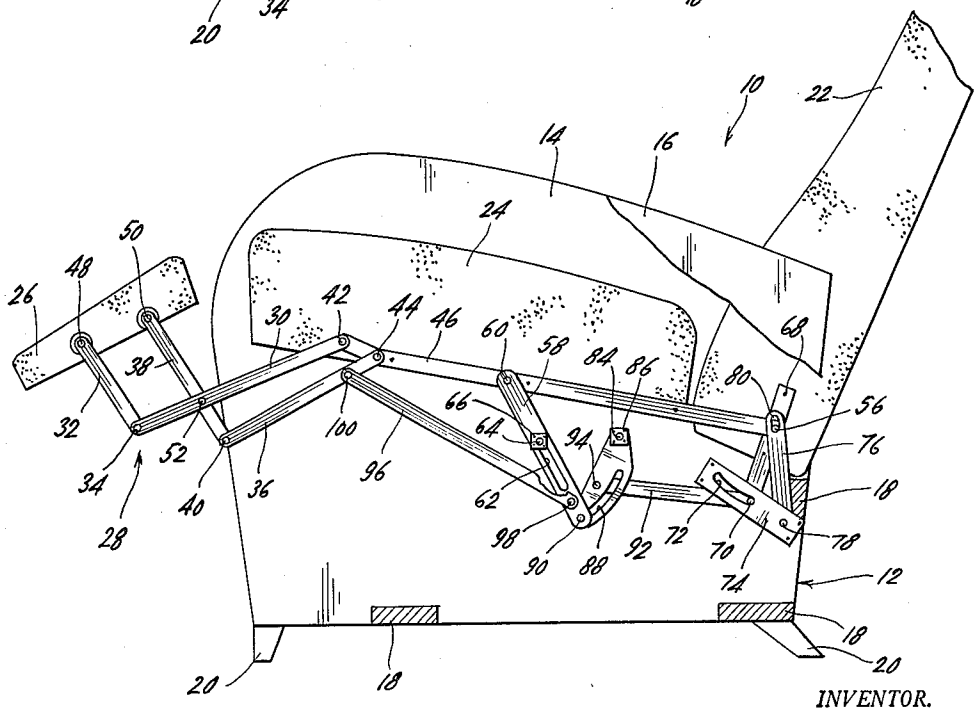




FIG. 2.

INVENTOR.
FRIDTJOF F. SCHLIEPHACKE
BY
Auster + Levy
ATTORNEYS

Sept. 17, 1963 F. F. SCHLIEPHACKE 3,104,128

RECLINING CHAIR OF THE MULTIPLE POSITION TYPE

Filed June 13, 1960 2 Sheets-Sheet 2

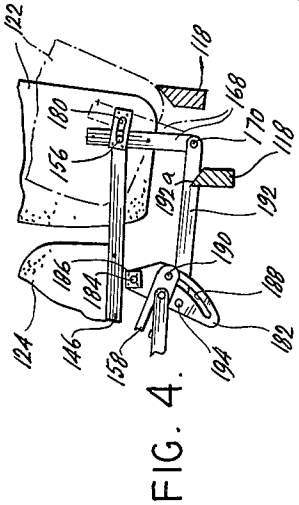


FIG. 4.

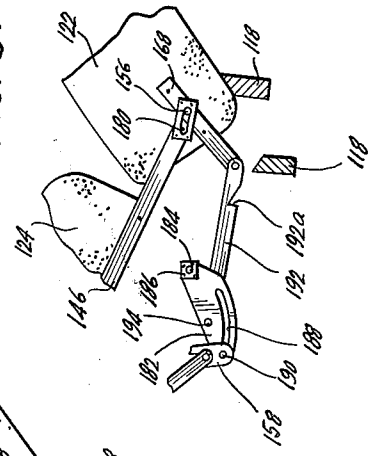


FIG. 5.



FIG. 3.

INVENTOR.
FRIDTJOF F. SCHLIEPHACKE
BY
Amster & Jury
ATTORNEYS

United States Patent Office 3,104,128 Patented Sept. 17, 1963



# 3,104,128
# RECLINING CHAIR OF THE MULTIPLE POSITION TYPE

Fridtjof F. Schliephacke, Berlin-Schmargendorf, Germany, assignor to Anton Lorenz, Boynton Beach, Fla.

Filed June 13, 1960, Ser. No. 35,821
6 Claims. (Cl. 297—85)

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

The recently developed multiple movement chair of the recliner type incorporates a movable seat and a movable back-rest wherein the chair has respective first and second movement phases, with the seat and backrest moving from a sitting position to an intermediate tilted sitting position during the first movement phase with substantially no change in the angular relationship therebetween, and with the seat and back-rest moving from the intermediate tilted sitting position to a reclining position in a second movement phase within an increase in the angular relationship therebetween. In such recliner type of multiple movement chair, a leg-rest is usually mounted for movement into a substantially elevated leg-supporting position during the first movement phase such as to provide an adequate support for the chair occupant in the intermediate tilted sitting position and throughout the second movement phase.

One of the problems encountered in the construction of this type of chair is the establishment of the sequence of operations for the chair such that the chair will operate in the intended fashion when actuated by the chair occupant. It is essential to establish the order or sequence of operations of the coordinating mechanisms of the chair to assure that the body-supporting means will be properly guided during the first and second movement phases respectively to establish the several positions of the chair. Such sequencing should be of a positive and reliable nature and preferably should be automatically operated when the chair occupant is seated and exerts the necessary actuating force on the body-supporting unit of the chair. Further the sequencing should be established in a manner compatible with the more generalized requirements of simplicity in construction and facility for mass production manufacture.

Broadly, it is an object of the present invention to provide an improved recliner type of multiple movement chair which realizes one or more of the aforesaid objectives. Specifically, it is within the contemplation of the present invention to provide an improved recliner type of multiple movement chair wherein the coordinating mechanism for the chair incorporates provision for establishing the sequence of operations for the chair.

It is a further object of the present invention to provide improved multiple movement reclining chairs of the recliner type having relatively simple coordinating mechanisms including means which establish the sequence of operations for the chair.

In accordance with an illustrative embodiment demonstrating objects and features of the present invention there is provided a reclining chair of the multiple movement type which comprises a support, body-supporting means including a seat and back-rest adapted to be mounted on the support for inclining and reclining movement respectively, and means pivotally connecting the seat to the back-rest at a pivot. A first movement guiding linkage is provided which serves during a first movement phase to guide the seat and back-rest to an intermediate tilted sitting position with substantially no angular change between the sea and back-rest. The first movement guiding linkage includes back-rest guiding means providing a fixed back-rest pivot during the first movement phase and seat guiding means which is operative during both movement phases. Provision is made for blocking the backrest guiding means against the movement when the body-supporting means is in the intermediate tilted sitting position such that the back-rest turns about the pivot between the seat and back during a second movement phase. A second movement guiding link is pivotally mounted on the support and is connected by a lost motion connection to the seat guiding means such that during the first movement phase provision is made for lost motion travel and during the second movement phase provision is made for a pivotal connection between the second movement guiding link and the seat guiding means. Connecting means are operatively connected between the second movement guiding link and the back-rest to impart turning movement of the back-rest about the pivot to the second movement guiding link during the second movement phase. A lost motion connection is provided between the seat guiding means of the first movement linkage and the support during the second movement phase and serves as a pivotal mount therebetween during the first movement phase. Sequencing means are operatively connected to the back-rest for blocking turning movement of the back-rest about the pivot during the first movement phase and for permitting turning movement of the back-rest about the pivot during the second movement phase. In a typical chair, there is provided a leg-rest which is mounted for movement from a stored position to an elevated leg-supporting position, with means being arranged to move the leg-rest to the elevated leg-supporting position during the first movement phase and as the chair moves into the intermediate tilted sitting position.



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

FIG. 1 is a side elevational view of a first embodiment of reclining chairs demonstrating features of the present invention, with parts being broken away and sectioned for clarity and with the chair shown in the upright or sitting position;

FIG. 2 is a side elevational view similar to FIG. 1, but showing the chair in the intermediate tilted sitting position;

FIG. 3 is a side elevational view similar to FIG. 2, but showing the chair in a fully reclined position;

FIG. 4 is a fragmentary elevational view showing a modified form of back-rest guiding means in accordance with further features of the present invention, shown in the position corresponding to the upright or sitting position for the chair; and,

FIG. 5 is a side elevational view similar to FIG. 4, but showing the back-rest guiding means in the position corresponding to the fully reclining position for the chair.

Referring now specifically to FIGS. 1 to 3 of the drawings, there is shown a reclining chair, generally designated by the reference numeral **10**, which includes a support **12** having opposite side walls **14**, **16** interconnected by suitable cross braces **18** and support 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 through a

first movement phase from the upright or sitting position illustrated in FIG. 1 to the intermediate tilted sitting position illustrated in FIG. 2; and for a second movement phase from intermediate tilted sitting position illustrated in FIG. 2 through a series of reclining positions to the fully reclining position illustrated in FIG. 3.

Disposed beneath the forward end of the seat **24** is a leg-rest **26** which is mounted for movement from a stored or retracted position shown in FIG. 1 to elevated leg-supporting positions shown in FIGS. 2 and 3. The leg-rest **26** is mounted for such movement by a leg-rest mounting arrangement, generally designated by the reference numeral **28**, which includes a first link pair **30**, **32** having their adjacent ends pivotally connected at **34** and a second link pair **36**, **38** having their adjacent ends pivotally connected at **40**. The links **30**, **36** of the respective link pairs have pivotal mounts **42**, **44** on the seat via an elongated bracket **46** rigidly secured to the seat and projecting rearwardly thereof, while the links **32**, **38** have pivotal connections **48**, **50** to the leg-rest **26** at spaced points thereof. The link **30** crosses over the link **38** and has a pivotal connection **52** thereto at the cross over point. Although one specific form of leg-rest mounting linkage **28** has been illustrated, it will be appreciated that the leg-rest mounting linkage and its coordination into the chair may take a wide variety of forms, as may be appreciated by reference to the prior art patents of the assignee herein.

The seat **24** and back-rest **22** are connected together at a pivot or pin **56** on the rearward end of the bracket **46** which serves as a seat pivot about which the seat **24** is inclined during the first and second movement phases and as a back-rest pivot about which the back-rest **22** reclines during the second movement phase, as will be appreciated hereinafter. Front or seat guiding means are operatively connected between the support **12**, the seat **24**, which is in the form of a front or seat guiding link **58** which is disposed in a forwardly inclined position and has a pivotal connection **60** at its upper end to seat **24** via the elongated seat bracket **46**. The front or seat guiding link **58** is formed from a point intermediate its ends towards its lower end with an elongated slot **62** which guidingly engages a pin **64** which is fixed to the support **12** via a mounting plate or bracket **66**. During the first movement phase, as may be appreciated by progressively inspecting FIGS. 1 and 2, the pin **64** is at the upper and forward end of the slot **62** and provides a pivot mount for the front or seat guiding link **58** on the support. The portion of the link intermediate the pin **64** and the pivotal connection **60** serves as a front guiding means which turns in the clockwise direction about the pin **64** serving as a pivotal mount to impart a prescribed inclination to the seat during the first movement phase. During the second movement phase, as may be appreciated by progressively inspecting FIGS. 2 and 3, the pin **64** and the slot **62** serve as a lost motion means to enable the front or seat guiding link **58** to translate upwardly in relation to the support **12** under the control of a second movement guiding link as will subsequently be described.

Rear guiding means are mounted on the support **12** and operatively connected to the back-rest **22** to guide the back-rest during the first movement phase, with the back-rest **22** reclining about the pivot **56** during the second movement phase. In this illustrative embodiment, the back-rest **22** is provided with a depending rigid back-rest arm **68** which carries a pin **70** at its lower end serving as a back-rest pivot during the first movement phase. The pin **70** is guidingly engaged within a slot **72** provided in a mounting bracket or plate **74** fixed to the support or frame **12**. The pin **70** is disposed at the lower and rearward end of the slot through out the first movement phase, as may be appreciated by progressively inspecting FIGS. 1 and 2, and serves as the back-rest pivot about which the back-rest reclines during such first movement phase. However, during the second movement phase, as



may be appreciated by progressively inspecting FIGS. 2 and 3, the pin **70** translates upwardly and forwardly along the slot **72** as the back-rest **22** turns about the pivot **56**, with the pin providing a driving connection to the second movement linkage, as will be subsequently described. During the first movement phase, there is provided a first movement guiding linkage which guides the seat and back-rest **24**, **22** to an intermediate tilted sitting position with substantially no angular change between the seat and back-rest. This first movement guiding linkage includes a stationary link intermediate the pin or pivotal mount **64** and the pin or pivotal mount **70** and movable links including the front guiding link **58** intermediate the pivotal mount **64** and the pivotal connection **60**, the seat intermediate the pivotal connection **60** and the pivot **56**, and the back-rest arm **68** intermediate the pivot **56** and the pivotal mount **70**. The movable links are arranged in relation to the stationary link to maintain the desired angular relationship between the seat and back-rest, during the first movement phase as may be appreciated by comparing FIGS. 1 and 2.

The first movement guiding linkage is completed by a constraining link **76** which is disposed in a forwardly inclined position and has a pivotal mount **78** on the support via the mounting bracket or plate **74** and a lost motion connection to the back-rest **22** via the slot **80** which engages the pivot or pin **56** on the back-rest **22**. During the first movement phase, and in response to pressure against the back-rest **22**, the constraining link **76** turns in the clockwise direction about the pivotal mount **78** and cooperates with the back-rest arm **68** to cause the back-rest **22** to turn about the pin or pivot **70** as a first back-rest pivot until such time that the constraining link **76** abuts the adjacent cross brace **18** of the chair frame or support **12** (see FIG. 2). During such first movement phase it will be appreciated that there is a lost motion travel of the pivot or pin **56** within the slot **80** such as to avoid an overconstraining guiding action on the back-rest as it turns around the pin or pivot **70**. At the end of the first movement phase when the constraining link **76** abuts the adjacent cross brace, it will be appreciated that the pivot or pin **56** which is at the lower end of the slot **80** becomes, for all intents and purposes, a stationary back-rest pivot on the support for the second movement phase. The curvature of the slot **72** in the bracket **74** which provides for the lost motion travel of the pin **70** in relation to the support **12** for the actuation of the second movement linkage is on an arc in a radius about the pin **56** when at the lower end of the slot **80** in the intermediate tilted sitting position of the chair shown in FIG. 2. It will be appreciated that the rear cross brace serves as a means for blocking the first movement guiding linkage against movement when the body-supporting means **22**, **24** is in the intermediate tilted sitting position such that the back-rest **22** will turn about the pivot **56** as a second back-rest pivot spaced above the first back-rest pivot **70** during such second movement phase.

The second movement guiding linkage includes a second movement guiding link or plate **82** which has a pivotal mount **84** via the bracket **86** to the chair support or frame **12**. The second movement guiding link **82** has a lost motion connection to the front guiding link **58** such that the front guiding link **58** may translate relative to the second movement guiding link **82** during the first movement phase and be operatively connected thereto during the second movement phase. Specifically, the second movement link or plate **82** is provided with a lost motion slot **88** which is on a radius about the front pivotal mount **64**. The slot **88** receives at its upper and rearward end a pin **90** carried on the lower end of the link **58**. During the first movement phase, as may be appreciated by progressively inspecting FIGS. 1 and 2, the pin **90** translates along the lost motion slot **88** as the link **58** turns around the pivotal mount **64**, with the pin **90** arriving at the lower end of the lost motion slot **88** in

the intermediate tilted sitting position shown in FIG. 2. During such first movement phase, the second movement guiding link 82 remains stationary in that it is actuated from the pin or pivot 70 which translates relative to the support only during the second movement phase. During such second movement phase, the second movement guiding link 82 is turned in the clockwise direction about its pivotal mount 84 by an actuating connection to the back-rest arm 68 at the pin or pivot 70 and a pivotal connection 94 to the second movement guiding link 82 at a point spaced below the pivotal mount 84. During the second movement phase, as may be appreciated by inspecting FIGS. 2 and 3, the second movement guiding link 82 and the front or seat guiding link 58 together serve as a seat guiding means, the links 58, 82 being coupled together at the pin or pivot 90 disposed at the lower end of the lost motion slot 88.

In this illustrative embodiment, the leg-rest mounting linkage 28 is actuated in response to the turning movement of the front guiding link 58, which is in a sense a double arm lever pivotally mounted intermediate its ends at the pivotal mount 64, through the provision of a connecting link 96 which has a pivotal connection 98 at its rearward end to the front guiding link 58 intermediate the lower end of the lost motion slot 62 and the pin or pivot 90 and a pivotal connection 100 at its forward end to the link 36 of the leg-rest mounting linkage 28.

In order to facilitate a more thorough understanding of the present invention, reference will now be made to a typical sequence of operations:

When the chair occupant is seated in the chair and presses against the back-rest 22, the first movement phase is initiated with the body-supporting means 22, 24 moving from the upright or sitting position of FIG. 1 into the intermediate tilted sitting position of FIG. 2. During such first movement phase, the back-rest 22 turns about the pin 70 serving as a first back-rest pivot, with the pin 70 remaining at the lower and rearward end of the lost motion slot 72. Concurrently, the seat 24 is guided by the front or seat guiding link 58 which turns about the pivotal mount 64. The combined action of the inclining of the seat 24 and reclining of the back-rest 22 is such as to establish the desired intermediate tilted sitting position wherein there is substantially no change in the angular relationship between the seat and backrest. During such first movement phase, the turning movement of the link 58 is transmitted via the connecting link 96 to the leg-rest mounting linkage 28 to move the leg-rest 26 to the elevated leg-supporting position shown in FIG. 2. As the link 58 turns, there is a lost motion travel of the pin 90 along the lost motion slot 88 in the second movement link 82 which second movement link 82 remains stationary throughout the first movement phase. During the first movement phase, the link 58 does not translate relative to the support and accordingly blocks the clockwise turning movement of the second movement link 82 about its pivotal mount 84. This blocking action, via the connecting link 82, tends to maintain the pin 70 at the lower and rearward end of the lost motion slot 72 in which position the pin 70 serves as the first movement phase back-rest pivot.

When the constraining link 76 abuts the rear cross brace 18, the pin 90 concurrently arrives at the lower end of the lost motion slot 88 and the intermediate tilted sitting position of FIG. 2 is established. Thereafter, continued pressure against the back-rest 22 by the chair occupant will cause the back-rest 22 to recline about the pin 56 serving as a second movement phase back-rest pivot, which pin is at the lower end of the lost motion slot 80. As the back-rest turns about the pin 56 as relatively stationary back-rest pivot, the pin 70 translates upwardly and forwardly along the lost motion slot 72 in the mounting bracket 74 which imparts a forward thrust via the connecting link 92 to the second movement link



82. This turns the second movement link 82 through an upward and forward arc about its pivotal mount 84. This movement is imparted via the front or seat guiding link 58 to the seat 24, with the link 58 translating relative to the support incident to the lost motion travel of the slot 62 relative to the pin or pivotal mount 64, as may be appreciated by progressively inspecting FIGS. 2 and 3. The second movement linkage is effective to increase the angular relationship between the seat 24 and the back-rest 22 during the second movement phase, with the fully reclined position being established when the pin 70 arrives at the forward end of the lost motion slot 72, as seen in FIG. 3. During such second movement phase, it will be appreciated that the link 58 not only translates relative to the support, but turns about the pin or pivotal mount 64 such that the leg-rest 26 moves to a further elevated leg-supporting position in relation to the seat 24, which seat is concurrently moving upwardly relative to the support and somewhat increasing in its inclination relative to the support. However, the rate of reclining of the back-rest 22 is greater than the rate of inclining of the seat 24 such that the angular relationship therebetween increases to establish progressively more optimum comfort positions for the chair occupant throughout the second movement phase.

When the chair occupant desires to restore the chair either to the intermediate tilted sitting position of FIG. 2 or the upright sitting position of FIG. 1, it is merely necessary to lean forward and apply pressure against the leg-rest and/or seat to initiate the reverse sequence of operations, with the chair moving into the intermediate tilted position of FIG. 2 and then moving to the upright or sitting position of FIG. 1.

Reference will now be made to the fragmentary showing of FIGS. 4 and 5 which show a modified form of back-rest guiding means in accordance with a further embodiment of the present invention, with the showings of FIGS. 4 and 5 corresponding respectively to the sitting and reclining chair position illustrated in FIGS. 1 and 3. In that the chair illustrated in the modification of FIGS. 4 and 5 is substantially identical to that shown in FIGS. 1 to 3 inclusive, a detailed description of the entire chair will be omitted in the interest of brevity and only the back-rest guiding means will be described. Further the corresponding parts will be designated by a reference numeral as part of a "100" series to facilitate the comparison of the corresponding parts of the respective chairs. Specifically, the back-rest 122 is provided with a depending rigid back-rest arm 168 which is connected at a pin or pivotal connection 170 to the rearward end of the connecting link 192. The forward end of the connecting link 192 has a pivotal connection 194 to the second movement link 182 which has its pivotal mount 184 via bracket 186 on the chair support. The second movement link 182 is connetced to the depending extension of the front or seat guiding link 158 at the pin or pivot 190 which is confined within the lost motion slot 188 and translates to the lower end thereof during the first movement phase. In order to impart stability to the construction, a stop 118 is positioned below the connecting link 192 and received within a corresponding notch or cutout 192*a* in such connecting link such as to support the connecting link 192 which remains stationary throughout the first movement phase. During the second movement phase, the connecting link 192 will translate forwardly in relation to the stop and move to a clearance position relative thereto as the pivotal connection 194 swings through an upward arc about the pivotal mount 184 of the second movement link 182 on the chair support. In this embodiment, the pivot 156 is between the elongated bracket 146 rigid with the seat 124 and the back-rest 122. The pin or pivot 156 is confined within a slot 180 which is on a radius relation to the pin 172 to somewhat lift the pin 170 to clear the notch 192*a* in the connecting link 192 from the cross brace

118. The pin 156 translates rearwardly along the slot about the pin 170 serving as a backrest pivot during the first movement phase and arrives at the rearward end of the slot 180 in the intermediate tilted sitting position of the chair. During the second movement phase, the pin 156 is at the rearward end of the slot 180 and serves as a back-rest pivot, with the arm 168 swinging through a forward arc about the pin 156 and with the connecting link 192 moving through a forward thrust to actuate the second movement linkage in the manner previously described.

Since the operation of this modification is substantially identical to that previously described insofar as the modified back-rest guiding means is concerned, description of a typical sequence of operations will be dispensed with.

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 be mounted on said support for inclining and reclining movement respectively, means pivotally connecting said seat to said back-rest at a pivot, a first movement guiding linkage including back-rest guiding means serving during a first movement phase to guide said seat and back-rest to an intermediate tilted sitting position, means for blocking said back-rest guiding means of said first movement guiding linkage against movement when said body-supporting means is in said intermediate tilted sitting position such that said back-rest turns about said pivot during a second movement phase, a second movement guiding means mounted on said support, means providing a lost motion connection between said first movement guiding linkage and said second movement guiding means during said first movement phase and a pivotal connection therebetween during said second movement phase, connecting means operatively connected between said second movement guiding means and said back-rest to impart turning movement of said back-rest about said pivot to said second movement guiding means during said second movement phase, and means providing a lost motion connection between said first movement linkage and said support during said second movement phase and a pivotal mount therebetween during said first movement phase.

2. A reclining chair comprising a support, body-supporting means including a seat and back-rest adapted to be mounted on said support for inclining and reclining movement respectively, means pivotally connecting said seat to said back-rest at a pivot, a first movement guiding linkage including back-rest guiding means serving during a first movement phase to guide said seat and back-rest to an intermediate tilted sitting position with substantially no angular change between said seat and said back-rest, means for blocking said back-rest guiding means of said first movement guiding linkage against movement when said body-supporting means is in said intermediate tilted sitting position such that said back-rest turns about said pivot during a second movement phase, a second movement guiding means mounted on said support, means providing a lost motion connection between said first movement guiding linkage and said second movement guiding means during said first movement phase and a pivotal connection therebetween during said second movement phase, connecting means operatively connected between said second movement guiding means and said back-rest to impart turning movement of said back-rest about said pivot to said second movement guiding means during said second movement phase, means providing a lost motion connection between said first movement linkage and said support during said second movement phase and a pivotal mount therebetween during said first movement phase, a leg-rest and means operatively connected to said first movement guiding linkage for moving said leg-rest to an elevated leg-supporting position during said first movement phase.



3. A reclining chair comprising a support, body-supporting means including a seat and back-rest adapted to be mounted on said support for inclining and reclining movement respectively, means pivotally connecting said seat to said back-rest at a pivot, a first movement guiding linkage serving during a first movement phase to guide said seat and back-rest to an intermediate tilted sitting position with substantially no angular change between said seat and said back-rest and including back-rest guiding means providing a fixed back-rest pivotal mount during said first movement phase, said first movement guiding linkage including seat guiding means operative during both movement phases, means for blocking said back-rest guiding means against movement when said body-supporting means is in said intermediate tilted sitting position such that said back-rest turns about said pivot during a second movement phase, a second movement guiding link pivotally mounted on said support, means providing a lost motion connection between said seat guiding means of said first movement guiding linkage and said second movement guiding link during said first movement phase and a pivotal connection between said seat guiding means and said second movement guiding link during said second movement phase, connecting means operatively connected between said second movement guiding link and said back-rest to impart turning movement of the back-rest about said pivot to said second movement guiding link during said second movement phase, and means providing a lost motion connection between said seat guiding means of said first movement linkage and said suport during said second movement phase and a pivotal mount therebetween during said first movement phase.

4. A reclining chair comprising a support, body-supporting means including a seat and back-rest adapted to be mounted on said support for inclining and reclining movement respectively, means pivotally connecting said seat to said back-rest at a pivot, front guiding means mounted on said support at a front pivotal mount and pivotally connected to said seat at a front pivotal connection, rear guiding means mounted on said support at a rear pivotal mount and pivotally connected to said back-rest at a rear pivotal connection, said front and rear guiding means providing a first movement guiding linkage serving during a first movement phase to guide said seat and back-rest to an intermediate tilted sitting position with substantially no angular change between said seat and said back-rest, said first movement guiding linkage including a stationary link intermediate said front pivotal mount and said rear pivotal mount and movable links including said front guiding means, said seat and said rear guiding means, means for blocking said rear guiding means of said first movement guiding linkage against movement when said body-supporting means is in said intermediate tilted sitting position such that said back-rest turns about said pivot during a second movement phase, second movement guiding means mounted on said support, means providing a lost motion connection between said front guiding means and said second movement guiding link such that said front guiding means may translate relative to said second movement guiding link during said first movement phase, connecting means operatively connected between said second movement guiding link and said back-rest to impart turning movement of said back-rest about said pivot to said second movement guiding link and said front guiding means together serving as a front guiding means for said seat during said second movement phase, means providing a lost motion connection between said front pivotal mount

and said support such that said front guiding means may translate relative to said support during said second movement phase, and sequencing means operatively connected to said back-rest and to said support for blocking turning movement of said back-rest about said pivot during said first movement phase and for permitting turning movement of said back-rest about said pivot during said second movement phase, a leg-rest, means mounting said leg-rest for movement into an elevated leg-supporting position during said first movement phase, and means operatively connected to said front guiding means and to said leg-rest for moving said leg-rest into said elevated leg-supporting position during said first movement phase.

5. In a reclining chair, a support, a back-rest, and means mounting said back-rest for reclining movement successively about first and second back-rest pivots during first and second movement phases, said means including a back-rest guiding link pivotally connected to said back-rest, a first pin and slot connection operatively connected to said back-rest and to said support and mounting said back-rest for reclining movement about said first pin serving as said first back-rest pivot during said first movement phase, means for maintaining said first pin at one end of said first slot during said first movement phase, a constraining link, means pivotally mounting said constraining link on said support, means including a second pin and slot connection between said constraining link and said back-rest such that said constraining link guides said back-rest during said first movement phase with said second pin translating relative to said second slot through a lost motion travel, said second pin serving as said second back-rest pivot during said second movement phase with said first pin translating relative to said first slot through a lost motion travel.

6. A reclining chair comprising a support, body-supporting means including a seat and a back-rest adapted to be mounted for inclining and reclining movements respectively, seat guide means mounting said seat on said support for movement into successive inclined positions,



a first pivot connecting said seat to said back-rest such that said seat moves into said successive inclined positions in response to movement of said back-rest into successive reclined positions, and back-rest guiding means mounting said back-rest on said support and including an extension of said back-rest depending from said first pivot, lost motion means mounting said depending extension on said support and including a movable pivotal connection, a constraining link pivotally mounted on said support at a pivotal mount spaced from said movable pivotal connection and pivotally connected to said back-rest, said movable pivotal connection remaining stationary during a first movement phase of said body-supporting means and providing a first relatively fixed pivot for said back-rest, said back-rest turning rearwardly about said first relatively fixed pivot and said constraining link turning rearwardly about said pivotal mount during said first movement phase such that said back-rest moves into an intermediate reclining position, and means for blocking movement of said constraining link when said back-rest is in said intermediate reclining position and to preclude further rearward turning of said back-rest about said first relatively fixed pivot, the stationary constraining link thereafter providing a second relatively fixed pivot about which said back-rest turns into a fully reclined position during a second movement phase of said body-supporting means, said movable pivotal connection moving during said second movement phase about said second relatively fixed pivot.

**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 2,615,497 | Luckhardt | Oct. 28, 1952 |
| 2,664,942 | Spear | Jan. 5, 1954 |
| 2,918,113 | Lorenz | Dec. 22, 1959 |
| 2,940,509 | Fletcher | June 14, 1960 |
| 2,940,510 | Schliephacke | June 14, 1960 |