Jan. 27, 1970 P. S. FLETCHER 3,492,049

RECLINING CHAIR OF THE MULTIPLE MOVEMENT TYPE

Filed April 14, 1967 2 Sheets-Sheet 1

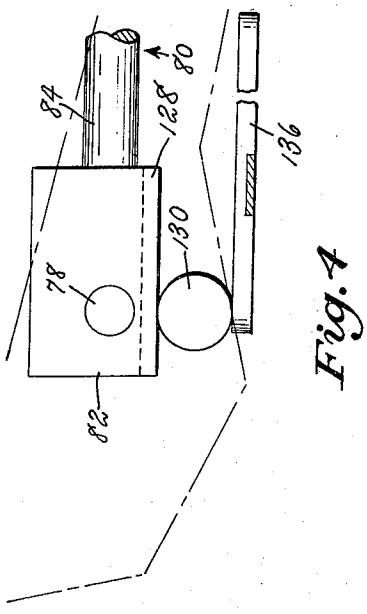


Fig. 4

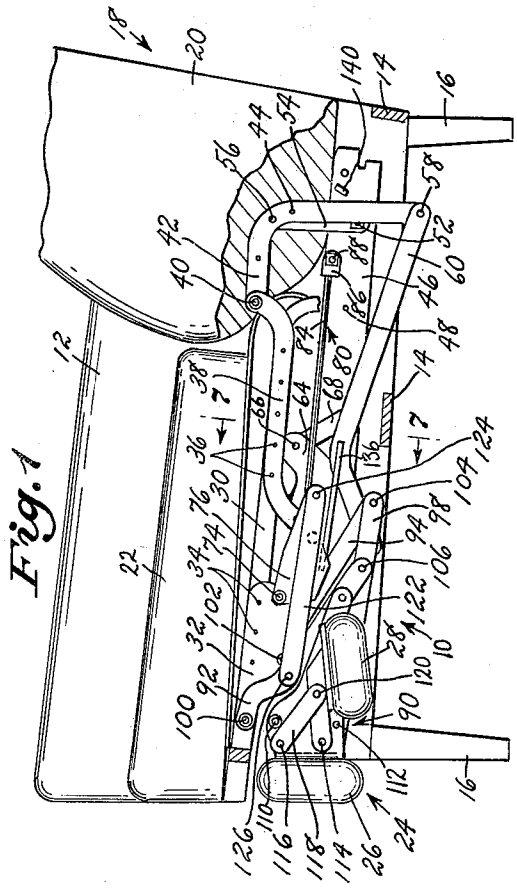


Fig. 1

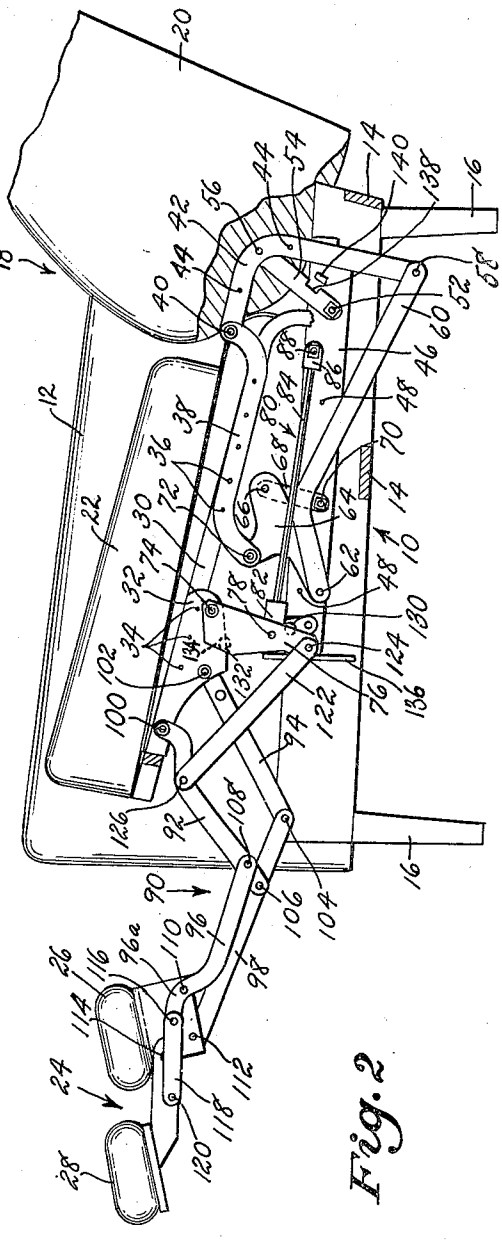


Fig. 2

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RECLINING CHAIR OF THE MULTIPLE MOVEMENT TYPE

Filed April 14, 1967 2 Sheets-Sheet 2

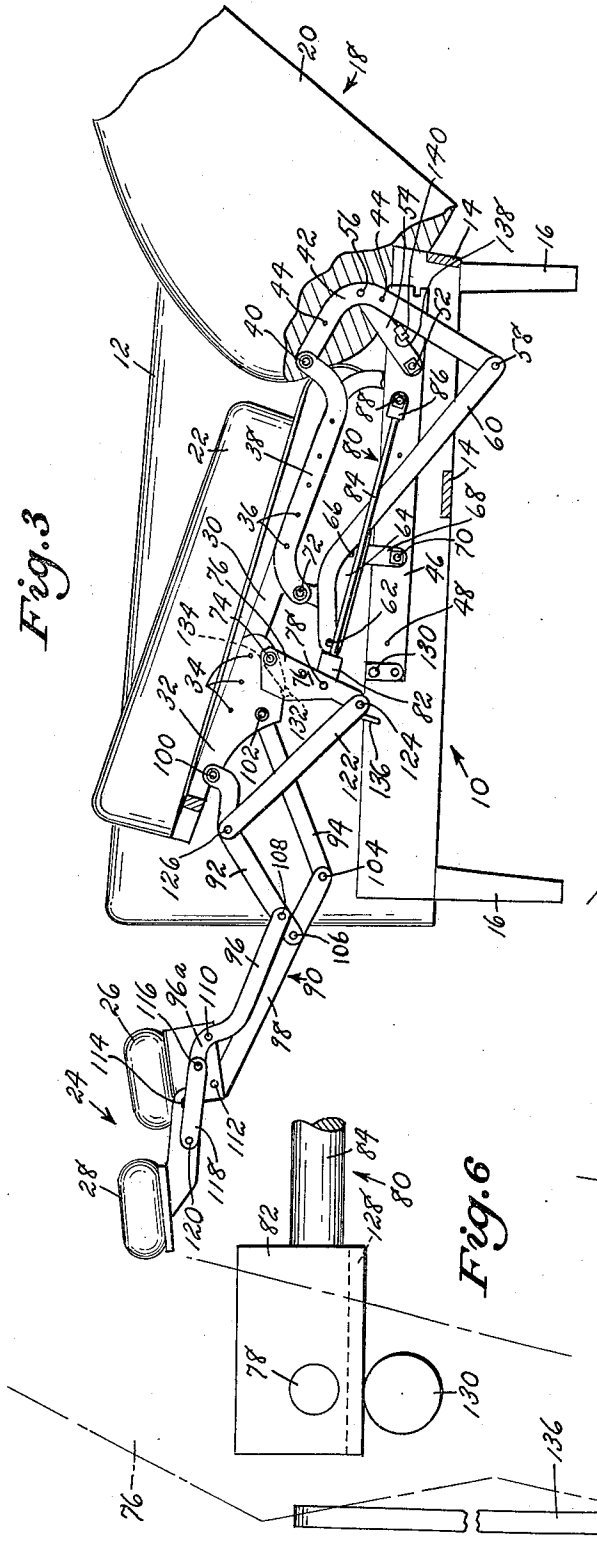


Fig. 3

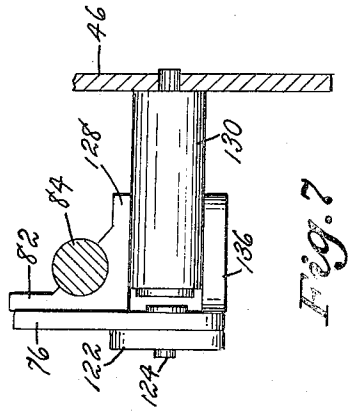


Fig. 7

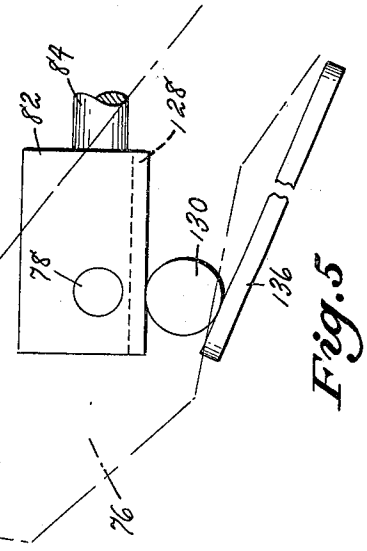


Fig. 5

Fig. 6

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3,492,049

RECLINING CHAIR OF THE MULTIPLE MOVEMENT TYPE

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Int. Cl. A47b 1/024
U.S. Cl. 297—316 10 Claims

ABSTRACT OF THE DISCLOSURE

A multiple movement reclining chair in which the control linkage for the body-supporting means includes a holding link which maintains the seat and back-rest in a unitary relationship during their movement in the first phase, and which actuates a linkage portion in the second phase to increase the included angle between the seat and back-rest. A flange on one of the movable links also revolves about a fixed member to insure proper sequencing of the two movement phases.

Background of the invention

A recent development in reclining chairs is the multiple position type which provides a substantially upright sitting position with extended leg-rest, and also provides a series of reclining positions with extended leg-rest for complete relaxation. In such chairs, the seat and back-rest are mounted by a linkage or mechanism on the stationary chair frame so that they are guided in a first movement phase along a substantially horizontal path to an intermediate position in which the seat and back-rest are slightly tilted but still support the body in an active sitting attitude for reading, television viewing, or the like. During this first movement phase, a leg-rest is extended and elevated to a position to support the occupant's outstretched legs in response to the movement of the seat and back-rest. The seat and back-rest can then be moved in a second movement phase along a substantially rotary path to a fully-reclined position, with the leg-rest maintained in its extended leg-supporting position.

Multiple position chairs are presently provided in two types, the first being that constructed with a unitary back-rest and seat which maintain a fixed relationship during both movement phases, and the second type being that constructed with a back-rest movable relative to the seat, both back-rest and seat being mounted on the chair frame for reclining and inclining movement respectively. In this second or so called "TV lounger" type, the included angle between the seat and back-rest is increased to provide a completely relaxed, reclining position for the chair occupant.

In the TV lounger type of chair, the advantages of the unitary back-rest and seat during the first movement phase are combined with the advantages of the relatively movable back-rest and seat during the second movement phase. That is to say, the seat and back-rest move together during the first movement phase without appreciable relative movement to provide an intermediate, tilted sitting position which is most suitable for accommodating the occupant's body in an active sitting attitude with his legs supported outstretched. During the second movement phase, however, the angle between the back-rest and seat is increased to provide a reclined position most suitable to support the occupant's body in an attitude of complete relaxation.

Among the problems inherent in the construction of the aforementioned type of TV lounger chair is that of providing a compact control linkage or mechanism which will guide the seat and back-rest as a substantially unitary structure through the first movement phase and also

move the seat and back-rest relative to each other to increase the included angle therebetween during the second movement phase. Another problem is to construct the mechanism in such a manner that movement of the seat and back-rest in the first phase will cause the leg-rest to be fully extended to a leg-supporting position, while movement of the seat and back-rest in the second motion phase will have little or no effect on the leg-rest, so that the latter is maintained in the leg-supporting position. In addition, it is desirable to provide sequencing means to insure that the seat and back-rest first move through the first movement phase before commencing the second movement phase. All of these functions must be incorporated in a relatively simple linkage, compact enough to fit within the body of the chair and be hidden from view when not in use.

An object of the present invention is to provide an improved reclining chair of the double movement type in which improved linkage means are provided for moving the seat and back-rest as a substantially unitary structure during the first movement phase and for increasing the included angle between the seat and back-rest during the second motion phase.

Another object of the invention is the provision of a chair of the character described in which a holding link is provided to maintain the seat and back-rest substantially unitary during the first movement phase. While holding links have been previously provided for this purpose, as shown in my U.S. Patent No. 3,157,431 issued on Nov. 17, 1964, such holding links were previously mounted on a movable portion of the control linkage so that they could move in an inactive manner during the second movement phase. In contrast, the holding link of the present invention is pivotally mounted on the support frame. This holding link arrangement produces flexibility of control of chair movement as well as independence of control of the seat and back-rest as explained in my pending U.S. patent application Ser. No. 565,272, which application shares some common features with this application.

A further object of the invention is the provision of an improved freely moving sequencing structure to insure proper operation of the chair at all times. This sequencing structure is formed as extensions of existing chair parts and avoids the usual cams and other parts which involve high opposing forces and the generation of high pressures which can result in jamming and/or excessive wear.

Summary of the invention

In accordance with the invention herein, there is provided a reclining chair including a seat and back-rest mounted by a control linkage on a support for inclining and reclining movement through first and second movement phases. The control linkage includes a front guide link pivotally connected to the seat and a rear guide link pivotally connected to the back-rest, with the guide links turning rearwardly during the first motion phase to move the seat and back-rest rearwardly. During the second movement phase, the front guide link is elevated to permit the seat to tilt to a reclined position and the back-rest turns about its pivotal mount with the rear guide link to increase the angle between the seat and back-rest. The control linkage also includes a bell crank pivotally mounted on the seat and movable during the second motion phase to effect tilting movement of the seat and back-rest relative to each other, and a holding link which prevents relative movement between the seat and back-rest during the first movement phase. Sequencing means are provided to prevent the front guide link from elevating during the first movement phase, said sequencing means including a flange carried by the front guide link and engaging a stop member during the first movement phase.

At the end of the first movement phase, the flange has turned clear of the stop member to permit upward movement of the front guide link and the forward portion of the seat.

Additional objects and advantages of the invention will become apparent during the course of the following specification when taken in connection with the accompanying drawings, in which:

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

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

FIG. 4 is an enlarged fragmentary elevational view showing in detail the sequencing structure of the chair in the upright sitting position of FIG. 1;

FIG. 5 is an enlarged fragmentary elevational view similar to FIG. 4, but showing the arrangement of the sequencing structure during the beginning of the first movement phase;

FIG. 6 is an enlarged fragmentary elevational view similar to FIG. 4, but showing the arrangement of the sequencing structure at the end of the first movement phase or in the intermediate position of FIG. 2; and

FIG. 7 is an enlarged section taken along line 7—7 of FIG. 1, showing the arrangement of the sequencing structure in the upright sitting position of the chair.

Referring in detail to the drawings and particularly to FIGS. 1–3, there is shown a reclining chair incorporating the present invention and including a support or stationary base frame **10** having opposite side walls **12** interconnected by suitable cross braces **14** mounted on high legs **16**.

The chair also includes body-supporting means **18** comprising a back-rest **20** and a seat **22** which are mounted on the support frame **10** for reclining and inclining movement respectively through a first movement phase from an upright position illustrated in FIG. 1, to an intermediate, tilted sitting position shown in FIG. 2, and through a second movement phase from the intermediate, tilted sitting position through a series of reclining positions to a fully-reclined or complete relaxation position, shown in FIG. 3.

Normally disposed beneath the forward end of the seat **22** is a leg-rest **24** formed of two hinged parts, namely a main leg-rest section **26** and an auxiliary leg-rest section or front extension **28**. The leg-rest **24** is mounted by a control linkage on the forward end portion of the seat **22** for movement between a retracted position shown in FIG. 1 and an extended leg-supporting position shown in FIGS. 2 and 3. As will be described, the leg-rest **24** is coordinated to the back-rest **20** and seat **22** for movement into an elevated leg-supporting position in response to the first movement phase of the chair, with the leg-rest remaining substantially in the elevated leg-supporting position as the chair moves from the intermediate, tilted sitting position of FIG. 2 to the fully-reclined position of FIG. 3.

Movement of the seat, back-rest and leg-rest, relative to the stationary support frame **10** and relative to each other, is achieved by means of a pair of identical metal fixtures secured at opposite sides of the chair of the side frames **12** and including mounting members or brackets affixed to the various chair parts and interconnected linkages for providing the leg-rest movement, seat movement and back-rest movement. For convenience of illustration, only one fixture is shown herein and the description thereof will apply identically to the opposite fixture. The fixture shown in FIGS. 1–3 includes a metal seat frame **30** which supports the upholstered seat **22**. Immovably secured by rivets **34** to the front portion of seat frame **30** and depending therefrom is a front seat mounting bracket **32**. Similarly secured by rivets **36** to the rear portion of the seat frame **30** is a rear seat bracket **38** which has an upwardly curved rear end portion which projects beyond the rear end of the mounted seat and is connected by pivot **40** to a back-rest mounting bracket **42**. The bracket **42** is secured to the back-rest **20** by bolts or rivets **44** and has a lower end which extends downwardly beyond the lower end of the back-rest **20** and serves as a rigid depending extension thereof.

The fixture also includes a support plate **46** secured by bolts or rivets **48** to the respective side frame **12** so that the support plate **46** constitutes a rigid and immovable portion of the support frame **10** about which the other fixture portions move. Mounted by pivot **52** on the stationary support plate **46** is a rear guide link **54**, the opposite end of which is connected by pivot **56** to the back-rest mounting bracket **42**.

The lower end of the back-rest mounting bracket **42** is connected by pivot **58** to a second movement control link **60** which extends forwardly to a pivotal connection **62** with a bell crank **64**. This bell crank **64** extends upwardly and rearwardly from the pivot **62** and has an arm connected by pivot **66** to a mid guide link or holding link **68**, the lower end of which is mounted by a stationary pivot **70** on the support plate **46**. The bell crank has an intermediate arm located between pivots **62** and **66**, which arm is connected by pivot **72** to the forward end on the rear seat bracket **38**.

Connected by pivot **74** to the front seat mounting bracket **32** is a front guide link **76** which, as shown in the drawings, is in the form of a wide plate. Intermediate its ends, the front guide link **76** is connected by pivot **78** to the forward end of a carrier link assembly **80** which comprises a front bracket **82** connected by an elongated rod **84** to a rear bracket **86**. The rear bracket **86** of the carrier link assembly **80** is mounted by stationary pivot **88** on the support plate **46**.

The fixture parts heretofore described constitute a linkage sub-assembly which guides and controls the movement of the seat and back-rest relative to the support frame during both the first and second movement phases. The front guide link **76**, however, also serves as the drive member for the leg-rest mounting linkage, as will be presently described.

The leg-rest **24** is mounted by a control linkage **90** on the forward end of the seat **22** for movement between the retracted position shown in FIG. 1 and the extended positions shown in FIGS. 2 and 3. The control linkage **90** includes a pair of supporting links **92** and **94** mounted on the seat, and a pair of leg-rest links **96** and **98** connected to the leg-rest **24**. Specifically, the supporting links **92** and **94** are mounted at spaced points on the front seat mounting bracket **32** by respective pivots **100** and **102**. The opposite end of the supporting link **94** is connected by pivot **104** to the end of leg-rest link **98**. The lower end of supporting link **92** is connected by pivot **106** to an intermediate portion of the leg-rest link **98**. The rear end of the leg-rest link **96** is connected by pivot **108** to the supporting link **92** at a point spaced slightly inwardly of the pivot **106**, and its forward end is connected by pivot **110** to the main leg-rest section **26**. The forward end of leg-rest **98** is connected by pivot **112** to the leg-rest main section **26**, the pivot **112** being spaced from the pivot **110**.

The auxiliary leg-rest section **28** is connected by pivot **114** to the main leg-rest section **26**. The leg-rest link **96** has an extension portion **96***a* projecting beyond the pivot **110**, and the end of this extension portion **96***a* is connected by pivot **116** to a connecting link **118**, the opposite

end of which is connected by pivot **120** to the auxiliary leg-rest section **28**.

As previously indicated, the front guide link **76** also serves as the drive means for the leg-rest mounting linkage **90**, such that when the front guide link turns during the first motion phase, it causes the mounting linkage **90** to expand and elevate and extend the leg-rest from the retracted position of FIG. 1 to the extended position of FIG. 2. For this purpose, one end of an actuating link **122** is mounted by pivot **124** to the lower end of the front guide link **76**, while the opposite end of link **122** is connected by pivot **126** to an intermediate portion of the leg-rest supporting link **92**.

Because of the pivot **40** interconnecting the seat **22** and back-rest **20**, the seat and back-rest can turn relative to each other so that the angle therebetween is varied during the chair movement. In double movement chairs of this type, however, it is desirable that there be little or no relative movement between the back-rest and seat during the first movement phase so that the intermediate, tilted sitting position of FIG. 2 is established with substantially no change in the angular relationship between the back-rest and seat, except for small adjustments which may be made in the included angle therebetween as may be required for balance and/or for establishing a more comfortable attitude in such intermediate, tilted sitting position. If the seat **22** and the back-rest **20** were connected together as a rigid integral unit, the movement of such an integral unit during the first movement phase would be guided and directed by the simultaneous rearward turning movements of the front guide link **76** and the rear guide link **54** about their respective pivotal mounts. In the chair shown herein, provision is made for precluding appreciable relative movement between the back-rest **20** and the seat **22** during the first movement phase. This is accomplished by means of the mid guide link **68** which acts as a holding link.

During the first movement phase, the body supporting means **18** is guided by two links, namely the front guiding link **76** and the rear guiding link **54**, with the mid guide link **68** positioned and pivotally connected to the linkage in such a manner that it serves substantially the same function as a stop between the seat and back-rest to effectively maintain a rigid relationship therebetween. Thus the pivot point **66** is guided by the mid guide link **68** to move through substantially the same path that it would follow if the seat **22** and back-rest **20** were rigid with each other. The mid guide link **68** may therefore be made of such a length that it maintains an absolutely rigid relationship between the moving seat and back-rest during the first motion phase, or its length may be adjusted to vary the angular relationship between the seat and back-rest slightly in accordance with the requirements of chair balance and comfort. The function and operation of such holding links generally, is more fully described in my prior U.S. Patent No. 3,157,431. The holding links disclosed therein, however, differ from the link **68** herein in that they are mounted on a movable portion of the chair linkage rather than mounted by a fixed pivot on the support.

The front bracket **82** of the carrier link assembly **80** has a lower perpendicular flange **128** which, in the upright sitting position of the chair, rests upon a stop member **130** affixed to and projecting from the forward end of the support plate **46** as can be best seen in FIGS. 4 and 7. The carrier link rod **84** is therefore supported immovably in a substantially horizontal position between its fixed pivot **88** at one end and the stop member **130** at the other end. The front guide link is inclined forwardly in an almost horizontal direction from its pivotal mount **78** on the stationary carrier link bracket **82** to its pivotal connection **74** with the front seat mounting bracket **32**. The front end of the seat **22** therefore supported upon the stop member **130** through bracket **32**, front guide link **76** and bracket **82**.

In the upright sitting position of FIG. 1, the mid guide link **68** is inclined forwardly from its lower fixed pivotal mount **70** to its pivotal connection **66** with the bell crank **64**, while the rear guide link **54** is in a substantially vertical position. The seat **22** is substantially level and the back-rest **20** is substantially upright in a normal sitting position.

During the first movement phase, the seat **22** and back-rest **20** are moved together as a unit in a substantially horizontal rearward path relative to the support frame **10**. In this movement phase, the seat and back-rest are guided by the rearward pivoting movement of the front guide link **76** about its pivotal mount **78** and by the rearward turning movement of the rear guide link **54** about its fixed pivot **52**. The carrier link assembly **80** remains immovable in horizontal position during this first movement phase, with the front bracket flange **128** resting upon stop member **130**, so that the pivotal mount **78** of the front guide link **76** upon the carrier link front bracket **82** remains stationary. A sequencing arrangement is provided, as will be presently described in detail, to insure that the carrier link assembly **80** does not turn upwardly about its rear pivotal mount **88** during this first movement phase.

In the course of the first movement phase, the mid guide link **68** turns rearwardly about its fixed pivot **70**, serving as a holding link which maintains the desired rigid relationship between the seat and back-rest, which move rearwardly as a unit. As previously indicated, the mid guide link **68** is sized and arranged to follow the movement of the seat and back-rest provided by the front and rear guide links **76** and **54**, and in turning rearwardly about its pivot **70** it guides both the rear portion of the seat **22** and the front portion of the back-rest **20** along the same path of movement. The mid guide link also carries the second movement linkage rearwardly with the seat and back-rest without relative movement of the links thereof. That is to say, during the first motion phase the rear seat, mounting bracket **38**, back-rest mounting bracket **42**, second movement control link **60**, and bell crank **64** move rearwardly together without change in the angular relationships, guided by the mid guide link **68** and the rear guide link **54**.

During the first movement phase, the leg-rest **24** is elevated and extended from its retracted position shown in FIG. 1 to its extended position shown in FIG. 2. As the front guide link **76** turns about its stationary pivot **78**, its lower end portion moves forwardly, urging actuating link **122** in a forward direction. Link **122** in turn causes supporting link **92** to turn forwardly about its pivot **100**, thereby extending the leg-rest control linkage **90** in the manner shown in FIG. 2.

During the extension of the leg-rest control linkage **90**, the leg-rest link **96** turns about its pivotal connection **110** with the main leg-rest section **26**, and its extension **96***a* moves connecting link **118** in such a manner that the latter causes the auxiliary leg-rest section **28** to turn rapidly about its pivotal connection **114** with the main-leg rest section **26**. Thus, while the main section **26** is turned through an angle of approximately 90° from its vertical position of FIG. 1 to the extended horizontal position of FIG. 2, the auxiliary section **28** is turned through an angle of approximately 180° from its inverted, horizontal, underslung position of FIG. 1 to its extended position of FIG. 2. In the extended position, the two leg-rest sections **26** and **28** are in planar alignment, and together make up the completed leg-rest **24**, which is of sufficient length to provide adequate support for the occupant's legs.

Provision is made for blocking relative movement between the front guide link **76** and the seat **22** to define the end of the first movement phase. Specifically, the front guide link **76** carries a laterally-projecting stop **132** which, when the leg-rest is in the fully extended position of FIG. 2, engages a notch **134** in the lower surface of the front seat mounting bracket **32**. This engagement

stops further rearward turning movement of the front guide link **76** about its pivotal mount **78** and halts further movement of the chair parts in the first movement phase, defining the intermediate, tilted sitting position. The chair is now free to move in the second movement phase, instituted by upward turning movement of the carrier link assembly **80** about the fixed pivot **88**.

As previously indicated, sequencing means are provided to insure that the chair in the upright position of FIG. 1 will first move through and complete the first movement phase, guided by turning movement of the front guide link **76** and rear guide link **54**, before it can move through the second movement phase by means of the upward turning movement of the carrier link assembly. This sequencing means comprises a sequence link in the nature of a flat plate or flange **136** secured to and extending perpendicularly from the front guide link **76** toward the support plate **46** as shown in FIG. 7. This flange **136** cooperates with the stop member **130** on the support plate **46** to perform the sequencing function. FIGS. 4 to 6 show successive positions of the sequencing flange **136** during the first movement phase. FIG. 4 shows the parts in the upright sitting position of FIG. 1, the flange **136** being disposed in a horizontal position and located directly beneath and in contact with the stop member **130**. The stop member **130** is thus in effect sandwiched between the flange **136** and the flange **128** of bracket **82**. In order for the carrier link assembly **80** to turn upwardly about its fixed pivot **88**, it would necessarily carry upwardly with it the connected front guide link **76** and the forward end of the seat **22**. However, the front guide link **76** is restrained from moving upwardly because of the engagement of its rigidly mounted sequencing flange **136** with the under surface of the stop member **130**, and the carrier link assembly is therefore effectively held in its horizontal position.

As the front guide link **76** turns about its pivotal mount **78** during the first movement phase, its sequencing flange **136** rotates about pivot **78** and thus turns around the adjacent stop member **130**. During this turning movement, the flange **136** is almost in continuous contact with the underside of the stop member **130**. FIG. 5 illustrates a successive position of the flange **136** during the first movement phase, in which will be seen that the flange **136** still underlies the stop member **130** and is effective in preventing the carrier link assembly from turning upwardly. FIG 6 illustrates the intermediate, tilted sitting position of the chair at the end of the first movement phase. It will be seen in this view that the sequence flange **136** has been turned by the front guide link **76** from its original horizontal position of FIG. 4 to a vertical position in which it is entirely clear of the stop member **130**. Thus, at the end of the first movement phase, the front guide link and its pivotal mount **78** are freed to move vertically upward, so that the carrier link assembly **80** is also freed to turn upwardly about the pivotal mount **88** and the second movement phase can be initiated.

In commercial practice, the stop member **130** is made in the form of a nylon roller so that the sequence flange **136** may turn freely with a minimum of friction if the flange is forced into hard contact with said stop member.

It should be also noted that the sequence flange prevents closing up of the leg-rest linkage until after the chair has been returned to the intermediate, tilted sitting position. FIGS. 3 and 6 show that the flange **136** is of a length which allows it to contact the stop member **130** if the leg-rest linkage would tend to close up in the fully reclined position of FIG. 3. Consequently, the chair must be moved to the intermediate, tilted sitting position so that the sequence flange **136** can clear the stop **130** as shown in FIG. 6

During the second movement phase, the carrier link assembly **80** turns about its pivotal mount **88** on the support plate **46**, causing movement of the seat **22** and back-rest **20** to the fully reclined position of FIG. 3. As the forward end of the carrier link assembly **80** moves upwardly, its front bracket **82** is lifted from the stop member **130**, and it elevates the connected front guide link **76** which is now maintained in an immovable position by virtue of engagement of the stop **132** with the notch **134**. Since the front guide link **76** is maintained in this rigid attitude, the leg-rest control linkage **90** is merely elevated with the forward portion of the seat in a constant and immovable attitude, without further extension of the leg-rest. Throughout the second movement phase and in the fully-reclined position of FIG. 3, therefore, the leg-rest is maintained at the same extended position relative to the forward end of the seat **22** that it had in the intermediate, tilted sitting position of FIG. 2.

The second movement phase is accomplished by pressure being exerted on the back-rest **20**. This rearward pressure on the back-rest **20** is transmitted through the rigidly connected back-rest mounting bracket **42** and the second movement control link **60**. The force in the link **60** is in the forward direction and causes the bell crank **64** to rotate clockwise as viewed in FIG. 2 about its pivot **66** on the mid-guide link **68**. This pivot **66** serves as a relatively stationary supporting mount for the bell crank **64** during the second movement phase. The clockwise rotation of the bell crank **64** carries the seat upwardly through the pivotal connection **72**. The upward movement of the seat carries the front guide link **76** and the front end of the carrier link assembly **80** in an upward direction also.

The effect of the aforementioned action is to raise the seat with an inclining movement through its pivotal connections **40** to the back-rest and **72** to the bell crank. At the same time, the back-rest **20** is reclined to open up the included angle between seat and back-rest. The pivot **66** of the mid-guide link **68**, the carrier link pivot **88** and the rear guide link pivot **56** serve as support pivots for the second movement linkage. As the back-rest turns rearwardly, the control link **60** moves forwardly and upwardly until it contacts the pin forming the pivot **72** between the bell crank **64** and rear seat bracket **38**. This contact between the control link **60** and the pin at **72** limits further movement of the chair parts to establish the end of the second movement phase when the chair has reached the fully-reclined position shown in FIG. 3.

In operation, when the chair occupant is seated in the chair and exerts rearward pressure with his body upon the seat and back-rest, the front guide link **76** and rear guide link **54** simultaneously turn rearwardly about their respective pivotal mounts **78** and **52** and carry the seat **22** and back-rest **20** as a rigidly coupled unit in a substantially horizontal path through the first motion phase. This movement continues until the front guide link stop member **132** engages the notch **134** in the front seat mounting bracket **32** and locks the extended leg-rest linkage **90** and front guide link **76** from further movement.

When the occupant of the chair in the intermediate, tilted sitting position of FIG. 2 wishes to assume a more relaxed attitude, he initiates the second movement phase by applying his weight rearwardly against back-rest **20**. Since the carrier link assembly **80** is now released by the sequencing link **136**, it can now turn upwardly about its pivotal mount **88**, allowing the seat **22** to move upwardly when the second movement linkage is actuated by turning rearward movement of the back-rest **20** relative to the seat **22** in such a manner as to increase the included angle therebetween. The second movement may be continued until the second movement control link **60** engages the pin **72**, at which point the chair is in the fully reclined position of FIG. 3.

When the chair occupant desires to restore the chair to the upright position of FIG. 1, he leans forwardly and exerts downward pressure on the leg-rest, so that the back-rest, seat and leg-rest move through the reverse sequence, with the chair first moving into the intermedi-

ate, tilted position of FIG. 2 and then returning to the upright sitting position illustrated in FIG. 1.

While a preferred embodiment of the invention has been shown and described herein, it is obvious that numerous omissions, changes and additions may be made in such embodiment without departing from the spirit and scope of the invention.

What is claimed is:

1. A reclining chair comprising a support, body supporting means including a seat and back-rest mounted on said support for inclining and reclining movement respectively, means pivotally connecting said seat and back-rest, a control linkage operatively connected between said support and said body supporting means and providing respective first and second paths of movement for said body supporting means during first and second movement phases, said control linkage including front guide means having a pivotal mount, means supporting said pivotal mount immovably adjacent the forward portion of said support during the first movement phase, said front guide means being pivotally connected to the forward end portion of said seat, rear guide means pivotally mounted on the support and pivotally connected to said back-rest, a bell crank pivotally mounted on said seat at a first pivot point, a holding link pivotally mounted on said support and pivotally connected to said bell crank at a second pivot point spaced rearwardly from said first pivot point, a second movement control link pivotally connected to said back-rest and connected to said bell crank at a third pivot point spaced forwardly of said first pivot point, said front and rear guide means and said holding link moving said seat and back-rest rearwardly together during said first movement phase and maintaining a substantially rigid relationship between said seat and back-rest, and said bell crank and second movement control link maintaining a substantially fixed angular relationship with each other and with said body supporting means, said bell crank turning relative to said support, said seat turning about its pivotal connection with said back-rest, and said back-rest turning about its pivotal connection with said rear guide means during said second movement phase to progressively increase the angular relationship between said seat and back-rest.

2. A reclining chair according to claim 1, in which the means supporting the pivotal mount of the front guide means includes a carrier member pivotally mounted on said support, said front guide means comprising a front guide link pivotally mounted on the forward end of said carrier member, said rear guide members comprising a rear guide link, said bell crank being pivotally mounted intermediate its ends on said seat and pivotally connected at one end to said holding link and at its other end to the second movement control link, said carrier member remaining stationary relative to the support during the first movement phase, and moving relative to the support during the second movement phase.

3. A reclining chair according to claim 2 in which said seat and the bell crank mounted thereon are moved upwardly with said carrier member during the second movement phase, said holding link serving as a pivotal support for said bell crank at its connected end therewith, and said bell crank turning about its pivotal mount on said seat, said bell crank being moved by said second movement control link to effect turning movement of said back-rest relative to said seat.

4. A reclining chair according to claim 2 which also includes a leg-rest, and a leg-rest linkage mounting said leg-rest on said seat for movement from a retracted position to an extended position during said first motion phase, said front guide link having a free end portion extending beyond its pivotal mount on said carrier member, and actuating link means connecting said front guide link free end portion to said leg-rest mounting linkage for movement of said leg-rest to its extended position in response to turning movement of said front guide link during said first motion phase.

5. A reclining chair according to claim 4 in which stop means are provided between said front guide link and said support for restraining further pivoting rearward movement of said front guide link at the end of said first movement phase with the leg-rest in extended position.

6. A reclining chair according to claim 4 which also includes sequencing means for limiting initial movement of said seat and back-rest in the first movement phase to said first path of movement provided by rearward turning movement of said front and rear guide links, said sequencing means comprising a fixed projection on said support, and a laterally-projecting flange on said front guide link, said flange being movable with said front guide link from a substantially horizontal position directly beneath said projection at the start of said first movement phase, to a substantially vertical position adjacent to and clear of said projection at the end of said first movement phase, whereby said guide link, at the vertical position of said flange is freed to move upwardly with said seat during the second movement phase.

7. A reclining chair of the multiple movement type comprising a support, body supporting means including a seat and back-rest mounted on said support for movement in a first phase along a first path from an upright sitting position to an intermediate, tilted sitting position and for further movement in a second movement phase along a second path from said intermediate position to a fully-reclined position, a link pivotally connected to said seat for turning movement about a pivotal connection during said first movement phase, and for upward translation with said seat during said second movement phase, and sequencing means to restrain upward translation of said link during said first motion phase, said sequencing means comprising a laterally projecting flange on said link and a stop member on said support, said flange being arranged for disposition in a substantially horizontal position proximate to said stop member and underlying the same in said upright, sitting position, whereby to block upward translation of said link, said flange turning with said link and revolving around said stop member during said first movement phase to a release position at the end of said first movement phase in which said flange is substantially vertically disposed adjacent one side of said stop member, whereby said link and seat are freed for upward movement during the second movement phase.

8. A reclining chair according to claim 7 which also includes carrier means movably mounted on said support, and in which said link comprises a front guide link pivotally mounted on said carrier means and pivotally connected to said seat, said guide link turning upon said carrier means during said first movement phase and being movable upwardly with said seat and said carrier means during said second movement phase.

9. A reclining chair according to claim 8 in which said carrier means includes a carrier member pivoted to said support, said stop member also supporting said carrier member in a stationary position during said first movement phase.

10. A reclining chair according to claim 9 which also includes a rear guide link pivotally mounted on the support and pivotally connected to said back-rest, a pivotal connection between said seat and said back-rest, a bell crank pivotally mounted on said seat, a holding link pivotally mounted on said support and pivotally connected to said bell crank, and a second movement control link pivotally connected to said back-rest and to said bell crank, said bell crank and second movement control link maintaining a substantially fixed angular relationship with each other and with said body supporting means during said first movement phase, said bell crank turning relative to said support, said seat turning about its pivotal connection with said back-rest, and said back-rest

turning about its pivotal connection with said rear guide link during said second movement phase to progressively increase the angular relationship between said seat and back-rest.

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