Feb. 23, 1960 A. LORENZ 2,925,852

ARTICLE OF REPOSE FOR SUPPORTING THE BODY OF A PERSON

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Fig. 1.

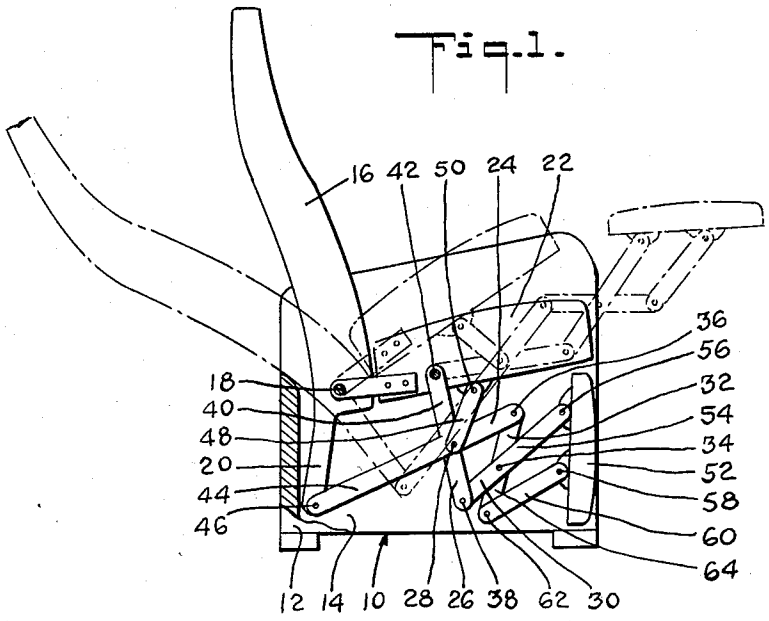

Fig. 2.

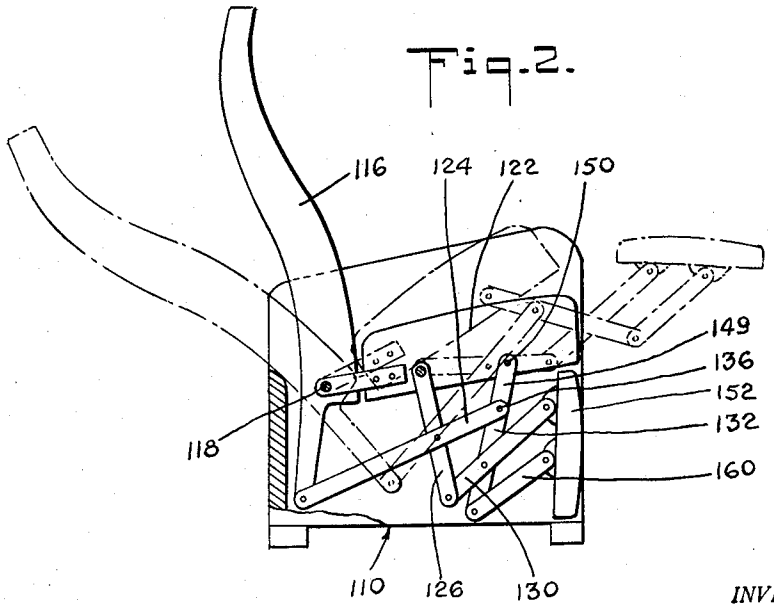

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Fig. 3.

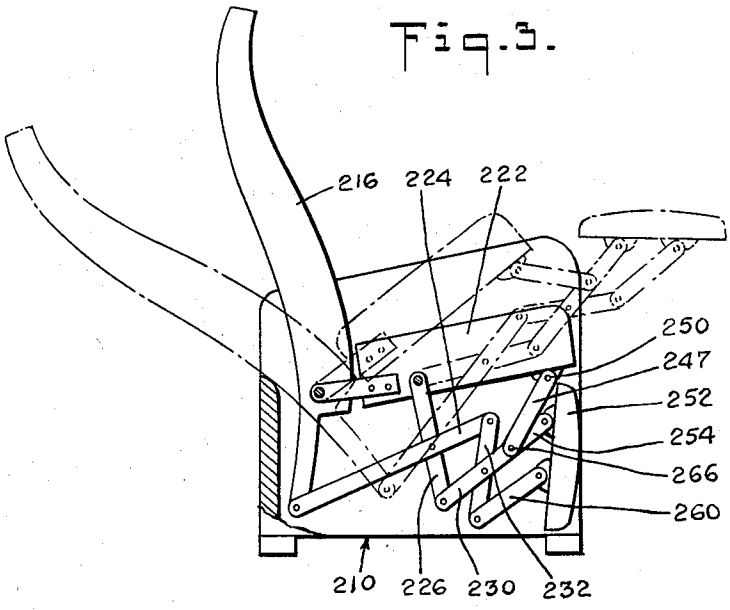
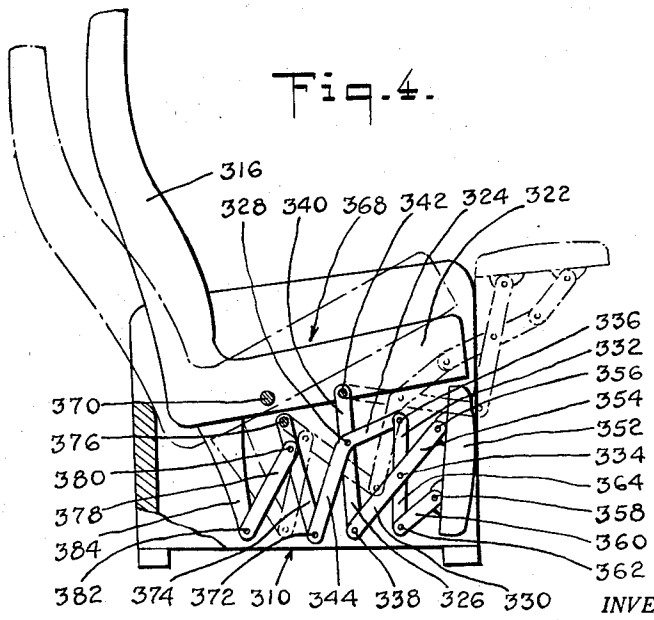


Fig. 4.



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ARTICLE OF REPOSE FOR SUPPORTING THE BODY OF A PERSON

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Fig. 5.

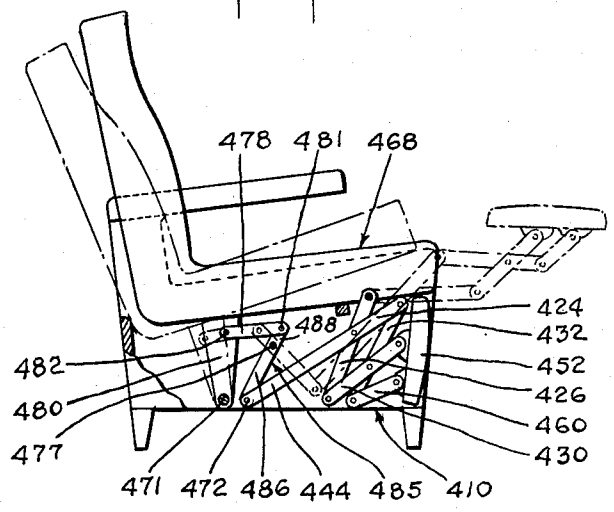
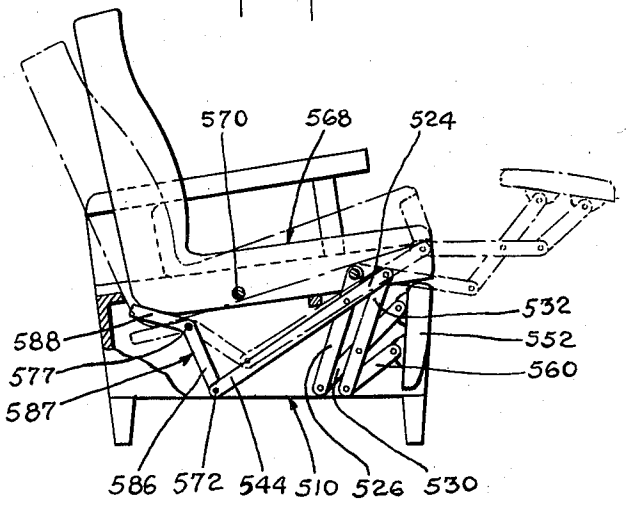


Fig. 6.



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United States Patent Office 2,925,852
Patented Feb. 23, 1960

2,925,852

ARTICLE OF REPOSE FOR SUPPORTING THE BODY OF A PERSON

Anton Lorenz, Boynton Beach, Fla.

Application November 5, 1954, Serial No. 466,993

7 Claims. (Cl. 155—106)

This invention relates to articles of furniture and more particularly to articles of repose for supporting the body of a person wherein a movable back-rest, seat and leg-rest may be brought from a sitting position into a reclined position and vice versa.

An object of the invention is to provide an article of repose of above described type wherein the movements of the movable members from one position into another one may be obtained with ease.

Another object of the invention is to improve on the construction of articles of repose as now customarily made.

Other objects and structural details of the invention will be apparent from the following description when read in conjunction with the accompanying drawings forming part of this specification, wherein:

Fig. 1 is a side elevational view of a reclining armchair according to the invention, a portion of a side wall being broken away,

Fig. 2 is a side elevational view of another embodiment of a reclining armchair according to the invention, a portion of a side wall being broken away,

Fig. 3 is a side elevational view of a further embodiment of a reclining armchair according to the invention, a portion of a side wall being broken away,

Fig. 4 is a side elevational view of still another embodiment of a reclining armchair according to the invention, a portion of a side wall being broken away,

Fig. 5 is a side elevational view of a further embodiment of a reclining armchair according to the invention, a portion of a side wall being broken away, and

Fig. 6 is a side elevational view of still a further embodiment of a reclining armchair according to the invention, a portion of a side wall being broken away.

Referring now to Fig. 1, **10** generally indicates a support having side walls **12** and **14** connected with each other in a suitable manner.

A back-rest **16** is swingably mounted on the support **10** at **18**. The back-rest **16** has a downward extension **20** rigid therewith.

A seat **22** is swingably mounted on the support **10** at **18** in coaxial alignment with the pivotal connection of the back-rest **16** with the support **10**.

There is a first pair of links **24, 26** pivotally connected with each other at **28** and there is a second pair of links **30, 32** pivotally connected with each other at **34**. Said two pairs of links **24, 26** and **32** are pivotally connected with each other at **36** and **38** so as to form a mechanism commonly known as lazy tongs. One rear arm **40** of said lazy tongs **24, 26, 30, 32** is swingably mounted on the support **10** at **42**. The other rear arm **44** of said lazy tongs **24, 26, 30, 32** is pivoted to the downward extension **20** of the back-rest **16** at **46**. Thus, the movements of the links of the lazy tongs **24, 26, 30, 32** are controlled by and coordinated with the swinging movements of the back-rest **16** about its pivot **18** on the support **10**.

The movements of the seat **22** are coordinated with

the movements of the lazy tongs **24, 26, 30, 32** and thus with the movements of the back-rest **16** by means of a link **48** pivoted at **50** to the seat **22** and pivoted at **28** to the link **40** of the lazy tongs **24, 26, 30, 32** in coaxial alignment with the pivot between the links **24** and **26** of said lazy tongs.

A leg-rest **52** is swingably mounted on one front arm **54** of the lazy tongs **24, 26, 30, 32** at **56**. Furthermore, said leg-rest **52** is pivoted at **58** to one end of a link **60**, the other end of which is pivoted at **62** to the other front arm **64** of the lazy tongs **24, 26, 30, 32**.

When a person resting on the chair leans the weight of his body against the back-rest **16** for swinging same from its upright position shown in full lines into a reclined position shown in dash and dot lines, the seat **22** is swung about its pivot **18** into the reclined position shown in dash and dot lines and the front arms **54, 64** of the lazy tongs **24, 26, 30, 32** are propelled forwardly and upwardly into the position shown in dash and dot lines. At the same time the leg-rest **52** is swung about its pivot **56** on the front arm **54** of the lazy tongs **24, 26, 30, 32** by means of the link **60** into the position shown in dash and dot lines.

According to the embodiment shown in Fig. 2, the arrangement of the back-rest **116**, the seat **122**, the lazy tongs **124, 126, 130, 132**, the leg-rest **152** and the controlling link **160** and their connections with each other and with the support **110** respectively are substantially the same as that of the embodiment shown in Fig. 1.

However according to Fig. 2 the link **132** of the lazy tongs **124, 126, 130, 132**, pivoted to the link **124** of said lazy tongs at **136**, has an upward extension **149** rigid therewith and pivoted to the seat **122** at **150**. Said extension **149** controls the movements of the seat **122** about its pivot **118** on the support **110**.

Thus, a swinging movement of the back-rest **116** about its pivot **118** into the reclined position shown in dash and dot lines causes also coordinated movements of the seat **122** and the leg-rest **152** into the position shown in dash and dot lines.

According to the embodiment shown in Fig. 3, again the arrangement of the back-rest **216**, the seat **222**, the lazy tongs **224, 226, 230, 232**, the leg-rest **252** and the controlling link **260** and their connections with each other and with the support **210** respectively are substantially the same as that shown in Fig. 1.

However according to Fig. 3, the link **247** controlling the seat **222** is pivoted to the seat **222** at **250** and to the front arm **254** of the lazy tongs **224, 226, 230, 232** at **266**.

The sitting position of the movable members of the chair is shown in full lines and the reclined position of said movable members is shown in dash and dot lines.

According to the embodiment shown in Fig. 4, the back-rest **316** and seat **322** are rigid with each other so as to form a unit **368** swingably mounted on the support **310** at **370**.

The lazy tongs are formed by the links **324, 326, 330, 332** pivotally jointed with each other at **328, 334, 336, 338**. One rear arm **340** of said lazy tongs **324, 326, 330, 332** is swingably mounted on the support **310** at **342**. The other rear arm **344** of said lazy tongs **324, 326, 330, 332** is pivoted at **372** to an arm **374** swingably mounted on the support **310** at **376**. One end of a link **378** is pivoted to an intermediate point of the arm **374** at **380**. The other end of said link **378** is pivoted at **382** to a downward extension **384** rigid with the unit **368**.

The leg-rest **352** is swingably mounted on one front arm **354** of the lazy tongs **324, 326, 330, 332** at **356**. Furthermore said leg-rest **352** is pivoted at **358** to one end of a link **360**, the other end of which is pivoted at **362** to the other front arm **364** of the lazy tongs **324, 326, 330, 332**.

When the unit 368 is swung about its pivot 370 from the sitting position shown in full lines into the reclined position shown in dash and dot lines, the leg-rest 352 controlled by the mechanism of the lazy tongs 324, 326, 330, 332 is propelled forwardly and swung about its pivot 356 into the position shown in dash and dot lines.

According to the embodiment shown in Fig. 5, the downward extension 480 of the seat-back-rest unit 468 is swingably mounted on the support 410 at 471.

The arrangement of the lazy tongs 424, 426, 430, 432, the leg-rest 452 and the controlling link 460 and their connections with each other and with the support 410 respectively is substantially the same as that shown in Fig. 4.

However the rear arm 444 of the lazy tongs 424, 426, 430, 432 is pivoted at 472 to one arm 486 of a double-armed lever 485 swingably mounted on the support 410 at 477. The other arm 488 of said double-armed lever 485 is pivoted at 481 to one end of a link 478, the other end of which is pivoted at 482 to the downward extension 480.

Upon a movement of the unit 468 from the sitting position shown in full lines into the reclined position shown in dash and dot lines, the leg-rest 452 is brought into the position shown in dash and dot lines by means of the mechanism described above.

According to Fig. 6, the back-rest-seat unit 568 is swingably mounted on the support 510 at 570.

The arrangement of the lazy tons 524, 526, 530, 532, the leg-rest 552 and the controlling link 560 and their connections with each other and with the support 510 respectively are substantially the same as that shown in Fig. 5.

However the rear arm 544 of the lazy tongs 524, 526, 530, 532 is pivoted at 572 to one arm 586 of a bell-crank lever 587 swingably mounted on the support 510 at 577. The other arm 588 of said bell-crank lever 587 is in slidable and disengageable engagement with the unit 568.

Thus, upon a swinging movement of the unit 568 about the pivot 570 into the reclined position shown in dash and dot lines, the leg-rest 552 is automatically brought into the position shown in dash and dot lines by means of the mechanism described above. Owing to the disengageable engagement between the arm 588 of the bell-crank lever 587 and the unit 568, it is however possible to bring the leg-rest 552 from the position shown in full lines into any desired other position without moving the back-rest-seat unit 568. Preferably locking mechanisms (not shown) are arranged for holding the unit 568 in a desired position during an independent movement of the leg-rest 252 and for holding the leg-rest 552 in any desired position relative to the unit 568.

In all of the embodiments shown in the drawings means may be arranged for limiting the sitting position and the extreme reclined position of the back-rest and seat or the back-rest-seat unit respectively.

Furthermore, in all of the embodiments shown in the drawings, locking means may be arranged for holding the movable members of the chair in any desired position.

I have described preferred embodiments of my invention, but it is understood that this disclosure is for the purpose of illustration and that various omissions or changes in shape, proportion and arrangement of parts, as well as the substitution of equivalent elements for those herein shown and described, may be made without departing from the spirit and scope of the invention as set forth in the appended claims.

What I claim is:

1. In an adjustable reclining chair comprising body-supporting means including a seat and a back-rest rockably mounted on a support for movement between an upright sitting position and a rearwardly-tilted reclining position, and a leg-rest, a control linkage for moving said leg-rest from a retracted position beneath the seat to an extended position substantially at the level of and forwardly of said seat, said control linkage comprising a first and second link crossing each other and pivotally connected at their crossing point, a third and fourth link crossing each other and pivotally connected at their crossing point, the second link being connected to the third link and the first link being connected to the fourth link to form a lazy tong linkage, the free end of the first link being pivotally connected to the support and the free end of the second link being operatively connected to the body supporting means, the free end of the fourth link being pivotally connected to said leg-rest, and a connecting link pivotally connected at one end to the free end of the third link and at the other end to said leg-rest.

2. In an adjustable reclining chair comprising body-supporting means including a seat and a back-rest rockably mounted on a support for movement between an upright sitting position and a rearwardly-tilted reclining position, and a leg-rest, a control linkage for moving said leg-rest from a retracted position beneath the seat to an extended position substantially at the level of and forwardly of said seat, said control linkage comprising a first and second link crossing each other and pivotally connected at their crossing point, a third and fourth link crossing each other and pivotally connected at their crossing point, the second link being connected to the third link and the first link being connected to the fourth link to form a lazy tong linkage, the free end of the first link being pivotally connected to the support, the back-rest having a depending extension, the free end of the second link being operatively connected to said back-rest extension, the free end of the fourth link being pivotally connected to said leg-rest, and a connecting link pivotally connected at one end to the free end of the third link and at the other end to said leg-rest, the free end of said second link being movable upwardly and forwardly by said back-rest extension toward the point of connection between the first link and said support when said back-rest is moved to its rearwardly-tilted position whereby to expand said lazy tong linkage and raise said leg-rest to its extended position.

3. In an adjustable reclining chair comprising body-supporting means including a seat and a back-rest rockably mounted on a support for independent movement between an upright sitting position and a rearwardly-tilted reclining position, and a leg-rest, a control linkage for moving said leg-rest from a retracted position beneath the seat to an extended position substantially at the level of and forwardly of said seat, said control linkage comprising a first and second link crossing each other and pivotally connected at their crossing point, a third and fourth link crossing each other and pivotally connected at their crossing point, the second link being connected to the third link and the first link being connected to the fourth link to form a lazy tong linkage, the free end of the first link being pivotally connected to the support, the back-rest having a rigid depending extension, the free end of the second link being operatively connected to said back-rest extension, the free end of the fourth link being pivotally connected to said leg-rest, and a connecting link pivotally connected at one end to the free end of the third link and at the other end to said leg-rest, the free end of said second link being movable upwardly and forwardly by said back-rest extension toward the point of connection between the first link and said support when said back-rest is moved to its rearwardly-tilted position whereby to expand said lazy tong linkage and raise said leg-rest to its extended position, and means coupling the forward end of said seat with said control linkage for raising said seat in response to rearward tilting movement of said back-rest.

4. A reclining chair comprising a support, a body-supporting structure and including a seat and a back-rest mounted on said support for tilting movement, a leg-rest, a leg-rest control linkage carrying said leg-rest and

adapted to guide said leg-rest in a selected path between a retracted position beneath the seat and an extended position forwardly of the seat, and a constrained linkage for actuating said leg-rest control linkage in response to tilting movement of said body-supporting structure, said constrained linkage including an arm and a first link pivotally mounted at spaced points on the support, a second link pivotally connected at spaced points to said arm and first link, and the portion of the support between the pivotal mounts of the arm and first link on the support as the fixed link of the constrained linkage, said arm being operatively coupled to the body-supporting structure for movement of the constrained linkage in response to tilting movement of the body-supporting structure, said leg-rest control linkage including an extension of said first link, an extension of said second link, a third link pivotally connected to the end of said second link, a fourth link pivotally connected to the end of said first link, said third and fourth links crossing each other and being pivotally connected at their crossing-over points, the free end of the fourth link being connected to said leg-rest, and a further link connecting the free end of the third link to a point on the leg-rest spaced from the pivotal connection of the fourth link thereto, the first, second, third and fourth links forming a closed quadrilateral linkage bounded by the pivotal connections of said four links to each other.

5. A reclining chair comprising a support, a body-supporting structure including a seat and a back-rest mounted on said support for tilting movement, a leg-rest, a leg-rest control linkage carrying said leg-rest and adapted to guide said leg-rest in a selected path between a retracted position beneath the seat and an extended position forwardly of the seat, and a constrained linkage for actuating said leg-rest control linkage in response to tilting movement of said body-supporting structure, said constrained linkage comprising as movable links an arm and a first link pivotally mounted at spaced points on the support and depending therefrom and a second link pivotally connected at spaced points to said arm and first link, said constrained linkage also including as a stationary link that portion of the support between the pivotal mounts of the arm and first link on the support, said arm being operatively coupled to the body-supporting structure for movement of the constrained linkage in response to tilting movement of the body-supporting structure, said leg-rest control linkage including a lower extension of said first link, a forward extension of said second link, a fourth link pivotally connected to the free end of said first link, a third link pivotally connected to the free end of said second link, said third and fourth links crossing each other and being pivotally connected at their crossing-over points, the free end of said fourth link being pivotally connected to said leg-rest, and a further link connecting the free end of the third link to a point on the leg-rest spaced from the pivotal connection of the third link thereto, the first, second and third and fourth links forming a closed quadrilateral linkage bounded by the pivotal connections of said four links to each other, the first and second links serving as connections between the constrained linkage and the quadrilateral control linkage whereby the constrained linkage actuates the quadrilateral linkage in response to tilting movement of the body-supporting structure.

6. A reclining chair comprising a support, a body-supporting structure including a seat and a back-rest pivotally mounted on said support for independent tilting movement, a leg-rest, a leg-rest control linkage carrying said leg-rest and adapted to guide said leg-rest in a selected path between a retracted position beneath the seat and an extended position forwardly of the seat, and a constrained linkage for actuating said leg-rest control linkage in response to tilting movement of said body-supporting structure, said back-rest having an extension depending from its pivotal mount on the support, said constrained linkage including as movable links said back-rest extension, a first link pivotally mounted at a point on the support spaced from the pivotal mount of the back-rest, and a second link pivotally connected at spaced points to said back-rest extension and said first link, said constrained linkage also including as a stationary link that portion of the support between the pivotal mounts of the back-rest extension and first link, said depending back-rest extension being movable forwardly when the back-rest is tilted rearwardly for forward movement of the constrained linkage, movable links in response to tilting movement of the back-rest, said leg-rest control linkage including an extension of said first link, an extension of said second link, a third link pivotally connected to the end of said second link, a fourth link pivotally connected to the end of said first link, said third and fourth links crossing each other and being pivotally connected at their crossing-over points, the free end of said fourth link being connected to said leg-rest, and a further link connecting the free end of the third link to a point on the leg-rest spaced from the pivotal connection of the third link thereto, the first, second and third and fourth links forming a closed quadrilateral linkage bounded by the pivotal connections of said four links to each other, the leg-rest being supported and guided solely by said control linkage.

7. A reclining chair according to claim 6 in which a seat control member carried by said quadrilateral control linkage is pivotally connected to the lower portion of said seat, said seat control member being positioned to apply an upward thrust on said seat when said control linkage is actuated, whereby said seat is tilted through the constrained linkage, the quadrilateral linkage and the seat control member in response to tilting movement of the back-rest.

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