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A. J. BELISLE ET AL

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RECLINING CHAIR

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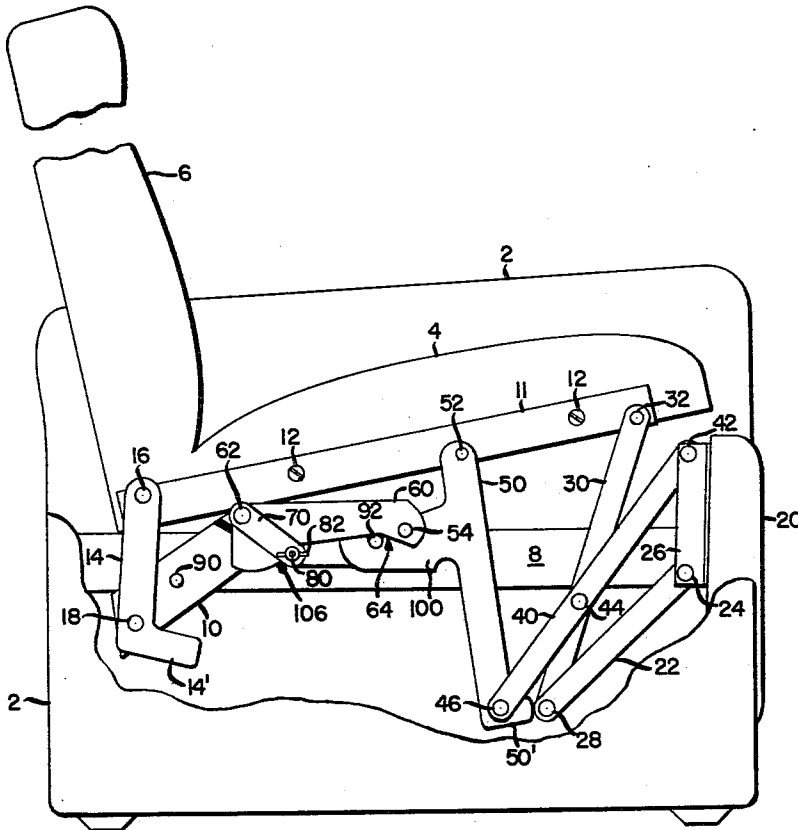


Fig. 1.

INVENTORS.  
ADELARD J. BELISLE  
HAROLD D. ALLYN  
FRANK M. RE  
BY *Kenneth Ross*  
ATTORNEY.

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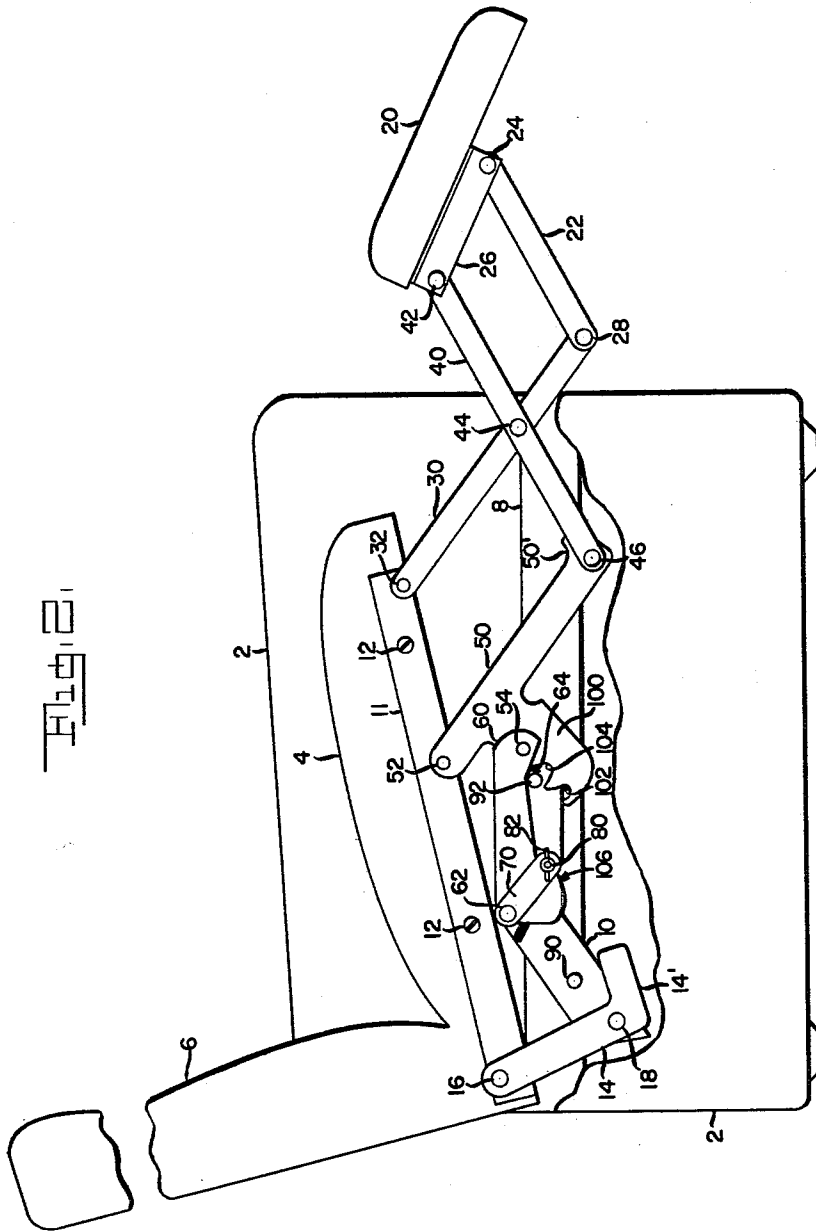
A. J. BELISLE ETAL

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**INVENTORS.**  
ADELARD J. BELISLE  
HAROLD D. ALLYN  
FRANK M. RE

**BY**

Kenwood Ross

**ATTORNEY.**

Oct. 16, 1962

A. J. BELISLE ETAL

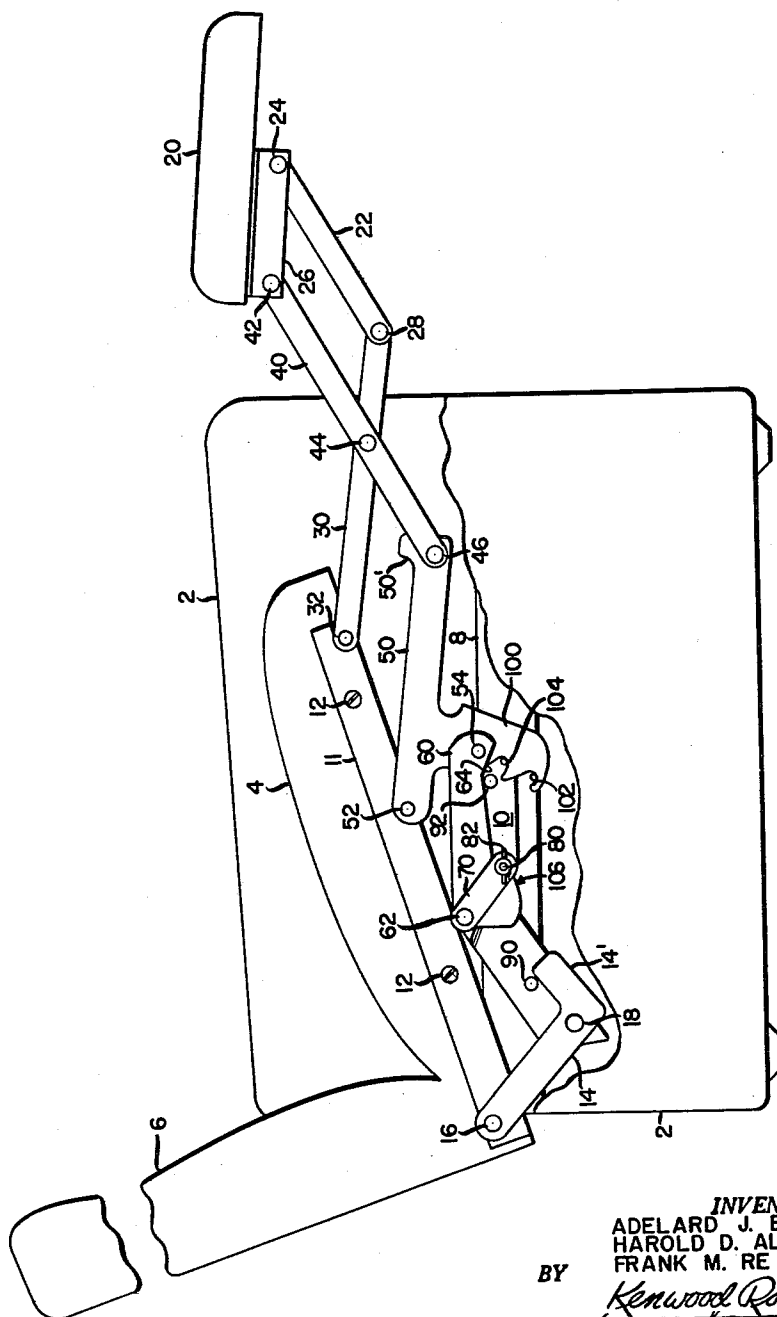
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Fig. 3



INVENTORS,  
ADELARD J. BELISLE  
HAROLD D. ALLYN  
FRANK M. RE  
BY *Kenwood Ross*  
ATTORNEY.

Oct. 16, 1962

A. J. BELISLE ETAL

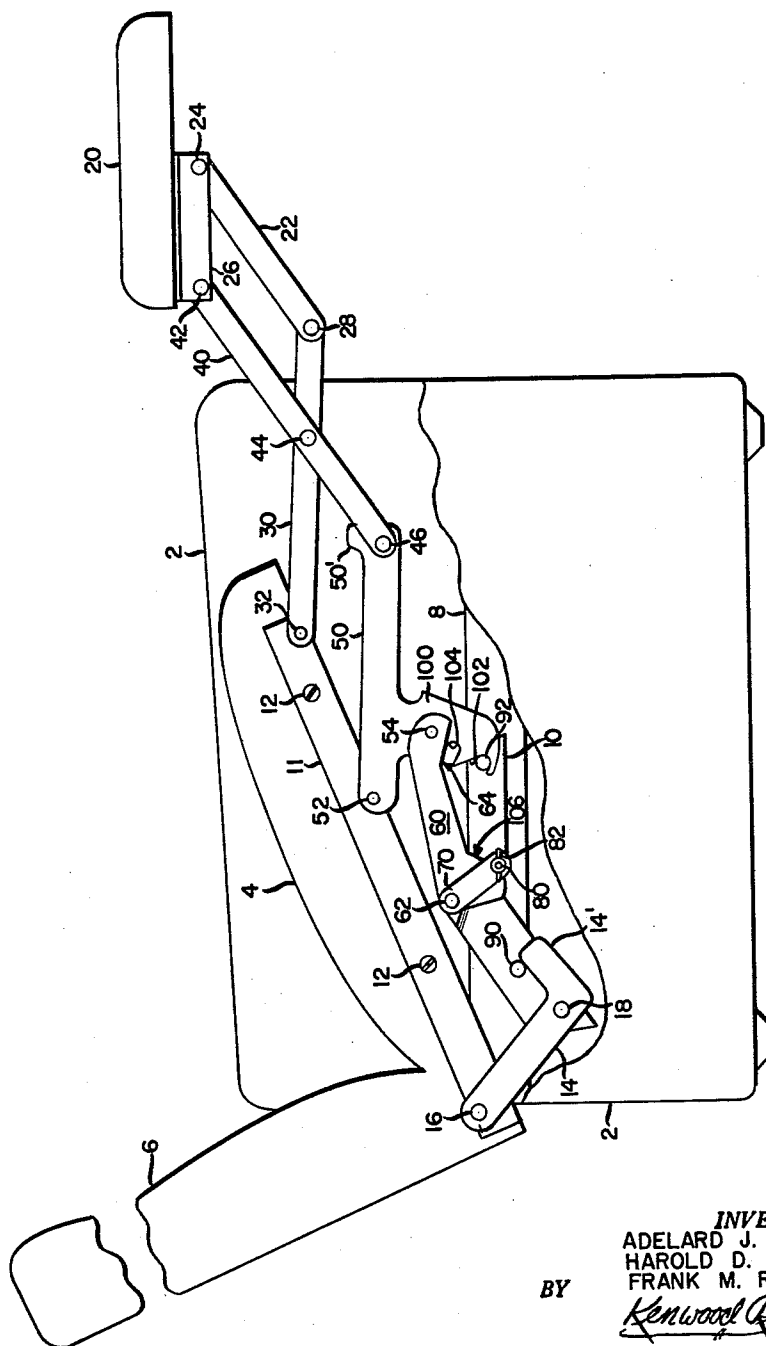
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Filed Dec. 12, 1960

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Fig. 4



BY

INVENTORS.  
ADELARD J. BELISLE  
HAROLD D. ALLYN  
FRANK M. RE

*Kenwood Ross*

ATTORNEY.

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3,058,774

## RECLINING CHAIR

Adelard J. Belisle, South Hadley Falls, Harold D. Allyn,  
Springfield, and Frank M. Re, Holyoke, Mass., assign-  
ors to Dual Manufacturing & Engineering, Inc.,  
Holyoke, Mass., a corporation

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1 Claim. (Cl. 297—89)

The present invention relates generally to reclining chairs and is directed to the provision of a reclining chair having a unitary or fixed seat and back, and a leg-rest linked therewith, and to an improvement in the means for effectuating the angularization of the unitary seat and back relative to a fixed frame and for effectuating the synchronous, coordinated, movement of the leg-rest relative to the seat and back as certain positions of reclination are assumed.

Our invention may be incorporated to advantage in a reclining chair where it is desired to coordinate the movement of the leg-rest with the pivotal movement of the seat and back, whereby the leg-rest will be extended as the seat and back is angularized and the leg-rest will be retracted as the said seat and back assumes the upright position.

It is a principal object hereof to incorporate a plurality of stopping means into the linkage construction whereby the chair may be brought to rest intermediate the upright and fully reclined positions, and whereby a double stopping means is provided to insure against the accidental further angularization of the seat and back from the fully reclined position whereby injury to the chair occupant could result.

Still a further object is to incorporate these novel stopping means with the linkage components in such manner that these components may serve the dual purpose of effectuating angularization of the seat and back and movement of the leg-rest, while also serving to limit these movements.

A salient feature of the present invention is the provision of a reclining chair mechanism which is versatile in its operation whereby a variety of positions of the seat and back-rest may be achieved. Herein, the unitary seat and back-rest is pivotal relative to a stationary support while the leg-rest is connected by a linkage system to said seat-back in such manner that the movement of the seat-back from the upright to one of the reclining positions effectuates the movement of the leg-rest upwardly and forwardly of the chair from a retracted to an extended position.

The operating linkages hereof function as a pair and are disposed intermediate the unitary seat and back and the leg-rest and each includes a link whose resistance to movement is controlled by a resistance adjusting device engaging said link. By controlling the frictional resistance adjusting device between certain positions which the chair assumes, the force required to move the seat-back unit to one of the reclining positions may be adjusted in accordance with the requirements or desires of the chair occupant.

The present invention contemplates a seating unit which is adjustable from a regular sitting position to one of a plurality of more or less reclining or tilted positions and includes a leg-rest which occupies an inoperative position when the seating element is in a position to support the body in an upright sitting posture and which may be advanced and raised so as to support the legs when the seating element is moved to any one of several reclining positions where the chair occupant is accommodated in partially reclined or resting attitudes.

In addition, the invention envisions a reclining article of furniture wherein the various coacting components

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above defined may cooperate with means being provided with a suitable arcuate sliding surface whereby the chair may be angularized to a position of further reclination simply by the application of increased body pressure by the occupant upon the chair back-rest.

In a broad way, the invention may be defined as an improved reclining chair for reading, television viewing, and the like, as well as for relaxing totally, a number of positions being attainable for each. In an intermediate, semi-reclined or tilted position, the seat and back is disposed at an angle relative to the horizontal plane of the base with the leg-rest elevated in front of the seat and back to a degree suitable for the attainment of relaxation. In a further reclined position, the seat and back is disposed at a different angle relative to the said horizontal plane of the base, with the leg-rest in an extremely elevated position in front of the seat and back, suitable for the attainment of a different degree of relaxation.

In the drawings:

FIG. 1 is a view of a reclining chair mechanism incorporating a preferred embodiment of the invention, the chair being shown in an upright position;

FIG. 2 is a view showing the chair in an intermediate reclining position;

FIG. 3 is a view showing the chair in a partially reclined position; and

FIG. 4 is a view showing the chair in a fully reclined position with the leg-rest extended.

With particular reference now to the drawings, a reclining article of furniture has been illustrated and is comprised generally of a supporting framework 2 and a seat and back-rest construction including a seat 4 and a back-rest 6 unitary therewith wherefore the seat and back-rest are rigidly connected together and move as a unit.

The mechanism hereof is one of a pair located at each side of the chair intermediate the framework 2 and the unitary seat and back and is fixed to a horizontally-extending base rail 8. In the following description, only one such mechanism is shown and described. It will be understood, however, that a unitary mechanism may be employed in lieu of a pair thereof in which instance, the single mechanism will be disposed centrally of the chair.

A base bracket 10 is fixed to the base rail 8 and extends horizontally or in a front-rear dimension of the chair. A seat bracket 11 is fixed to the lower edge of seat 6 as by a plurality of screws 12.

The unitary seat and back is supported for pivotal movement relative to the framework 2 by an L-link 14 pivotally attached at its upper end at 16 to the seat bracket 11 and thus to the unitary seat-back structure.

The lower end of the link 14 is pivotally connected at 18 to the base bracket 10 on the horizontal base rail 8.

A leg-rest 20 is provided at the forward end of the chair and functions as an integral unit therewith by means of a linkage system now to be described.

A primary elevator link 22 is pivotally connected at 24 at its forward end to a leg-rest link 26 fixed to said leg-rest and at its rearward end at 28 to the lower-end of a propeller link 30, the upper end of which is pivoted at 32 to the seat bracket 11.

A secondary elevator link 40 is pivotally connected at 42 at its forward end to the leg-rest link 26 and at its approximate mid-section at 44 to the propeller link 30 and at its rearward end at 46 to the lower end of an impeller link 50, which is provided with a rearwardly extending stop portion 100, as shown in FIG. 1.

The impeller link 50 is pivoted at its upper end at 52 to the seat bracket 11 and at 54 adjacent said upper end and adjacent the stop portion 100 to a generally horizontally-extending pivot link 60.

The pivot link 60 is pivoted adjacent its rearward end

at 62 to the base bracket 10, approximately centrally of said bracket.

The generally horizontally-extending lower edge of the pivot link 60 is provided, adjacent its forward end, with a stop portion 64, which portion functions as a stop in manner to be subsequently described.

A friction link 70 embraces the outer planar face of pivot link 60 and is fixed at its upper end at 62 to said link 60 and to the bracket 10 as aforesaid, and is fixed at its lower end to said bracket in a frictional relationship in manner now to be described.

A bolt 80 extends laterally through the bracket 10 and the lower end of the friction link 70 and has a nut 82 threaded thereon which may be tightened against the planar face of the link 70 whereby the frictional engagement between pivot link 60 and bracket 10 may be increased.

Stops 90 and 92 extend outwardly from the bracket 10 adjacent the rearward and forward ends thereof, with the stop 92 limiting the downward motion of the pivot link 60 upon engagement with the forward stop portion 64 of said link, and the stop 90 limiting further angularization of the unitary seat and back upon engagement of a lower toe portion 14' of the L-link 14 therewith.

As shown in FIG. 1, the stop portion 100 extends generally horizontally rearwardly from the impeller link 50 adjacent the pivot 54, with the inner longitudinal edge of said stop portion being provided with recesses 102 and 104 as shown in FIGS. 3 and 4 into which the stop 92 may be received in the several positions of angularization of the unitary seat and back, all in manner subsequently to be described.

In the upright position illustrated in FIG. 1 it will be observed that the leg-rest is retracted, the stop 92 is resting in the recess 104 of the stop portion 100, with the lower longitudinal edge 64 of the pivot link 60 in turn resting on said stop, while the frictional adjustment means 80 and 82 is positioned at the forward end of an arcuate surface 106 provided adjacent the rearward end of the lower longitudinal edge of said link 60.

The chair occupant may reach the position shown in FIG. 2 by bringing pressure to bear upon the back-rest 6 causing the unitary seat and back to assume an angularized position relative to the base bracket 10 and base rail 8 by pivotal movement of the L-link 14 upon the pivot points 16 and 18.

Stated otherwise, the unitary seat and back is pivotally mounted to the upper extremity of L-link 14 which is also pivotally mounted to the bracket 10 whereby the body-supporting unit is movable from the upright or sitting position of FIG. 1 to the position of FIG. 2.

In the movement from an upright position, the impeller link 50 and propeller link 30 are rotated forwardly and upwardly as the back 6 is angularized while the L-link 14 pivots upon the points 16 and 18. As the impeller 50 rotates, it urges secondary elevator link 40 forwardly and upwardly and this, in turn, moves propeller link 30 forwardly and upwardly so as to cause a similar movement of primary elevator link 22 thereby bringing the leg-rest 20 to the raised or extended position shown in FIGS. 2 or 3.

It will be observed that, during the sequence of movements just described, the pivot link 60 has not changed its generally horizontal position relative to the bracket 10 and remains in contact with the stop 92, while, on the other hand, the stop 92 is no longer fully engaged in the recess 104 of the stop portion 100.

It will also be noted that the occupant has stopped the chair at a point wherein the toe portion 14' of the L-link 14 is not contacting the stop 90 and he has assumed an intermediate reclining position, with the leg-rest extended as shown in FIG. 2.

To reach the position illustrated in FIG. 3, from that shown in FIG. 2, the occupant causes additional weight to bear upon the back 6 whereupon the unitary seat and

back is further angularized relative to the base rail 8 while the L-link 14 pivots causing the toe 14' to engage the stop 90. At this point it will be noted that the stop 92 is completely free from the recess 104 of the stop portion 100 of the impeller link 50.

To reach the reclined position of FIG. 4 from the position shown in FIG. 3, the chair occupant may once again bring additional pressure to bear upon the chair back, whereupon the forward end of the pivot link 60 is urged upwardly by the impeller link 50 through the pivotal connection 54, and the rearward end of the said link 60 is caused to pivot at 62.

Further angularization of the seat and back is precluded when the stop 92 is engaged in the recess 102 provided in the stop portion 100 extending rearwardly from the impeller link 50.

Thus, as the link 60 pivots, the arcuate surface 106 is caused to ride upwardly relative to the bolt 82. When the stop 92 is received in the recess 102, further angularization of the chair back is precluded and the chair components have assumed the reclined position shown in FIG. 4.

The occupant may return the chair from this reclined position to the position of FIG. 3 by exerting a slight downward pressure upon the seat 4, causing the arcuate surface 106 of the pivot link 60 to ride downwardly relative to the bolt 80 and the recess 102 to be freed from its engagement with the stop 92.

To return to the fully upright position of FIG. 1 from the position of FIG. 4 a slight downward pressure is exerted upon the seat 4 causing the arcuate surface 106 of the pivot link 60 to slide downwardly relative to the bolt 80 until the lower edge 64 of link 60 strikes the stop 92 whereupon further downward movement of the seat is precluded. Then a similar downward pressure of the heels is exerted on the leg rest to bring the linkage components to the collapsed or retracted position.

Referring to FIG. 1, it will also be noted that the impeller link 50 is provided at its lower extremity with a toe portion 50' which extends outwardly therefrom so as to act as a secondary stop upon abutment with the lower end of the primary elevator link 22 or propeller link 30 to preclude further retracting of the leg-rest mechanism.

It will be appreciated that the chair occupant may, if he so desires, cause the various components of the linkage to stop at any point between the upright position of FIG. 1 and the intermediate positions of FIGS. 2 and 3. The chair occupant need not continue angularization of the unitary seat and back to cause the toe portion 14' of the L-link 14 to engage the stop 90; he may come to rest at any position intermediate the upright position and the position shown in FIG. 3, and intermediate the positions of FIGS. 2 and 3.

To reach the fully reclined position of FIG. 4 from the position of FIG. 3, the leg-rest 20 must be in the fully-extended position, in order that the recess 104 may clear the stop 92 as the impeller link 50 is rotated.

Further, it will also be appreciated that a number of chair positions may be achieved by the application or shifting of body weight relative to the unitary seat and back, and that the pressure required to move those components from the position shown in FIG. 3 to that shown in FIG. 4 will be directly related to the pressure of the friction link 70 upon the pivot link 60 same being increased or decreased by rotation of the nut 82 relative to the fixed bolt 80.

It is believed that the gist of the invention will be clearly understood from the foregoing disclosure and accordingly, further analysis thereof at this point is considered unnecessary, as we have, in accordance with the provisions of the patent statutes, described the construction and principle of operation of our invention together with the apparatus which we believe to represent the best embodiment thereof, to the end that others can, by applying cur-

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rent knowledge, readily adapt it for various applications without omitting features which, from the standpoint of prior art, fairly constitute essential characteristics of its generic and/or specific aspects. The substitution of equivalents and other changes, modifications and alterations as circumstances may suggest or render expedient, are reasonably contemplated, the invention being susceptible of such without departing from its real spirit or underlying principles.

The protection which is sought for this invention is covered by the language of the above specification and the spirit represented thereby and same is limited only by the prior art and the scope of the appended claim.

We claim:

A reclining article of furniture comprising, a support, a body-supporting unit including a unitary seat and back-rest, an L-link extending between said support and said body-supporting unit mounting said body-supporting unit for movement about a pivot successively between a sitting position and an intermediate resting position and a fully reclined position and a plurality of positions between said sitting position and said intermediate position, a leg-rest, a leg-rest control linkage including coaxing links movable relative to each other in response to movement of said body-supporting unit, said leg-rest control linkage including: a base bracket fixed to said support, a seat-bracket fixed to said seat, primary and secondary elevator links pivotally mounted to said leg-rest, a primary propeller link pivotally connected to said primary and secondary elevator links and to said seat bracket, an impeller link having a stop portion integral therewith and pivotally connected to said secondary elevator link and to

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said seat bracket, said stop portion having a pair of recesses therein, a pivot link pivotally mounted on said base bracket independently of said L-link and pivotally connected to said impeller link, a manually adjustable friction link superposed upon said pivot link whereby the frictional engagement between said pivot link and said base bracket may be adjusted, a first stop member on said base and engageable in the recesses of said stop portion of said impeller link, a second stop member on said base and engageable with said L-link, with said first stop member being receivable in the first of said recesses of said stop portion when the chair is in a sitting position with the leg-rest retracted, and being receivable in the other of said recesses when the chair is in a fully reclined position with the leg-rest fully extended, whereby said body-supporting unit may be moved between a sitting position and an intermediate position and a fully reclined position and a plurality of positions therebetween, and whereby said leg-rest may be elevated into a leg-supporting position in response to movement of the links of said leg-rest control linkage.

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

##### UNITED STATES PATENTS

|    |           |              |               |
|----|-----------|--------------|---------------|
| 25 | 2,918,109 | Schliephacke | Dec. 22, 1959 |
|    | 2,918,113 | Lorenz       | Dec. 22, 1959 |
|    | 2,921,624 | Lorenz       | Jan. 19, 1960 |
|    | 2,940,509 | Fletcher     | June 14, 1960 |
|    | 2,940,510 | Schliephacke | June 14, 1960 |
| 30 | 2,948,330 | Lorenz       | Aug. 9, 1960  |
|    | 2,964,095 | Hoffman      | Dec. 13, 1960 |
|    | 2,965,158 | Fletcher     | Dec. 20, 1960 |