May 24, 1960 E. DUBECK 2,937,693

RECLINING CHAIR MECHANISM

Filed Feb. 24, 1956 2 Sheets-Sheet 1

FIG. 1

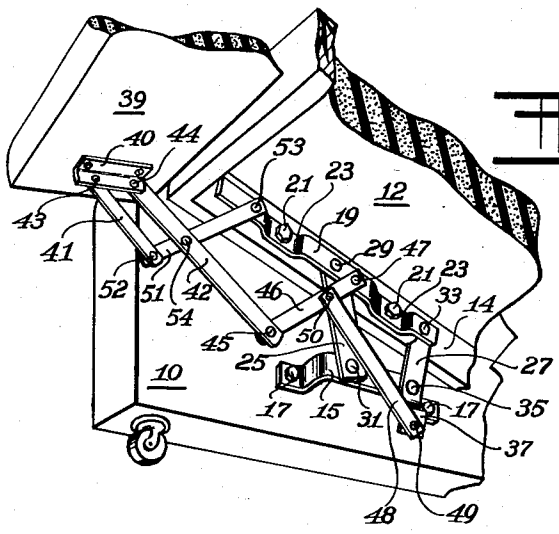
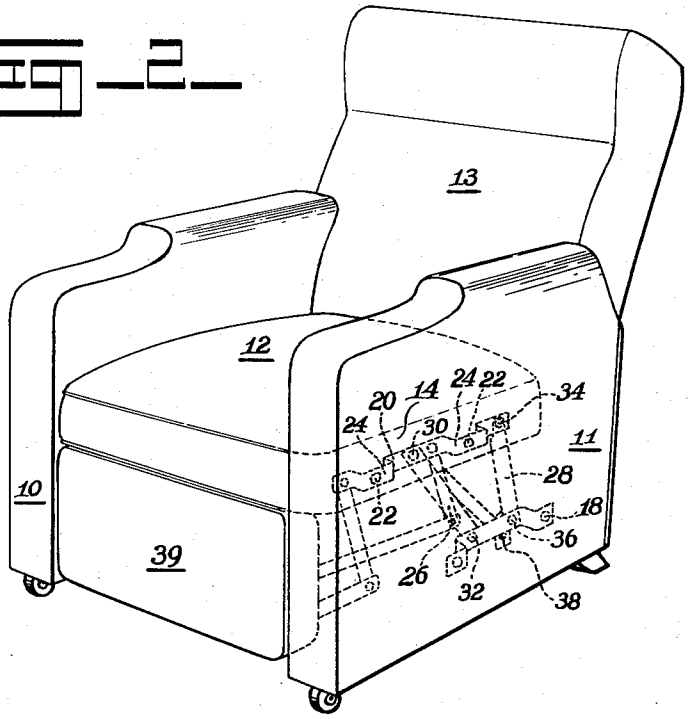



FIG. 2



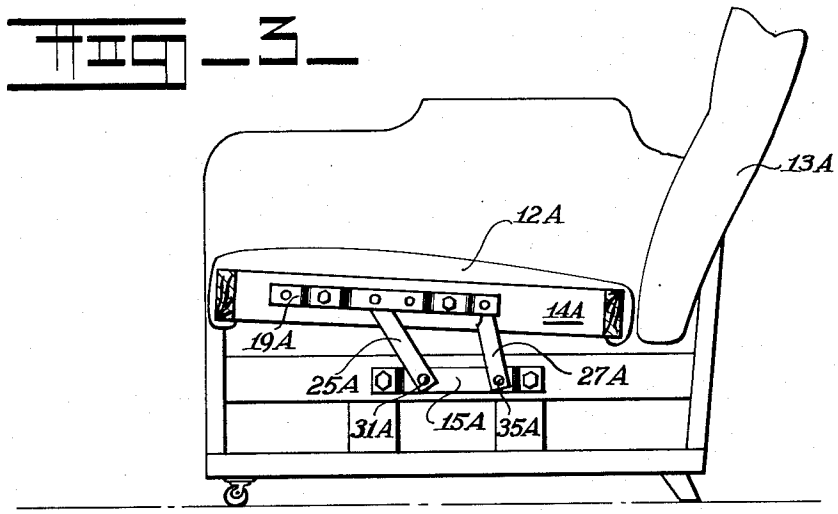

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FIG. 3




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2,937,693

# RECLINING CHAIR MECHANISM

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5 Claims. (Cl. 155—106)

This invention relates to reclining chairs in general and more particularly to an improved and simplified mechanism for imparting controlled reclining action to a unitary seat and back unit in a reclining chair.

The principal object of the invention is the provision of a simple and efficient mechanism for movably mounting a unitary seat and back unit in a reclining chair.

A further object of the invention is the provision of a mechanism for supporting a seat and back unit in a tiltable manner in a reclining chair so as to permit the seat and back unit to move in a convex arcuate path with respect to the stationary portions of the chair.

A still further object of the invention is the provision of a simple and economically formed mechanism for tiltably supporting a seat and back unit in a reclining chair which avoids pivoting the seat and back unit about a fixed pivot point.

A still further object of the invention is the provision of a mechanism for tiltably mounting a seat and back unit in a reclining chair which is particularly adapted for actuating a leg supporting platform attached to said mechanism.

The reclining chair mechanism disclosed herein comprises an improvement over that known in the art and used in conjunction with mounting unitary seat and back constructions in reclining chairs. Such mechanisms as have heretofore been known in the art and generally used commercially have comprised variations of simple pivot pins and/or hinge constructions and including constructions in which arcuate slots were formed in the seat or chair structures and connected one with the other by members slidably engaged in the slots. Such constructions permitted the seat and back units of the chair to be tilted with respect to the arms which remained stationary but were objectionable from the standpoint of the careful matching and fitting of the respective parts and the tendency of the seat and back units of the chair to tilt backwardly too rapidly or to be difficult to move to upright position from a reclining position.

A mechanism for a reclining chair should permit the chair to be occupied while in an upright position without any tendency on the part of the chair to go into reclining position until and unless the occupant so desired. Additionally, the mechanism should be capable of holding the seat and back unit in any desired tilted relation from full upright to full reclining position without any tendency on the part of the seat and back unit to change that position without the definite desire of the occupant.

The reclining chair mechanism disclosed herein meets these several objectives while at the same time comprising a mechanism which may be quickly and easily installed with a minimum of fitting and adjustment or registry of the parts and which in addition is particularly suitable for actuating an attached leg supporting platform which is commonly associated with reclining chair structures.

The mechanism accomplishes the primary objects of



controlled tilting motion by positioning the seat and back unit so that the weight of the occupant of the chair effectively counterbalances the weight of the seat and back unit and any tendency thereof toward assuming a reclining position. The mechanism thereby requires the seat and back unit to move upwardly and backwardly in a convex arcuate path when the same is moved from upright to reclining position and by the same token requires the seat and back mechanism to move over the arcuate path in reverse travel from rear to front when the seat and back unit is moved from reclining to upright position.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being the intention to cover all changes and modifications of the example of the invention herein chosen for purposes of the disclosure, which do not constitute departures from the spirit and scope of the invention.

The invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a perspective view of a portion of the bottom of a reclining chair illustrating one-half of the reclining chair mechanism, it being understood that a duplicate assembly is employed adjacent the opposite arm of the chair (not shown).

Figure 2 is a perspective view of a reclining chair in upright position showing in dotted lines the respective position of the reclining chair mechanism in the other side of the chair with respect to that shown in Figure 1.

Figure 3 is a vertical section through a reclining chair showing the reclining chair mechanism.

By referring to Figures 1 and 2 of the drawings the preferred embodiment of the invention may be seen and it will be observed that a chair, including stationary arms **10** and **11**, has been illustrated. The arms **10** and **11** are connected to one another by frame members (not shown) so as to form a suitable rigid supporting structure for a unitary seat and back construction including a seat **12** and back **13**.

The main supporting frame of the seat **12** is provided with side members **14—14**, it being understood that the frame, including the side members **14—14**, supports the cushion material of the seat **12** as well as the entire back **13**.

Each of the arms **10** and **11** is provided on its inner side adjacent its lower surface with support brackets **15** and **16**, respectively, the ends of the support brackets being offset from the intermediate portions and secured as by fasteners **17** and **18** to the arms **10** and **11**, respectively.

The oppositely disposed inner sides of the side members of the seat **12** are provided with elongated brackets **19** and **20** which are secured to the side members **14—14** by fasteners **21** and **22** which are positioned through offset portions of each of the elongated brackets **19** and **20**, as indicated at **23—23**, **24—24**, respectively, thus leaving the majority of the elongated brackets **19** and **20** spaced with respect to the side members **14—14** of the seat and back unit.

Oppositely disposed pairs of support arms **25—26** and **27—28** are pivotally connected to the support brackets **15** and **16**, respectively, and the elongated brackets **19** and **20**, respectively, so that the seat and back unit is supported in movable position between the arms **10** and **11** of the reclining chair.

It will be observed that while the support arms **25—26** and **27—28** are approximately the same length, they are pivoted to the support brackets and elongated brackets,

respectively, at different locations and at different angles to one another, the support arms 25—26 being pivoted adjacent their upper ends to the elongated brackets 19 and 20, respectively, and pivoted adjacent their lowermost ends to the support brackets 15 and 16, respectively, while the support arms 27—28 are pivoted adjacent their upper ends to the elongated brackets 19 and 20 while the pivots connecting them to the support brackets 15 and 16 are located inwardly from the lower ends of the support arms 27—28 as best shown in Figure 1 of the drawings.

Thus, when the seat 12 is in substantially horizontal relation, as shown in Figure 2 of the drawings, the arms 27 and 28 are substantially vertical while the support arms 25 and 26 are disposed on approximately 45 degree angles from vertical and the elongated brackets 19 and 20 and the support brackets 15 and 16 are substantially parallel.

At such time as the seat 12 is moved to reclining position, such as shown in Figure 1 of the drawings, the support arms 25 and 26 and the support arms 27 and 28 are both disposed at inclinations from vertical while the elongated brackets 19 and 20 assume the same angular relation as the seat 12 with respect to the support brackets 15 and 16.

The pivots connecting the top ends of the support arms 25 and 26 to the elongated brackets 19 and 20 are indicated by the numerals 29 and 30. The pivots connecting the lower ends of the support arms 25 and 26 to the support brackets 15 and 16 are indicated by the numerals 31 and 32. Pivots connecting the upper ends of the support arms 27 and 28 to the elongated brackets are indicated by the numerals 33 and 34, respectively, and the pivots connecting the intermediate portion of the support arms 27 and 28 to the support brackets 15 and 16 are indicated by the numerals 35 and 36, respectively.

Still referring to Figures 1 and 2 of the drawings it will be observed that the depending ends 37 and 38 of the support arms 27 and 28 act as levers moving in directions opposite to the above described action when the chair seat and back unit is moved to or from reclining position and the leverage thus obtained is utilized to actuate a leg platform 39 which is in retracted vertical position when the chair is upright, as in Figure 2 of the drawings, and in extended substantially horizontal position when the chair is in reclining position, as shown in Figure 1 of the drawings.

The leg supporting platform 39 has a pair of angle brackets 40 secured therebeneath, as best shown in Figure 1 of the drawings, and a pair of actuating arms 41 and 42 are pivoted as by pivots 43 and 44 to each of the angle brackets 40. The actuating arm 42 is approximately twice the length of the actuating arm 41 and its opposite end is pivoted by a pivot 45 to one end of a lever 46, the other upper end of which is pivoted at 47 to the elongated bracket 19 on the seat and back unit of the reclining chair.

A link 48 is pivotally connected to the depending end 37 of the support arm 27 by a pivot 49 and the other end of the link 48 is pivoted to the lever 46 inwardly from the pivot 47 by a pivot 50. The opposite end of the actuating arm 41 is pivoted to a secondary lever 51 by a pivot 52 and the other end of the secondary lever 51 is pivoted to the elongated bracket 19 by a pivot 53. A pivot 54 engages the actuating arm 42 and the secondary lever 51 at their point of closing.

Thus, reclining motion of the seat and back unit which causes the depending end 37 of the support arm 27 to move forwardly of the chair, to the left in Figure 1 of the drawings, imparts similar motion to the lever 46 and the secondary lever 51 by way of the links 48 and actuating arm 42. The resulting motion of the actuating arm 42 and the secondary lever 51 is imparted to the actuating arm 41 to cause the leg supporting platform 39 to move from retracted vertical position, as shown in Figure 2 of the drawings, when the chair is in upright position, to the extended horizontal position shown in Figure 1 of the drawings when the chair is in reclining position and vice versa.

It will be understood that duplicate assemblies, as shown in Figure 1 of the drawings, are used in the chair, one on each side of the chair beneath the seat 12 thereof, and thus normally hidden from view.

Those skilled in the art will observe that modifications of the structure described are possible. For example, the levers, links and actuating arms by means of which the leg platform 39 is moved may be disconnected from their pivotal engagement with the depending ends 37 and 38 of the support arms 27 and 28 and actuated separately or the leg platform and its associated mechanism may be dispensed with entirely as illustrated in Figure 3 of the drawings.

By referring to Figure 3 of the drawings it will be observed that the same mechanism as heretofore described in connection with Figure 1 of the drawings is disclosed with the exception that the support arm 27A is not provided with the depending end 37 of the structure in Figure 1 of the drawings, the chair seat 12A and back 13A being supported for desirable reclining motion by the oppositely disposed pairs of arms 25A and 27A which are pivoted at their upper and lower ends to oppositely disposed pairs of elongated brackets 19A and at their lower ends to support brackets 15A.

In Figure 3 of the drawings dotted lines indicate the arcs based on pivots 31A and 35A described by the upper ends of the support arms 25A and 27A in moving the seat 12A and back 13A from substantially horizontal or upright position to inclined or reclining position.

It will be observed that when the seat and back unit move from upright position to reclining position, the forward edge of the seat 12A will move upwardly and backwardly while the rearmost edge thereof at the junction of the back 13A will move rearwardly and downwardly, the weight of the seat and back unit of the chair thus balancing over the pivots and offsetting any tendency of the seat and back unit to move into reclining position until and unless it is definitely so urged.

Those skilled in the art will observe that when the seat portion is in substantially horizontal position, the support arms 25A and 27A are inclined forwardly of vertical center lines extending through the pivots adjacent their lowermost ends so that the seat and back unit of the chair will remain in upright position until definitely moved rearwardly, and, in the case of the major portion of the seat, upwardly to such reclining position. Such position is illustrated in Figure 3 of the drawings.

It will further be observed that the same mechanism that is employed in the preferred embodiment of the reclining chair mechanism as illustrated in Figures 1 and 2 of the drawings may be employed in forming the modifications of Figure 3 of the drawings, as interdependent portions of the seat and back unit supporting structure are used in both forms of the invention.

It will thus be seen that the reclining chair mechanism disclosed herein meets the several objects of the invention.

Having thus described my invention, what I claim is:

1. In a reclining chair having forward and rearward portions and spaced stationary arms and a movable seat and back unit disposed therebetween, said seat and back unit including interconnected seat and back portions disposed in fixed relationship to one another, a pair of support brackets secured to the inner sides of said stationary arms below said seat and back unit, a pair of elongated brackets secured to the seat portion of said seat and back unit above said support brackets and midway between the front and back edges of said seat and back unit, a pair of spaced support arms, each of which has an upper portion pivotally connected to one

of said support brackets and a lower portion pivotally connected to one of said elongated brackets, said support arms each being inclined forwardly of vertical center lines extending through the lower pivotal connections thereof when said seat and back unit is in upright position, the forward ones of each pair of said support arms being inclined forwardly of the associated vertical center lines at an angle of approximately 45 degrees when the seat and back unit is in upright position.

2. The reclining chair as set forth in claim 1 and wherein the support brackets on said chair arms are offset inwardly with respect thereto and the elongated brackets on said seat and back unit are offset inwardly with respect thereto and wherein the pairs of support arms are pivoted to said offset portion of said brackets and lie in a common vertical plane.

3. In a reclining chair having forward and rearward portions and spaced stationary arms and a movable seat and back unit disposed therebetween, said seat and back unit including interconnected seat and back portions disposed in fixed relationship to one another, a pair of support brackets secured to the inner sides of said stationary arms below said seat and back unit, a pair of elongated brackets secured to the seat portion of said seat and back unit above said support brackets and midway between the front and back edges of said seat and back unit, a pair of spaced support arms, each of which has an upper portion pivotally connected to one of said support brackets and a lower portion pivotally connected to one of said elongated brackets, said support arms each being inclined forwardly of vertical center lines extending through the lower pivotal connections thereof when said seat and back unit is in upright position, the forward ones of each pair of said support arms being inclined forwardly of the associated vertical center lines at an angle of approximately 45 degrees when the seat and back unit is in upright position, and a leg platform normally positioned in vertical retracted position beneath the forward edge of said seat and back unit and oppositely disposed pairs of actuating arms and levers pivotally supported on said elongated brackets holding said leg platform, one of each of said pairs of support arms having end portions depending below said supporting brackets and links pivoted to said depending end portions and to said levers for imparting movement to said actuating arms and levers of said leg platform when said heat and back unit is moved relative to said arms.



4. The reclining chair as set forth in claim 3, wherein the elongated brackets, the support brackets, and the support arms comprise two unitary pivoted assemblies, one of the pivoted assemblies being secured to each of said arms, and both of said pivoted assemblies being secured to said seat and back unit and to said leg platform.

5. The reclining chair set forth in claim 3 and wherein the elongated brackets, the support brackets, the support arms and the actuating arms and levers comprise two unitary pivoted assemblies, one of which is secured to each of said arms and both of which are secured to said seat and back unit and to said leg platform.

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# CERTIFICATE OF CORRECTION

Patent No. 2,937,693 May 24, 1960

Emil Dubeck

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 5, line 1 and lines 28 and 29, for "support", each occurrence, read -- elongated --; same column 5, lines 2 and 30, for "elongated", each occurrence, read -- support --; column 6, line 11, for "heat" read -- seat --.

Signed and sealed this 4th day of September 1962.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents