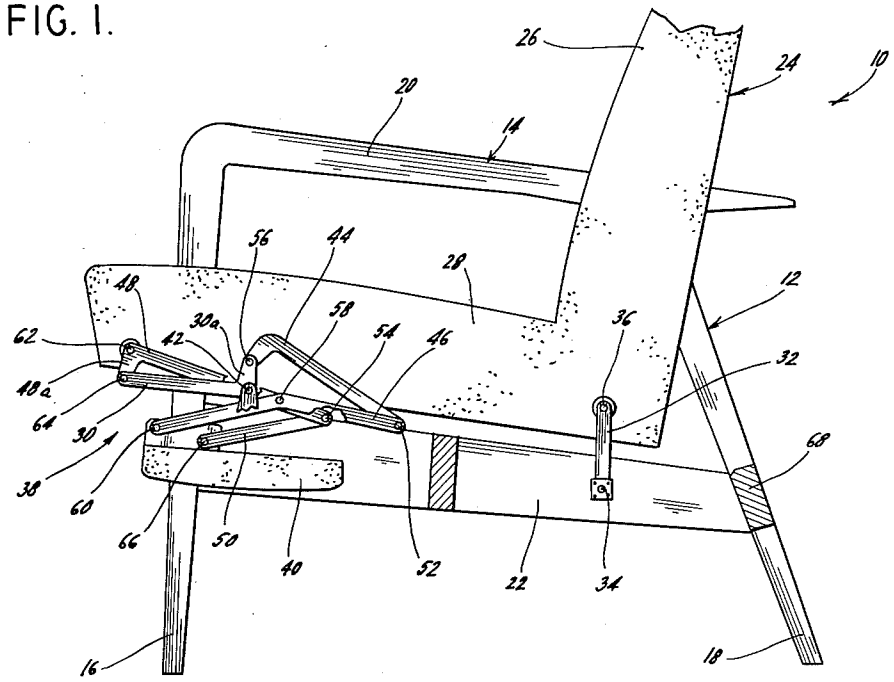
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RECLINING CHAIR AND LEG-REST CONTROL

Filed June 11, 1959

FIG. 1.



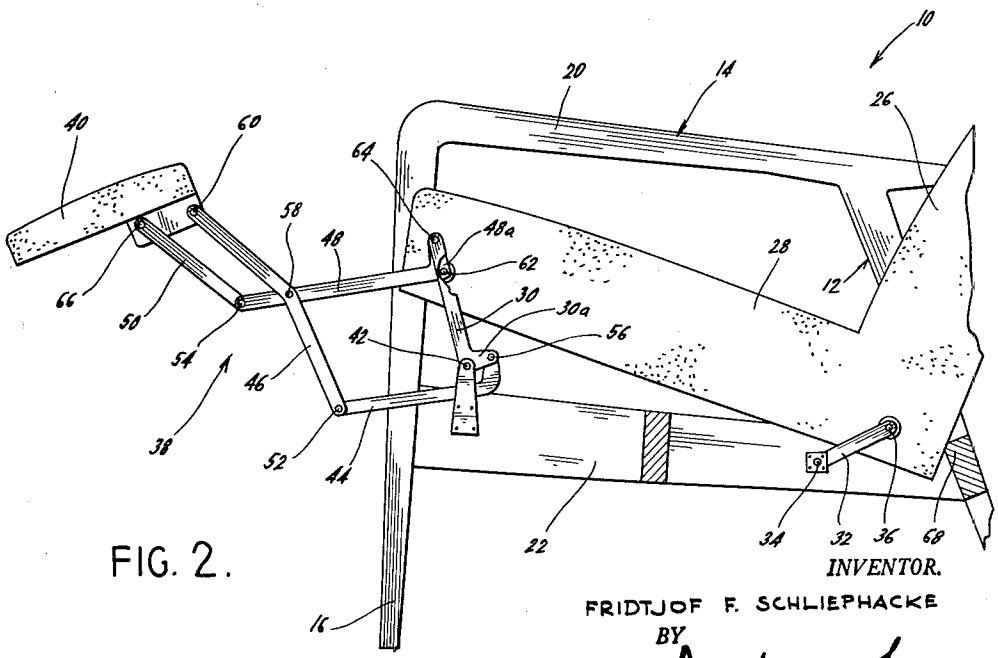


FIG. 2.

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RECLINING CHAIR AND LEG-REST CONTROL

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The present invention relates generally to reclining chairs, and in particular to an improved leg-rest mounting and controlling arrangement for reclining chairs.

The well known reclining chair comprises a support, body-supporting means including a back-rest and seat movably mounted on the support, and a leg-rest disposed beneath the seat and mounted for movement into various elevated leg-supporting positions. Provision is made for moving the leg-rest from beneath the seat to the elevated leg-supporting position in response to the movement of the body-supporting means of the chair. Of recent times, and with the tendency towards more modern and streamlined furniture, there has developed the need for reclining chairs wherein the chair support or frame is supported above the level of the floor by depending legs, with the leg-rest being stored in a folded-back position within the vertical extent of the chair frame and with the leg-rest substantially hidden from view by such frame. With the leg-rest thus hidden from view, it is possible to style such reclining chairs to have the appearance of other pieces of high-leg modern design such that the reclining chair may be used in modern furniture.

Broadly, it is an object of the present invention to provide an improved leg-rest mounting and controlling arrangement for a reclining chair. Specifically, it is within the contemplation of the present invention to provide an improved and simplified leg-rest mounting and control arrangement for coordinating the elevation of the leg-rest of a reclining chair to the movement of the body-supporting means thereof. Advantageously, my improved leg-rest mounting and controlling arrangement finds application in reclining chairs of the type incorporating a unitary seat and back-rest unit of high-leg modern styling.

In accordance with an illustrative embodiment demonstrating objects, features and advantages of the present invention there is provided a reclining chair of the type which includes a support, body-supporting means including a seat and back-rest, a main guiding linkage mounting said body-supporting means for rearward tilting movement relative to said support, the main guiding linkage including at least a front guiding link and means pivotally connecting said front guiding link to said support at a front pivotal mount. A leg-rest is disposed beneath the seat and is mounted for movement by an extensible mounting linkage comprising a first link pair including first and second pivotally connected mounting links, means pivotally connecting said first link to said front guiding link at a point spaced from said front pivotal mount, means pivotally connecting said second link to said leg-rest, a second link pair including third and fourth pivotally connected mounting links, means pivotally mounting said third link on said seat at a front pivotal connection, means pivotally connecting said third link to said front guiding link at a point spaced from said front pivotal connection, means pivotally connecting said fourth link to said leg-rest, and means operatively connected to a link of each of said first and second link pairs for coordinating said first and second link pairs.

The above brief description as well as further objects, features and advantages of the present invention will be more fully appreciated by reference to the following detailed description of an illustrative embodiment in accordance with the present invention, when taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a side elevational view of an improved reclining chair demonstrating features of the present invention, the chair being shown in the upright or sitting position with the leg-rest in the stored or retracted position; and

FIG. 2 is a side elevational view similar to FIG. 1 but showing the chair in a titlted position with the leg-rest in an elevated leg-supporting position.

Referring now specifically to the drawings, there is shown in FIGS. 1 and 2 an improved reclining chair, demonstrating features of the present invention and generally designated by the reference numeral 10, which includes a chair frame or support 12 having opposite sides 14 interconnected by appropriate cross braces, the adjacent side having been removed for clarity to expose the operating linkages at such adjacent side of the chair. The side frames 14 of the chair are seen to be of modern design and each include front and rear legs 16, 18 interconnected by an arm rest 20 and a side panel 22.

Interposed between the chair side frames is a rigid body-supporting unit 24 which includes a back-rest 26 and a seat 28 mounted on the chair support or frame 12 for rearward tilting movement relative to the support into various tilted relaxation positions such as shown in FIG. 2. The body-supporting unit 24 is mounted between the side frames 14 by a main guiding or mounting linkage which includes a front guiding and actuating link 30 and a rear guiding link 32. The rear guiding link 32 is disposed in a substantially upstanding position in the sitting position of the chair and has a pivotal mount 34 at its lower end on the side panel 22 of the side frame 14 and has a pivotal connection 36 at its upper end to the body-supporting unit 24 at the juncture of the lower end of the back-rest 26 and the rear end of the seat 28. The guiding and actuating link 30 is incorporated in a mounting and control arrangement, generally designated by the reference numeral 38, which movably mounts a leg-rest 40 for movement from a stored or retracted position extending substantially horizontally and within the vertical extent of the side panel 22 of the side frame to an extended and elevated leg-supporting position spaced forwardly of the seat. During the extensile movement of the leg-rest 40, the leg-rest moves through an arc of substantially 180° from the retracted position shown in FIG. 1 to the extended position shown in FIG. 2. The leg-rest mounting and control arrangement 38 includes the guiding and actuating link 30 as one link thereof, which guiding and actuating link has a stationary pivotal mount 42 adjacent one end thereof on the side panel 22 of the side frame 14. The mounting arrangement 38 further comprises a first link pair including pivotally interconnected first and second links 44, 46 and a second link pair including pivotally interconnected third and fourth links 48, 50. The adjacent ends of the links 44, 46 of the first link pair are connected at a pivotal connection 52, while the adjacent end of the links 48, 50 of the second link pair are connected at a pivotal connection 54. The link 44 of the first link pair has a pivotal connection 56 to an integral projection or extension 30*a* of the guiding and actuating link 30 at a point spaced from the stationary pivotal mount 42. The link 46 of the first link pair crosses over the link 48 of the second link pair and at the cross over point has a pivotal connection 58 which serves to coordinate the first and second link pairs. The forward end of the link 46 of the first link pair has a direct pivotal connection 60 to the leg-rest 40. The link 48 of the second link pair has a movable pivotal mount 62 on the forward end of the seat 28 and is formed with an integral projection 48*a*. The guiding and actuating link 30 has a pivotal connection 64 to the projection or extension 48*a* at a point spaced from the movable pivotal mount 62. The link 50 of the second link pair has a direct pivotal

connection 66 to the leg-rest 40 at a point spaced from the pivotal connection 60.

The link pairs 44, 46 and 48, 50 with their pivotal mounts 56, 62 on the guiding and actuating link 30 and the seat 28 respectively provide an extensible leg-rest mounting linkage for the leg-rest 40 of the lazy tongs type, which upon actuation thereof brings about the extension and elevation of the leg-rest, as may be seen by progressively inspecting FIGS. 1 and 2. The guiding and actuating link 30 with its stationary pivotal mount 42 and the link portion 48*a* intermediate the pivotal connection 64 and the movable pivotal mount 62 provide a guiding link pair in the main guiding linkage which mounts the body-supporting unit 24 for rearward tilting movement relative to the support. The main guiding linkage is completed by the portion of the seat intermediate the pivotal mount 62 and the pivotal connection 36 serving as a movable link, the rear guiding link 32 serving as a further movable link, and the portion of the support intermediate the pivotal mounts 34, 42 serving as a stationary link thereof.

A typical sequence of operations will now be described to facilitate a more thorough understanding of the present invention:

When the chair occupant is seated and leans against the back-rest 26 of the body-supporting unit 24, the body-supporting unit moves rearwardly into various tilted resting or reclining positions as a function of the design of the main guiding or mounting linkage.

During such movement, the movable pivotal mount 62 of the leg-rest mounting linkage 38 moves through an upward and rearward arc, with the guiding and actuating link 30 turning about the stationary pivotal mount 42. The extension 30*a* thereof turns in a clockwise direction about the stationary pivotal mount 42, with the pivotal connection 56 translating about the stationary pivotal mount 42. Simultaneously the pivotal connection 64 translates in the clockwise direction about the pivotal mount 62. This brings about the extension of the leg-rest 40, with the leg-rest moving through a downward arc and then through an upward and forward arc to various elevated leg-supporting positions, such as shown in FIG. 2. The final tilted back or reclining position may be established by the provision of an appropriate stop associated with any one of the links, for example the stop 68 arranged to abut the rear guiding link 32 when the desired reclining position is established. When the chair occupant desires to restore the chair to the upright sitting position, the occupant merely presses against the leg-rest which causes the chair to move from the tilted position shown in FIG. 2 to the upright sitting position shown in FIG. 1.

A latitude of modification, change and substitution is intended in the foregoing disclosure and in some instances some features of the invention will be employed without a corresponding use of other features. Accordingly, it is appropriate that the appended claims be construed broadly and in a manner consistent with the spirit and scope of the invention herein.

What is claimed is:

1. A reclining chair comprising a support, body-supporting means including a seat and back-rest, a main guiding linkage mounting said body-supporting means for rearward tilting movement relative to said support, a leg-rest, and an extensible leg-rest mounting linkage for moving the leg-rest from an underslung substantially horizontal inverted position beneath the seat to an extended, upright substantially horizontal position forwardly of the seat, said mounting linkage including a guiding and actuating link, means pivotally mounting said guiding and actuating link on said support at a stationary pivotal mount, a first link pair including first and second pivotally connected mounting links, means pivotally connecting said first link to said guiding and actuating link at a first pivotal connection, means pivotally connecting said second link to said leg-rest, a second link pair including third and fourth pivotally connected mounting links, means pivotally connecting said third link to said seat at a movable pivotal mount, said third link having an angularly disposed extension projecting beyond said movable pivotal mount, means pivotally conecting said fourth link to said leg-rest, means operatively connected to a link of each of said first and second link pairs of coordinating said first and second link pairs, and means pivotally connecting said guiding and actuating link to said third link extension at a second pivotal connection, the portion of said guiding and actuating link intermediate said stationary pivotal mount and said second pivotal connection and the third link extension providing a guiding link pair in said main guiding linkage.

2. An improved leg-rest mounting and controlling arrangement for a reclining chair of the type including a support, a unitary body-supporting unit including a seat and back-rest, and a main guiding linkage mounting said body-supporting unit for rearward tilting movement relative to said support, said arrangement comprising a leg-rest, a guiding and actuating link, means pivotally mounting said guiding and actuating link on said support at a stationary pivotal mount, an extensible leg-rest mounting linkage operatively connected to said leg-rest for moving the leg-rest from an underslung substantially horizontal inverted position beneath the seat to an extended, upright substantially horizontal position forwardly of the seat, said mounting linkage including first and second mounting links, said guiding and actuating link having an extension projecting beyond its stationary pivotal mount, means pivotally connecting said first mounting link to said guiding and actuating link extension at a first pivotal connection spaced from said stationary pivotal mount, means pivotally connecting said second mounting link to said seat at a movable pivotal mount, said second mounting link having an extension projecting beyond said movable pivotal mount on the seat, and means pivotally connecting said guiding and actuating link to said second mounting link extension at a second pivotal connection spaced from said movable pivotal mount, the portion of said guiding and actuating link intermediate said stationary pivotal mount and said second pivotal connection and the second mounting link extension providing a guiding link pair in said main guiding linkage, the extension of said second mounting link being disposed angularly to the axis of said second mounting link and extending downwardly in the underslung position of the leg-rest, said front guiding link moving said extension to an upwardly-extending position when the body-supporting unit is tilted rearwardly.

3. A leg-rest mounting and control arrangement according to claim 2 in which the extension of said guiding and actuating link extension is disposed angularly to the axis of the latter, said extension extending upwardly in the underslung position of the leg-rest and turning to a rearwardly-extending position by movement of the guiding and actuating link when the body-supporting unit is tilted rearwardly.

4. A leg-rest mounting and control arrangement according to claim 3 in which the guiding and actuating link extension is disposed substantially perpendicular to the axis of said guiding and actuating link.

5. A leg-rest mounting and control arrangement according to claim 3 in which the extension of said second mounting link is disposed angularly to the axis of the latter, said second mounting link extension extending downwardly in the underslung position of the leg-rest and being turned to an upwardly extending position by said guiding and actuating link when the body-supporting unit is tilted rearwardly.

6. A reclining chair comprising a support, body-supporting means including a seat and back-rest, a main guiding linkage mounting said body-supporting means for rearward tilting movement relative to said support, a leg-rest, and an extensible leg-rest mounting linkage for moving

said leg-rest from an underslung substantially horizontal inverted position beneath the seat to an extended, upright substantially horizontal position forwardly of the seat, said mounting linkage including a pair of bell-crank levers each having a long arm and a short arm, the first bell-crank lever having a fixed pivotal mount intermediate its ends on the support frame, the second bell-crank lever having a pivotal mount on the seat, the long arm of the first bell-crank lever being pivotally connected to the short arm of the second bell-crank lever, a pair of interconnected links connecting the short arm of the first bell-crank lever to the leg-rest, and a single link connecting the long arm of the second bell-crank lever to the leg-rest.

7. A reclining chair comprising a support, body-supporting means including a seat and back-rest, a main guiding linkage mounting said body-supporting means for rearward tilting movement relative to said support, a leg-rest, and an extensible leg-rest mounting linkage for moving said leg-rest from an underslung substantially horizontal inverted position beneath the seat to an extended, upright substantially horizontal position forwardly of the seat, said mounting linkage including a pair of bell-crank levers each having a long arm and a short arm, the first bell-crank lever having a fixed pivotal mount intermediate its ends on the support frame, the second bell-crank lever having a pivotal mount on the seat and movable therewith,

the long arm of the first bell-crank lever being pivotally connected to the short arm of the second bell-crank lever, a pair of links connected end-to-end, one of said links being pivotally connected to the short arm of the first bell-crank lever and the other of said links being pivotally connected to the leg-rest, and a single link connecting the long arm of the second bell-crank lever to the leg-rest, said other link of the pair of links crossing over the long arm of the second bell-crank lever and being pivotally connected thereto at its crossing-over point.

8. A reclining chair according to claim 7 in which said main guiding linkage includes a rear guide pivotally mounted on the support and pivotally connected to the rear of the seat, and a front guiding link comprising the long arm of the first bell-crank lever and the short arm of the second bell-crank lever.

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