

[54] **MULTIPLE POSITION RECLINING CHAIR ASSEMBLY**

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[58] Field of Search **297/317, 325, 322, 297/329, 68, 85, 88, 90, 91, 69**

[56] **References Cited**

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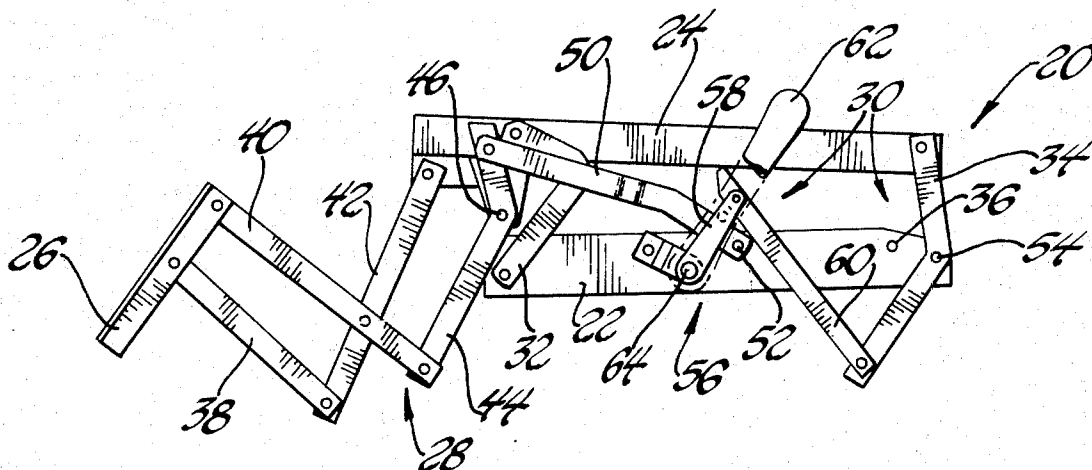
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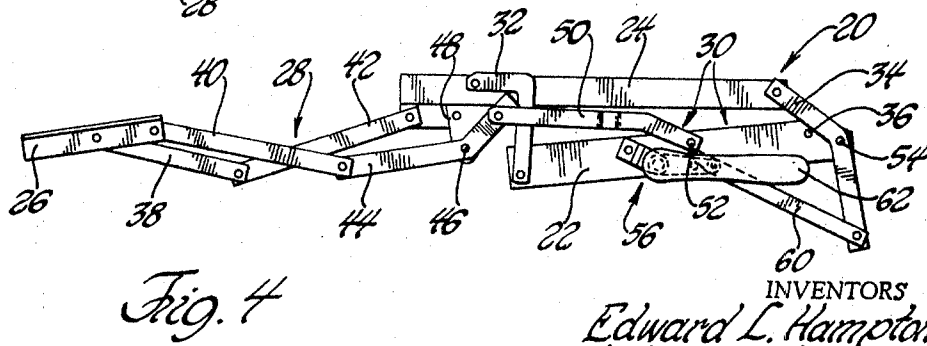
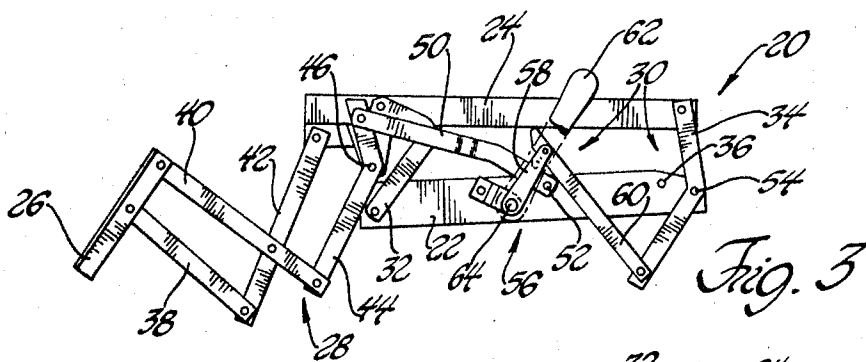
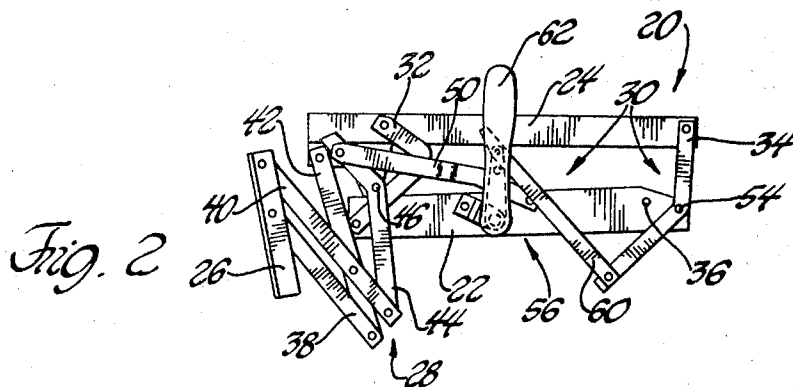
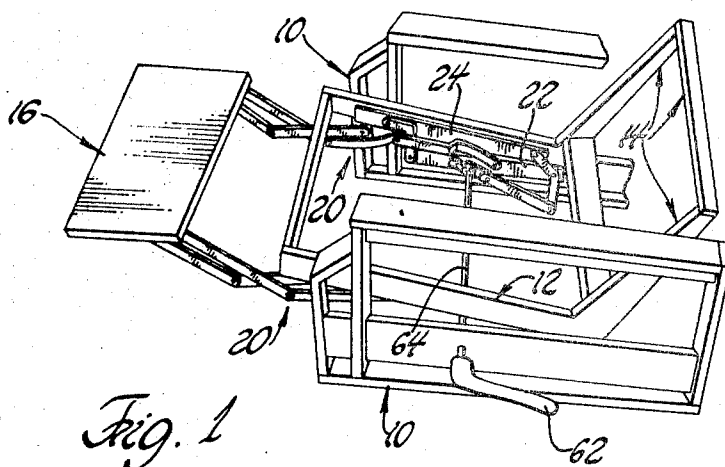
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ABSTRACT

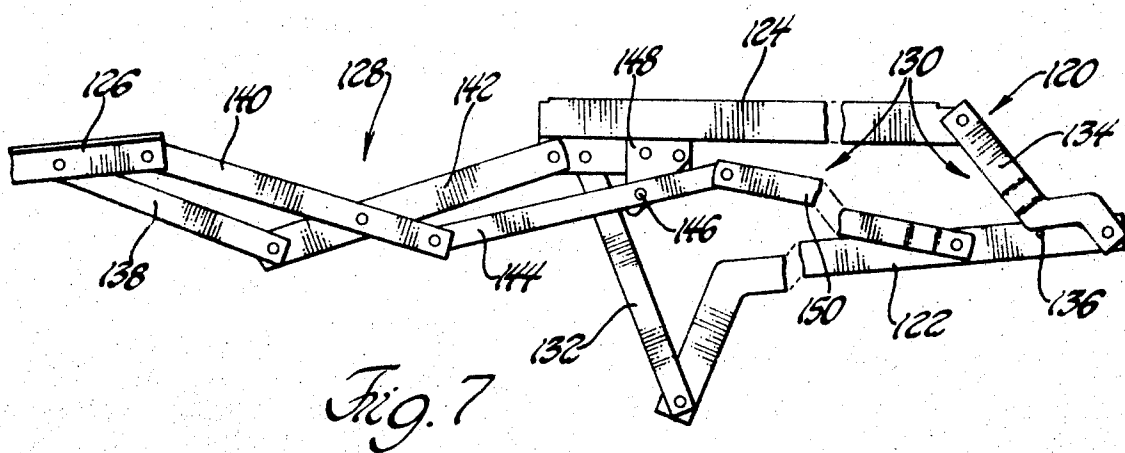
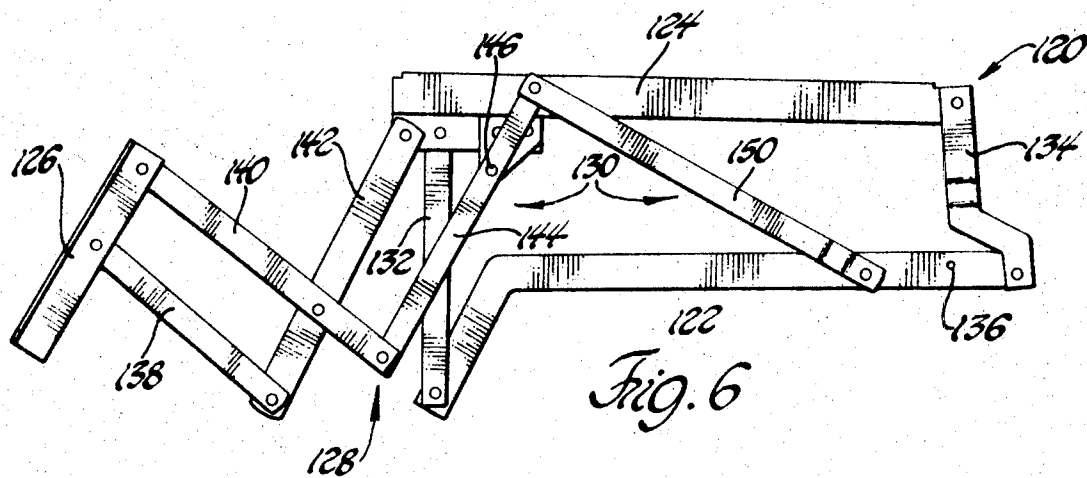
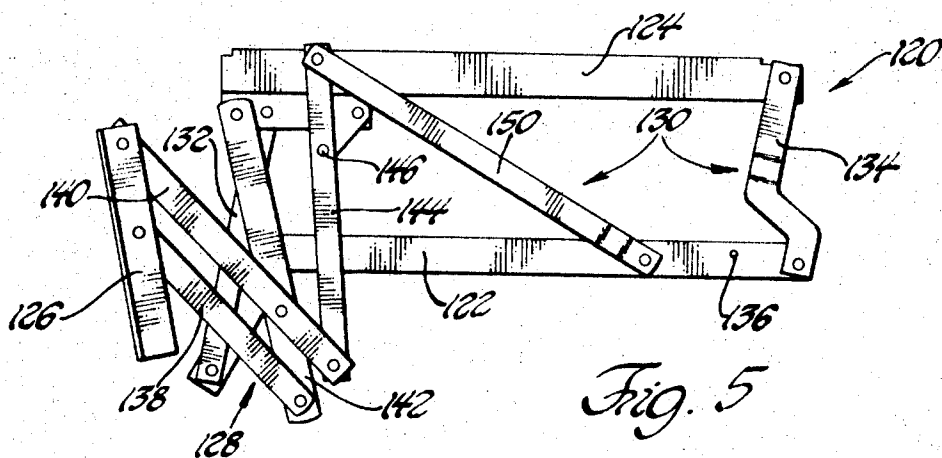
Two embodiments of a multi-position reclining chair assembly wherein both embodiments include a metal plate like support member, a metal plate-like seat member, a leg rest and attendant linkage, whereby the seat member moves forwardly relative to the support member in moving to a reclining position as the leg rest is extended so that no room is required behind the chair to accommodate reclining movement of the seat back. In one embodiment a manually graspable handle and associated linkage is utilized to move the assembly between an upright position and a fully reclined position, whereas in the other embodiment the assembly is moved between the upright and fully reclined positions by applying force to the seat member.

15 Claims, 7 Drawing Figures





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MULTIPLE POSITION RECLINING CHAIR ASSEMBLY

This invention relates to a multiple position reclining chair assembly. More specifically, this invention relates to a reclining chair assembly of the type including an extensible leg rest associated with a seat which is moved between an upright position and a fully reclined position. Typical of such assemblies known to the prior art are those which include a pair of mechanisms which are secured to opposite sides of a wooden furniture structure or chair frame. Since two mechanisms are paired only one will be described throughout this specification. The prior art assemblies normally include a metal support member which is adapted to be attached to the wooden frame of a chair. They also normally include a seat member which is secured to a wooden seat frame for moving the wooden seat frame relative to the wooden support frame, such movement being accomplished by linkages interconnecting the support member and the seat member. A leg rest and associated linkages are also connected to the assembly for extending during at least some portion of the reclining movement.

The problem with the prior art assemblies is that during reclining movement the seat member moves rearwardly relative to the support member. Normally the front end of the seat member moves rearwardly and upwardly, while the rear portion moves rearwardly and downwardly. It will be appreciated that during such movement the seat back moves slightly downwardly but more generally rearwardly. In other words, the top of the seat back moves in an arc rearwardly and downwardly, and this movement is substantial, thus requiring that there be substantial space behind the prior art reclining chairs to allow for reclining movement. Therefore, the areas in which such prior art reclining chairs are utilized is determined by the space available and many space conditions do not allow the use of such reclining chairs. For example, such reclining chairs are rarely found in small hotel or motel rooms.

Accordingly, it is an object and feature of this invention to provide a new and improved multiple position reclining chair assembly which does not require substantial space behind the chair to allow the chair to be moved to the fully reclined position.

In correlation with the foregoing object and feature, it is another object and feature of this invention to provide such a reclining chair assembly which includes support means, seat means, a leg rest, leg rest mounting linkage mounting the leg rest for movement between a collapsed stored position and an extended leg supporting position, and linkage means operatively interconnecting the support means and the seat means and the leg rest mounting linkage for moving the seat means from an upright position forwardly relative to the support means to a fully reclined position, while at the same time actuating the mounting linkage to move the leg rest to the extended leg supporting position whereby the bottom of the seat back is moved forwardly and downwardly, thus eliminating the need for substantial space behind the chair.

In correlation with the foregoing objects and features, it is another object and feature of this invention to provide such a reclining chair assembly, wherein the linkage means includes first and second links with each link pivotally connected to the support means and to

the seat means respectively, with both links being moved forwardly in an arc about their pivotal connections to the support means during movement from the upright to the fully reclined position.

In correlation with the foregoing objects and features, it is another object and feature of this invention to provide such a reclining chair assembly wherein the mounting linkage includes a plurality of pivotally interconnected and crossed links with one of the links being a control link pivotally connected adjacent its lower end to another of the crossed links and pivotally connected intermediate its ends to the seat means and wherein the linkage means includes a connecting link pivotally connected to the upper end of the control link and pivotally connected to the support means for extending the leg rest to the leg supporting position as the seat means moves forwardly relative to the support means during the movement to the fully reclined position.

Other objects and attendant advantages of the present invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

FIG. 1 is a partially broken away perspective view showing a first embodiment of the present invention incorporated into a furniture structure comprising a wooden chair frame with the assembly in the fully reclined position;

FIG. 2 is an elevational view of a first embodiment of the instant invention and showing the assembly in the upright position;

FIG. 3 is an elevational view similar to FIG. 2 but showing the assembly in an intermediate position between the upright position and the fully reclined position;

FIG. 4 is an elevational view similar to FIGS. 2 and 3 but showing the assembly in the fully reclined position;

FIG. 5 is an elevational view of a second embodiment of the instant invention shown in the upright seat forming position;

FIG. 6 is an elevational view similar to FIG. 5 but showing the assembly in an intermediate position between the upright position and the fully reclined position; and

FIG. 7 is an elevational view partially broken away and showing the second embodiment in the fully reclined position.

Referring now to the drawings when like numbers indicate like or corresponding parts throughout the several views, there is a first embodiment shown in FIGS. 1 through 4 and a second embodiment shown in FIGS. 5 through 7. These embodiments will be described simultaneously with the second embodiment of FIGS. 5 through 7 being indicated with numerals corresponding to those utilized to describe the first embodiment but increased by 100 on corresponding parts.

A wooden frame for a piece of furniture comprising a chair is shown in FIG. 1. A main portion of the frame is generally indicated at 10 and is constructed so that it rests upon the floor or the like and is generally made of wood. There is also a wooden frame defining a seat, which is generally indicated at 12, and a seat back, which is generally indicated at 14, also made of wood. There is also a leg rest generally indicated at 16.

A pair of multiple-position reclining chair assemblies or mechanisms are generally indicated at 20, and are disposed on opposite sides of the wooden frame for allowing the seat 12 and the seat back 14 to move between an upright seat forming position to a fully reclined position as illustrated, while at the same time moving the leg rest 16 to the leg supporting position illustrated. The second embodiment is generally indicated at 120 in FIGS. 5 through 7.

Each embodiment includes a support means defined by the metal plate-like members 22 and 122. Each embodiment also includes a seat means defined by the metal plate-like members 24 and 124. As shown in FIG. 1, the support members 22 are secured to the frame 10 and seat member 24 is secured to the seat frame 12. Normally the members 22, 24, 122 and 124 have holes therein so that they may be bolted or otherwise suitably fastened to the wood members of the seat frame.

Both embodiments also include leg rest members 26 and 126. The leg rest members 26 and 126 are secured to and support the wooden leg rest such as that generally indicated at 16 in FIG. 1. Both embodiments also include leg rest mounting linkage 28 and 128 mounting the leg rest members 26 and 126 for movement between the collapsed stored position, as shown in FIGS. 2 and 5, and an extended leg supporting position, as shown in FIGS. 4 and 7.

The embodiments include linkage means generally shown at 30 and 130. The linkage means 30 operatively interconnects the support member 22 and seat member 24 and the leg rest mounting linkage 28 for moving the seat member 24 from an upright position as shown in FIG. 2 forwardly relative to the support member 22 through an intermediate position as shown in FIG. 3 to a fully reclined position as shown in FIG. 4 while at the same time actuating the mounting linkage 28 to move the leg rest member 26 to the extended leg supporting position shown in FIG. 4. Similarly, the linkage means 130 of the embodiment of FIGS. 5 and 7 interconnects the support member 122 and the seat member 124 and the leg rest mounting linkage 128 for moving the seat member 124 from an upright position shown in FIG. 5 forwardly relative to the support member 122 through an intermediate position shown in FIG. 6 to a fully reclined position shown in FIG. 7 while at the same time actuating the mounting linkage 128 to move the leg rest member 126 to the extended leg supporting position shown in FIG. 7.

The linkage means 30 includes first and second links 32 and 34 with the first link 32 being disposed forwardly of the assembly and the second link 34 being disposed rearwardly of the assembly. Each of the first and second links 32 and 34 are pivotally connected to the support member 22 and to the seat member 24 respectively. In a similar fashion, but although of different configuration, the linkage means 130 of the second embodiment includes a downwardly extending projection to which the lower end of the first link 132 is pivotally connected. Thus, the distance between the pivotal connections of the first link 132 of the second embodiment to the seat and support members respectively is greater than the distance between the pivotal connections of the second link 132 to the seat and support members respectively.

Both embodiments include stop means comprising the pins 36 and 136 for limiting forward movement of the seat members 24 and 124 relative to the support

members 22 and 122, the pins 36 and 136 extend from the support members 22 and 122, respectively, to engage the second links 34 and 134 in the fully reclined position.

The mounting linkage 28 includes a plurality of pivotally interconnected and crossed links 38, 40, 42 and 44 to define a scissor-type linkage. One of the links 44 is a control link pivotally connected at its lower end to another 40 of the cross links and pivotally connected intermediate its ends at 46 to the seat member 24 through a bracket 48.

The linkage means 30 also includes a connecting link 50 which is pivotally connected to the upper end of the control link 44 at one end and pivotally connected to the support member 22 at the other end as indicated at 52 for extending the leg rest member 26 to the leg supporting position shown in FIG. 4 as the seat member 24 moves forwardly relative to the support member 22. In other words, the support member 22 is secured to an immovable furniture structure so that the pivot 52 of the connecting link 50 remains stationary, so that as the seat member 24 is moved forwardly the connecting link 50 forces the control link 44 to pivot about its pivotal connection 46 to the seat member 24 as the pivotal connection 46 moves forwardly, thereby effecting extension of the mounting linkage 28.

In a similar fashion, the mounting linkage 128 of the second embodiment includes a plurality of pivotally interconnected and crossed links 138, 140, 142 and 144, with one of the links 144 being a control link pivotally connected adjacent its lower end to another 140 of the cross links and pivotally connected intermediate its ends at 146 to the seat member 124 through a depending bracket 148. Also the linkage means 130 includes a connecting link 150 pivotally connected to the upper end of the control link 144 and pivotally connected to the support member 122 for extending the leg rest member 126 to the leg supporting position shown in FIG. 7 as the seat member 124 moves forwardly relative to the support member 122. Again, as the pivot point 146 moves forwardly as the assembly moves from the upright position to the fully reclined position the connecting link 150 forces the control link 144 to pivot about the pivot point 146 to extend the mounting linkage 128. The embodiment of FIGS. 5 through 6 is moved between the upright and fully reclined positions by an individual sitting in a chair assembly into which this embodiment is incorporated and grasping the arms of the assembly so that the buttocks apply the force to move the seat member 124 between the upright position of FIG. 5 and the fully reclined position of FIG. 7.

In contra-distinction, the embodiment of FIGS. 1 through 4 includes an actuation means for moving the assembly between the upright and fully reclined positions. More specifically, the second link 34 extends downwardly from its pivotal connection at 54 to the support member 22 and an actuation means generally shown at 56 is operatively connected to the lower end of the second link 34. The actuation means 56 includes an arm 58 pivotally connected to the support member 22 and a push-pull link 60 interconnecting the arm 58 and the bottom of the second link 34. The actuation means 56 also includes a handle 62 connected to the arm 58 through a shaft 64 whereby rotation of the handle 62 pivots the arm 58 which in turn rotates the second link 34 through the push-pull link 60, thereby moving the assembly between the upright position shown in

FIG. 2 and the reclined position shown in FIG. 4. As illustrated in FIG. 1, a handle 62 is disposed on only one side of a chair and a shaft 64 interconnects the two assemblies 20. To move the assembly 20 of FIGS. 1 through 4 from the upright position shown in FIG. 2, the handle 62 is grasped and rotated in a clockwise direction. The handle 62 may be rotated clockwise until it reaches the position shown in FIG. 2 where the assembly is in the fully reclined position. To move the assembly from the fully reclined position shown in FIG. 4, the handle 62 is rotated in a counter-clockwise direction back to the position shown in FIG. 2.

As an alternative embodiment the control link 44 could be pivotally connected to and supported by the first link 32 instead of the seat member 24 at pivot 46. The same is true of control link 144 with respect to first link 132.

Also, it will be appreciated that although the assembly is referred to as a chair assembly, such includes and describes both single and multiple seat furniture structures.

As it will be appreciated from the description of both embodiments, the seat members 24 and 124 move forwardly in a fashion that their rear ends move forwardly and downwardly while the front ends move forwardly and upwardly. Because the rear ends of the seat members 24 and 124 move forwardly, the top of the seat back connected thereto will not move in a large arc rearwardly as in the prior art assemblies and will therefore not require a large amount of space behind a piece of furniture to accommodate the reclining movement.

The invention has been described in an illustrative manner and it is to be understood that the terminology which has been used is intended to be in the nature of words of description rather than of limitation.

Obviously, many modifications and variations of the present invention are possible in light of the above teachings. It is, therefore, to be understood that with the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A multiple position reclining chair assembly comprising: support means, seat means, a leg rest member, leg rest mounting linkage mounting said leg rest member for movement between a collapsed stored position and an extended leg supporting position and, linkage means operatively interconnecting said support means and said seat means and said leg rest mounting linkage for moving said seat means from an upright position forwardly relative to said support means to a fully reclined position while at the same time actuating said mounting linkage to move said leg rest member to said extended leg supporting position, said linkage means including first and second links with each link pivotally connected to said support means and said seat means respectively, said mounting linkage including a plurality of pivotally interconnected and crossed links with one of said links being a control link pivotally connected adjacent its lower end to another of said crossed links and pivotally connected intermediate its ends to one of said first link and said seat means and said linkage means including a connecting link pivotally connected to the upper end of said control link and pivotally connected to said support means for extending said leg rest member to said leg supporting position as said

seat means moves forwardly relative to said support means.

2. An assembly as set forth in claim 1 including actuation means for moving said assembly between said upright and fully reclined positions.

3. An assembly as set forth in claim 2 wherein said second link extends downwardly as well as upwardly from its pivotal connection to said support means, and said actuation means is connected to said second link below its pivotal connection to said support means.

4. An assembly as set forth in claim 3 wherein said actuation means includes an arm pivotally connected to said support means and a push-pull link pivotally interconnecting said arm and said second link.

5. An assembly as set forth in claim 4 wherein said actuation means includes a handle connected to said arm for pivoting said arm to move said assembly between said upright and reclined positions.

6. An assembly as set forth in claim 5 wherein said actuation means includes a shaft interconnecting said handle and said arm.

7. An assembly as set forth in claim 6 wherein said support means comprises a metal plate-like member adapted for attachment to furniture structure and said seat means comprises a metal plate-like member adapted for attachment to a furniture seat.

8. A multiple position reclining chair assembly comprising: support means, seat means, a leg rest member, leg rest mounting linkage mounting said leg rest member for movement between a collapsed stored position and an extended leg supporting position and, linkage means operatively interconnecting said support means and said seat means and said leg rest mounting linkage for moving said seat means from an upright position forwardly relative to said support means to a fully reclined position while at the same time actuating said mounting linkage to move said leg rest member to said extended leg supporting position, said mounting linkage including a plurality of pivotally interconnected and crossed links with one of said links being a control link pivotally connected adjacent its lower end to another of said crossed links and pivotally supported intermediate its ends and said linkage means including a connecting link pivotally connected to the upper end of said control link above the intermediate pivotal support thereof and pivotally connected to said support means for rotating said control link like a lever to extend said leg rest member to said leg supporting position as said seat means moves forwardly relative to said support means.

9. An assembly as set forth in claim 8 wherein said linkage means includes first and second links with each link pivotally connected to said support means and said seat means respectively.

10. An assembly as set forth in claim 9 wherein said first link is disposed adjacent the front of said assembly and said second link is disposed adjacent the rear of said assembly.

11. An assembly as set forth in claim 10 wherein said control link is pivotally connected to one of said first link and said seat means.

12. An assembly as set forth in claim 11 wherein said first link is generally L-shaped.

13. An assembly as set forth in claim 10 wherein the distance between the pivotal connections of said first link to said seat and support means is greater than the

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distance between the pivotal connections of said second link to said seat and support means.

14. An assembly as set forth in claim 10 including stop means for limiting forward movement of said seat means relative to said support means.

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15. An assembly as set forth in claim 14 wherein said stop means extends from said support means and engages said second link in said fully reclined positions.

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