Jan. 24, 1967 C. A. HUGHES 3,300,244

RECLINING CHAIR

Filed Jan. 6, 1966 3 Sheets-Sheet 1

Fig. 1

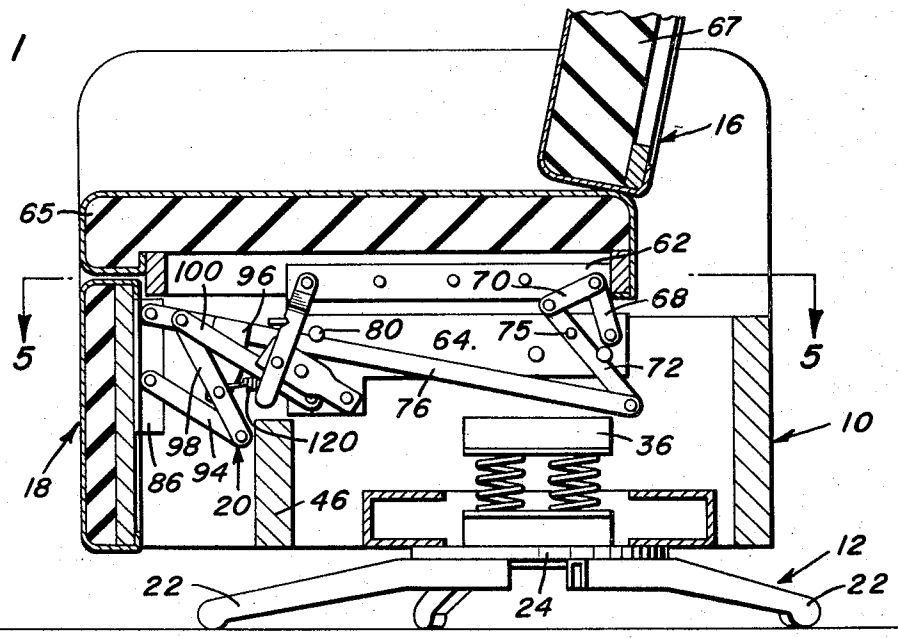


Fig. 2

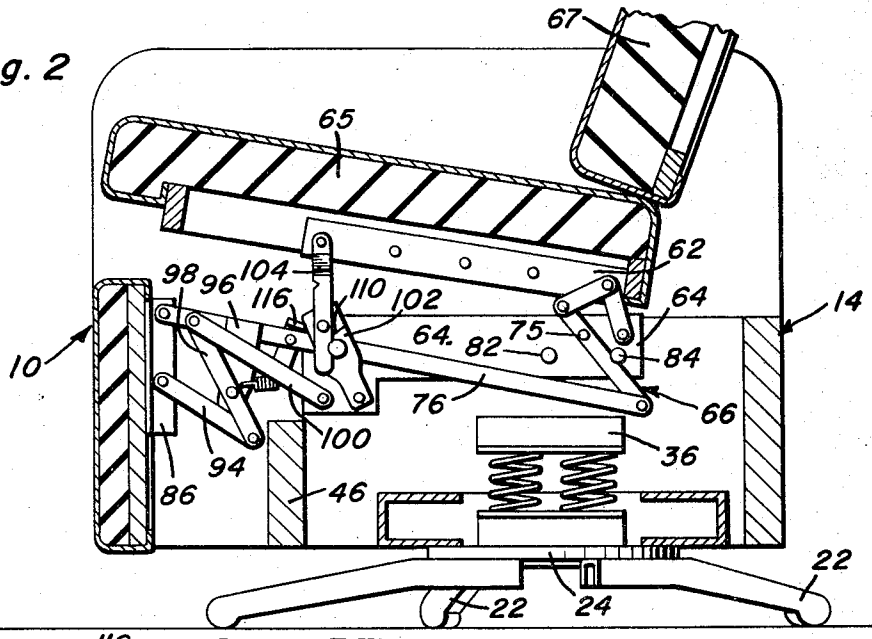
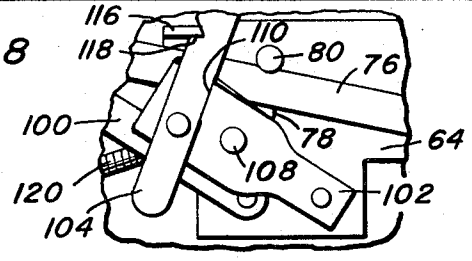


Fig. 8



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Jan. 24, 1967 C. A. HUGHES 3,300,244

RECLINING CHAIR

Filed Jan. 6, 1966 3 Sheets-Sheet 2

Fig. 3

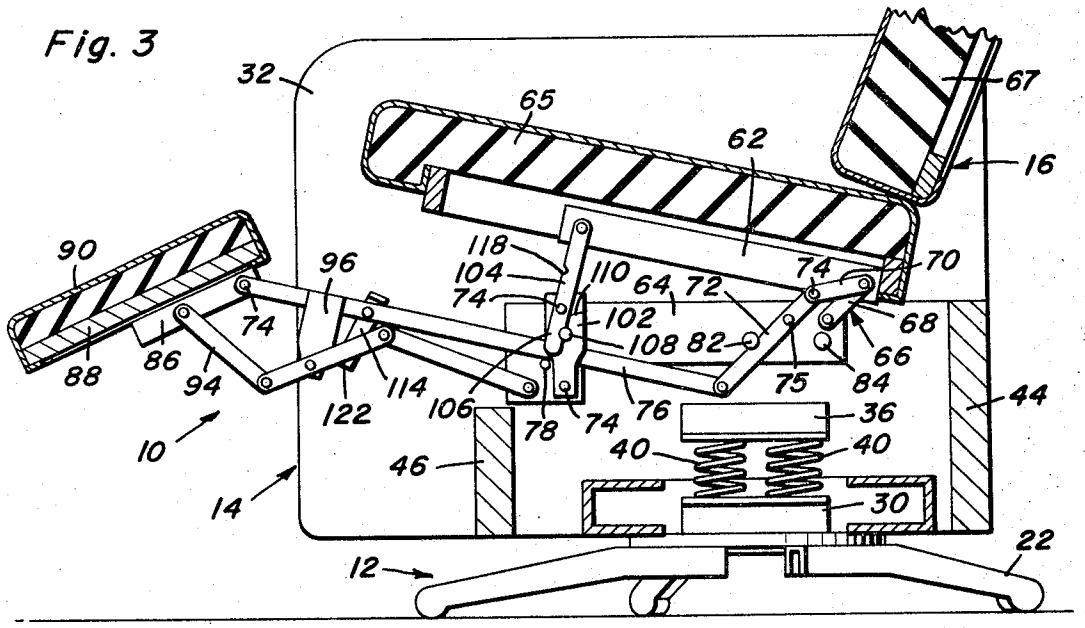
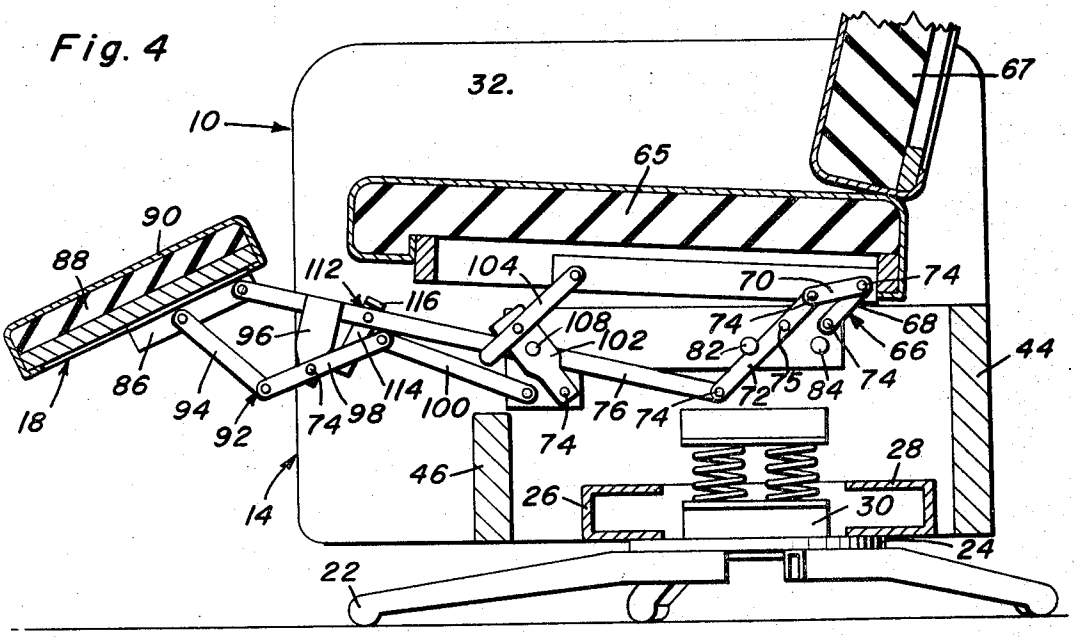


Fig. 4



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Jan. 24, 1967 C. A. HUGHES 3,300,244

RECLINING CHAIR

Filed Jan. 6, 1966 3 Sheets-Sheet 3

Fig. 5

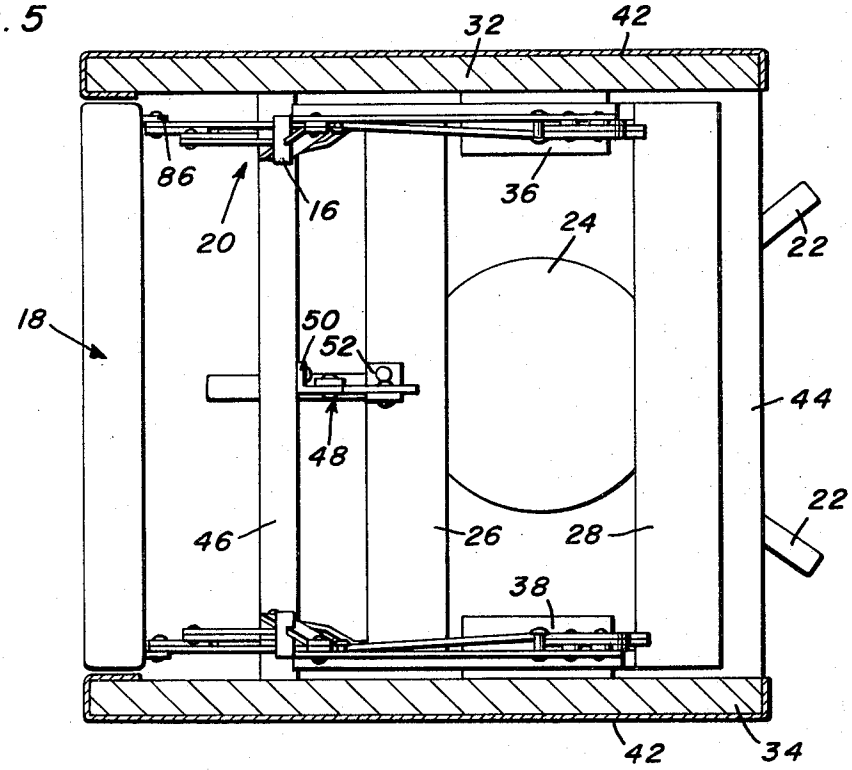


Fig. 6

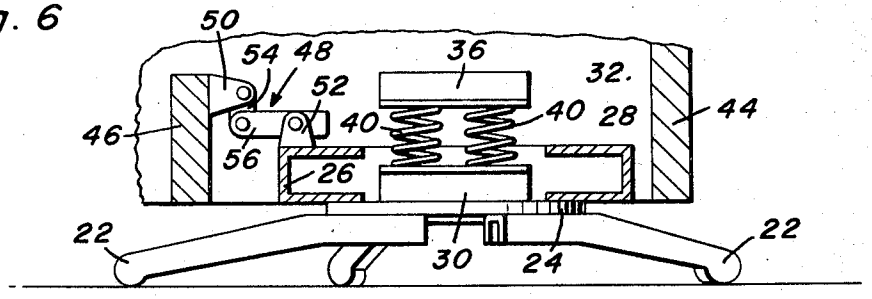
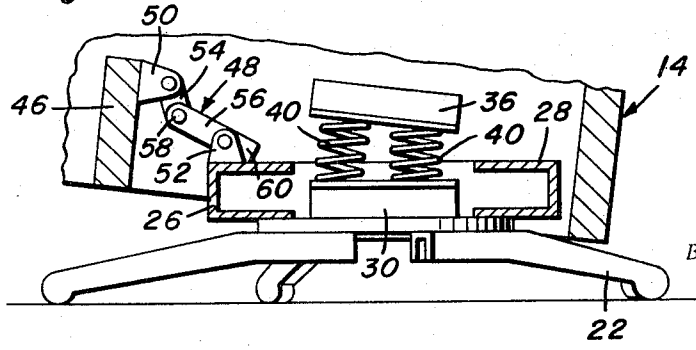


Fig. 7



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3,300,244

RECLINING CHAIR

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12 Claims. (Cl. 297—89)

This invention relates generally to reclining chairs, and more particularly to reclining chairs which are movable to a plurality of positions as well as being rockable, rotatable and which has a leg rest member thereon which is movable from folded to unfolded or foot supporting position in response to movement of the chair body.

Briefly, this invention comprises a ground engaging supporting base member having a chair supporting frame mounted thereon by means of a turntable whereby the frame is rotatable on the base. The frame is further rockingly supported by springs on the base. A chair body comprising a rigidly connected seat and back is mounted in said frame on a pair of seat supporting members, the seat supporting member being in turn movably supported on said frame by control assemblies. A leg rest is mounted at the front end of and between said control assemblies and said leg rest is movable between folded and unfolded positions as said control assemblies are moved in response to movement of said seat supporting members. Further, locking means in said control assemblies are provided to releasably lock said control assemblies and thereby maintain said chair body in upright position when it is not in use.

The chair body and leg rest are movable from a first or folded position wherein the chair body is untilted and the leg rest is withdrawn, to three other possible positions by a person seated on the chair. Thus, by applying upward pull on the seat (or a slight pressure on the back), the chair may be tilted or rotated rearwardly, overcoming the locking means, while the leg rest remains withdrawn. If the person, on the other hand, leans back strongly against the chair back, the chair will tilt and, at the same time the leg rest will be moved outwardly to a leg supporting position. If the person, rather than leaning back strongly against the chair back, merely applies force against the seat and the base of the back, the leg rest will be moved into leg supporting position while the chair will not tilt to the fully reclined position.

Accordingly, it is an object of the instant invention to provide a reclining chair of the type which includes a rigid unitary reclining seat and back section and a leg rest which is movable, upon reclining of the seat and back, to an extended leg supporting position.

It is another object of the present invention to provide a reclining chair including a leg rest which is supported by a pair of operating linkages, thereby being extensible forwardly of the chair as well as rotatable upwardly into leg supporting position.

It is a further object of the present invention to provide a reclining chair of the character described including novel and unique means for controlling the operation and thus the positioning of the leg rest and seat and back sections.

Yet another object of the present invention is to provide a linkage assembly for reclining chairs which is very light of weight as well as being quite sturdy, easy to use and easy to install, and which may therefore be used on reclining chairs of the type which are rotatable and rockable.

A still further object of the present invention is to provide a reclining chair structure having a leg rest member which is moved forwardly and upwardly of the seat by movement of the chair to reclining position.

Another object of the present invention is to provide a

reclining chair and leg rest operating structure which allows for at least four possible positions of the chair and leg rest.

A further object of the present invention is to provide a linkage assembly of the character described including means for releasably locking the chair seat and back in upright position when the chair is unoccupied.

A still further object of the present invention is to provide a reclining chair which may be rocked, swivelled or reclined as preferred.

In accordance with the above object, a further object of the present invention is to provide means for limiting the distance through which the chair may be rocked.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a view partially in section and partially in side elevation of the reclining chair comprising the present invention, the seat and back portion as well as the leg rest being illustrated in a first position;

FIGURE 2 is a view similar to that of FIGURE 1 with the seat and back portion of the chair moved to a second position;

FIGURE 3 is a view similar to that of FIGURES 1 and 2 with the seat and back portion and the leg rest moved to a third preferred position;

FIGURE 4 is a view similar to that of FIGURES 1–3, wherein the seat and back portion and the leg rest are moved to a fourth preferred position;

FIGURE 5 is a horizontal sectional view taken substantially on the plane of the line 5—5 of FIGURE 1;

FIGURE 6 is a partial view partially in side elevation and partially in section of the rockable supporting frame and stationary base portion of the reclining chair illustrated in FIGURES 1–5, including an illustration of means for limiting the rocking motion of the supporting frame;

FIGURE 7 is a view similar to that of FIGURE 6 illustrating the supporting frame in a second position; and

FIGURE 8 is an enlarged detail view of a portion of the linkage assembly used in the reclining chair as illustrated in FIGURES 1–5.

Referring now to the drawings in greater detail and particularly to FIGURES 1–4 and 8, reference numeral **10** generally denotes the reclining chair comprising the present invention. The chair **10** comprises a ground engaging supporting base member generally denoted by reference numeral **12**, a chair body supporting frame generally denoted by reference numeral **14**, a chair body generally denoted by reference numeral **16** supported on said frame **14**, a leg rest member generally denoted by reference numeral **18**, and a linkage assembly generally denoted by reference numeral **20** for supporting said chair body **16** on said frame **14**, and said leg rest **18** on said frame **14**.

The ground engaging supporting base **12** includes a plurality of ground engaging legs **22**, the legs **22** being joined to a turntable assembly **24**, which includes the angle members **26** and **28** as well as a pair of spring blocks **30** (only one of which is illustrated) in order to mount the frame **14** on the base **12** for swivelling or rotation thereabout.

The chair body supporting frame **14** includes a pair of upstanding arms **32** and **34** which are mounted on spring blocks **36** and **38**, respectively, which spring blocks **36** and **38** are substantially identical to the spring blocks **30** and are mounted in close alignment thereover on a pair of heavy duty coil springs **40**. The arms **32** and **34** are

covered by a suitable covering 42 of fabric or the like and are joined by the cross member 44. The frame 14 further includes a front cross member 46 joining the arms 32 and 34 and, as illustrated in FIGURES 6 and 7, for example, the frame 14 is rockable on the base 12 by means of the springs 40 which provide the connection between the frame 14 and the base 12. Further, a stop linkage generally denoted by reference numeral 48 is provided to limit the rearward rocking movement of the frame 14 on the base 12, the linkage 48 including a bracket 50 mounted on the cross member 46, and a bracket 52 mounted on the member 26. A pair of pivotable linkages 54 and 56 are rotatably connected to the brackets 50 and 52, respectively, as well as to each other as indicated by reference numeral 58, and thus, as illustrated in FIGURE 7, when the frame 14 is rocked rearwardly on the base 14 the rear end 60 or the link 56 will eventually strike the member 26 thereby limiting any further rocking or tilting of the frame 14.

Referring again to FIGURES 1–4, the linkage assembly 20 will be observed, it being understood, of course, that the mechanism shown in the drawings is in practice duplicated, one such assembly being provided at each side of the chair, but as the two mechanisms are identical, only one set will be described for purposes of illustration. A seat supporting bracket 62 is attached by suitable attaching means to seat section 65 of the chair body 16. A second bracket 64 is fixedly mounted by suitable attaching means to the frame 14 adjacent the bracket 62 which is mounted on the seat portion 65 of the chair body 16. A rear linkage assembly generally denoted by reference numeral 66, and including the linkage members 68, 70 and 72 mount the bracket 62 to the bracket 64 and hence the seat portion 65 of the chair body 16 to the frame 14. The link 68 is pivotally mounted by suitable rivet-type mounting means 74 to the bracket 64 at one end and to the bracket 62 at the other end. The link 70 is also mounted by mounting rivet 74 to the bracket 62 at one end and at the other end is mounted by a similar rivet 74 to the link 72, which link 72 is pivotally mounted as at 75 to the bracket 64. Thus, it will be apparent by observing FIGURES 1–4, that the rear end of the seat portion 65 of chair body 16 may be moved both longitudinally and vertically of the frame 14 by means of the linkage assembly 66.

A main linkage member 76 is rotatably mounted, at the rearmost end thereof, by a rivet 74 to the bottom end of the link 72 and is movable thereby longitudinally of the frame 14. The vertical movement of the main linkage member 76 is limited by a pair of spaced guide pins 78 and 80 between which the linkage member 76 is restrained, the guide pins 78 and 80 being mounted on the bracket 64. Further, the rearward tilt of the chair 16 as well as the forward extension of the main linkage member 76 is limited by a pair of stop pins 82 and 84 which are spaced apart on the bracket 64, and which, as illustrated best in FIGURES 1–4, limit the rotational movement of the link 72 and hence of the linkage assembly 66.

The leg rest 18 includes a bracket 86 on which is fixedly mounted a body portion 88, which body portion is covered by a suitable covering 90. The leg rest 18 is supported by the main linkage member 76 inasmuch as the bracket 86 is pivotally mounted on the front end of the main linkage member 76 by rivet 74. Thus, when the main linkage member 76 is moved longitudinally on the frame 14 by rotation of the link 72 in response to rearward tilt of the chair body 16, the leg rest 18 will be moved longitudinally outwardly from between the arms 32 and 34, or from the position illustrated in FIGURES 1 and 2 to the position illustrated in FIGURES 3 and 4. However, if the leg rest 18 were mounted only on the forwardmost end of the main linkage member 76, the movement thereof would be laterally outwardly of the frame 14 but the leg rest 18 would not rotate upwardly to the position illustrated in FIGURES 3 and 4.

In order to effect this upward rotational movement of the leg rest 18 in order to move the leg rest into position for supporting a person's feet and legs, the leg rest tilting linkage assembly generally denoted by reference numeral 92 is provided. The linkage assembly 92 includes a first link 94 pivotally mounted at one end on the bracket 86 below the mounting of the main linkage member 76 thereon, a fixed leg 96 perpendicularly fixed on the main linkage member 76 adjacent the end thereof, a second or cross-link 98 pivotally mounted by rivet 74 on the depending leg 96 substantially at the center point thereof, and pivotally attached at one end to link 94, and at the other end to another link 100. The link 100 is pivotally mounted at the other end thereof to the bracket 64. Thus, if a person were to sit on the seat 65 and thrust his weight rearwardly against the backrest portion 67, the linkage assembly 66 will rotate on the frame 14 until the link 72 strikes the stop 82, thrusting the main linkage member 76 forwardly, and unfolding the linkage assembly 92 from the position thereof illustrated in FIGURE 1 to the position thereof illustrated in either FIGURE 3 or 4, thereby rotating the leg rest 18 upwardly to the leg supporting position illustrated in these figures.

Means in the form of a bracket 102, rotatably mounted by rivet 74 to the bracket 64, and a link 104 rotatably mounted between the bracket 102 and the bracket 62 are provided in order to support the front portion of the bracket 62 and hence the seat portion 65 of the chair body 16. The upward movement of the chair body 16 is limited by the extension of the link 104 and bracket 102 as illustrated in FIGURES 2 and 3 for example, the lower portion 106 of link 104 striking a stop pin 108 on the bracket 102 slightly below the point 74 to which the bracket 102 and link 104 are joined, thus limiting such rearward rotation and tilting of the chair body 16. Further, the downward or forward rotation of the chair body 16 is limited by a stop 110 on the bracket 102, which stop 110 comprises a struck-out or flanged leg which the link 104 will abut as illustrated in FIGURES 1, 4 and 8 when the chair body is rotated downwardly. Thus, it will be appreciated that the limits of rotation of the chair body 16 are defined by the stops 108 and 110.

A lock, generally denoted by reference numeral 112, is provided in the link assembly 20 for releasably retaining the chair body 16 in substantially upright position when the chair is unoccupied. The lock 112 comprises a lock member 114 rotatably mounted on the main linkage member 76 and having a flanged head portion 116 thereon which is adapted to be seated in the notch 118 in the link 104 when the chair body 16 is rotated to the upright position illustrated in FIGURES 1 and 8. A small coil spring 120 is mounted between the lower end 122 of the lock member 114 and the leg 96 in order to normally bias the head 116 into the notch 118. The locking member 112 will thus retrain the chair body 16 in the position illustrated in FIGURE 1 when the chair is unused, inasmuch as the link 104 will be retained in this downward position by the head 116, holding the bracket 62 in a substantially horizontal position. It is possible, however, to move the chair body 16 to the position illustrated in FIGURE 2 if so desired. Thus, if it is desired to tilt the chair body 16 rearwardly as illustrated in FIGURE 2, over the retaining force of the lock member 112, the user of the device merely needs to sit in the chair body 16 and either pull upwardly on the seat portion 65 or lean back against the backrest portion 67, taking care not to exert too much pressure. Upon application of such slight force on the chair body 16, the chair body will rotate to the position illustrated in FIGURE 2, as the head 116 is forced out of notch 118 and the bracket 62 rotates with respect to the linkage assembly 66 without rotating such assembly, and the bracket 102 and link 104 straighten. At this time, by remaining in a slightly rearwardly oriented position, the user of the reclining chair 10 can maintain this position. However, if it is

desired to move the leg rest **18** outwardly in leg supporting position as illustrated in FIGURE 3, the user merely has to exert a greater force against the backrest portion **67**, thus causing the linkage assembly **66** to rotate and the leg rest **18** to be forced up and out.

If, on the other hand, the user of the device desired to raise the footrest **18** to the position shown in FIGURE 4, while moving the chair body upwardly only to the position illustrated in this figure, this may be accomplished by applying pressure rearwardly against the seat portion **65** and the lower portion of the backrest portion **67** of the chair body **16** so as to refrain from rotating the bracket **103** and link **104** upwardly, while at the same time forcing the linkage assembly **66** to rotate to force the leg rest **18** outwardly and upwardly. Thus, it will be appreciated that FIGURE 4 illustrates one of four possible positions in which the chair **10** may be moved.

If it is desired to rotate the chair, this may be accomplished merely by outward pressure on either arm **32** or **34** thereof whereby the frame **14** will rotate on the turntable assembly **24**. If on the other hand, it is desired to rock the chair, this may be accomplished by grasping the arms **32** and **34**, while holding the chair body **16** in place therebetween, and causing the frame **14** to rock with respect to the base **12**, as illustrated in FIGURE 7. However, if it is desired to recline the chair body with respect to the frame **14**, rather than rock the frame **14** with respect to the base **12**, the user of the device should not grasp the arms **32** and **34** in the same manner, but rather should either lean back against the backrest portion **67** of the chair body **16** or should grasp the seat portion **65** and pull upwardly thereon.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A reclining chair comprising ground engaging supporting base means, a chair body supporting frame, means for swivelly mounting said chair body supporting frame on said base means, means mounting said frame on said base means for rocking said frame thereon, a chair body supported by said frame for movement between reclined positions, a leg rest, control means for supporting said leg rest, said control means operably connected between one end of said chair body and said leg rest and responsive to movement of said chair body for controlling the movement of said leg rest, lock means on said control means for releasably retaining said chair body in substantially upright position when said reclining chair is unoccupied, said control means comprising a main linkage member, said leg rest pivotally mounted on the forward end of said main linkage member, and a linkage assembly pivotally mounted on said chair body supporting frame, said linkage assembly operatively connecting said chair body to said main linkage member whereby movement of said chair body will impart movement to said main linkage member and hence to said leg rest, said linkage assembly including a cross-linkage member pivotally mounted on said support frame, said main linkage member connected to said cross-linkage member, said control means further including linkage assembly means for tilting said leg rest in response to movement of said main linkage member, and a pair of stop pins on said supporting frame adjacent said cross-linkage member for limiting the rotational movement thereof.

2. A linkage assembly for use in reclining chairs having a leg rest and a stationary frame, comprising a seat supporting member, a linkage assembly supporting one end of said seat supporting member on said frame for swinging movement of said seat supporting member with respect to said frame, a main link connected between said linkage assembly and said leg rest, said main link being responsive to movement of said seat supporting member for moving said leg rest between folded and unfolded positions, bracket means pivotally mounted on said frame adjacent the other end of said seat supporting member, a link pivotally mounted between the other end of said seat supporting member and said bracket means, the other end of said seat supporting member thereby being vertically movable with respect to said frame, means on said bracket means for limiting the rotation of said bracket means and the link connecting said bracket means to said seat supporting member in a first direction, said limiting means thereby limiting the vertical movement of the other end of said seat supporting member, and lock means on said main link for releasably preventing the rotation of said bracket means and the link connecting the bracket means to said seat supporting member, said lock means engaging recess means in the link connecting said bracket means to said seat supporting member when said seat supporting member is in its lowermost position for retaining said link and hence said seat supporting member in this position.

3. The combination of claim **1** including means connecting the front end of said chair body to said supporting frame for tilting of said chair body without actuation of said control means, said means connecting the front end of said chair body to said supporting frame including bracket means pivotally mounted on said frame adjacent the other end of said chair body, a link pivotally mounted between said other end of said chair body and said bracket means, and means on said bracket means for limiting the rotation of said bracket means and the link connecting said bracket means to said chair body in a first direction.

4. The combination of claim **2** wherein said main link comprises a single elongated rigid member extending from adjacent said one end of said seat supporting member into direct pivotal engagement with said leg rest, and leg rest tilting linkage means comprising leg means fixed on said main link, a cross-link pivotally mounted on said leg means, a link pivotally connected between one end of said cross-link and said frame, and a link pivotally connected between the other end of said cross-link and said leg rest.

5. A reclining chair comprising ground engaging supporting base means, a chair body supporting frame, means mounting said frame on said base means, a chair body supported by said frame for movement to reclined positions, a leg rest, control means for supporting said leg rest, said control means operably connected between one end of said chair body and said leg rest and responsive to movement of said chair body for controlling the movement of said leg rest, said control means comprising a main linkage member, said leg rest pivotally mounted on the forward end of said main linkage member, and a linkage assembly pivotally mounted on said chair body supporting frame, said linkage assembly operatively connecting said chair body to said main linkage member whereby movement of said chair body will impart movement to said main linkage member and hence to said leg rest, said linkage assembly including a cross-linkage member pivotally mounted on said support frame, said main linkage member connected to said cross-linkage member, said control means further including linkage assembly means for tilting said leg rest in response to movement of said main linkage member, and stop means on said supporting frame adjacent said cross-linkage member for limiting the rotational movement thereof.

6. The combination of claim **5** wherein said main linkage member comprises a single elongated rigid link directly pivoted to the leg rest and extending rearwardly therefrom to a point located adjacent the rear of the chair body, said linkage assembly being engaged with the chair body adjacent the rear thereof.

7. The combination of claim 6 wherein said control means further includes linkage assembly means for tilting said leg rest in response to movement of said main linkage member, said leg rest tilting linkage assembly means comprising leg means fixed on said main linkage member, a cross-link pivotally mounted on said leg means, a link pivotally connected between one end of said last-mentioned cross-link and said supporting frame, and a link pivotally connected between the other end of said last-mentioned cross-link and said leg rest.

8. A reclining chair comprising ground engaging supporting base means, a chair body supporting frame, means mounting said frame on said base means, a chair body supported by said frame for movement to reclined positions, a leg rest, control means for supporting said leg rest, said control means operably connected between one end of said chair body and said leg rest and responsive to movement of said chair body for controlling the movement of said leg rest, said control means comprising a main linkage member, said leg rest pivotally mounted on the forward end of said main linkage member, and a linkage assembly pivotally mounted on said chair body supporting frame, said linkage assembly operatively connecting said chair body to said main linkage member whereby movement of said chair body will impart movement to said main linkage member and hence to said leg rest, said linkage assembly including a cross-linkage member pivotally mounted on said support frame, said main linkage member connected to said cross-linkage member, said control means further including linkage assembly means for tilting said leg rest in response to movement of said main linkage member, said main linkage member consisting of a single elongated rigid link extending from a point adjacent said one end of said chair body forwardly into direct pivotal engagement with said leg rest.

9. The combination of claim 8 wherein said leg rest tilting linkage assembly means comprises leg means fixed on said main linkage member, a cross-link pivotally mounted on said leg means, a link pivotally connected between one end of said cross-link and said supporting frame, and a link pivotally connected between the other end of said cross-link and said leg rest.

10. The combination of claim 8 wherein said main linkage member is connected to the cross-linkage member at one end thereof, and a link pivotally connected to the other end of said cross-linkage member and to said one end of said chair body whereby movement of said chair body will impart pivotal movement to said cross-linkage member and a corresponding substantially longitudinal movement of said main linkage member.

11. The combination of claim 10 including bracket means pivotally mounted on said frame adjacent the other end of said chair body, a link pivotally mounted between the other end of said chair body and said bracket means, the other end of said chair body thereby being vertically movable with respect to said frame, means on said bracket means for limiting the rotation of said bracket means and the link connecting said bracket means to said chair body in a first direction, and a link pivotally mounted between said one end of said chair body and the frame therebelow for enabling a movement of the chair body independent of the main linkage member.

12. The combination of claim 11 including lock means on said main linkage member for releasably preventing the rotation of said bracket means and the link connecting the bracket means to said chair body, said lock means engaging means on the link connecting said bracket means to said chair body when said chair body is in its lowermost position for retaining this link and hence the chair body in this position.

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