Sept. 1, 1953 A. LORENZ 2,650,649

RECLINING ARTICLE OF FURNITURE

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FIG. 1

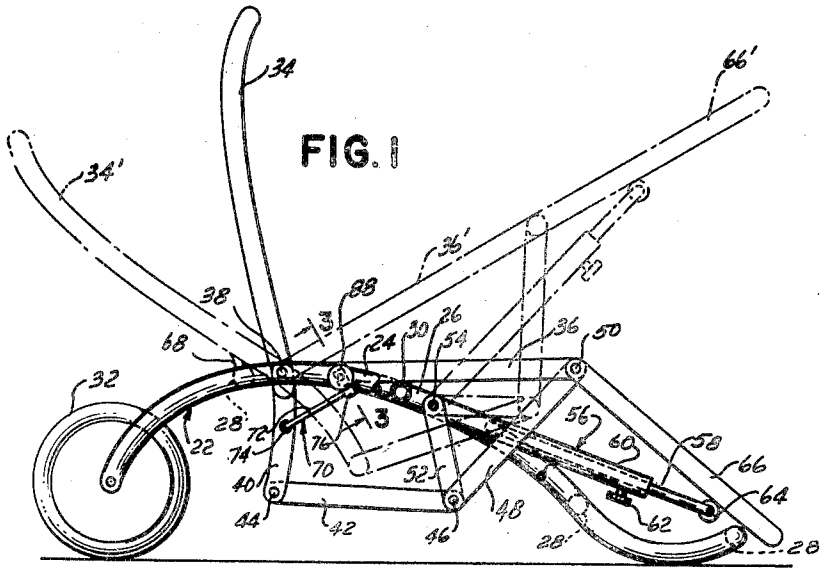


FIG. 2

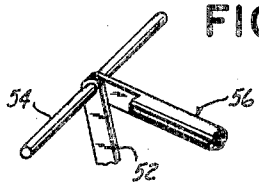
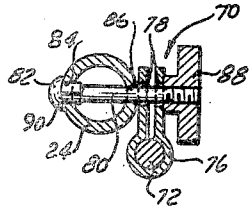


FIG. 3



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FIG. 5

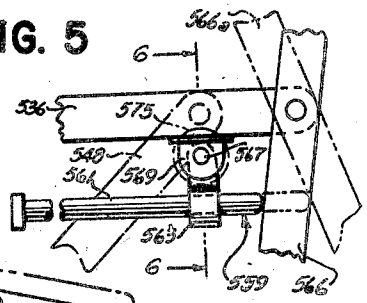


FIG. 4

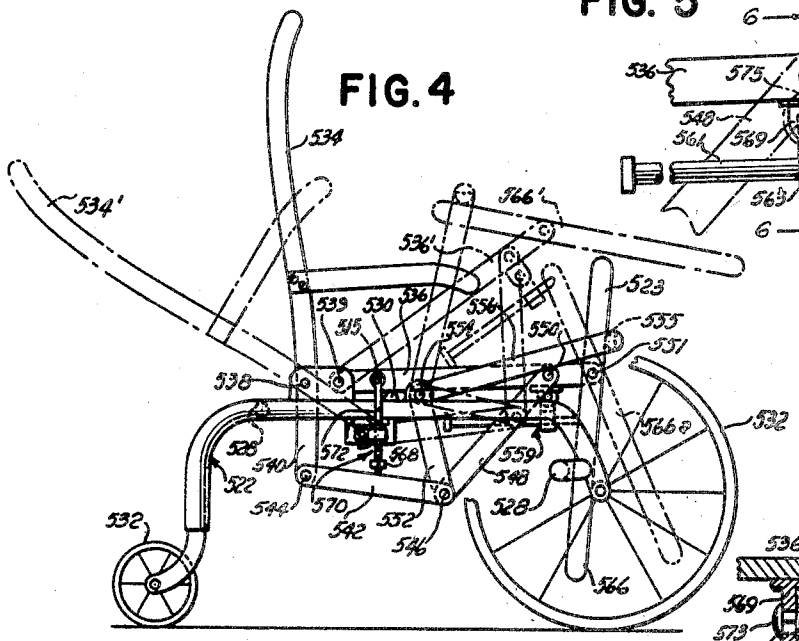


FIG. 6

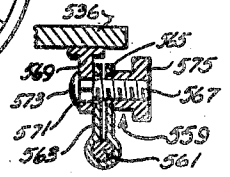


FIG. 8

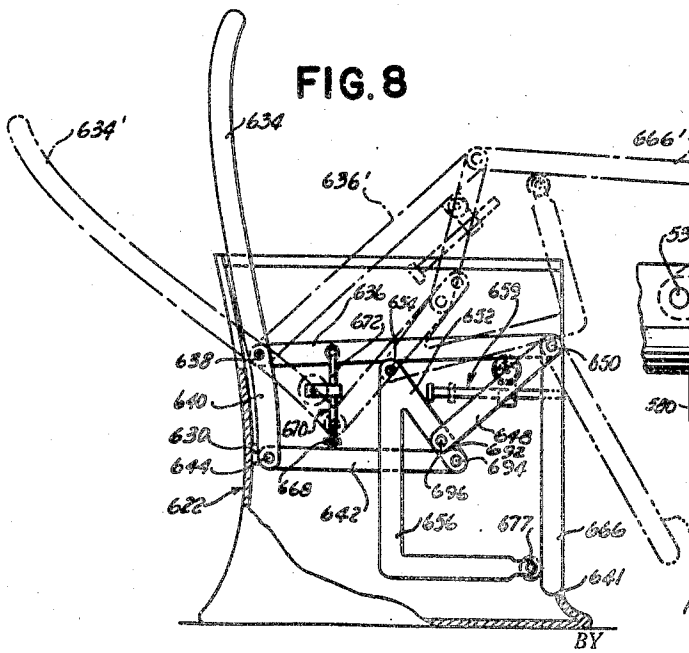
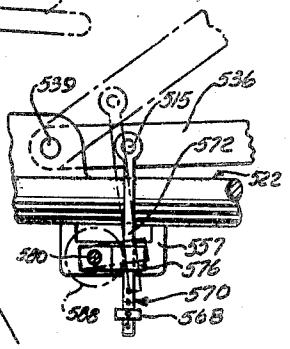


FIG. 7



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2,650,649

UNITED STATES PATENT OFFICE

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RECLINING ARTICLE OF FURNITURE

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Original application January 22, 1946, Serial No. 642,652, now Patent No. 2,576,466, dated November 27, 1951. Divided and this application November 19, 1951, Serial No. 256,983

7 Claims. (Cl. 155—106)

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This application is a divisional application divided out of my copending application Ser. No. 642,652 filed on January 22, 1946 for "A Reclining Article of Furniture" which matured into Patent No. 2,576,466 issued on November 27, 1951.

This invention relates to an article of furniture, and more particularly to an article of repose for supporting the body of a person, wherein the downward extension of a back-rest, a seat, a guiding link and a chain of connecting links form movable members of a constrained linkage mounted on a support, and wherein one end of said guiding link is pivoted to said support and its other end is connected with at least one connecting link of said chain of connecting links.

An object of the present invention is to provide a controlling mechanism for a leg-rest swingably mounted on the seat of an article of repose of above described type, by means of which the angle between the leg-rest and the seat is automatically altered in dependence on the movements of the guiding link when the movable members of the article of repose including the back-rest and the seat are brought from a certain position, such as the sitting position, into another position, such as a reclined position, or vice versa.

A further object of the present invention is to equip an article of repose of above described type with a controlling mechanism for the leg-rest, which may cause a movement of the leg-rest relative to the seat, when the position of the movable links of the linkage is altered, which, however, does not form a positive connection between the leg-rest and the controlling mechanism, thus permitting an independent movement of the leg-rest relative to the seat, when the links of the linkage are held in a certain position relative to each other.

Another object of the present invention is to improve on the construction of articles of repose of above described type as now customarily made.

Other objects and structural details of the invention will be apparent from the following description when read in conjunction with the accompanying drawings forming part of this specification, wherein:

Fig. 1 is a side elevational view of a reclining lounge-chair according to the invention, a portion of the support being broken away,

Fig. 2 is a fragmentary perspective view of a detail of the lounge-chair shown in Fig. 1,

Fig. 3 is a sectional view of the locking device of the lounge-chair shown in Fig. 1, taken on line 3—3 of Fig. 1,

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Fig. 4 is a side elevational view of a reclining wheel chair according to the invention,

Fig. 5 is a fragmentary side elevational view of the front portion of the wheel chair shown in Fig. 4, illustrating the holding device for the leg-rest,

Fig. 6 is a sectional view of the holding device of the wheel chair shown in Fig. 4, taken on line 6—6 of Fig. 5,

Fig. 7 is a fragmentary side elevational view of the locking device of the wheel chair shown in Fig. 4, and

Fig. 8 is a side elevational view of another embodiment of a reclining arm-chair according to the invention, a portion of a side wall of the support being broken away.

Referring now to Fig. 1, 22 generally indicates the support of a lounge-chair. Said support 22 comprises the side frames 24, 26 connected with each other by transverse rods 28 and 30. The support 22 may be moved along the ground by means of wheels 32 (only one being shown) journalled in suitable bearings of the support.

The back-rest 34 and the rear portion of a seat 36 are coaxially pivoted to the support 22 at 38. The back-rest 34 has a downward extension 40 substantially in the center of the lounge-chair. The rear end of a connecting link 42, hereinafter called a lower connecting link is pivoted to said extension 40 of the back-rest 34 at 44. The other end of said lower connecting link 42 is pivoted at 46 to the adjacent end of another connecting link 48, hereinafter called the front connecting link. The upper end of said front connecting link 48 is pivoted to the front portion of the seat 36 at 50. The pair of connecting links 42, 48, pivotally connected with each other at 46 form a link-chain. The lower end of a guiding link 52 is connected with the pivotal connection 46 between the connecting links 42 and 48. The upper end of said guiding link 52 is rigidly connected with a transverse rod 54 journalled in suitable bearings of the support 22 (see Figs. 1 and 2). Thus, said downward extension 40 of the back-rest 34, said seat 36, said pair of connecting links 42, 48 and said guiding link 52 form the movable links of a constrained linkage, while the portion of the support 22 between the pivots 38 and 54 constitutes the stationary link of said constrained linkage.

One end of a telescopic controlling member or controlling bar 56 is also rigidly connected with said transverse rod 54, so that said controlling bar 56 participates in the movements of the guiding link 52. The element 58 slidably arranged in the hollow element 60 of the telescopic con-

trolling bar 56 may be held in any desired position relative to said hollow element 60 by means of a set screw 62. A roller 64 journalled in said element 58 of the telescopic controlling bar 56 is in shiftable engagement with a leg-rest 66 swingably mounted on the front portion of the seat 36 at 50. Thus, when the occupant of the lounge-chair leans the weight of his body against the back-rest 34, whereby the latter is swung about its pivot 38 into a reclined position, for example the position 34', the seat 36 controlled by the movements of the guiding link 52 is brought into the reclined position 36', and the leg-rest 66 is swung by means of the controlling bar 56 about its pivot 50 into the reclined position 66' in dependence on the movements of the guiding link 52 and the controlling member 56 fixed thereto.

The sitting position of the movable members of the lounge-chair shown in full lines is limited by the transverse rod 30 of the support 22 forming a stop on which the seat 36 comes to a rest. The extreme reclined position of the movable members of the lounge-chair shown in dash and dot lines is limited by a stop 68 mounted on the support 22 for cooperation with the back-rest.

The movable members of the lounge-chair may be held in said extreme reclined position or in any other intermediate reclined position by means of a locking device generally indicated by 70. As best shown in Figs. 1 and 3, said locking device 70 comprises a locking rod 72 swingably mounted on the extension 40 of the back-rest 34 at 74. The free end of said locking rod 72 is in slidable engagement with a clamping sleeve 76 having bores 78 for engagement with a bolt 80. Said bolt 80 having a head 82 and passing through apertures 84, 86 of the side frame 24 has a threaded end for engagement with the threaded bore of a locking knob 88. A square portion 90 of the bolt 80 engaged with the corresponding square aperture 84 of the tubular side frame 24 prevents the bolt 80 from rotation when the knob 88 is turned. When the locking knob 88 is loosened, the locking rod 72 may freely slide in the clamping sleeve 76, so that the movable members of the lounget may be readily moved from one position into another one. When the locking knob 88 is tightened, the clamping sleeve 76 is tightly pressed on the locking rod 72, whereby the latter and the movable members of the lounget are held in their position. Of course, any other suitable locking device may be used instead of the locking device 70 shown in the drawings.

As mentioned above, the controlling bar 56 is of the telescopic type, so that its effective length may be varied and adjusted by loosening the set screw 62 displacing the member 58 relative to the hollow member 60, and holding the member 58 in the displaced position by tightening again the set screw 62. When the movable links 36, 40, 42, 48, 52 of the constrained linkage are held in a certain position by means of the stop 30 or by means of the locking device 70, the angle between the leg-rest 66 and the seat 36 may be altered by means of such an adjustment of the effective length of the telescopic controlling bar 56.

According to the embodiment of a reclining wheel chair shown in Fig. 4, the support 522 is provided with wheels 532 of any conventional construction. The side frames of the support 522 are connected with each other by transverse rods 528.

The back-rest 534 is pivoted to the support 522 at 538. The seat 536 is pivoted to said support 522 at 539 spaced from the pivot 538. The rear end of a lower connecting link 542 arranged on each side of the wheel chair is pivoted to the downward extension 540 of the back-rest at 544. The other end of said lower connecting link 542 is pivoted at 546 with the lower end of the guiding link 552 and one end of the front connecting link 548. The upper end of said front connecting link 548 is pivoted at 550 to the seat 536.

The leg-rest 566 swingably mounted on the seat 536 at 551 has an upward extension 523. A controlling member or bar 556 integral with the guiding link 552 swingably mounted on the support 522 at 554 has a controlling surface 555 in the shape of a cam, which is in loose contact with said extension 523 of the leg-rest 566. The extension 523 of the leg-rest may be held against said controlling cam 555 by means of a spring (not shown). When the controlling cam 555 of the controlling bar 556 is in engagement with said extension 523 of the leg-rest 566, the movements of the leg-rest are controlled in dependence on the movements of the guiding link 552. Thus, if the back-rest 534 is swung about its pivot 538 into the reclined position 534', the seat 536 and the leg-rest 566 controlled by said guiding link 552 are brought into the position 536' and 566'.

The sitting position of the movable members of the chair is limited by the stop 530 mounted on the support 522, and the extreme reclined position of the movable members of the chair is limited by the adjustable stop collar 568 mounted on the locking rod 572 of a locking device, generally indicated by 570. As best shown in Fig. 7, the locking rod 570 is swingably mounted on the seat 536 at 515, and the bolt 580 carrying the clamping sleeve 576 and the locking knob 588 is mounted on a bracket 557 attached to a side frame of the support 522. The movable members of the link-system of the wheel chair may be held in any desired position by tightening the locking knob 588.

As mentioned above, the controlling cam 555 is in loose contact with the extension 523 of the leg-rest 566, so that the leg-rest 566 with its extension 523 may be disengaged from said controlling cam 555, when the seat 536 is held by the locking device 570 in a certain position. For example, the extension 523 of the leg-rest 566 may be grasped by hand, and the leg-rest may be swung into the position 566*a*, while the seat 536 remains in the sitting position shown in full lines. A holding device generally indicated by 559 and mounted on the seat 536 may be used for holding the leg-rest 566 in a certain position, for example said position 566*a* relative to the seat 536. As best shown in Figs. 5 and 6, said holding device 559 comprises a rod 561 slidably engaged with a clamping sleeve 563 having bores 565 for receiving a bolt 567 mounted on a lug 569 attached to the seat 536. A square portion 571 of the bolt 567 having a head 573 is engaged with a corresponding square aperture of the lug 569, so that the bolt 567 is prevented from rotation when a locking knob 575 screwed on the threaded end of the bolt 567 is turned. Assuming the rod 561 is in the position shown in full lines in Fig. 5, and the leg-rest has been swung by hand from the position shown in full lines into the position 566*a*: In order to hold said leg-rest in said position 566*a*, the locking knob 575 of the holding device 559 is loosened, whereupon the rod 561 may be axially displaced in the clamping sleeve 563 until it abuts against said leg-rest in

the position 566a as shown in dash and dot lines. Now, the locking knob 575 is tightened, whereby the clamping sleeve 563 is tightly pressed on the rod 561 so as to hold same and the leg-rest in the dash and dot line position. When, after a loosening of the locking device 570 the movable members of the chair are brought into a reclined position, the leg-rest will remain in said position 566a relative to the seat 536 until the controlling cam 555 of the controlling bar 556 abuts against the extension 523 of the leg-rest 566. If, after such an abutment, the movement of the movable members of the wheel chair is continued, the position of the leg-rest 566 relative to the seat 536 is altered by the controlling cam 555 in dependence on the movements of the guiding link 552.

According to the embodiment of a reclining arm-chair shown in Fig. 8 the back-rest 634 and the seat 636 are coaxially pivoted to the support 622 at 638. The downward extension 640 of the back-rest 634 is pivoted at 644 to the rear end of the lower connecting link 642. The other end of said lower connecting link is pivoted at 694 to an intermediate connecting link 692, which, in turn, is pivoted at 696 to one end of the front connecting link 648. The upper end of said front connecting link 648 is pivoted to the seat 636 at 650. A guiding link 652 integral with the intermediate connecting link 692 is swingably mounted on the support at 654. A bent controlling bar 656 integral with the guiding link 652 carries a controlling surface in the shape of a roller 677 for loose contact with the leg-rest 666 swingably mounted on the seat 636 at 659. The leg-rest 666 and the controlling bar 656 may pass through a slot 641 in the front wall of the support 622.

When the leg-rest 666 is in engagement with the controlling roller 677 and the back-rest 634 is swung about its pivot 638 into the extreme reclined position 634', the seat and the leg-rest are brought into the position 636', 666'.

The movable members of the chair may be held in any desired position by means of the locking device 670 of the type described above in connection with Fig. 7.

The sitting position of the movable members of the chair is limited by a stop 630 mounted on the support 622 for cooperation with the downward extension 640 of the back-rest 634, and the extrame reclined position is limited by the stop collar 668 adjustably mounted on the locking rod 672 of the locking device 670.

The leg-rest 666 may be disengaged from the roller 677 of the controlling bar 656, so that, if desired, the leg-rest may be brought into a different position relative to the seat 636, for example into the position 666a. The leg-rest may be held in said position 666a by means of a holding device 659 mounted on the seat 636. The holding device 659 is of the same construction as the holding device shown in Figs. 5 and 6.

I have described preferred embodiments of my invention, but it is understood that this disclosure is for the purpose of illustration, and that various omissions or changes in shape, proportion and arrangement of parts, as well as the substitution of equivalent elements for those, herein shown and described, may be made without departing from the spirit and scope of the invention as set forth in the appended claims.

What I claim is:

1. An article of repose for supporting the body of a person, comprising in combination: a support, a constrained linkage having stationary link-means and a plurality of movable links, said stationary link-means being included in said support, said movable links including a seat-member, a downward extension of a back-rest member, a guiding link and a chain of connecting links including a lower connecting link at one end of the chain and a front connecting link at the other end of the chain, at least one of said connecting links being arranged below the plane of the seat-member, one end of said guiding links being pivoted to said support, the other end of said guiding link being connected with at least one connecting link of said chain of connecting links, said lower connecting link being pivoted to the downward extension of the back-rest member, said front connecting link being pivoted to the front portion of said seat-member, means pivotally connecting at least one of said back-rest- and seat-members with said support, a leg-rest swingably mounted on the front portion of said seat-member, a controlling member fixedly connected to said guiding link, and cooperating abutting surfaces on said controlling member and the structure of said leg-rest for effecting movement of the latter in coordination with said controlling member.

2. In an article of repose as claimed in claim 1, said abutting surfaces on the controlling member and the leg-rest being disengageable from each other.

3. In an article of repose as claimed in claim 1, a roller journalled on said controlling member for engagement with the abutting surface on the structure of said leg-rest.

4. In an article of repose as claimed in claim 1, said controlling member being in the shape of a bar of adjustable length, and means associated with said bar for setting a predetermined length thereof.

5. In an article of repose as claimed in claim 1, said abutting surfaces on the controlling member and the leg-rest being disengageable from each other, and a holding device associated with the seat-member and the leg-rest for holding the leg-rest in a predetermined position relative to the seat.

6. In an article of repose as claimed in claim 1, the structure of the leg-rest including an extension projecting upwardly beyond its pivotal connection with the seat-member, and one of said cooperating abutting surfaces being arranged on said upward extension of the leg-rest.

7. In an article of repose as claimed in claim 1, said controlling member being in the shape of a bent bar.

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