March 23, 1954 J. LUCKHARDT 2,672,918

ARTICLE OF REPOSE FOR SUPPORTING THE BODY OF A PERSON

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Fig. 3.

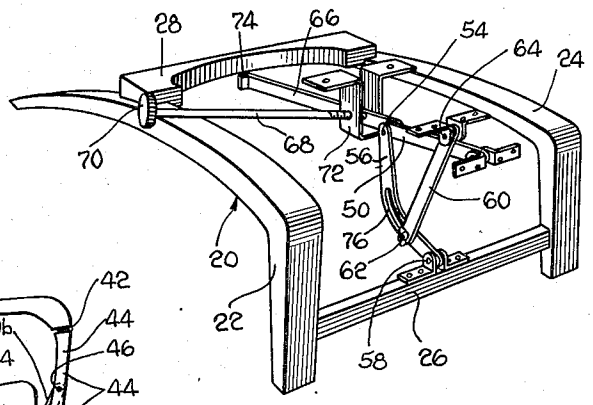


Fig. 1.

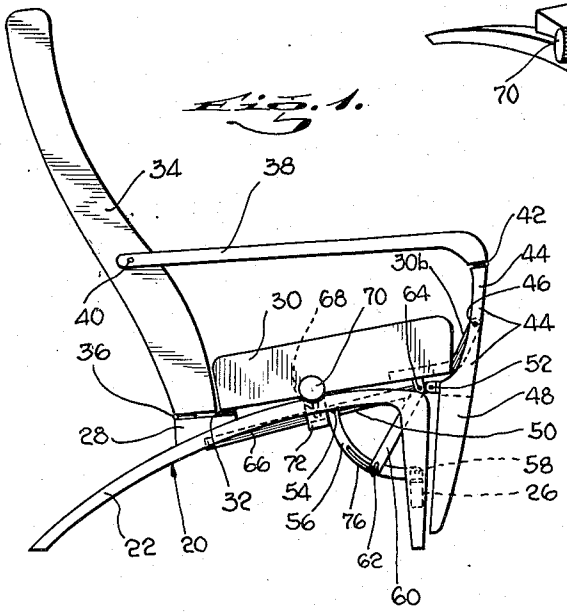


Fig. 2.

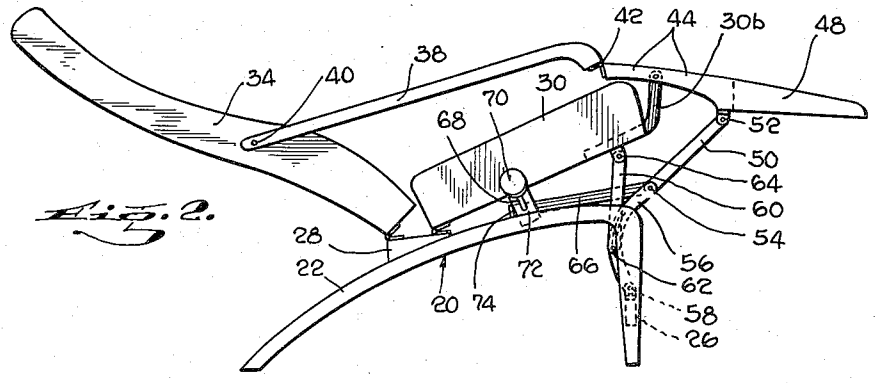
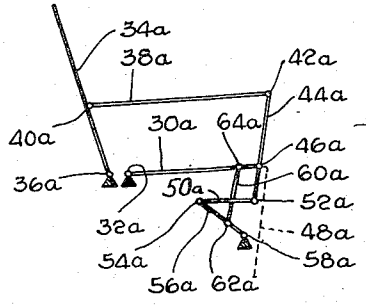


Fig. 4.



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Fig. 5.

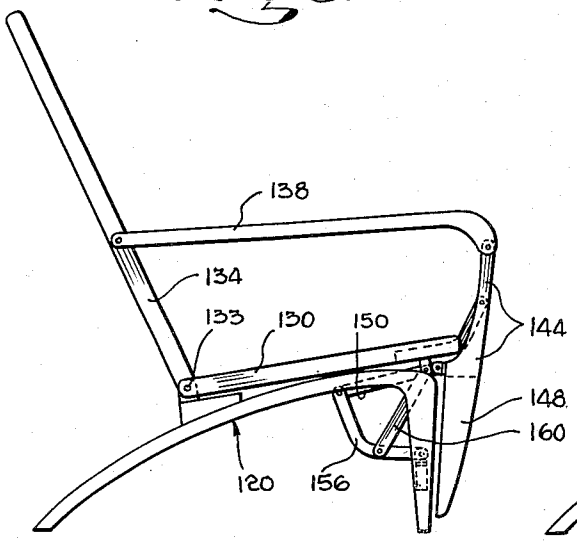


Fig. 6.

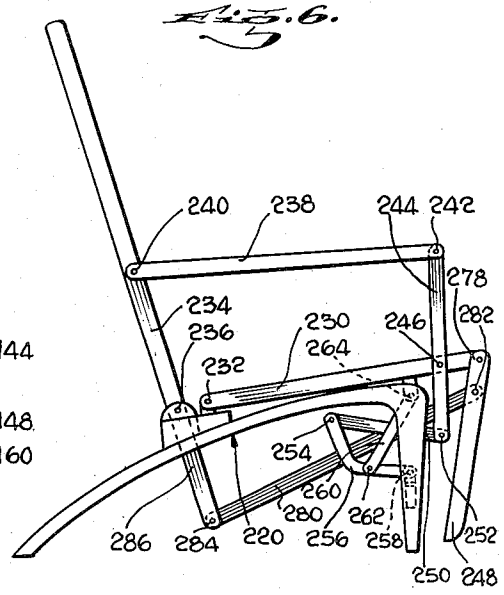


Fig. 7.

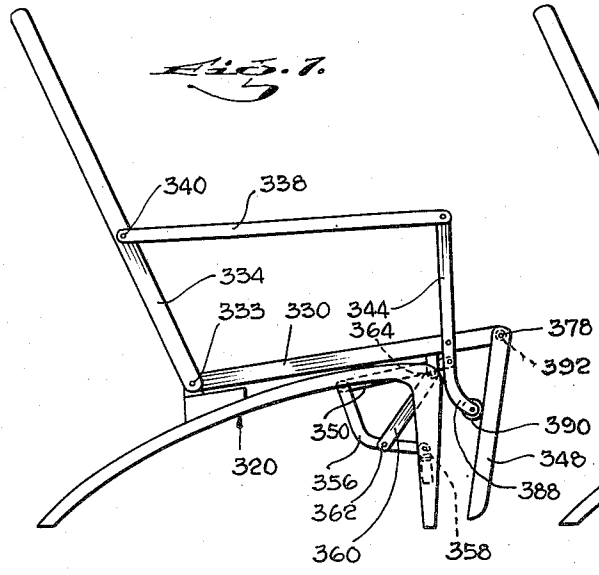
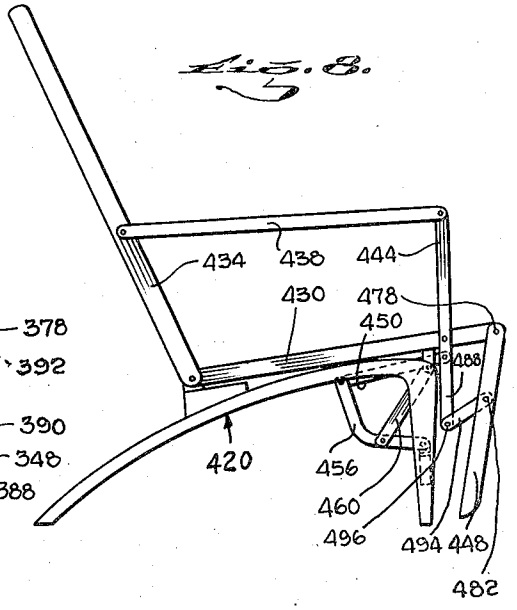


Fig. 8.



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ARTICLE OF REPOSE FOR SUPPORTING THE BODY OF A PERSON

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Application February 12, 1952, Serial No. 271,240

Claims priority, application Germany March 9, 1951

18 Claims. (Cl. 155—106)

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This invention relates to articles of furniture, and more particularly to articles of repose for supporting the body of a person and being equipped with a constrained linkage with stationary link means and a plurality of movable links, the seat and the back-rest forming movable links of such a constrained linkage.

An object of the present invention is to provide an article of repose for supporting the body of a person wherein the seat, the back-rest and a leg-rest connected with the constrained linkage of the article may be readily moved from a sitting position into a comfortable reclined position or vice versa.

Another object of the present invention is to provide an article of repose for supporting the body of a person which may be readily manufactured at low costs.

A further object of the present invention is to improve on the construction of reclining articles of furniture 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 chair according to the invention,

Fig. 2 is a side elevational view of the chair shown in Fig. 1, wherein, however, the movable parts of said chair are in a different position,

Fig. 3 is a perspective view of the support of the chair shown in Fig. 1 and of some elements of the linkage of said chair,

Fig. 4 is a simplified diagrammatical illustration of the link-system of the chair shown in Fig. 1,

Fig. 5 is a side elevational view of a different embodiment of a reclining chair according to the invention,

Fig. 6 is a side elevational view of a further embodiment of a reclining chair according to the invention,

Fig. 7 is a side elevational view of another embodiment of a reclining chair according to the invention, and

Fig. 8 is a side elevational view of still another embodiment of a reclining chair according to the invention.

Referring now to Figs. 1–3, 20 generally indicates a support comprising side frames 22 and 24 rigidly connected with each other by a front connecting bar 26 and a rear connecting bar 28.

In Fig. 4 the link system of the chair is shown in a simplified manner so as to facilitate the understanding thereof. Corresponding links of the chair shown in Figs. 1–3 and of the link system diagrammatically shown in Fig. 4 are indicated by the same reference numerals, however, the letter *a* has been added to the reference numerals of the links and pivots of the diagrammatical illustration.

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The rear end portion of a seat structure 30 is pivotally connected at 32 with the rear connecting bar 28 of the support 20 by means of a hinge or the like. Furthermore, the lower portion of a back-rest 34 is pivotally connected at 36 to said rear connecting bar 28 of the support 20 by a hinge or the like. On each side of the chair the rear end of a top link 38 constituting an arm-rest is pivoted to an intermediate point of the back-rest 34 at 40. The front end of said top link 38 is pivoted at 42 by a hinge or the like to a front link 44 pivotally connected at 46 with a forwardly and upwardly extending bar 30*b* forming a part of the seat structure 30. A leg-rest 48 is integral with the front link 44 so as to participate in the movements of the latter. If desired, however, the leg-rest 48 could be a separate member rigidly connected with the front link 44 by screws or the like.

The front end of a link 50 is pivoted to the front link 44 at 52. The rear end of said link 50 is pivoted at 54 to the upper end of an auxiliary link 56 of curved shape. The front end of said auxiliary link 56 is pivoted at 58 to the front connecting bar 26 of the support 20. The lower end of a connecting link 60 is pivotally connected at 62 with the auxiliary link 56. The upper end of said connecting link 60 is pivoted at 64 to the seat structure 30.

Thus, the connecting link 60, the seat structure 30, the back-rest 34 and the link chain consisting of the top link 38, the front link 44, the link 50 and the link 56, constitute the movable links of a constrained linkage, the stationary links of which are included in the support 20, i. e., the portion of the support between the pivots 58 and 32 and the portion of the support between the pivots 32 and 36.

An occupant resting on the chair may readily displace the movable links of the chair from the sitting position shown in Fig. 1 into the reclined position shown in Fig. 2 by leaning the weight of his body against the backrest 34. On the other hand, the movable members of the chair may be readily returned from the reclining position shown in Fig. 2 into the sitting position shown in Fig. 1 by exerting a slight pressure with the legs on the leg-rest 40. The movable members

of the chair may be held in any desired position by the following locking device:

According to Figs. 1–3 the front end of a locking bar **66** is swingably mounted on the pivot **54** joining the links **50** and **56**. The spindle **68** of a locking screw **70** is threaded into a threaded bore of a U-shaped member **72** attached to the lower surface of the seat **30**. The locking bar **66** passes between the legs of the U-shaped member **72**. If it is desired to hold the movable members of the chair in a predetermined position, the locking screw **70** is tightened, whereby the locking bar **66** is pressed against one leg of the U-shaped member **72** for fixing the position of the movable members of the chair. Upon loosening the locking screw **70**, the movable members of the chair may be readily released.

The sitting position of the movable members of the chair is limited by an abutment of the link **56** against the front edge of said U-shaped member **72** (see Figs. 1 and 3). The extreme reclined position of the movable members of the chair is limited by the abutment of a flange **74**, arranged at the rear end of the locking bar **66**, against the rear edge of said U-shaped member **72** (see Fig. 2).

As shown in Figs. 1–3, the auxiliary link **56** is provided with a slot **76** extending along the axis of said link **56**. The pivot connecting the auxiliary link **56** with the connecting link **60** passes through said slot **76** and may be adjusted by suitable adjusting means in any desired position along the slot **76**. Thus, the relative movements of the movable members of the chair may be modified by an adjustment of said pivot **62** in a different position. It is understood that after such an adjustment and during movements of the movable members of the chair from one position to another one said pivot **62** remains in its set position relative to the auxiliary link **56**.

According to the embodiment shown in Fig. 5, both the seat **130** and the back-rest **134** are pivotally connected with the support **120** at **133** in coaxial alignment. The arrangement and the connections of the remaining movable links of the constrained linkage, i. e. the top link **138**, the front link **144**, the link **150**, the link **156** and the connecting link **160** are identical with the arrangement and connections shown in the embodiment of Fig. 1. Again the leg-rest **148** is integral with the front link **144**.

According to the embodiment shown in Fig. 6 the seat **230** and the back-rest **234** are pivoted to the support **220** at spaced points **232** and **236**, respectively. The rear end of the top link **238** is pivoted to an intermediary point **240** of the back-rest **234**. The front end of said top link **238** is pivoted at **242** to the front link **244**, which is pivoted to the seat **230** at the point **246** intermediate its ends. One end of the link **250** is pivoted at **252** to the lower end of the front link **244**. The rear end of said link **250** is pivoted at **254** to one end of the auxiliary link **256**, the other end of which is swingably mounted on the support **220** at **258**. One end of the connecting link **260** is pivoted at **262** to the auxiliary link **256**, the other end of said connecting link is pivoted to the seat **230** at **264**.

The leg-rest **248** is swingably mounted at **278** on the front end portion of the seat. The movements of said leg-rest **248** are controlled by a controlling link **280**, the front end of which is pivoted at **282** to the leg-rest **248** and the rear end of which is pivoted at **284** to a downward extension of the back-rest **234** rigid with the latter.

According to the embodiment of Fig. 7 the seat **330** and the back-rest **334** are jointly pivoted to the support **320** at **333**. The link chain of the constrained linkage comprises again the top link **338**, the front link **344**, the link **350** and the auxiliary link **356**. One end of said link chain is pivoted at **340** to the back-rest **334**, the other end of said link chain is pivoted to the support **320** at **358**. One end of the connecting link **360** is pivoted at **362** to the auxiliary link **356**, the other end of said connecting link **360** is pivoted at **364** to the seat **330**.

The leg-rest **348** is swingably mounted on the front end portion of the seat **330** at **378**. A downward extension **388** of the front link **344**, rigid with the latter, carries a roller **390** journalled thereon. A spring **392** wound around the pivot **378** and engaged with the leg-rest **348** tends to hold the latter in abutting engagement with said roller **390**. The movements of the leg-rest **348** are controlled by the movements of the extension **388** carrying the roller **390**, in dependence on movements of the front link **344**.

The arrangements and connections of the movable links **430**, **434**, **438**, **444**, **450**, **456** and **460** of the constrained linkage of the chair shown in Fig. 8 are identical with the arrangements and connections of the corresponding movable links of the linkage of the chair shown in Fig. 7. The movements of the leg-rest **448** swingably mounted on the seat **430** at **478**, however, are controlled by a controlling link **494**, one end of which is pivoted at **482** to the leg-rest, the other end of which is pivoted at **496** to a downward extension **488** rigid with the front link **444**.

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.

For example, each of the chairs shown in Figs. 5–8 may be provided with limiting means for limiting extreme positions of the movable members of the chair and/or with a locking device for holding the movable members of the chair in a desired position, as shown in Fig. 1.

Of course, the limiting means and/or the locking means could be replaced by means of different constructions.

Furthermore, the auxiliary link forming the end link of the link chain pivoted to the support could be straight, as shown in the diagrammatical Fig. 4 rather than curved as shown in the other figures.

Also, any other means for setting the pivot **62** between the links **56** and **60** in a predetermined position may be used instead of the arrangement shown in Figs. 1–3.

What I claim is:

1. In an article of repose for supporting the body of a person, the combination of: a support, a seat-structure, a back-rest structure, means pivotally connecting at least one of said seat and back-rest structures with said support, a chain of links including a first link arranged at one of its ends and pivoted to said back-rest structure, a second link pivoted to said first link, a third link pivoted to said second link, and a fourth link pivoted to said third link and arranged at the other end of said chain of links, said second link being in pivotal connection with said seat-struc-

ture, said fourth link being pivoted to said support, a connecting link pivoted at one of its ends to said seat-structure and at its other end to said fourth link, said seat-structure, said back-rest structure, said chain of links and said connecting link forming the movable links of a constrained linkage composed of stationary link-means and a plurality of movable links, the stationary link-means of said constrained linkage being included in said support, and a leg-rest connected with a movable link of said constrained linkage.

2. In an article of repose for supporting the body of a person as claimed in claim 1, said second link of the chain of links being pivoted to said seat-structure at an intermediate point located between its pivotal connections with the adjacent links of the chain.

3. In an article of repose for supporting the body of a person as claimed in claim 1, the pivotal connection between said connecting link and said seat-structure being located between the rear end of the latter and the pivotal connection of the latter with the second link of the chain of links.

4. In an article of repose for supporting the body of a person as claimed in claim 1, said connecting link being pivoted to said fourth link of the chain of links at a point located between the pivotal connections of said fourth link with said support and said third link of the chain of links.

5. In an article of repose for supporting the body of a person as claimed in claim 1, said fourth link being curved between its pivotal connections with the support and the adjacent third link of the chain of links.

6. In an article of repose for supporting the body of a person as claimed in claim 1, the pivotal connection between said connecting link and the fourth link of the chain of links being adjustable in the direction of the axis of said fourth link.

7. In an article of repose for supporting the body of a person as claimed in claim 1, said means pivotally connecting said seat-structure and said back-rest structure at spaced points to said support.

8. In an article of repose for supporting the body of a person as claimed in claim 1, said means pivotally connecting said seat-structure and said back-rest structure at coaxially aligned points to said support.

9. In an article of repose for supporting the body of a person as claimed in claim 1, said leg-rest being rigid with said second link of the chain of links.

10. In an article of repose for supporting the body of a person as claimed in claim 1, said means pivotally connecting said seat-structure and said back-rest structure at spaced points to said support, and said leg-rest being rigid with said second link of the chain of links.

11. In an article of repose for supporting the body of a person as claimed in claim 1, said means pivotally connecting said seat-structure and said back-rest structure at coaxially aligned points to said support, and said leg-rest being rigid with said second link of the chain of links.

12. In an article of repose for supporting the body of a person as claimed in claim 1, said leg-rest being swingably mounted on said seat-structure, and controlling means, interposed between a link of said linkage and said leg-rest, for effecting movements of the latter in coordination with movements of said linkage.

13. In an article of repose for supporting the body of a person as claimed in claim 1, said leg-rest being swingably mounted on said seat-structure, and controlling means, interposed between a movable link of said linkage and said leg-rest, for effecting movements of the latter in coordination with movements of said movable link.

14. In an article of repose for supporting the body of a person as claimed in claim 1, said leg-rest being swingably mounted on said seat-structure, and a controlling link pivoted at one of its ends to a movable link of said linkage and at its other end to said leg-rest.

15. In an article of repose for supporting the body of a person as claimed in claim 1, said leg-rest being swingably mounted on said seat-structure, said back-rest structure including a downward extension, and a controlling link pivoted at one of its ends to said downward extension and at its other end to said leg-rest.

16. In an article of repose for supporting the body of a person as claimed in claim 1, said leg-rest being swingably mounted on said seat-structure, and a controlling link pivoted at one of its ends to said second link of the chain of links and at its other end to said leg-rest.

17. In an article of repose for supporting the body of a person as claimed in claim 1, said leg-rest being swingably mounted on said seat-structure, and cooperating abutting surfaces on a movable link of said linkage and said leg-rest for effecting movements of the latter in coordination with movements of said movable link.

18. In an article of repose for supporting the body of a person as claimed in claim 1, said leg-rest being swingably mounted on said seat-structure, and cooperating abutting surfaces on said second link of the chain of links and said leg-rest for effecting movements of the latter in coordination with movements of said movable link.

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