Oct. 14, 1952 A. LORENZ 2,613,727

RECLINING ARTICLE OF FURNITURE

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FIG. 1.

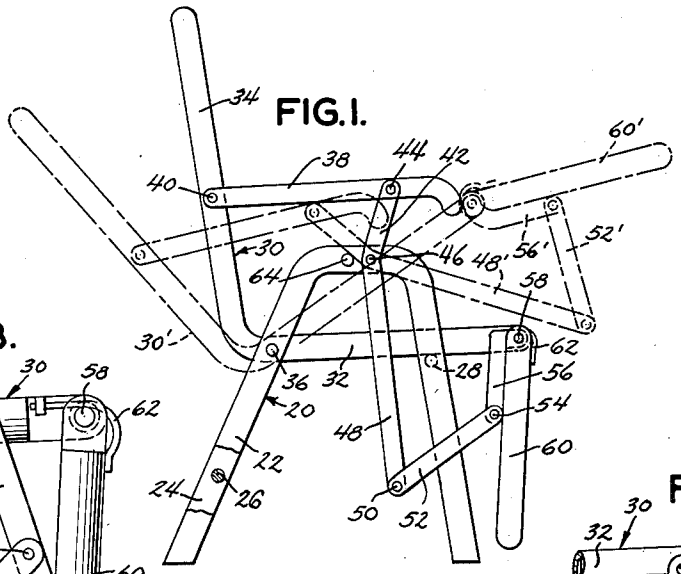


FIG. 3.

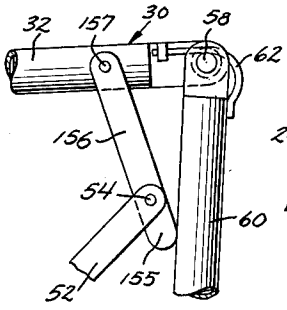


FIG. 4.

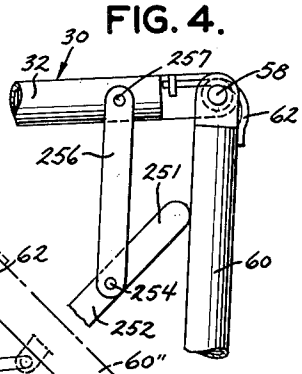


FIG. 2.

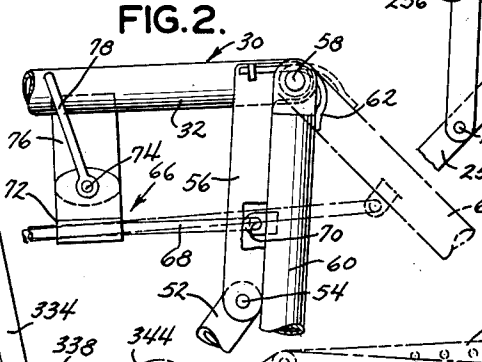


FIG. 5.

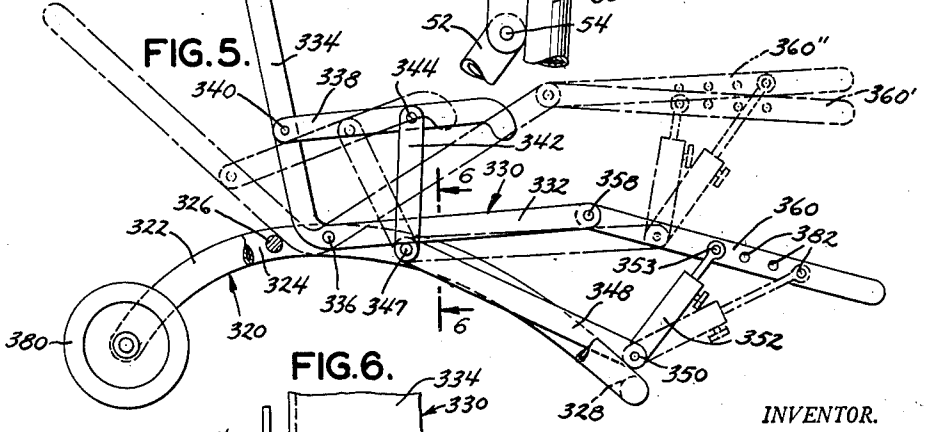
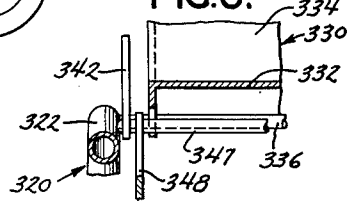


FIG. 6.



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RECLINING ARTICLE OF FURNITURE

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11 Claims. (Cl. 155—106)

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This invention relates to articles of furniture, and more particularly to a reclining article of furniture wherein a seat and a back-rest rigidly connected with each other are swingably mounted as a unitary structure on a support.

An object of the present invention is to provide a convenient controlling mechanism for a leg-rest swingably mounted on the seat of a reclining article of furniture of above described type, by means of which the angle between the leg-rest and the seat is automatically altered when the seat-backrest structure is brought from a certain position, for example the sitting position, into another position, for example a reclined position, and vice versa.

Another object of the present invention is to equip a reclining article of furniture 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 seat-backrest structure is altered, which, however, does not form a positive connection between the leg-rest and the controlling mechanism and permits an independent movement of the leg-rest relative to the seat if so desired.

With the above and other objects of the invention in view, the invention consists in the novel construction, arrangement and combination of various devices, elements and parts, as set forth in the claims hereof, certain embodiments of the same being described in the specification and being illustrated in the accompanying drawings forming part of this specification, wherein:

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

Fig. 2 is a fragmentary side elevational view of a chair according to Fig. 1, which is equipped with a holding device for holding the leg-rest in a predetermined position relative to the seat,

Fig. 3 is a fragmentary side elevational view illustrating a modification of the leg-rest control of the chair according to Fig. 1,

Fig. 4 is a fragmentary side elevational view illustrating another modification of the leg-rest control of the chair according to Fig. 1,

Fig. 5 is a side elevational view of a reclining chaise longue according to the invention, a portion of the support being broken away and,

Fig. 6 is a sectional view taken on line 6—6 of Fig. 5.

Referring now to Fig. 1, 20 generally indicates a support comprising two side frames 22, 24 connected with each other by cross bars 26 and 28.

A seat-backrest unit 30 comprising a seat 32 and a back-rest 34 rigidly connected with each other is swingably mounted on said support 20 at 36.

On each side of the chair the rear end of a top link 38 constituting an arm-rest is pivoted to the back-rest 34 of the seat-backrest structure 20 at 40. The upper end of a guiding link or arm 42 is pivoted to the top link or arm-rest 38 at 44. Said guiding link 42 is pivoted to the support 20 at 46.

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A controlling bar or arm 48 integral with the guiding link or arm 42 so as to form a double-armed lever is pivotally connected at its lower end at the point 50 with one end of a first controlling link 52. The other end of said first controlling link 52 is pivotally connected at 54 with one end of a second controlling link 56 swingably mounted on the seat 32 at 58. In the embodiment shown in Fig. 1 the controlling bar 48 and the guiding link 42 constitute an integral body in the shape of a bell-crank lever. However, it is understood, that the rigid connection between the controlling bar 48 and the guiding link 42 may be carried out also in any other suitable manner.

An abutting surface on the second controlling link 56 is in loose contact with an abutting surface of a leg-rest 60 swingably mounted on the front portion of the seat 32 at 58 in coaxial alignment with the pivotal connection between the second controlling link and the seat 32. A spring 62 tends to hold the leg-rest 60 in engagement with the second controlling link 56.

The sitting position of the seat-backrest structure 30 and the leg-rest 60 shown in full lines in Fig. 1 is limited by the cross bar 28 of the support 20 cooperating with the lower surface of the seat 32.

When the seat-backrest structure 30 is swung about its pivot 36 into a reclined position, for example into the extreme reclined position 30' shown in dash and dot lines in Fig. 1, the controlling bar 48 rigidly connected with the guiding link 42 is brought into the position 48' which in turn brings the first controlling link 52 and second controlling link 56 into the positions 52' and 56'. Consequently, the leg-rest 60 engaged with the second controlling link 56 is brought into the position 60' by said second controlling link. Thus, the angle between the leg-rest 60 and the seat 32 has been increased during a displacement of the movable members of the chair from the sitting position shown in full lines into the extreme reclined position shown in dash and dot lines.

The extreme reclined position of the movable members of the chair shown in Fig. 1 is limited by the abutment of the guiding link 42 against a stop 64 arranged on the support 20.

Of course, the movable members of the chair may also be brought into an intermediate reclined position, and, if so desired, the chair may be equipped with a locking device for holding the seat-backrest unit 30 in such an intermediate or extreme reclined position. Such a locking device is not shown in Fig. 1.

As mentioned above, the leg-rest 60 is loosely engaged with the second controlling link 56. If desired the leg-rest 60 may be moved by hand

relative to the seat 32 against the action of the spring 62. Such a movement of the leg-rest 60 relative to the seat 32 by hand may be desirable if the user of the chair wishes to have the leg-rest 60 at a certain angle relative to the seat 32 in a certain position of the latter.

Fig. 2 illustrates a holding device generally indicated by 66 for holding the leg-rest 60 at a predetermined angle relative to the seat 32, for example in the position 60''. Said holding device 66 comprises a rod 68 pivotally connected with the leg-rest 60 at 70 and slidably engaged with a clamping sleeve 72 swingably mounted at 74 on a lug 76 rigidly connected with the seat 32. A handle 78 serves either to tighten the clamping sleeve 72 on the rod 68 or to loosen same. If the clamping sleeve 72 is loosened, the rod 68 may freely slide therein, and consequently the leg-rest 60 held by the spring 62 against the second controlling link 56 may follow the movements of the latter during a swinging of the seat-backrest unit 30 about its pivot on the support in the manner described above in connection with Fig. 1.

Now assume the seat-backrest structure 30 is in the sitting position shown in full lines in Fig. 2 and the occupant of the chair wishes to have the leg-rest 60 in the position 60''. When the leg-rest has been brought into said position 60'' relative to the seat 32, the clamping sleeve 72 is tightened by the handle 78 on the rod 68, so that the leg-rest is held in said position 60''. Now, the occupant of the chair may bring the seat-backrest structure 30 into a somewhat reclined position, until the second controlling link 56 comes again into engagement with the leg-rest. During said limited reclining movement of the seat-backrest structure, the leg rest remains at all times in the same position 60'' at the predetermined angle relative to the seat 32. Of course, if desired any other suitable holding device arranged between the seat and the leg-rest may be used for this purpose.

In the modification of a reclining chair as shown in Fig. 3, the leg-rest 60 pivoted at 58 to the seat portion 32 of a seat-backrest structure 30 corresponding to the structure shown in Fig. 1 is again in engagement with a second controlling link 156 pivotally connected at 54 with a first controlling link 52. In said modification, however, the upper end of said second controlling link 156 is pivoted to the seat 32 at 157 at a point spaced from the pivotal connection 58 between the leg-rest 60 and the seat 32. Furthermore, contrary to the embodiment of Fig. 1 only a portion of the second controlling link 156, i. e. an extension 155 of the second controlling link 156 is in loose engagement with the leg-rest 60.

It is understood that the remaining linkages not shown in Fig. 3 correspond to the linkages shown in Fig. 1 and that the operation of a chair equipped with the modified leg-rest control shown in Fig. 3 corresponds to the operation of the chair shown in Fig. 1.

According to the modification shown in Fig. 4, the second controlling link 256 is again pivoted to the seat 32 of a seat-backrest structure 30 at a point 257 spaced from the pivotal connection 58 between the leg-rest 60 and the seat 32. However, according to said modification the leg-rest 60 is in loose engagement with an extension 251 of the first controlling link 252 pivotally connected with the second controlling link 256 at 254.

It is understood that the remaining linkages not shown in Fig. 4 correspond to the linkages shown in Fig. 1 and that the operation of a chair equipped with the modified leg-rest control shown in Fig. 4 corresponds to the operation of the chair shown in Fig. 1.

The reclining chaise longue shown in Figs. 5 and 6 comprises a support 320 made of side frames 322, 324 connected with each other by cross bars 326 and 328. The support 320 is equipped with rotatable wheels 380.

The structure 330 consisting of a seat 332 and a back-rest 334 rigidly connected with each other is swingably mounted on the support 320 at 336.

On each side of the chaise longue the rear end of a top link or arm-rest 338 is pivoted to the back-rest 334 at 340. The upper end of a guiding link 342 is pivoted to said top link 338 at 344. The lower end of said guiding link 342 is rigidly connected with a transverse rod 347 journalled in suitable bearings of the support 320. Furthermore, one end of a controlling bar 348 is rigidly connected with said transverse bar 347, so that said controlling bar 348 participates in movements of the guiding link 342 caused by movements of the seat-backrest structure 330. The other end of said controlling bar 348 is pivotally connected at 350 with one end of a telescopic controlling link generally indicated by 352. The other end of said telescopic controlling link 352 is joined to a leg-rest 360 by a pin or pivot 353. The leg-rest 360 is swingably mounted on the front portion of the seat 332 at 358. Furthermore, the leg-rest 360 is provided with a series of bores 382 for selectively receiving the pin or pivot 353 connecting the controlling link 352 with the leg-rest 360.

Above described rigid connection between the guiding link 342 and controlling bar 348 could also be made in a different manner, for example, the guiding link 342 and the controlling bar could be made as an integral piece of material in the shape of a bell-crank lever.

In above described embodiment shown in Fig. 5, the portion of the leg-rest 360 between the pivots 353 and 358 may also be considered as a controlling link which is rigidly connected with the leg-rest forming an integral part thereof. In such a case, said portion of the leg-rest 360 between the pivots 353 and 358 would correspond to the second controlling link 56 of the chair shown in Fig. 1 and the controlling link 352 of the chair shown in Fig. 5 would correspond to the first controlling link 52 of the chair shown in Fig. 1 with the difference that the second controlling link of the chair shown in Fig. 5, i. e. the portion of the leg-rest 360 between the pivots 353 and 358 is rigidly connected with the leg-rest 360, while the second controlling link 56 of the chair shown in Fig. 1 is loosely engaged with the leg-rest 60.

In the embodiment shown in Fig. 5, the relative position between the leg-rest 360 and the seat 332 may be adjusted by inserting the pivot 353 into any bore of the series of bores 382 of the leg-rest and/or by altering the effective length of the telescopic controlling link 352.

The sitting position of the seat-backrest structure 330 shown in Fig. 5 is limited by an abutment of the seat 332 against the transverse rod 347. The extreme reclined position of the movable members of the chaise longue is limited by an abutment of the back-rest 332 against the cross bar 326.

When the movable members of the chaise longue shown in Fig. 5 are moved from the sitting position shown in full lines into the extreme re-

clined position shown in dash and dot lines, the leg-rest **360** is brought into the position **360'** through the medium of the linkage **338, 342, 348, 352** when the pivot **353** is engaged with the bore at the left hand end of the series of bores **382** of the leg-rest **360**. If, however, the pivot between the controlling link **352** and the leg-rest **360** were inserted into the bore at the right hand end of the series of bores **382** of the leg-rest, the leg-rest would reach the position **360''**.

If desired the chaise longue shown in Fig. 5 could be equipped with a locking device for holding the movable members of the chaise longue in any reclined position.

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. A reclining article of furniture comprising: a support, a structure including a seat and a back-rest rigidly connected with each other, said structure being swingably mounted on said support, a top link pivoted at its rear end to said back-rest, a double-armed lever including a guiding arm and a controlling arm, said double-armed lever being swingably mounted on said support, said guiding arm being pivoted to the front end of said top link, a leg-rest swingably mounted on the front portion of said seat, a first controlling link pivoted at one of its ends to said controlling arm, and a second controlling link, one end of said second controlling link being pivoted to the other end of said first controlling link, the other end of said second controlling link being pivoted to the front portion of said seat, and one of said controlling links being engaged with said leg-rest for controlling the movements thereof.

2. In a reclining article of furniture as claimed in claim 1, said leg-rest and said second controlling link being coaxially joined to said seat.

3. In a reclining article of furniture as claimed in claim 1, said leg-rest and said second controlling link being pivoted to said seat at points spaced from each other.

4. In a reclining article of furniture as claimed in claim 1, one of said controlling links being loosely engaged with said leg-rest.

5. In a reclining article of furniture as claimed in claim 1, said second controlling link being rigidly engaged with said leg-rest.

6. A reclining article of furniture comprising: a support, a structure including a seat and a back-rest rigidly connected with each other, said structure being swingably mounted on said support, a top link pivoted at its rear end to said back-rest, a double-armed lever including a guiding arm and a controlling arm, said double-armed lever being swingably mounted on said support, said guiding arm being pivoted to the front end of said top link, a leg-rest swingably mounted on the front portion of said seat, a first controlling link pivoted at one of its ends to said controlling arm, a second controlling link, one end of said second controlling link being pivoted to the other end of said first controlling link, the other end of said second controlling link being pivoted to the front portion of said seat, and cooperating abutting surfaces on said second controlling link and said leg-rest, said cooperating abutting surfaces being in loose contact with each other.

7. In a reclining article of furniture as claimed in claim 6, said leg-rest and said second controlling link being coaxially joined to said seat.

8. In a reclining article of furniture as claimed in claim 6, said leg-rest and said second controlling link being pivoted to said seat at points spaced from each other.

9. A reclining article of furniture comprising: a support, a structure including a seat and a back-rest rigidly connected with each other, said structure being swingably mounted on said support, a top link pivoted at its rear end to said back-rest, a double-armed lever including a guiding arm and a controlling arm, said double-armed lever being swingably mounted on said support, said guiding arm being pivoted to the front end of said top link, a leg-rest swingably mounted on the front portion of said seat, a first controlling link pivoted at one of its ends to said controlling arm, a second controlling link, one end of said second controlling link being pivoted to the other end of said first controlling link, the other end of said second controlling link being pivoted to the front portion of said seat, and cooperating abutting surfaces on said first controlling link and said leg-rest, said cooperating abutting surfaces being in loose contact with each other.

10. In a reclining article of furniture as claimed in claim 9, said leg-rest and said second controlling link being pivoted to said seat at points spaced from each other.

11. A reclining article of furniture comprising: a support, a structure including a seat and a back-rest rigidly connected with each other, said structure being swingably mounted on said support, a top link pivoted at its rear end to said back-rest, a double-armed lever including a guiding arm and a controlling arm, said double-armed lever being swingably mounted on said support, said guiding arm being pivoted to the front end of said top link, a leg-rest swingably mounted on the front portion of said seat, a first controlling link pivoted at one of its ends to said controlling arm, a second controlling link, one end of said second controlling link being pivoted to the other end of said first controlling link, the other end of said second controlling link being pivoted to the front portion of said seat, cooperating abutting surfaces on one of said controlling links and said leg-rest, said cooperating abutting surfaces being in loose contact with each other, and holding means arranged on said seat and associated with said leg-rest for holding same in a predetermined position relative to said seat.

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