June 14, 1955 J. LUCKHARDT 2,710,645

FOLDABLE RECLINING ARTICLE OF FURNITURE

Filed Nov. 1, 1951 2 Sheets-Sheet 1

Fig. 1.

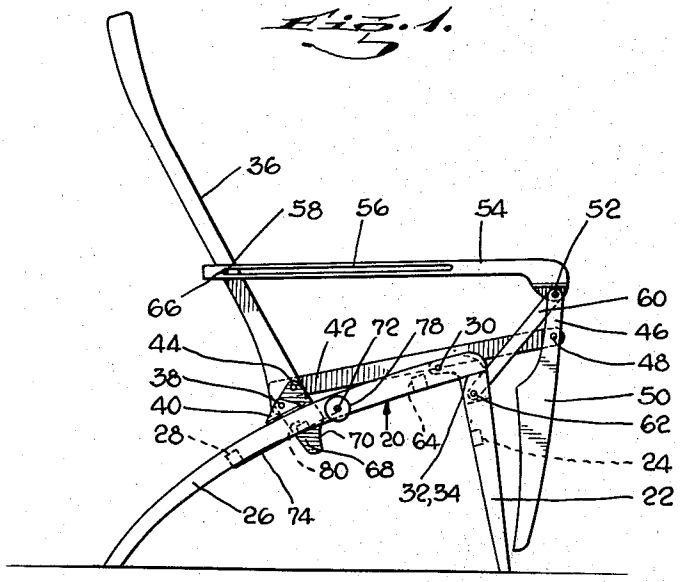
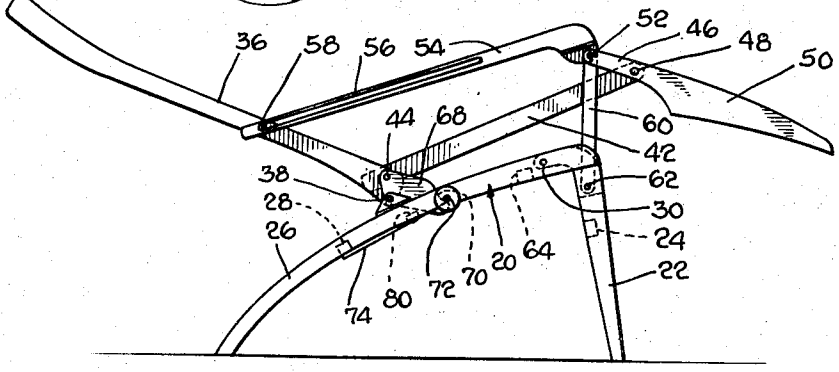



Fig. 2.




INVENTOR
JOHANNES LUCKHARDT
BY
ATTORNEY

June 14, 1955 J. LUCKHARDT 2,710,645

FOLDABLE RECLINING ARTICLE OF FURNITURE

Filed Nov. 1, 1951 2 Sheets-Sheet 2

Fig. 3.

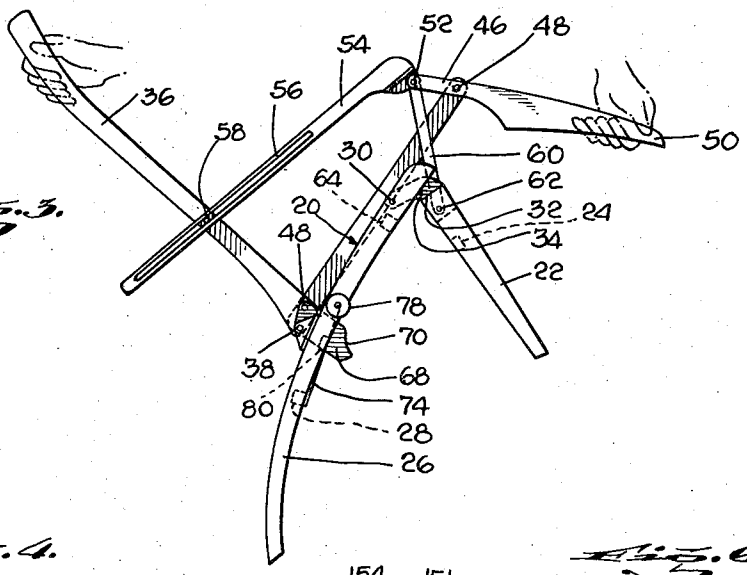



Fig. 4.

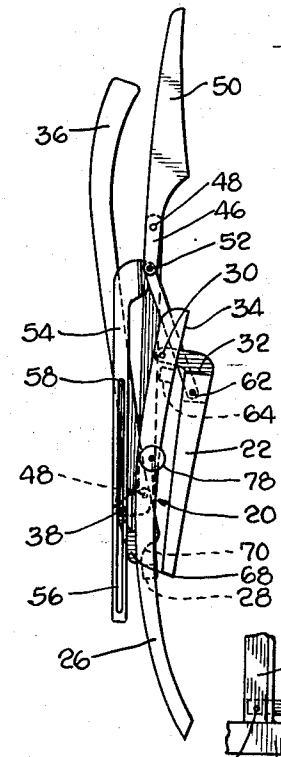



Fig. 5.

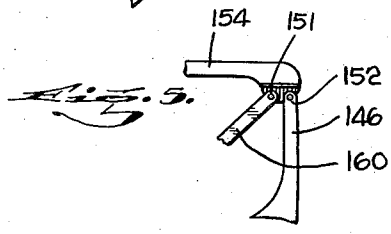



Fig. 6.

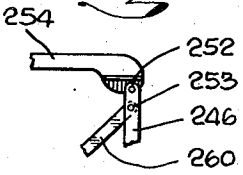



Fig. 7.

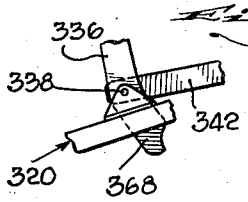



Fig. 8.

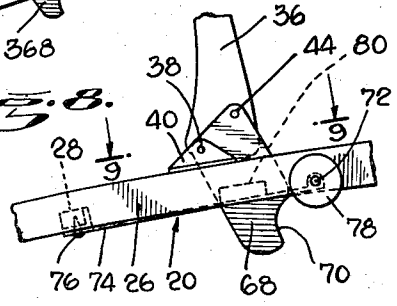
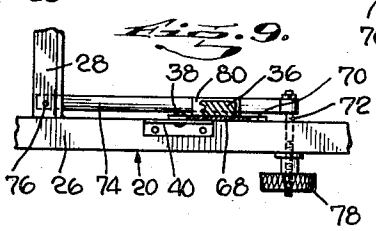



Fig. 9.




INVENTOR
JOHANNES LUCKHARDT
BY
ATTORNEY

United States Patent Office

2,710,645

Patented June 14, 1955



2,710,645

# FOLDABLE RECLINING ARTICLE OF FURNITURE

Johannes Luckhardt, Berlin-Dahlem, Germany, assignor, by mesne assignments, to Norman P. Martin and Otto L. Walter as trustees of Epsilon Trust, Lake Worth, Fla.

Application November 1, 1951, Serial No. 254,267

Claims priority, application Germany March 9, 1951

9 Claims. (Cl. 155—110)

The present invention relates to reclining articles of furniture, and more particularly to foldable reclining articles of furniture wherein the seat and the back-rest are included in a link system swingably mounted on a foldable support.

An object of the present invention is to provide a foldable reclining article of furniture, which may be readily collapsed or set up in its entireness by gripping the back-rest and a leg-rest rigidly connected with a link of the link system of the article of furniture.

Another object of the invention is to provide a foldable reclining article of furniture with a support having front legs and rear legs pivotally connected with each other, wherein, for the collapsing of the article of furniture, the back-rest and leg-rest are swung towards each other about their respective pivots and the swinging movement of the leg-rest causes automatically a swinging movement of the front legs of the support towards the rear legs of the latter.

A further object of the invention is to improve on the construction of foldable 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 foldable reclining chair according to the invention, showing the latter in set up condition, the movable members of the chair being in sitting position,

Fig. 2 is a side elevational view of the set up chair shown in Fig. 1, wherein, however, the movable members of the chair are in a reclined position,

Fig. 3 illustrates the members of the foldable reclining chair shown in Fig. 1 in an intermediate position during the collapsing of the chair,

Fig. 4 illustrates the chair shown in Fig. 1 in collapsed condition,

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

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

Fig. 7 is a fragmentary side elevational view of a further embodiment of a chair according to the invention,

Fig. 8 is a fragmentary side elevational view illustrating the locking mechanism of the chair shown in Fig. 1, and

Fig. 9 is a sectional view taken on line 9—9 of Fig. 8.

Referring now to Figs. 1–4, 8 and 9, **20** generally indicates a foldable support comprising a pair of front legs **22** connected with each other by a cross-bar **24** and a pair of rear legs **26** connected with each other by a cross-bar **28**. On each side of the chair the front and rear legs are pivotally connected with each other at **30**. The spread position of the front and rear legs **22**, **26** of the foldable support is limited by cooperating abutting surfaces **32**, **34**, arranged on said front and rear legs. When the chair is set up, said abutting surfaces **32**, **34**, are in engagement with each other.



A back-rest **36** is swingably mounted at **38** on lugs **40** (only one being shown) carried by the rear legs **26** of the support **20**. The rear portion of a seat **42** is pivotally connected with the back-rest at **44**, at a point above and in front of the pivot **38** between the back-rest **36** and the support **20**. On each side of the chair the lower end portion of a front connecting link **46** is pivotally connected at **48** with the front end portion of the seat **42**. A leg-rest **50** is integral with the front connecting link **46**, so that the leg-rest participates in movements of the front connecting link and vice versa. If desired, the leg-rest **50** could also be a separate member which is rigidly connected with the front connecting link in any suitable manner. The upper end of the front connecting link **46** is pivotally connected at **52** with the front end portion of a top connecting link **54** representing an arm-rest. The top connecting link **54** is provided with a slot **56** slidably engaged with a pin **58** attached to the back-rest **36** at an intermediate point thereof.

The upper end of a guiding link **60** is pivotally connected with the front connecting link **46** and top connecting link **54** at **52**. The lower end of said guiding link **60** is pivotally connected with the front leg **22** of the foldable support **20** at **62**, at a point spaced from the pivotal connection **30** between the front leg **22** and rear leg **26** of the support. The sitting position of the movable members of the chair, when the latter is set up, is limited by a cross-bar **64**, connecting the rear legs **26** of the support **20** with each other.

When the chair is set up, as shown in Figs. 1 and 2, the pin **58** and the abutting surface on the left hand end **66** of the slot **56** being in engagement with each other form a rockable connection between the back-rest **36** and the top connecting link **54**, so that the back rest **36** may be swung in counter-clockwise direction about its pivot **38** from the position shown in Fig. 1 into the position shown in Fig. 2. If, for example, a person sitting on the chair performs such a swinging movement of the backrest **36** by leaning the weight of his body against the backrest **36** from the position shown in Fig. 1 into the position shown in Fig. 2, the pin **58** attached to the back-rest **36** being in engagement with the left hand end **66** of the slot **56** causes the formation of a constrained linkage including the back-rest **36**, the seat **42**, the front connecting link **46**, the top connecting link **54**, the guiding link **60** as movable links and the portion of the support **20** between the pivot **38** and the piot **62** as a stationary link. Thus, the movements of the seat **42** and the leg-rest **50** take place in coordination with the movement of the back-rest **36**, and the seat **42** and leg-rest **50** are brought into the reclined position shown in Fig. 2 when the back-rest **36** is brought into the reclined position shown in said figure.

In order to limit the extreme reclined position of the movable members of the chair, the following device is arranged on the chair:

As best shown in Figs. 1, 2, 8 and 9, a plate **68** is rigidly connected with a back-rest **36** by the pins **38** and **44**. This plate has a recess **70** which comes into abutting engagement with a bolt **72** carried by an arm **74** pivotally mounted on the cross-bar **28** of the support **20** at **76**, when the back-rest **36** is in its extreme reclined position shown in Fig. 2.

The bolt **72** passing through a bore of the rear leg **26** has a threaded end engaged with the threaded bore of a locking knob **78**. A braking element **80** is mounted on the arm **74**. If it is desired to hold the movable members in any suitable position, the locking knob **78** is tightened, whereby the braking element **80** is presesd against the plate **68** urging the latter against the rear leg **26**. Thus, owing to the rigid connection between the plate **68** and

the back-rest **36**, the movable members of the set-up chair may be held in any desired position.

If it is desired to collapse the set-up chair, the back-rest **36** and the leg-rest **50** are gripped by the hands. The back-rest is swung about its pivot **38** in clockwise direction; during this swinging movement the pin **58** attached to the back-rest **36** becomes disengaged from the left hand end **66** of the slot **56** and, thereafter, slides along the slot **56** of the top connecting link **54**. The leg-rest **50** is swung in counter-clockwise direction about its pivot **48** towards the back-rest **36**; the pivot **62** between the front leg **22** of the support **20** and the guiding link **60** is arranged so spaced from the pivot **30** between the front leg **22** and rear leg **26** of the support **20**, that during this swinging movement of the leg-rest **50** the front leg **22** is swung in clockwise direction about its pivot **30** towards the rear leg **26** of the foldable support.

Fig. 3 illustrates an intermediate position of the members of the chair during above described collapsing thereof.

Fig. 4 illustrates the chair in completely collapsed condition. Owing to the relative arrangement between the pivots **38** and **44** the back-rest **36** and leg rest **50** are near to each other and owing to the arrangement of the pivots **30** and **62** the rear legs **26** and front legs **22** are adjacent to each other, when the chair is completely collapsed.

In order to bring the collapsed chair into set-up condition, above described manipulation of the chair is reversed, that is, the back-rest **36** is swung about its pivot **38** in counter-clockwise direction and the leg-rest **50** is swung about its pivot **48** in clockwise direction, away from each other. This manipulation causes a sliding of the pin **58** along the slot **56** of the top connecting link **54** and a swinging movement of the front leg **22** in counter-clockwise direction about the pivot **30** for unfolding the collapsed chair.

Fig. 5 illustrates a different embodiment of the chair wherein the guiding link **160** is pivotally connected with the top connecting link **154** at a point **151** spaced from the pivotal connection **152** between the front connecting link **146** and the top connecting link **154**. The remaining elements of the foldable chair (not shown in Fig. 5) may be connected with each other substantially in the same manner as shown in Fig. 1.

Fig. 6 illustrates another emobdiment of a foldable chair according to the invention, wherein the guiding link **260** is pivoted at **253** to the front connecting link **246** at a point spaced from the pivotal connection **252** between the front connecting link **246** and the top connecting link **254**. Again, the remaining elements of the foldable chair (not shown in Fig. 6) may be connected with each other substantially in the same manner as shown in Fig. 1.

According to the embodiment shown in Fig. 7, the pivotal connection **338** between the back-rest **336** and the support **320** is in coaxial alignment with the pivotal connection between the back-rest **336** and the seat **342**. The downward extension **368** of the back-rest **336** is integral with the latter. The remaining elements of the foldable chair (not shown in Fig. 7) may be connected with each other substantially in the same manner as shown in Fig. 1.

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. In a foldable reclining article of furniture, the combination of a foldable support including a pair of connected front legs and a pair of connected rear legs, said pairs of legs being pivotally connected with each other for collapsing and setting up the support, a linkage having stationary link-means and a plurality of movable links, said stationary link-means being included in said support when the latter is set up, said movable links including a seat-member, a back-rest member, a guiding link and a chain of connecting links including a top connecting link at one end of the chain and a front connecting link at the other end of the chain, the lower end portion of said guiding link being pivoted to a front leg of said pair of front legs of said foldable support at a point spaced from the pivotal connection of said front leg with the associated rear leg, the upper end portion of said guiding link being connected with at least one of said connecting links, connecting means on said pair of rear legs enabling said back-rest and said seat members to move relative thereto, the lower portion of said front connecting link being pivoted to the front portion of said seat member, a rockable connection and disengageable means arranged on the rear end portion of said top connecting link and an intermediate point of said back-rest member above the plane of said seat-member, said disengageable means and said rockable connection being in engagement with each other when the back-rest member of the set-up article is moved backwardly so as to render said linkage a constrained one, and a leg-rest rigid with said front connecting link, said disengageable means between the top connecting link and the rockable connection permitting a collapsing movement of the back-rest member in forward direction towards the support, and said rigid arrangement of the leg-rest and the front connecting link in cooperation with said pivotal connection between the guiding link and the front leg of the support causing a movement of the front legs towards the rear legs of the support when, during the collapsing of the article, the leg-rest and back-rest are swung forwardly in opposite directions towards each other.

2. In a foldable reclining article of furniture as claimed in claim 1, cooperating abutting surfaces arranged on associated front and rear legs of said foldable support for limiting the spread position thereof.

3. In a foldable reclining article of furniture as claimed in claim 1, said back-rest member being pivoted to the rear legs of the foldable support, and said seat-member being pivoted to said back-rest member.

4. In a foldable reclining article of furniture as claimed in claim 1, said back-rest member being pivoted to the rear legs of the foldable support, and said seat-member being pivoted to said back-rest member at a point above and in front of the pivotal connection between the back-rest member and the rear legs of the foldable support.

5. In a foldable reclining article of furniture as claimed in claim 1, said back-rest member and said seat-member being pivoted to the rear legs of the foldable support.

6. In a foldable reclining article of furniture as claimed in claim 1, said back-rest member and said seat-member being coaxially pivoted to the rear legs of the foldable support.

7. In a foldable reclining article of furniture as claimed in claim 1, the upper end portion of said guiding link being in pivotal connection with said front connecting link and said top connecting link.

8. In a foldable reclining article of furniture as claimed in claim 1, the upper end portion of said guiding link being pivoted to said top connecting link.

9. In a foldable reclining article of furniture as claimed in claim 1, the upper end portion of said guiding link being pivoted to said front connecting link.

References Cited in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 2,195,091 | Lorenz et al. | Mar. 26, 1940 |
| 2,571,463 | Lorenz | Oct. 16, 1951 |

FOREIGN PATENTS

| | | |
|---|---|---|
| 603,245 | Great Britain | June 11, 1948 |