United States Patent [19]

Zawadzki

[11] **3,758,156**

[45] **Sept. 11, 1973**

[54] **AUTOMATIC ROCKER AND GLIDER**

[76] Inventor: **Antoni Zawadzki,** 18 Hirschbeck, Buffalo, N.Y.

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[52] **U.S. Cl.** **297/260,** 5/109

[51] **Int. Cl.** **A47c 3/02**

[58] **Field of Search** 297/260, 271, 330, 297/85; 128/25; 5/109

[56] **References Cited**

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3,019,052	1/1962	Zawadzki	297/260
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Primary Examiner—Bobby R. Gay
Assistant Examiner—Glenn O. Finch
Attorney—Christel & Bean

[57] **ABSTRACT**

A rocking chair assembly including a flexible line connected at one end to a drive means on the chair base and movably connected at the other end in a housing mounted on the movable rocking chair member. A manually operated control mechanism has a first position tightening the line thereby providing a driving connection between the drive means and the rocking chair member. The mechanism has a second position loosening the line thereby permitting free movement of the rocking chair member. The chair assembly can include manually operated tension adjusting means operatively connected to the line to compensate for the different weights and sizes of persons using the chair.

10 Claims, 7 Drawing Figures

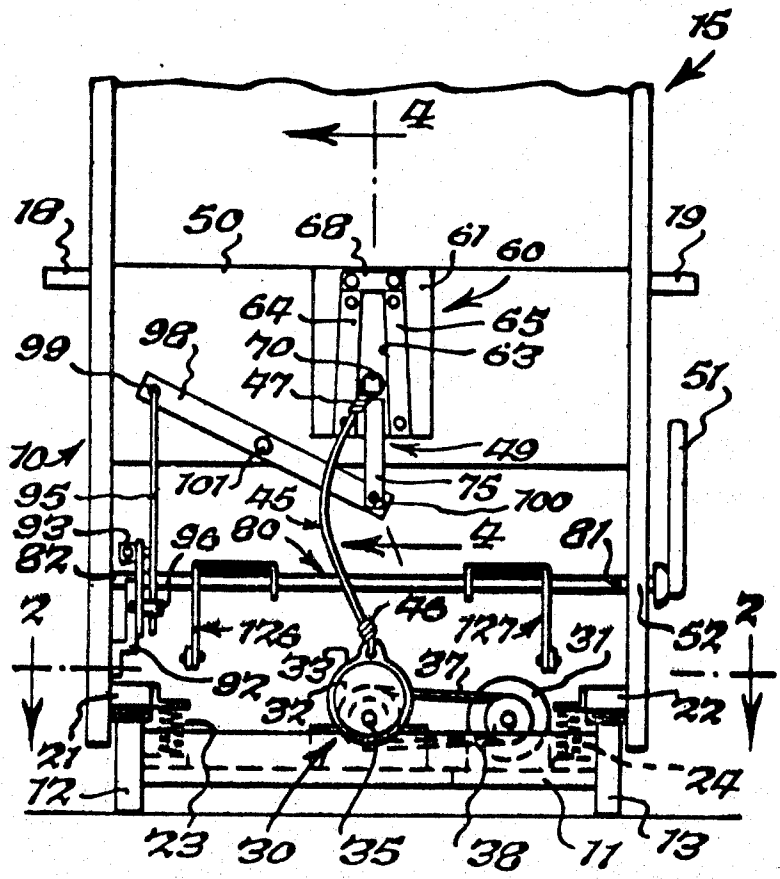


Fig. 1.

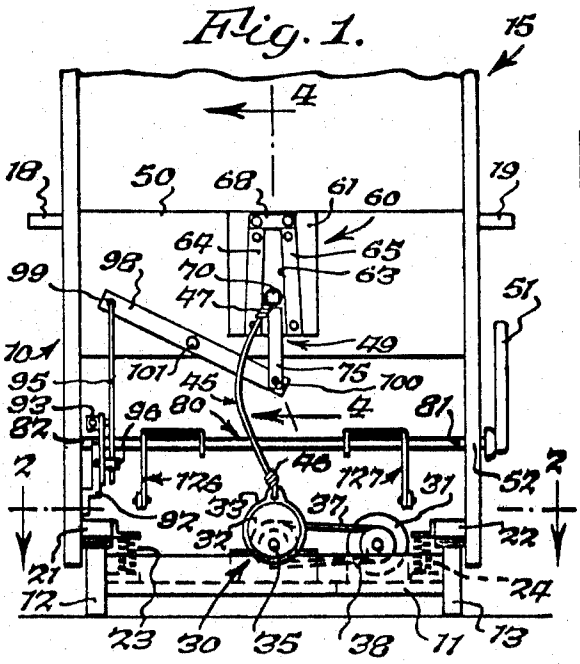


Fig. 2.

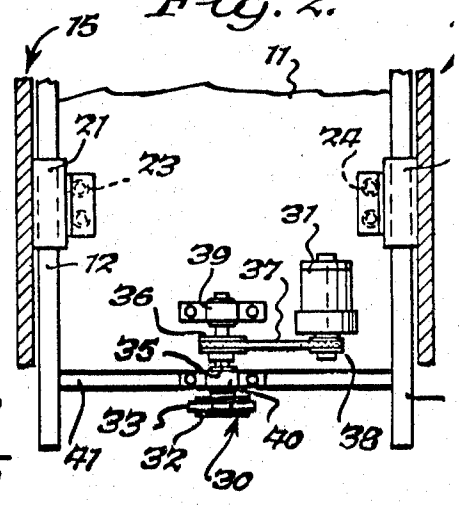
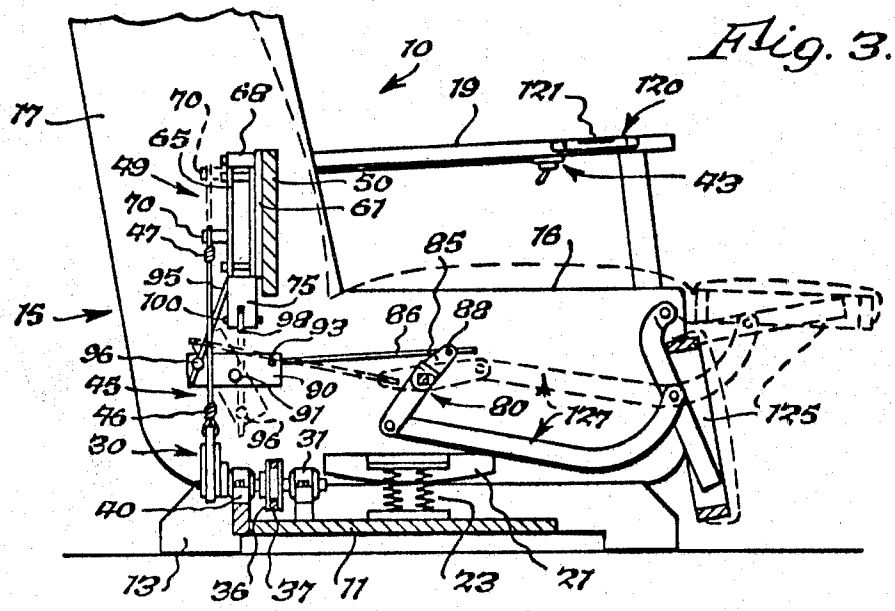


Fig. 3.



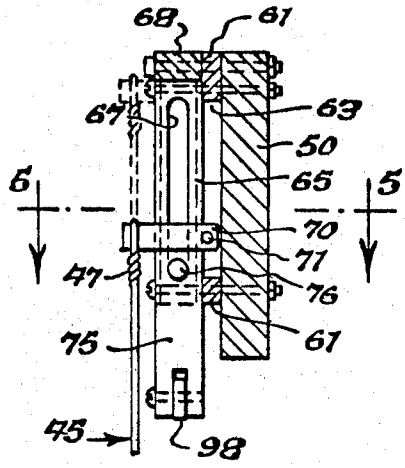


Fig. 4.

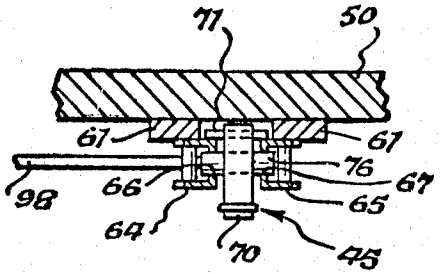


Fig. 5.

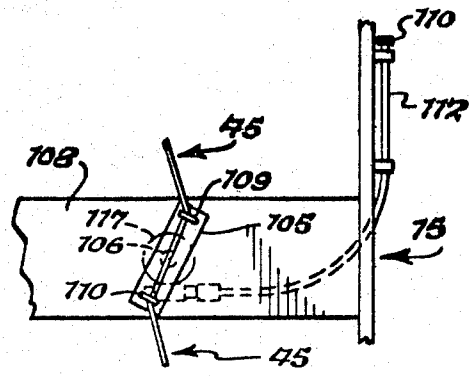


Fig. 6.

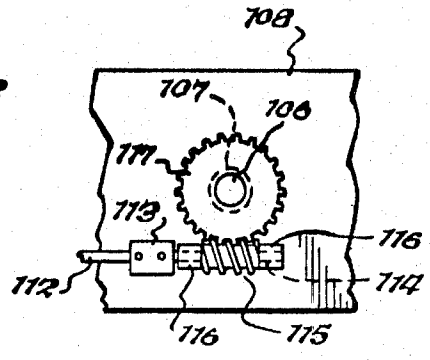


Fig. 7.

AUTOMATIC ROCKER AND GLIDER

BACKGROUND OF THE INVENTION

This invention relates to rocking chairs and, more particularly, to a new and improved rocking chair provided with motor means for automatically rocking the same.

Motor-operated rocking chairs have been proposed and patented, and such a chair is especially suited for use in hospitals and nursing homes. An example of this type of chair is shown in my U.S. Pat. No. 3,019,052 issued Jan. 30, 1962 and entitled, "Automatic Rocker and Glider." As described in that patent, the chair assembly includes a mechanical clutch arrangement which is engaged under control of the user to provide a driving connection between the motor and rocking chair member.

It would be highly desirable to provide an automatic rocking chair having both motor-operated and free rocking modes wherein a relatively greater degree of movement is obtainable in the free rocking mode than heretofore possible. Inasmuch as persons of considerably different sizes and weights will use the same chair, it would be desirable also to include in such a chair a means compensating for such differences so that a smooth rocking movement is obtainable by all users. It would of course be advantageous to provide the foregoing in a motor operated rocking chair which is economical to manufacture and relatively easy to maintain.

SUMMARY OF THE INVENTION

The present invention provides a rocking chair assembly including a flexible line connected at one end to a drive means in the chair base and movably connected at the other end to a rocking chair member. When the line is tightened by a manually operated control mechanism, a driving connection is provided between the drive means and the rocking chair member. The tension of the flexible line is adjustable by manually operated means to compensate for the different weights and sizes of persons using the chair.

The foregoing and additional advantages and characterizing features of the present invention will become clearly apparent upon a reading of the ensuing detailed description together with the included drawing wherein:

BRIEF DESCRIPTION OF THE DRAWING FIGURES

FIG. **1** is a rear end elevational view, with parts removed, of a rocking chair assembly according to the present invention;

FIG. **2** is a sectional view taken about on line **2—2** of FIG. **1**;

FIG. **3** is a side elevational view, partly in vertical cross section, of the rocking chair assembly of FIG. **1**;

FIG. **4** is a sectional view taken about on line **4—4** of FIG. **1**;

FIG. **5** is a sectional view taken about on line **5—5** of FIG. **4**;

FIG. **6** is a fragmentary elevational view of a tension adjusting means for the chair assembly of the present invention; and

FIG. **7** is a rear elevational view of the adjusting means of FIG. **6**.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENT

Referring now to the drawing, a rocking chair assembly according to the present invention is designated generally at **10** in FIGS. **1** and **3** and comprises a base member **11** including supporting members **12, 13** which in the present instance have horizontal supporting surfaces. A rocking chair member **15** is movably mounted on base **11** and includes a generally horizontal seat portion **16**, an inclined back portion **17** and a pair of arm rest members **18, 19.** Rocking chair member **15** includes supporting members **21, 22** having downwardly convex surfaces which are supportingly engaged on the respective horizontal surfaces of the supporting member **12** and **13.** Rocking chair **15** is retained on base **11** by means of a coil or fastening spring assembly **23** connected to supporting member **12** and supporting member **21** and by an identical spring assembly **24** connected to supporting member **13** and supporting member **22.** It is to be understood that included within the scope of this invention are alternative arrangements for movably mounting chair member **15** on base **11** auch as the arrangement shown in my U.S. Pat. No. 3,019,052.

The rocking chair assembly **10** further comprises an eccentric designated generally at **30** drivenly connected to motor means shown at **31** and mounted on base member **11.** Motor **31** is a standard fractional horsepower gear motor operable from conventional, line frequency alternating current. Eccentric **30** comprises relatively rotatable inner and outer members **32** and **33,** respectively, which preferably can be separated by a bushing or sleeve of Teflon. The Teflon bushing or sleeve obviates the need to lubricate eccentric **30.** Eccentric member **32** can of course be directly connected through a shaft to the output of motor **31.** When, however, a small reduction in r.p.m. of the drive is desired, eccentric **32,** as shown in detail in FIG. **2,** is connected to a shaft **35** on which is mounted a wheel or pulley **36** drivenly connected through a belt **37** to a wheel or pulley **38** connected on the output or drive shaft of motor **31.** Shaft **35** is supported at opposite ends by a pillow bearing assembly **39** mounted on base **11** and by a similar bearing assembly **40** mounted on a transverse frame member **41** attached to supporting members **12, 13.**

Eccentric **30** is disposed in a generally vertical plane when chair assembly **10** is in its position of use. The assembly **10** according to the present invention further comprises a flexible line designated **45** connected at one end **46** to eccentric **30** and at the other end **47** to rocking chair member **15.** Line **45** preferably is of wire to provide the required strength and flexibility which a metal wire can furnish.

The rocking chair assembly according to the present invention also comprises a manually operated control mechanism connected to rocking chair member **15** and to line **45** at end **47.** The mechanism has a first position tightening line **45** and thereby providing a driving connection between eccentric **30** and rocking chair member **15.** The broken line portion of line **45** in FIGS. **3** and **4** illustrates the tightened condition of line **45** in this first position. The mechanism has a second position loosening line **45** thereby permitting free, that is not powered or motor operated, movement of rocking chair member **15.** The control mechanism comprises, briefly, connecting means designated generally at **49**

mounted on rocking chair member **15**, such as on transverse frame member **50**, and connected to end **47** of line **45** for raising that end of line **45** to loosen the line. The control mechanism further comprises a handle **51** rotatably mounted at **52** on rocking chair member **15** at a readily accessibly location such as below the arm rest members **18** or **19**. The control mechanism also includes motion transmitting means connected to handle **51** and to connecting means **50** for raising end **47** of line **45** and tightening the line to provide the afore-mentioned driving connection, in response to rotation of handle **51** in one direction. The motion transmitting means also functions to lower end **47** of line **45** to loosen the line in response to rotation of handle **51** in another, i.e. the opposite direction.

The manually operated control mechanism according to the present invention can be seen in detail in FIGS. **1** and **3**. Connecting means **59** includes a housing **60** provided by a plate **61** mounted on rocking chair member **15** such as on frame member **50** thereof. Plate **61** is provided with an elongated slot **63** therein and disposed so that slot **63** is generally vertical. The surface of frame member **62** behind slot **63** can be recessed or, alternatively, plate **61** can be mounted on member **50** through spacers to provide the needed room behind plate **61**. Housing **60** further comprises first and second right angle channel members **64** and **65**, respectively, mounted on plate **61** in opposed relation on each side of slot **63**. The surface of channel member **64** which is perpendicular to the plane of plate **61** is provided with an elongated slot **66**, and the surface of channel member **65** perpendicular to the plane of plate **61** likewise is provided with an elongated slot **67**. By virtue of this arrangement, slots **66** and **67** are in opposed, generally aligned positions on each side of slot **63**. In addition, it will be noted that channel members **64, 65** are disposed with the longitudinal axes thereof slightly oblique relative to the axis of slot **63**. In other words, the space separating channel members **64, 65** is slightly larger near the bottom than at the top for a purpose which will be described. Housing **60** also includes a block member **68** mounted on plate **61** and positioned adjacent the tops of channel members **64, 65** whereby the space between the channel members is closed by block **68** at the top thereof.

A connector member in the form of an elongated bar **70** is movably positioned in housing **60** in a manner such that it can be raised and lowered. As shown in FIG. **4**, bar **70** is of a length greater than the distance from plate **61** to the front surface of either channel member **64, 65** and is of a width and thickness such that it is slidable in slot **63** and, accordingly, movable between the channel members **64, 65**. Bar **70** is provided with a pin **71** extending therethrough at one end thereof and disposed perpendicular to the longitudinal axis of the bar **70**. In operating position, bar **70** is positioned whereby the ends of pin **71** engage the rear surface or underside of plate **61** and the outer end of bar **70** extends slightly beyond channel members **64, 65**. As a result, connector member **70** is movable vertically within the limits defined by the length of slot **63** and is movably retained in housing **60** by virtue of the engagement of pin **71** with the surface of plate **61**. Line **45** is connected at end **47** to the outwardly projecting end of connector member **70**. When connector member **70** is raised a sufficient distance, line **45** is tightened as will be described presently. In addition, the provision of block member **68** limits the upward travel of connector member **70**.

The control mechanism further comprises a vertically movable operator member in the form of bar **75** which is positioned in housing **60** and contacts connector member **70** for raising and lowering the same. Bar **75** is of a width and thickness such that it is movable longitudinally between channel members **64** and **65**. A pin **76** extends through bar **75** in a direction perpendicular to the longitudinal axis thereof, and opposite ends of pin **76** are received in corresponding slots **66** and **67** of the channel members **64** and **65**, respectively, for guiding bars **75** therebetween. In addition, bar **75** is of a length such that when it raises connector member **70** to the upper limit of travel, the lower end of bar **75** extends below the bottom end of channel members **64, 65**. The slightly larger gap or spacing between channel members **64, 65** near the bottom thereof is to insure ease of vertical movement of bar **75** therebetween.

The control mechanism also comprises motion transmitting means connected to handle **51** and to the operator member **75** for raising member **75** to tighten line **45** in response to rotation of handle **51** in one direction, and for lowering operator member **75** to loosen line **45** in response to rotation of handle **51** in another or the opposite direction. The motion transmitting means comprises a shaft **80** connected at one end **81** to handle **51** and rotatably supported in rocking chair member **15** at the other end **82** thereof such as by a bushing. Shaft **80** preferably is disposed generally horizontally, and perpendicular with respect to the plane of movement of chair **10**. A first generally rectangular plate **85** is rigidly mounted on shaft **80** near end **82**, and disposed so that the plane of plate **85** is generally perpendicular with respect to the axis of shaft **80**. A first connecting rod **86** is pivotally connected at one end thereof by connecting means **88** to plate **85** at a point offset from the axis of shaft **80**. Rod **86** is disposed so that in all operative positions thereof it lies in a plane generally perpendicular to the axis of shaft **80**. Connecting means **88** is threadably connected to the end of rod **86** to facilitate adjustment therebetween.

A second, generally rectangular plate **90** is pivotally mounted to rocking chair member **15** such as through a connector member **91** rotatably connected in a bracket **92** secured to chair member **15**. The other end of connecting rod **86** is pivotally connected by means of a connector **93** to plate **90** and at a point offset from the pivot axis **91** of plate **90**. A second connecting rod **95** is pivotally connected by a connecting means **96** at one end thereof to plate **90** at a point offset from the pivot axis of plate **90** and from the point **93** at which first rod **86** is connected. Rod **95** in all operative positions thereof extends at an angle relative to rod **86** and is disposed in a plane generally parallel to the plane of rod **86**. A lever **98** is pivotally connected at one end **99** to the other end of rod **95**, and lever **98** is pivotally connected at the other end **100** to operator member **75**. Lever **98** is pivotally mounted at **101** intermediate the ends thereof to rocking chair member **15**, such as on frame member **50**.

The rocking chair assembly **10** according to the present invention can further comprise manually operated tension adjusting means operatively connected to line **45** for maintaining the proper tension on line **45** as persons of different sizes and weights use the chair. The tension adjusting means comprises a member **105** ro-

tatably mounted on rocking chair member **15**, such as by means of a shaft **106** rigidly attached to member **105** and rotatably received in a bushing **107** which, in turn, is fixed in a transverse frame member **108** of chair member **15**. While a separate frame member **108** is shown, it is apparent that if the width of frame member **50** were increased in a direction toward base **11**, member **105** could be mounted on member **50**. Member **105** is provided with spaced apart hook means **109** and **110**, respectively, for engaging line **45** but permitting movement of line **45** along the axis thereof. It will be appreciated that rotation of member **105** about shaft **106** a slight angular distance will tension the line **45**. A rotatable knob **110** is mounted on chair assembly **10** at a readily accessible location, such as on rocking chair member **15** below arm rests **18**, **19**, and rotations of knob **110** are transmitted through a coupling means to member **105**. In preferred form the coupling means comprises a flexible line **112** connected at one end to knob **110** and at the other end to a coupling **113** which, in turn, is connected to a shaft **114** having connected thereon a worm **115**. Shaft **114** is rotatably supported in a bracket **116** which is mounted on rocking chair member **15**. A worn wheel **117** is connected to shaft **106** and disposed so as to be in meshing relation with worn **115**.

The rocking chair assembly according to the present invention can further comprise visual lever indicator means **120**, shown in FIG. **3**, on rocking chair member **15** to indicate to the user his position of proper balance in the chair. In preferred form, the indicator **120** can comprise an elongated tube provided with a liquid including an air bubble **121** and spaced apart lines similar to a standard spirit level.

The rocking chair assembly according to the present invention also can comprise a foot rest, designated generally at **125**, operatively connected to shaft **80** through spaced-apart linkage assemblies indicated generally at **126** and **127**, whereby upon rotation of shaft **80** by handle **51** in one direction foot rest **125** is raised and upon rotation of handle **51** in the other direction foot rest **125** is lowered. Linkages **126**, **127** are of conventional construction readily familiar to those skilled in the art so that a detailed description thereof is deemed to be unnecessary.

The rocking chair assembly **10** according to the present invention operates in the following manner. When line **45** is in a loosened or slack condition, a person sitting in chair assembly **10** can rock back and forth using his own effort as in a conventional rocking chair. When automatic or motor-operated rocking action is desired, the user simply grasps handle **51** to pull it back toward him and thus rotate shaft **80** in a counterclockwise direction as viewed in FIG. **3**. The counterclockwise rotation of shaft **80** rotates plate **85** in its plane in a counterclockwise direction which, in turn, moves connecting rod **86** to rotate plate **90** about its axis in a counterclockwise direction. This, in turn, causes connecting rod **95** to move downwardly and pulling with it the corresponding end **99** of lever **98**. Lever **98**, in turn, is pivoted about is connection **101** to move operator member **75** upwardly thereby causing a corresponding upward movement of connector member **70**. As a result, line **45** is tightened or made taut, and this position of the control mechanism is maintained or locked by virtue of the offset relationship or particular spacing of the pivotal connections on plate **90**. With the control mechanism being locked and line **45** tightened to provide a driving connection between eccentric **30** and rocking chair member **15**, the user now can activate a switch **43** mounted on arm rest **19** to energize motor **31** for automatic rocking.

Prior to beginning this mode of operation, if the user notices that the driving connection does not appear to be tight, as evidenced by the feel or the play of the rocking chair member **15**, he can accordingly adjust the tension in line **45**. The user also can reposition himself in chair member **15** while observing the level indicator **120** so as to adjust himself to the chiar to get the proper balance. In particular, the user would rotate knob **110** by hand to cause a corresponding rotation of member **105** to make line **45** shorter or longer. This may be necessary when persons of a weight and size relatively larger or smaller than normal use the chair. By insuring that line **45** is in proper tension, the chair assembly **10** will give the smoothest motion. Then, the user simply actuates switch **43** and chair **10** provides a gentle rocking movement.

When the user wishes the automatic operation to stop so that he can leave the chair or switch to a manual or free rocking movement, he would first move switch **43** to deenergize motor **31** and then push handle **51** forwardly to rotate shaft **80** in a clockwise direction as viewed in FIG. **3**. This, in turn, causes plate **85** to rotate in its plane in a clockwise direction, and through connecting rod **86** produces a corresponding rotation of plate **90**. This, in turn, raises rod **95** to lower operator member **75** and pin **70** to loosen line **45**.

The smooth and gentle rocking movement provided by chair assembly **10** has been determined to be particularly desirable for many hospital patients in providing relaxation and in being beneficial to circulation. The provision of flexible line **45** permits a longer or greater degree of movement in the free or manual rocking mode. Persons of considerably different size and weight may use the same chair, especially in nursing homes or hospitals, but in all instances these variations are compensated for by the chair assembly **10** of the present invention. A person can adjust his position relative to the chair to maintain the proper balanced condition as shown to him by level indicator **120**. In addition the tension in line **45** is adjustable by the member **105** under control of knob **110**.

Accordingly, it is seen that the present invention accomplishes its intended objects. While a single specific embodiment of the present invention has been described in detail, this has been done by way of illustration without thought of limitation.

I claim:

1. A rocking chair assembly comprising:

a. a base;

b. a rocking chair member movably mounted on said base;

c. an eccentric drivenly connected to motor means mounted on said base;

d. a flexible line connected at one end to said eccentric and at the other end to said rocking chair member; and

e. a manually operated control mechanism connected to said rocking chair member and to said line at said other end, said mechanism having a first position tightening said line thereby providing a driving connection through said line between said eccentric and said rocking chair member, and said

mechanism having a second position loosening said line thereby permitting free movement of said rocking chair member.

2. A rocking chair assembly according to claim **1** wherein said flexible line is a wire line.

3. A rocking chair assembly according to claim **1** further comprising manually operated tension adjusting means operatively connected to said flexible line to compensate for the different weights and sizes of persons using the chair.

4. A rocking chair assembly according to claim **1** further comprising visual level indicator means on said rocking chair member to indicate to the user a position of proper balance.

5. A rocking chair assembly comprising:

a. a base;

b. a rocking chair member movably mounted on said base;

c. an eccentric drivenly connected to motor means mounted on said base;

d. a flexible line connected at one end to said eccentric and at the other end to said rocking chair member; and

e. a manually operated control mechanism connected to said rocking chair member and to said line at said other end, said mechanism comprising a housing mounted on said rocking chair member; a connector member movably positioned in said housing for raising and lowering; said line being connected to said connector member and tightened when said connector member is raised a sufficient distance; a vertically movable operator member positioned in said housing and contacting said connector member for raising and lowering the same; a handle rotatably mounted on said rocking chair member; and motion transmitting means connected to said handle and to said operator member for raising said operator member to tighten said line in response to rotation of said handle in one direction whereby said mechanism has a first position tightening said line thereby providing a driving connection between said eccentric and said rocking chair member, and for lowering said operator to loosen said line in response to rotation of said handle in another direction whereby said mechanism has a second position loosening said line thereby permitting free movement of said rocking chair member.

6. A rocking chair assembly according to claim **5** wherein said motion transmitting means includes means for maintaining said operator in the raised position tightening said line until said handle is rotated in said other direction.

7. A rocking chair assembly according to claim **5** wherein said motion transmitting means comprises:

a. a shaft connected at one end to said handle and rotatably supported in said rocking chair member;

b. a first plate rigidly mounted to the other end of said shaft and disposed so that the plane of said plate is generally perpendicular to the axis of said shaft;

c. a first connecting rod;

d. means for pivotally connecting one end of said rod to said plate at a point offset from said shaft;

e. a second plate pivotally mounted to said rocking chair member;

f. means for pivotally connecting the other end of said rod to said second plate offset from the pivot axis of said second plate;

g. a second connecting rod;

h. means for pivotally connecting one end of said second rod to said second plate offset from the pivot axis of said second plate and from said first rod; and

i. a lever connected at one end to the other end of said second connecting rod and at the other end to said operator member, said lever being pivotally mounted intermediate the ends thereof to said rocking chair member.

8. A rocking chair assembly according to claim **5** further including a footrest operatively connected to said shaft whereby upon rotation of said shaft by said handle in one direction said footrest is raised and in another direction of rotation said footrest is lowered.

9. A rocking chair assembly comprising:

a. a base;

b. a rocking chair member movably mounted on said base;

c. an eccentric drivenly connected to motor means mounted on said base;

d. a flexible line connected at one end to said eccentric and at the other end to said rocking chair member;

e. a manually operated control mechanism connected to said rocking chair member and to said line at said other end, said mechanism having a first position tightening said line thereby providing a driving connection between said eccentric and said rocking chair member, and said mechanism having a second position loosening said line thereby permitting free movement of said rocking chair member; and

f. manually operated tension adjusting means operatively connected to said flexible line to compensate for the different weights and sizes of persons using the chair, said tension adjusting means comprising a member rotatably mounted on said rocking chair member and having spaced-apart hook means for engaging said line but permitting movement of said line along the axis of said line, said member tensioning said line upon rotation thereof; a rotatable knob mounted on said assembly; and coupling means connected to said knob and to said member for transmitting rotation of said knob to said member.

10. A rocking chair assembly comprising:

a. a base;

b. a rocking chair member movably mounted on said base;

c. an eccentric drivenly connected to motor means mounted on said base;

d. a flexible line connected at one end to said eccentric and at the other end to said rocking chair member; and

e. a manually operated control mechanism connected to said rocking chair member and to said line at said other end, said mechanism having a first position tightening said line thereby providing a driving connection between said eccentric and said rocking chair member, and said mechanism having a second position loosening said line thereby permitting free movement of said rocking chair member, said control mechanism comprising connect-

ing means mounted on said rocking chair member and connected to one end of said line for raising said end of said line to a tightened position and lowering said end of said line to loosen said line; a handle rotatably mounted on said rocking chair member; and motion transmitting means connected to said handle and to said connecting means for raising said end of said line and tightening said line to provide said driving connection in response to rotation of said handle in one direction and for lowering said end of said line to loosen said line in response to rotation of said handle in another direction.

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