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(54) **RECIPROCATING ROCKING DEVICE**

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(51) **Int. Cl.**

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A47C 3/029 (2006.01)
A61G 5/10 (2006.01)
A47C 3/02 (2006.01)
A47C 3/027 (2006.01)
F16H 21/24 (2006.01)

(52) **U.S. Cl.**

CPC **F16H 21/40** (2013.01); **A47C 3/02** (2013.01); **A47C 3/027** (2013.01); **A47C 3/029** (2013.01); **A47D 9/02** (2013.01); **A61G 5/10** (2013.01); **F16H 21/24** (2013.01); **Y10T 74/18056** (2015.01); **Y10T 74/18216** (2015.01)

(58) **Field of Classification Search**

CPC A61G 5/104; A61H 1/003; A63B 2071/0018; B62B 9/22

See application file for complete search history.

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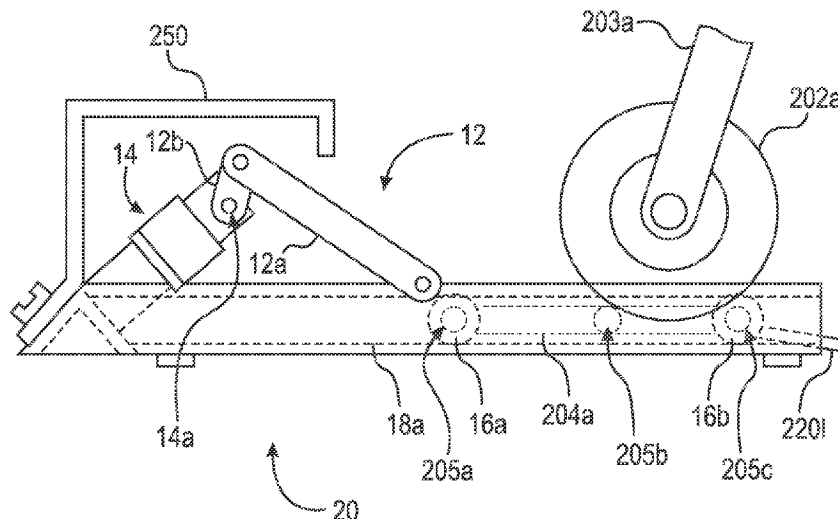
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(57) **ABSTRACT**

A reciprocating rocking device for the rocking of a chair or cradle, the chair or cradle having rockers and a seat member, the reciprocating rocking device comprising a base secured to the rockers, the base comprising a first bracket, a second bracket secured to the seat member of the chair or cradle, a tension member connected to the second bracket, an eccentric, the eccentric constantly engaged with the second bracket and, a motor secured to the first bracket, the motor having a drive shaft operatively arranged to drive the eccentric, wherein the motor is coaxially arranged with the eccentric.

5 Claims, 12 Drawing Sheets



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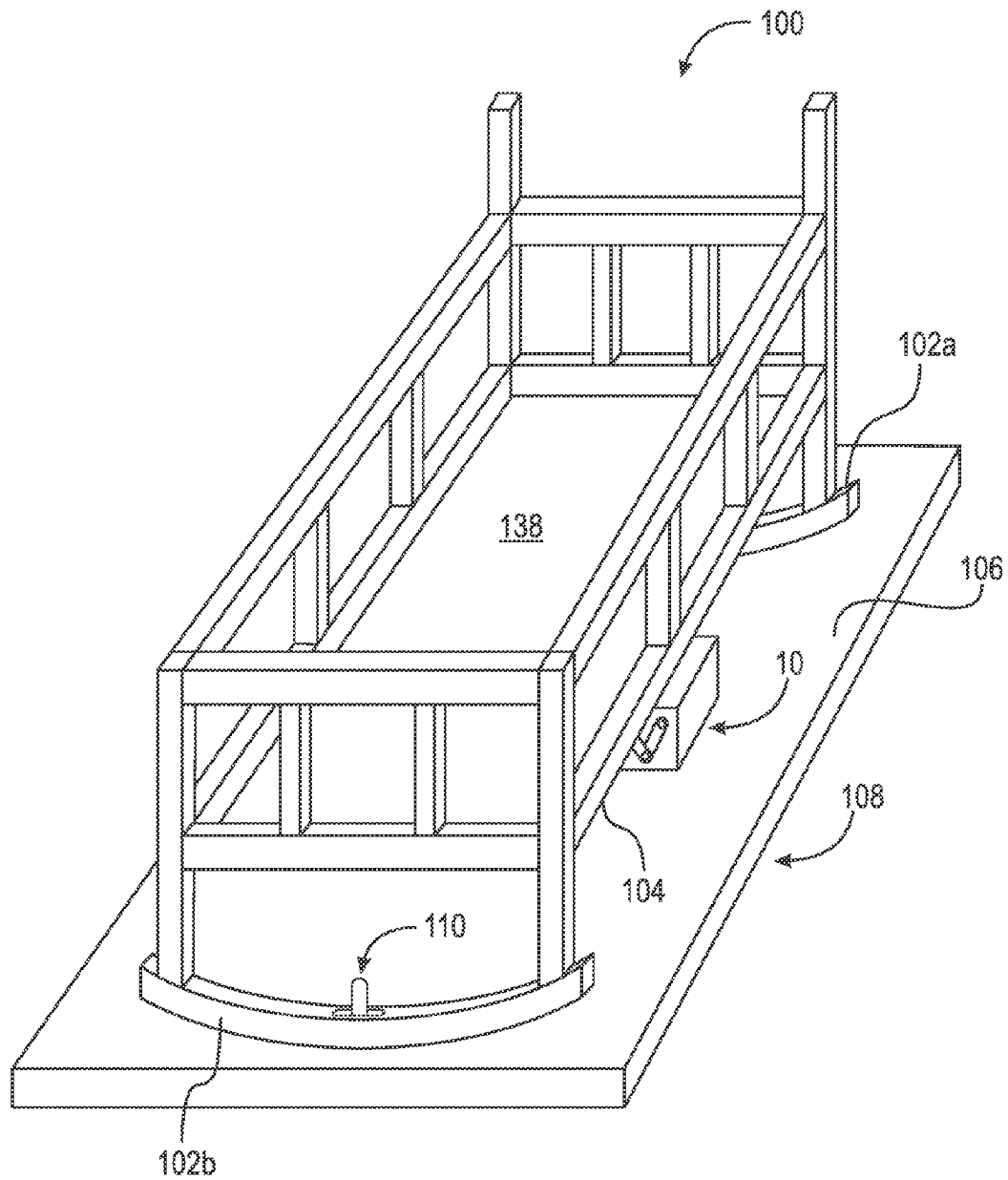


Fig. 1

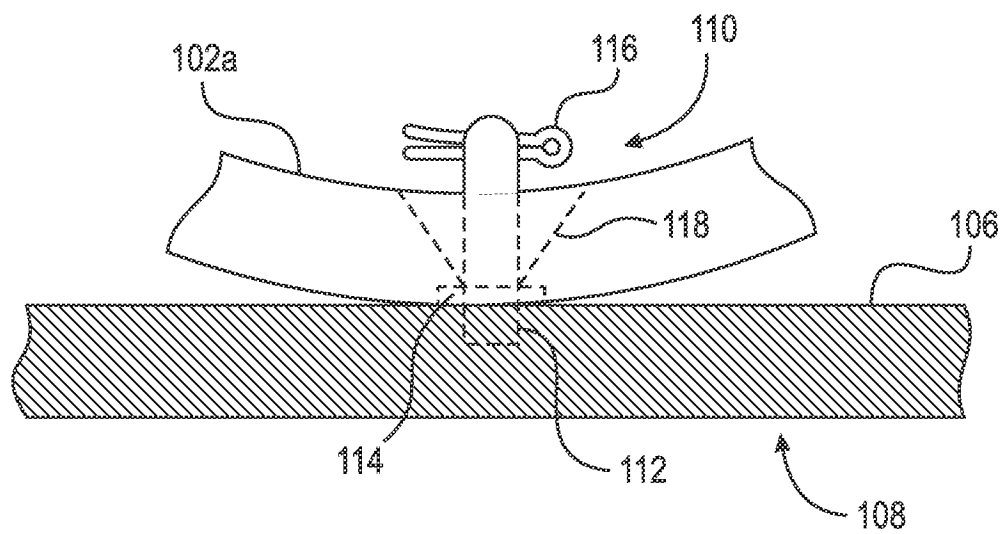


Fig. 2

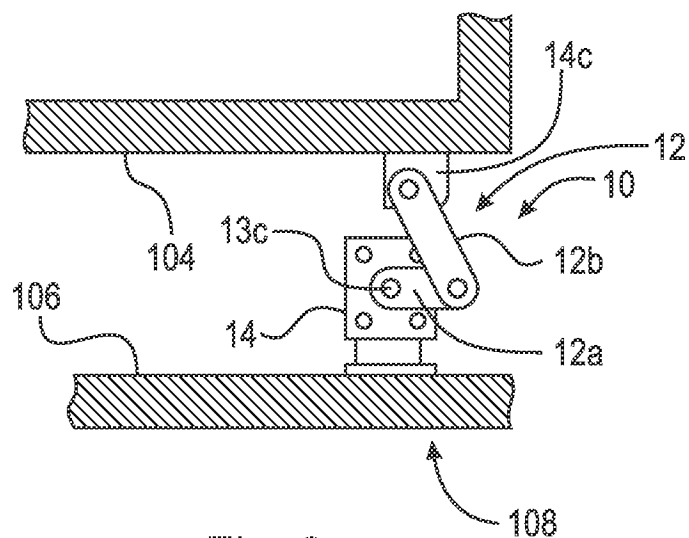


Fig. 3

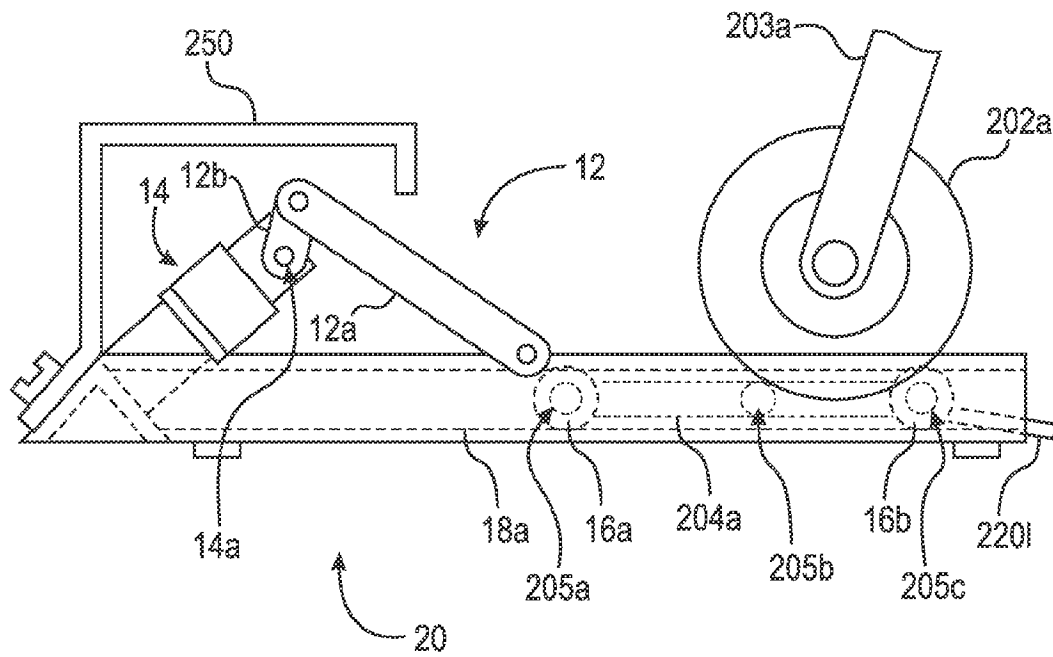


Fig. 4A

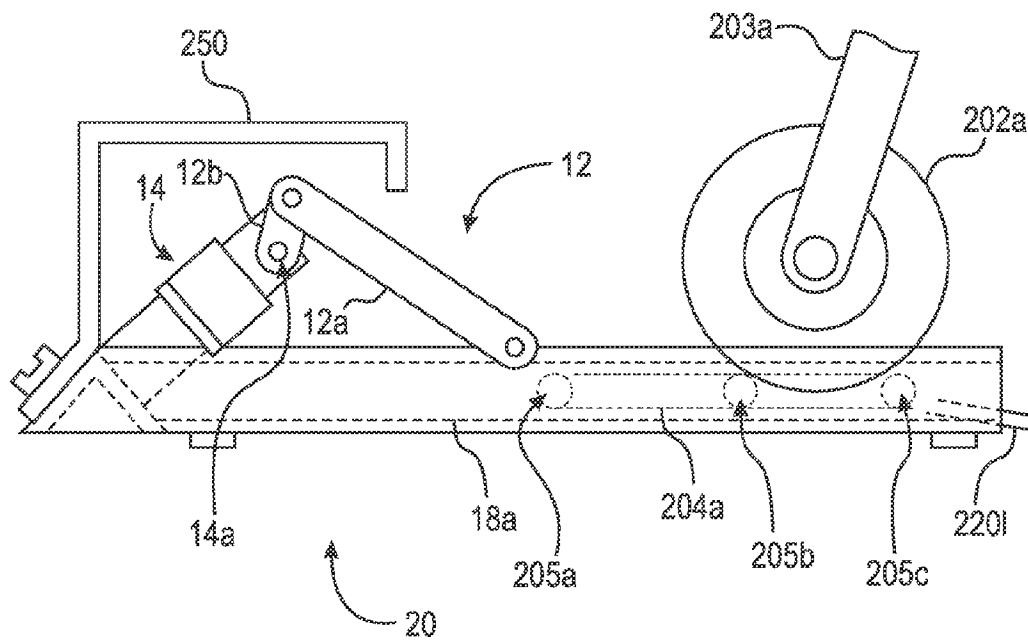


Fig. 4B

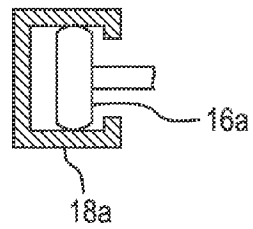


Fig. 5

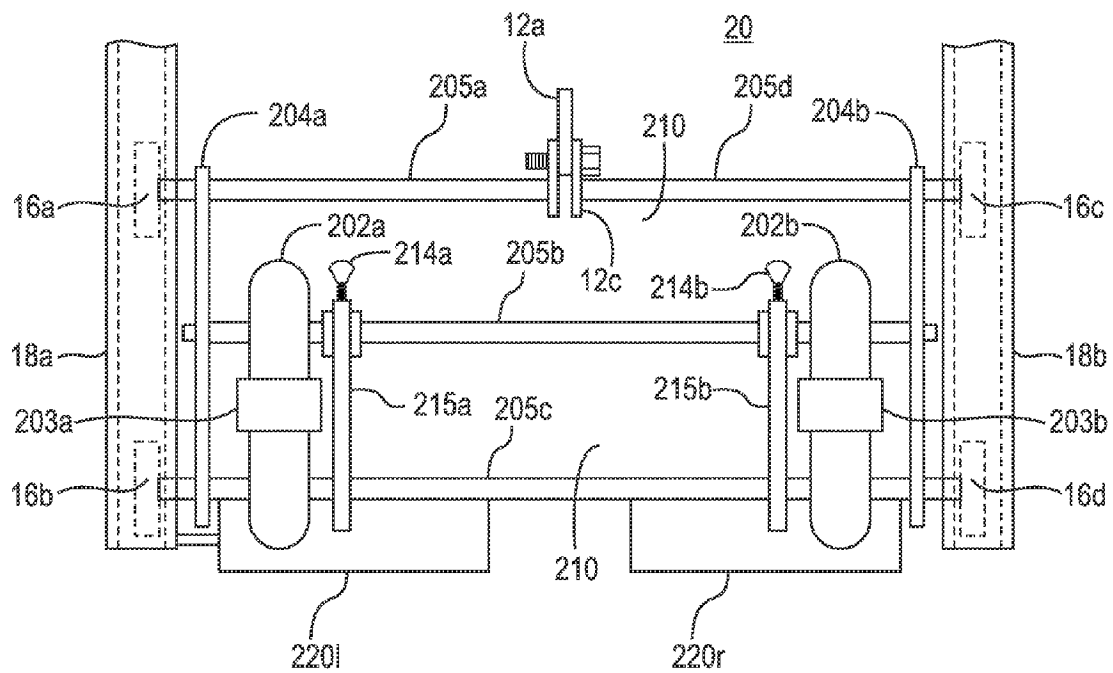


Fig. 6

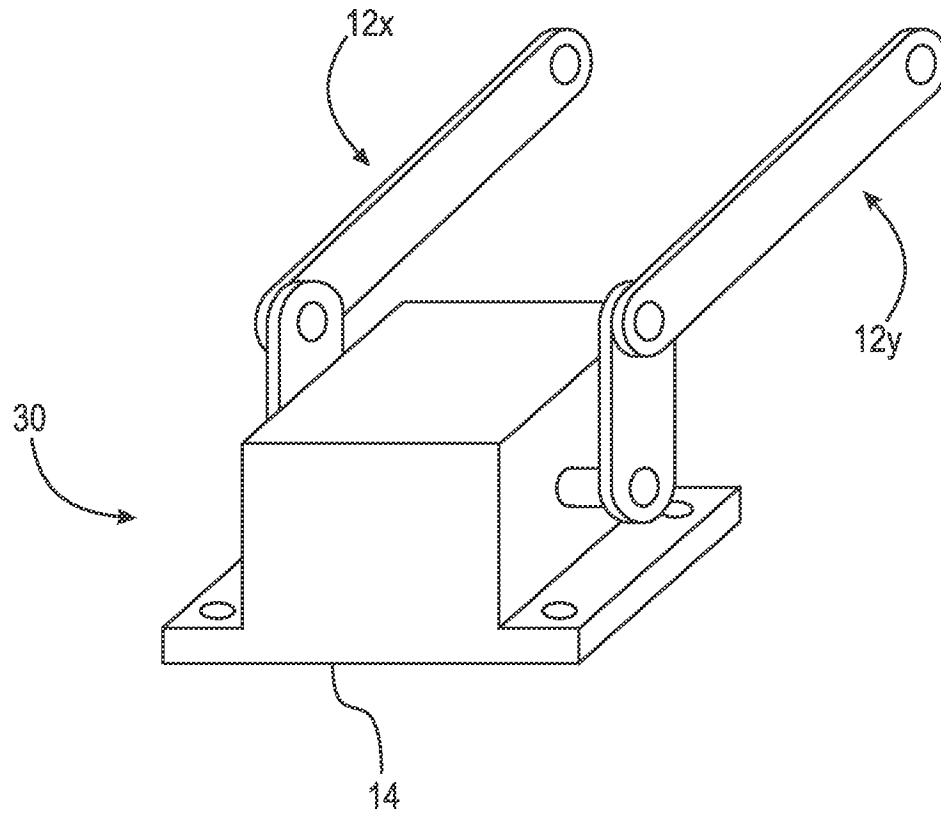


Fig. 7

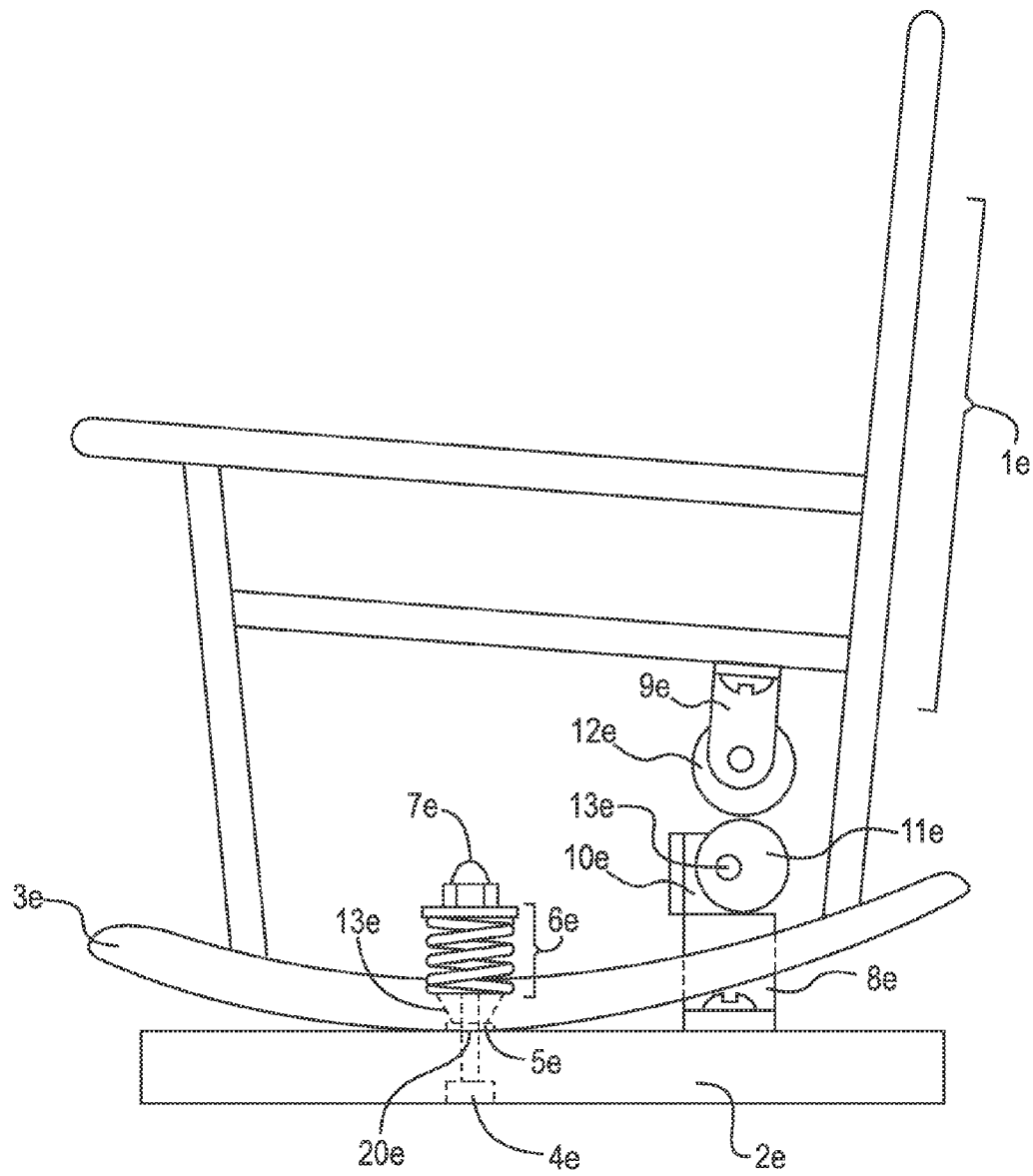


Fig. 8

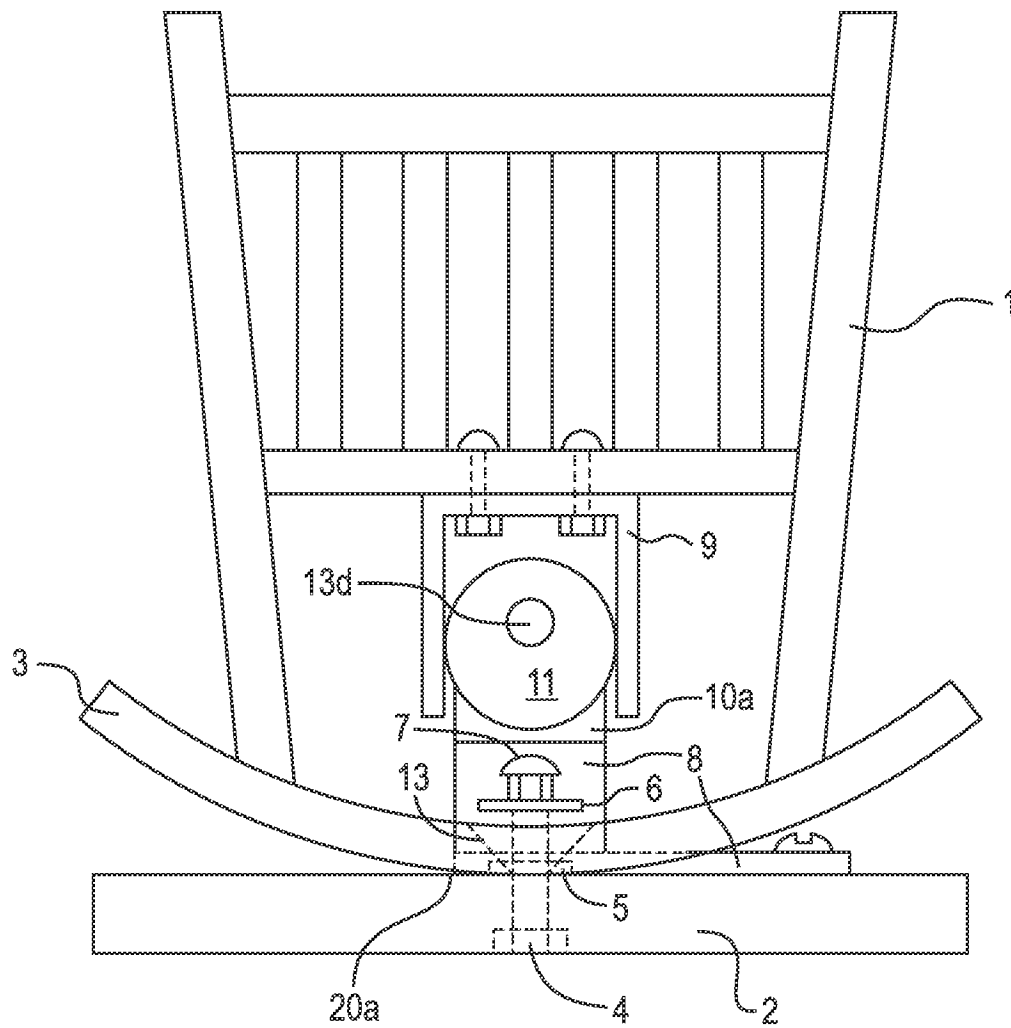


Fig. 9

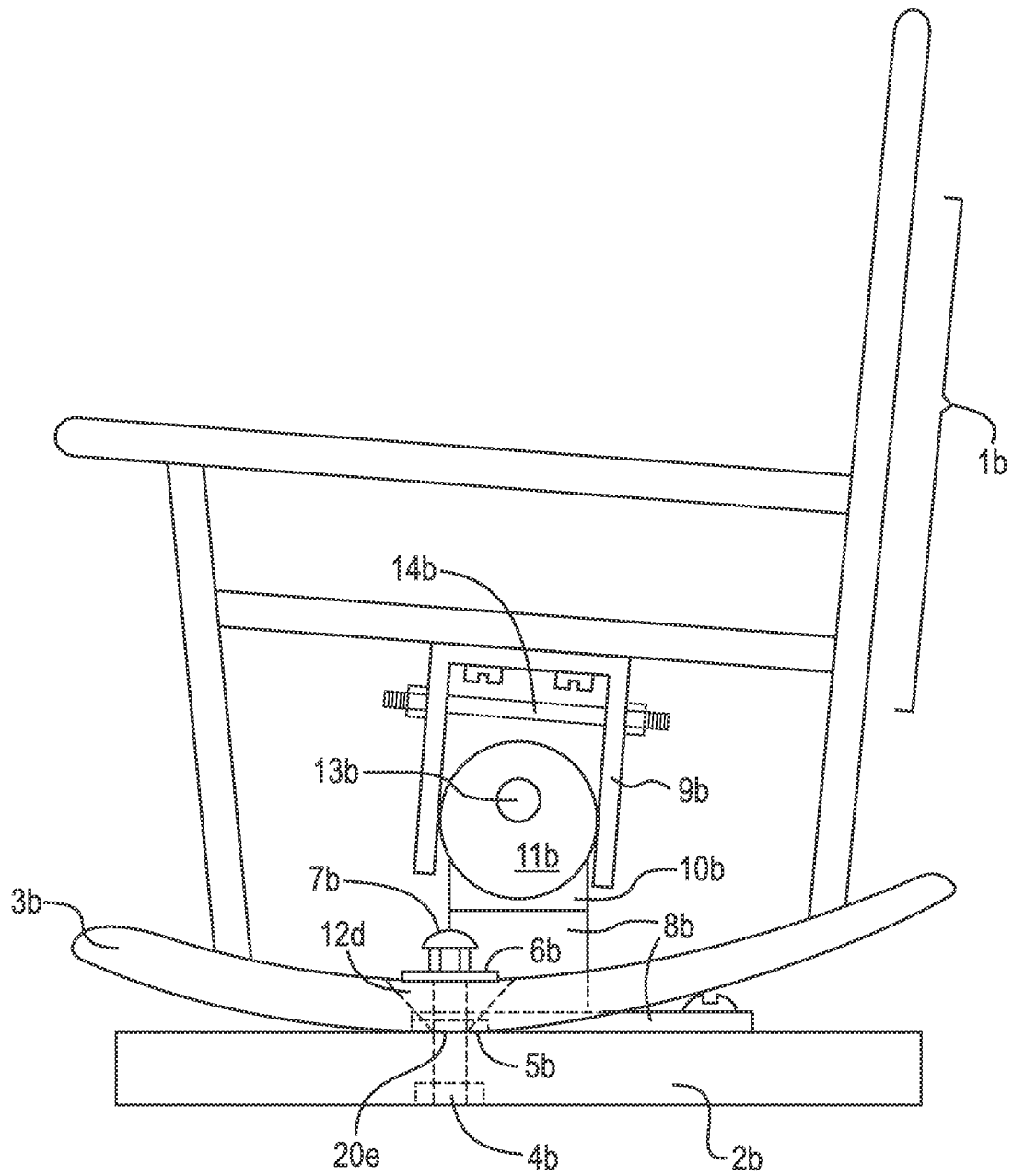


Fig. 10

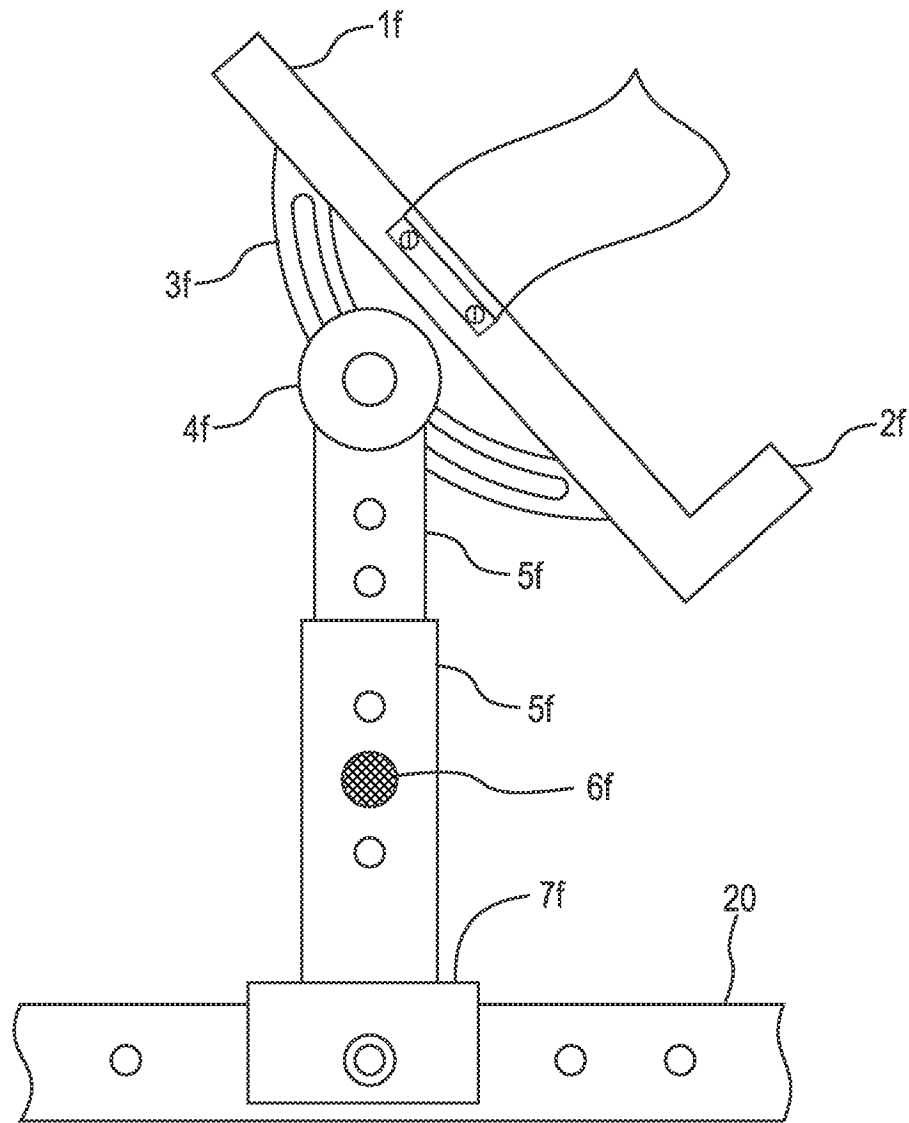


Fig. 11

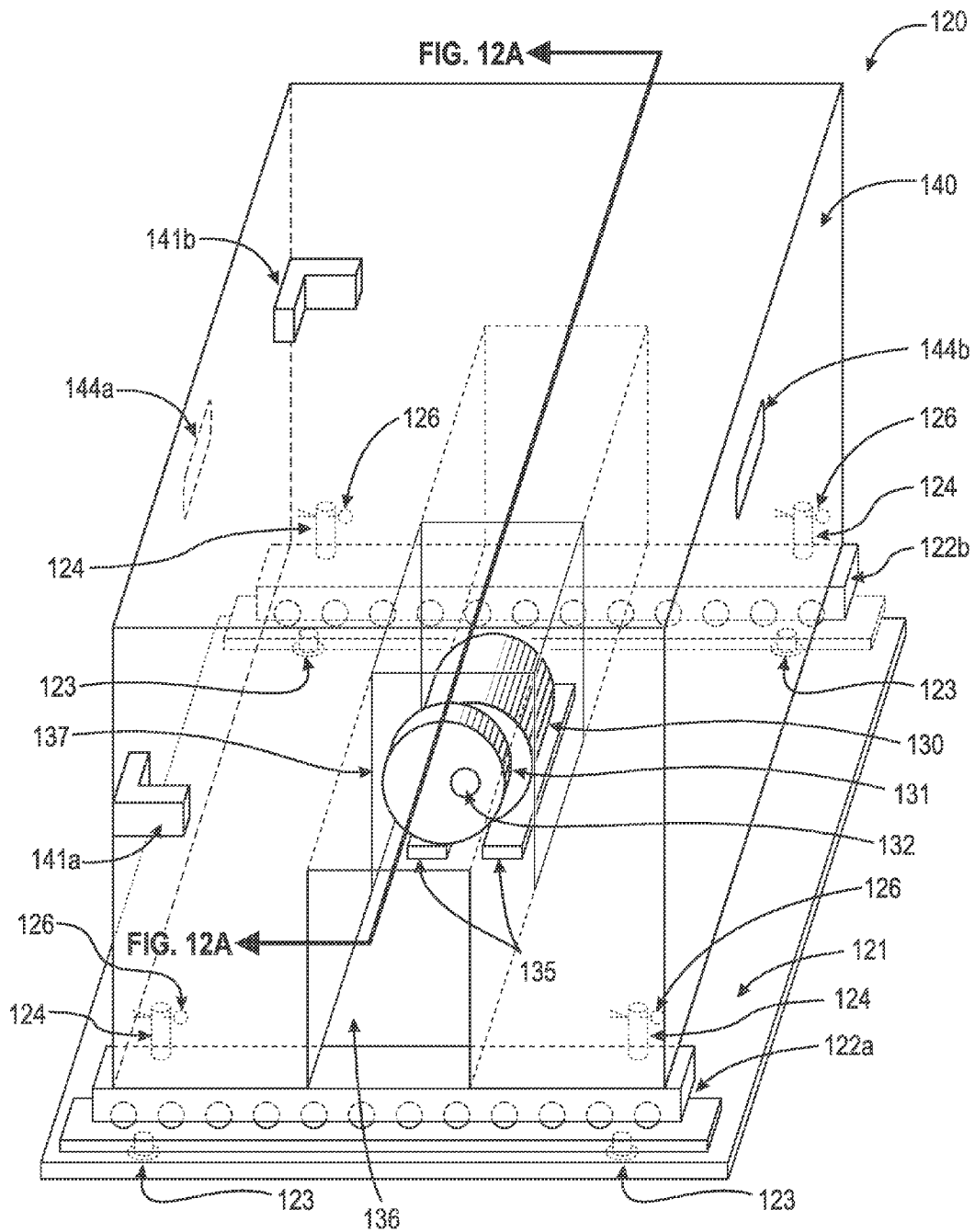


Fig. 12

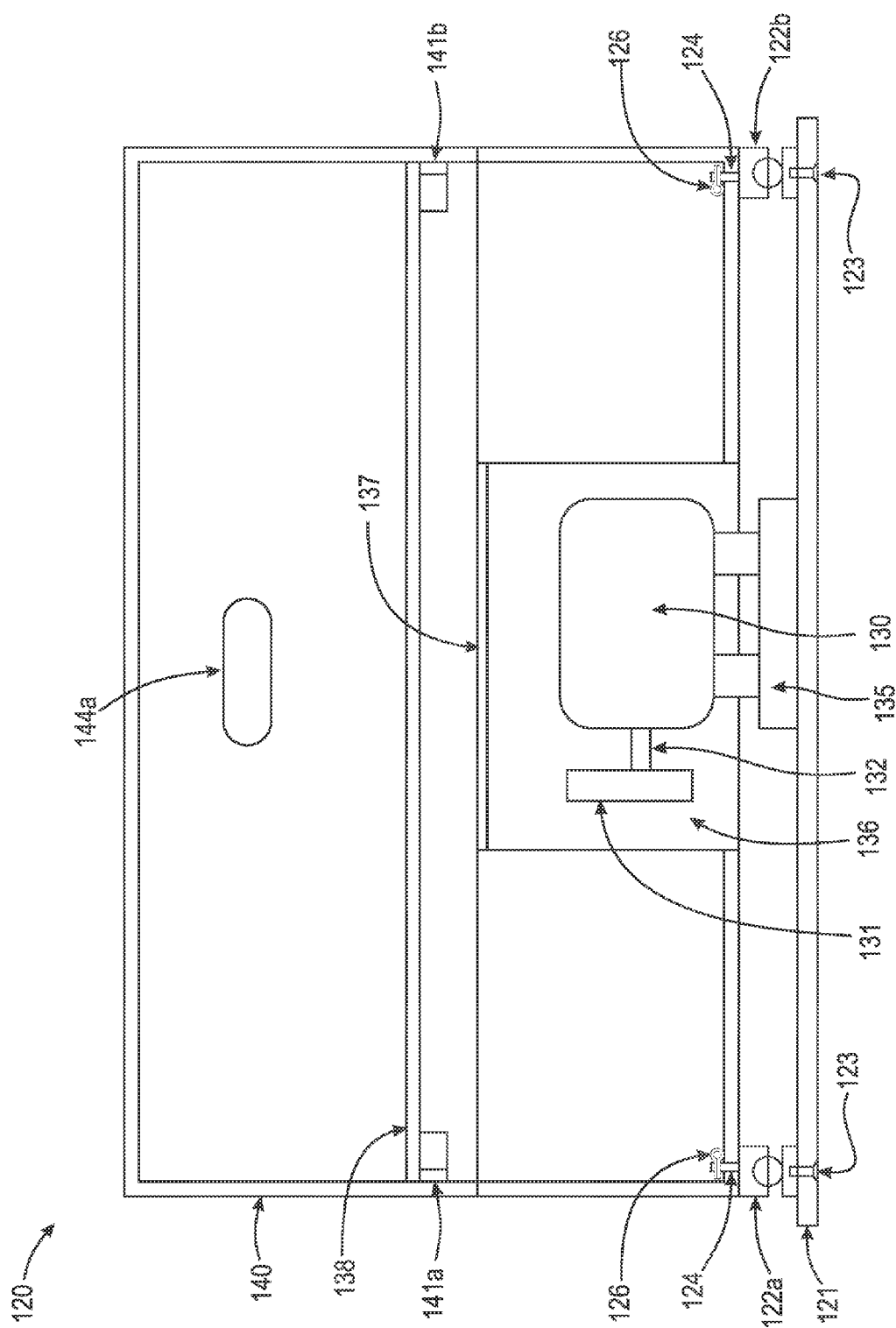


Fig. 12A

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RECIPROCATING ROCKING DEVICE**CROSS-REFERENCE TO RELATED APPLICATIONS**

This patent application is a Continuation-in-Part of application Ser. No. 13/228,866, filed on Sep. 9, 2011, which application claims the benefit under 35 U.S.C. §119(e) of U.S. Provisional Patent Application No. 61/446,261, filed Feb. 24, 2011, which applications are incorporated herein by reference.

FIELD OF THE INVENTION

The invention relates generally to a reciprocating rocking device, and, more specifically, to a reciprocating rocking device for rocking a wheelchair, cradle, rocking chair, and the like which provides a continuously smooth motion.

BACKGROUND OF THE INVENTION

Recent studies demonstrate that a rocking motion, including gliding, is beneficial to both physical and mental health. Patients with mid-stage dementia are often difficult to calm. Because these people are aware, to some extent, of what is happening to them, they often feel fear, anger and anxiety. A study sponsored by the School of Nursing of the University of Rochester found that the act of rocking released endorphins that calm and relax patients suffering from dementia. Researchers at the Medical College of Virginia found that one hour of a rocking-type motion per day provides relief to people suffering from arthritis and can help post-operative patients recover faster and suffer from fewer complications. Smooth repetitive motion also was shown to improve muscle tone and flexibility. Children with ADD and similar learning difficulties were reported to be able to concentrate while they are experiencing of a rocking motion. Observations of patients made in the Orange Spine and Disc Rehabilitation Center in California led to conclusions that the rocking motion of a rocking chair combined with some basic exercises help relieve chronic back pain. It is well known that rocking helps to induce sleep, especially in infants. Such rocking, of course, may be provided by rocking an infant in a cradle instead of a rocking chair.

In addition to the therapeutic effects of rocking, many child caregivers simply enjoy rocking an infant in a rocking chair. The time spent rocking can be a time of bonding for both a parent or caregiver and the child. Adults of all ages also enjoy the rocking motion provided by a rocking chair. Sometimes a user isn't physically able to rock in a chair and requires the assistance of a caregiver.

In order for the beneficial effects of rocking to be fully achieved, the rocking motion should be continuous, that is, without abrupt changes in direction and also be performed as quietly as possible. A caregiver can easily rock a cradle or chair with ease in a quiet manner, but this requires the caregiver to stay next to the cradle or chair and prevents other tasks from being completed. Additionally, the caregiver can become fatigued from manually rocking the cradle or chair. In order to alleviate this fatigue what is needed is a device which simulates the rocking motion of a caregiver.

A problem that occurs with mounting a power source to the cradle or chair is the noise that results from its operation. Additionally, excessive noise occurs if an extensive gear train is used to transfer rotational movement from a motor from the rotating gears meshing with one another. A second problem associated with a caregiver manually rocking a

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wheelchair is the abrupt change in direction due to the front wheels which pivot in order to steer the wheelchair when moving forward. The constant forward and backward motion the caregiver performs in order to rock a patient in a wheelchair is both non-continuous and places excessive physical strain on the caregiver.

Thus, there has been a long-felt need for a device which can rock or glide cradles, chairs, wheelchairs, or the like in a smooth and continuous manner without excessive noise from complicated gear couplings or the need of a caregiver present.

BRIEF SUMMARY OF THE INVENTION

The present invention broadly comprises a reciprocating rocking device for the gliding of a wheelchair, the wheelchair having a pair of front wheels, the reciprocating rocking device comprising a frame comprising a pair of tracks, each track having a channel therein, a bracket comprising two pairs of rollers, each of the two pairs of rollers arranged for rolling engagement within one of the channels, the two pairs of rollers arranged parallel to one another and joined to one another by a first and second drawbar, the first and second drawbars arranged parallel to and spaced apart from one another and perpendicularly to the tracks, the first and second parallel drawbars arranged to hold the pair of front wheelchair wheels, a linkage connected to the bracket, an eccentric connected to the linkage and arranged to move the bracket in a linear, reciprocating manner within the tracks and, a motor secured to the frame, the motor having a drive shaft operatively arranged to drive the eccentric.

Additionally, the present invention comprises a reciprocating rocking device for the rocking of a chair or cradle, the chair or cradle having rockers and a seat member, the reciprocating rocking device comprising a base secured to the rockers, the base comprising a first bracket, a second bracket secured to the seat member of the chair or cradle, a tension member connected to the second bracket, an eccentric, the eccentric constantly engaged with the second bracket and, a motor secured to the first bracket, the motor having a drive shaft operatively arranged to drive the eccentric, wherein the motor is coaxially arranged with the eccentric.

Additionally, the present invention comprises a reciprocating rocking device for the rocking of a chair or cradle, said chair or cradle having rockers and a seat member, said reciprocating rocking device comprising a base secured to the rockers, a bracket secured to the seat member of the chair or cradle, a linkage comprising a first member and a second member, wherein each member is rotatably secured to one another and the second member is connected to the bracket and, a motor secured to the base, the motor having a drive shaft operatively arranged to drive the first member of the linkage, wherein the motor is coaxially arranged with the first member of the linkage.

Even further, the present invention comprises a reciprocating rocking device for the gliding of a chair or cradle, said reciprocating rocking device comprising a base, a glider secured to the base, a body comprising a centrally arranged channel, the body secured to the glider, an eccentric, the eccentric constantly engaged with the channel of the body and, a motor secured to the base, the motor having a drive shaft operatively arranged to drive the eccentric, wherein the motor is coaxially arranged with the eccentric.

Accordingly, the present invention comprises a device that provides a powered, continuously smooth rocking or

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gliding motion when used in combination with a rocking chair, cradle, or a wheeled device such as a wheelchair.

A primary object of the invention is to provide a device which can rock or glide a chair, cradle, wheelchair, or the like in a smooth and continuous manner without excessive noise from complicated gear couplings or the assistance of a caregiver.

These and other objects, features and advantages of the present invention will become readily apparent upon a review of the following detailed description of the invention, in view of the drawings and appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The nature and mode of operation of the present invention will now be more fully described in the following detailed description of the invention taken with the accompanying figures, in which:

FIG. 1 is a perspective view of a first embodiment of the present invention secured to cradle 100;

FIG. 2 is a fragmentary side view of rocker 102a and base 108 of cradle 100;

FIG. 3 is fragmentary a side view of device 10 secured to bottom surface 104 and to top surface 106 of bed board 138 and base 108, respectively;

FIG. 4A is a side view of a second embodiment of the present invention secured to wheelchair wheel 202;

FIG. 4B is a side view of a second embodiment of the present invention secured to wheelchair wheel 202a with rollers 16a and 16b removed;

FIG. 5 is a detailed side view of track 18a and roller 16a;

FIG. 6 is a top view of the second embodiment of the present invention secured to wheelchair wheels 202a and 202b;

FIG. 7 is a perspective view of device 30 of the present invention;

FIG. 8 is a side view of a third embodiment of the present invention secured to chair 1e;

FIG. 9 is a front view of a fourth embodiment of the present invention secured to cradle 1;

FIG. 10 a side view of a fifth embodiment of the present invention secured to chair 1b;

FIG. 11 is a view of a footrest 1f secured to frame 20;

FIG. 12 is a fragmentary perspective view of a sixth embodiment of the present invention secured to body 140; and,

FIG. 12a is cross-sectional view taken generally along line 12A in FIG. 12.

DETAILED DESCRIPTION OF THE INVENTION

At the outset, it should be appreciated that like drawing numbers on different drawing views identify identical, or functionally similar, structural elements of the invention. It is to be understood that the invention as claimed is not limited to the disclosed aspects.

Furthermore, it is understood that this invention is not limited to the particular methodology, materials and modifications described and as such may, of course, vary. It is also understood that the terminology used herein is for the purpose of describing particular aspects only, and is not intended to limit the scope of the present invention.

Unless defined otherwise, all technical and scientific terms used herein have the same meaning as commonly understood to one of ordinary skill in the art to which this invention pertains. It should be understood that any meth-

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ods, devices or materials similar or equivalent to those described herein can be used in the practice or testing of the invention. The assembly of the present invention could be driven by hydraulics, electronics, and/or pneumatics.

Adverting now to the figures, FIG. 1 is a perspective view of a first embodiment of the present invention secured to cradle 100. Motorized reciprocating motion device 10 provides a reciprocating rocking motion for cradle 100. Cradle 100 comprises bed board 138, bottom surface 104, rockers 102a and 102b, and base 108. Cradle 100 is removably secured to base 108.

FIG. 2 is a fragmentary side view of rocker 102a and base 108 of cradle 100 and further illustrates the details of mount 110, which includes connector 112 and support plate 114 extending into notch 118 through rocker 102a into base 108 to attach cradle 100 to base 108. In a preferred embodiment, notch 118 is cut so that the angle of the notch is comparable to the maximum rocking angle. In this example, pin 116 secures to connector 112 allowing cradle 100 to be lifted and moved along with base 108 while also staying secured to base 108. In a preferred embodiment, pin 116 secures to mount 110. It should be appreciated, however, that there are many other ways of maintaining the connection which are considered to be within the scope of the invention as claimed. For example, pin 112 can be threaded to accept a nut and washer.

FIG. 3 is a fragmentary side view of device 10 secured to bottom surface 104 and to top surface 106 of bed board 138 and base 108, respectively. Motor 14 comprises driveshaft 13c and rotates linkage 12. Linkage 12 comprises first member 12a and second member 12b. Driveshaft 13c non-rotatably engages first member 12a and second member 12b is rotatably secured to bracket 14c. Bracket 14c is arranged on bottom surface 104 at an edge of cradle 100. In a preferred embodiment, the rotary motion produced by a gear motor is converted to a reciprocating motion to produce a continuous, smooth rocking or gliding of cradle 100. This is accomplished by functionally coupling the rotary output of the gear motor to linkage 12. The weight of cradle 100 and its contents resting on rockers 102a and 102b seek equilibrium and, thus, provide a counterforce to any rocking motion. Device 10 is secured between bottom surface 104 and top surface 106 and overcomes the counterforce to rocking to produce a smooth, continuous rocking movement. Device 10 provides the energy required to maintain the rocking motion in a continuous manner.

FIG. 4A is a side view of a second embodiment of the present invention secured to wheelchair wheels 202a and 202b. As discussed above, wheelchairs comprise rear weight bearing wheels and front steering or caster wheels. Wheels 202a and 202b are supported by frame 20 and secured to a wheelchair by wheel mounts 203a and 203b, respectively. Wheels 202a and 202b of a wheelchair are easily rolled onto frame 20 using ramps 220l and 220r. Frame 20 provides support for both device 10 and wheels 202a and 202b of a wheelchair. In a preferred embodiment, motor 14 is secured to track 18a and track 18b and is protected by housing 250. Rollers 16a and 16b mount to drawbars 205b and 205c allow bracket 204a to move within track 18a with reduced friction. Additionally, first member 12a, second member 12b, and third member 12c are rotatably secured to one another and form linkage 12. Second member 12b is secured to gear motor 14 via driveshaft 14a. Linkage 12 is designed to translate the rotary motion of motor 14 to a reciprocating motion in order to provide a smooth and continuous reciprocating rocking or gliding motion to the wheelchair. It should be appreciated, however, that the number of members

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required is reduced when the members are replaced by with an eccentric, which could also reduce the noise while in operation.

FIG. 4B is a side view of a second embodiment of the present invention secured to wheelchair wheels **202a** and **202b** with rollers **16a** and **16b** removed. The figure shows that wheel **202a** is arranged between drawbars **205b** and **205c** in order to secure wheel **202a** during operation. If wheel **202a** needed to be secured even further, the gap between drawbar **205b** and drawbar **205c** could be increased to allow wheel **202a** to sit lower in bracket **204a**. It is important to note that drawbars **205a**, **205b**, **205c**, and **205d** are all perpendicularly secured to bracket **204a** and **204b** (shown in FIG. 6) and also arranged parallel to one another.

FIG. 5 is a detailed side view of roller **16a** positioned within track **18a**. In a preferred embodiment, roller **16a** is a ball bearing roller. It should be appreciated, however, that the use of different devices to reduce the friction on track **18a** is possible and considered to be within the scope of the invention as claimed. For example, roller **16a** and track **18a** could be concentric tubes which are telescopically engaged.

FIG. 6 is a top view of the second embodiment of the present invention secured to wheelchair wheels **202a** and **202b**. Drawbars **205a**, **205b**, **205c**, and **205d** are secured to brackets **204a** and **204b**. Drawbar **205a** has roller **16a** secure to one end, with the other end of drawbar **205a** securing to third member **12c** of linkage **12**. Drawbar **205d** has roller **16c** secure to one end, with the other end of drawbar **205d** securing to third member **12c** of linkage **12**. Additionally, rollers **16b** and **16d** secure to either end of drawbar **205c**. Rollers **16a**, **16b**, **16c**, and **16d** are securely arranged within track **18** formed within the structure of frame **20**. This connection allows a gliding motion of wheels **202a** and **202b** once wheels **202a** and **202b** are positioned in space **210**. One end of linkage **12** is non-rotatably secured to a motor **14** (shown in FIG. 4) which is supported by frame **20**, with the other end of linkage **12** being fixedly secured to drawbars **205a** and **205d**. In order to provide gliding motion to a wheelchair, wheels **202a** and **202b** of the wheelchair are positioned within space **210** between drawbars **205b** and **205c** of brackets **204a** and **204b**. Rollers **16** are supported by and move within track **18** of base frame **20** and translate the motion to wheels **202a** and **202b** of a wheelchair supported by frame **20**. Wheels **202a** and **202b** are securely arranged within space **210** that is between drawbars **205b** and **205c**. Because wheels **202a** and **202b** are the steering wheels of a wheelchair, they are made to easily turn or caster. In order to keep wheels **202a** and **202b** from rotating to the point that could cause them to slip into space **210** between drawbars **205b** and **205c**, frame **20** further comprises wheel guides **215a** and **215b**. In a preferred embodiment, thumbscrews **214a** and **214b** are used to loosen and tighten wheel guides **215a** and **215b**, respectively, which are mounted on drawbars **205b** and **205c**. By loosening thumbscrews **214a** and **214b**, wheel guides **215a** and **215b** may be adjusted to allow for different wheelchairs to be used, as the wheel base can range from about 15 to 30 inches for a typical wheelchair. Wheel guides **215a** and **215b** can be set so that they will be close to the inside surface of wheels **202a** and **202b**, thereby restricting the degree that wheels **202a** and **202b** can turn. Smooth gliding motion of the wheelchair is provided by rollers **16a**, **16b**, **16c**, and **16d** that are firmly seated within track **18**. Rollers **16a**, and **16c** are fixedly secured to drawbars **205a** and **205d** upon which third member **12c** of linkage **12** is fixedly secured. When power is provided to motor **14** (shown in FIG. 4), linkage **12** provides a smooth, continuous gliding motion for frame **20** via its connection to drawbars

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205a and **205d**. Brackets **204a** and **204b** are easily moved forward and backward due to the decrease in friction made possible by rollers **16a**, **16b**, **16c**, and **16d**. As brackets **204a** and **204b** are actuated in a forward and reverse motion, wheels **202a** and **202b** supported on drawbars **205b** and **205c** of frame **20** are gently, continuously, and smoothly moved in a reciprocating motion by the action of motor **14** and linkage **12**. Because the weight of the occupant is centered over the rear supporting wheels of a wheelchair, the chair can be moved easily even by a relatively low-powered motor, such as a 7.5 amp motor.

FIG. 7 is a perspective view of device **30** of the present invention fitted with dual linkages **12x** and **12y** providing for powered motion to be delivered from both sides of the motor where required. Device **30** can replace device **10** in any of the previous embodiments if a dual gear motor (not shown) is required to power a rocking or gliding device.

FIG. 8 is a side view of a third embodiment of the present invention secured to chair **1e**. Motor **10e** and eccentric **11e** produce a reciprocal motion that is translated to chair **1e**. As chair **1e** rocks, each of its rockers **3e** has a single point of contact **20e** with base **2e**. In a preferred embodiment, bolt **4e**, washer **5e**, and nut **7e** secure rockers **3e** to base **2e**. Notch **13e** provides for unimpeded oscillation or rocking of rockers **3e** about bolt **4e** without damaging rockers **3e**. Notch **13e** provides space for the rockers to oscillate about bolt **4e** without stressing rockers **3e**. Spring **6e** is secured to rockers **3e** and base **2e** by bolt **4e** and nut **7e**. Motor **10e** is secured to base **2e** by mounting bracket **8e**. The rotary motion produced by motor **10e** is translated to smooth, continuous, reciprocal motion by eccentric **11e**. As eccentric **11e** is caused to rotate by motor **10e** via driveshaft **13e**, its eccentric shape causes wheel **12e**, attached to the seat of the chair **1e** by mounting bracket **9e**, to turn. As the maximum diameter of eccentric **11e** contacts wheel **12e** it lifts the seat of chair **1e** and as the minimum diameter contacts wheel **12e**, it allows the seat of chair **1e** to lower. Motor **10e** can be powered by a variety of power sources, such as, in-house electricity, a battery, or solar energy.

FIG. 9 is a front view of a fourth embodiment of the present invention secured to cradle **1**. Cradle **1** comprises rockers **3** which secure to base **2** using bolt **4**, washer **5**, and nut **7** with washer **6**. Notch **13** provides for unimpeded oscillation or rocking of rockers **3** about bolt **4** without damaging rockers **3**. Notch **13** provides space for rockers **3** to oscillate about bolt **4** without stressing rockers **3**. Motor **10a** is secured to base **2** via mounting brackets **8**. Driveshaft **13d** of motor **10a** is functionally coupled to eccentric **11** to translate the rotary motion of motor **10a** to bracket **9** that is secured to the bottom of cradle **1** to provide a powered continuously smooth, rocking motion to cradle **1** when the power is turned on. The weight of cradle **1** and its contents resting on rockers **3** seek equilibrium and, thus, provide a counterforce to any rocking motion. The continuously smooth rocking motion provided by motor **10a** and eccentric **11** overcomes the counterforce to produce a smooth, continuous rocking movement.

FIG. 10 is a side view of a fifth embodiment of the present invention secured to chair **1b**. Rocking chair **1b** with rockers **3b** is secured to base **2b** using bolt **4b**, washer **5b**, and nut **7b** with washer **6b**. Notch **12d** provides for unimpeded rocking of rockers **3b** about bolt **4b** without damaging rockers **3b**. Notch **12d** provides space for rockers **3b** to oscillate about bolt **4b** without stressing rockers **3b**. Motor **10b** is secured to base **2b** via mounting brackets **8b**. Drive shaft **13b** of motor **10b** is non-rotatably connected to eccentric **11b** to translate the rotary motion of motor **10b** to

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bracket **9b** that is secured to rocking chair **1b** to provide a continuously smooth, rocking motion to chair **1b** when the power is turned on. It is important to note that bracket **9b** is a u-shaped bracket to allow eccentric **11b** to continuously contact bracket **9b**. Tension member **14b** is arranged within bracket **9b** to allow tensioning of bracket **9b** which would change the rate of oscillation of chair **1b**. The weight of chair **1b** and its contents resting on rockers **3b** seek equilibrium and, thus, provide a counterforce to any rocking motion. The continuously smooth rocking motion provided by motor **10b** and eccentric **11b** overcomes the counterforce to produce a smooth, continuous rocking movement.

FIG. **11** is a view of footrest **1f** secured to frame **20** (shown in FIG. **6**) and comprises heel stop **2f** to prevent a user's feet from slipping off of footrest **1f**. Footrest **1f** is secured to angle adjustment **3f** which allows footrest **1f** to be angled for a user's comfort. Angle adjustment **3f** is rotatably connected to footrest **1f** via attachment mechanism **4f** that is securely attached to brace **5f**. Brace **5f** supports angle adjustment **3f** and allows for the adjustment of the height of footrest **1f**. In a preferred embodiment, brace **5f** is designed to slide-ably engage to adjust the height of footrest **1f**. To maintain the desired height, lock pin **6f** is inserted into the aligned apertures of each brace **5f** when the desired height has been attained. Brace **5f** is secured to base **20** by mounting bracket **7f**.

FIG. **12** and FIG. **12A** are a fragmentary perspective and cross-sectional view, respectively, taken generally along line **12A** in FIG. **12** of body **140**. The support base **121** has ball bearing gliders **122a** and **122b** mounted by screws **123** so that the stationary portions of gliders **122a** and **122b** are supported by base **121**. Mounts **124** are mounted to the movable portions of gliders **122a** and **122b** and body **140** is mounted on mount **124** thereby allowing body **140** side to side horizontal motion. Removable pins **126** secure body **140** to mounts **124** so that body **140** and support base **121** can be lifted and transported together. In a preferred embodiment, base **121** can be constructed of wood, plastic, metal or any suitable material, while body **140** itself can be vacuum formed from plastic with channel **136** molded into body **140**. Additionally, a $\frac{1}{100}$ horsepower motor **130** having about 10 rpm drives eccentric **131** which is mounted on shaft **132** of motor **130**. Eccentric **131** can also be made of any suitable material such as wood, metal, or plastic. Motor **130** is mounted on base **121** via mounting brackets **135**. Insert **137** is bonded to channel **136** to provide a wear resistant surface for eccentric **131**. In operation eccentric **131** makes continuous contact against insert **137** rocking or gliding body **140** from side to side. In a preferred embodiment, insert **137** is made from a durable material such as metal. It should be appreciated, however, that the use of different materials is possible and considered to be within the scope of the invention as claimed. Bed board **138** is arranged on tabs **141a** and **141b** which provide a flat surface inside body **140** (shown in FIG. **12A**). Bed board **138** is removable from body **140** while body **140** is also removable from support base **121** thereby allowing for easy cleaning. Handles **144a** and **144b** are molded into body **140** providing easy lifting and carrying. Motor **130** and mounting brackets **135** are mounted so that eccentric **131** is centrally positioned in the center of body **140**, providing smooth and continuous motion. Although the invention has been described in detail, modifications such as placing handles **144a** and **144b** of body **140** in other locations are possible. Also, pins **126** for securing body **140** to base **121** could be replaced with some other means, such as a latch or threaded bolt. With respect to the latch, body **140** would automatically lock in place

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when placed on base **121**, but would require depression of a safety release for removal. Finally, body **140** could have small access holes at each of its corners so that pins **126** can be removed so an infant and body **140** can be removed together from its base. This would allow the body **140** to be used without rocking or gliding.

It will be appreciated that various aspects of the above-disclosed invention and other features and functions, or alternatives thereof, may be desirably combined into many other different systems or applications. Various presently unforeseen or unanticipated alternatives, modifications, variations, or improvements therein may be subsequently made by those skilled in the art which are also intended to be encompassed by the following claims.

LIST OF REFERENCE NUMERALS

1 cradle
1b chair
1e chair
1f footrest
2 base
2b base
2e base
2f heel catch
3 rocker
3b rocker
3e rocker
3f angle adjustment
4 bolt
4b bolt
4e bolt
4f attachment mechanism
5 washer
5b washer
5e washer
5f brace
6 washer
6b washer
6e spring
6f lock pin
7 nut
7b nut
7e nut
7f mounting bracket
8 mounting bracket
8b mounting bracket
8e mounting bracket
9 bracket
9b bracket
9e mounting bracket
10 device
10a motor
10e motor
10b motor
11 eccentric
11b eccentric
11e eccentric
12 linkage
12a first member
12b second member
12c third member
12d notch
12e wheel
12x dual linkage
12y dual linkage
13 notch

13*b* driveshaft
 13*c* driveshaft
 13*d* driveshaft
 13*e* driveshaft
 13 notch
 14 motor
 14*a* driveshaft
 14*b* tension member
 14*c* bracket
 16*a* roller
 16*b* roller
 16*c* roller
 16*d* roller
 18*a* track
 18*b* track
 20 frame
 20*a* point of contact
 20*e* point of contact
 30 device
 100 cradle
 102*a* rocker
 102*b* rocker
 104 bottom surface
 106 surface
 108 base
 110 mount
 112 connector
 114 support plate
 116 pin
 118 notch
 120 device
 121 base
 122*a* glider
 122*b* glider
 123 screw
 124 mount
 126 pin
 130 motor
 131 eccentric
 132 shaft
 135 mounting brackets
 136 channel
 137 insert
 138 bed board
 140 body
 141*a* tab
 141*b* tab
 144*a* handle
 144*b* handle
 202*a* wheel
 202*b* wheel
 203*a* wheel mount
 203*b* wheel mount
 204*a* bracket
 204*b* bracket
 205*a* drawbar
 205*b* drawbar
 205*c* drawbar
 205*d* drawbar
 210 space
 214*a* thumbscrew
 214*a* thumbscrew
 215*a* wheel guide
 215*b* wheel guide
 220*l* ramp
 220*r* ramp
 250 housing

What is claimed is:

1. A reciprocating rocking device for the gliding of a wheelchair, said wheelchair having two pairs of wheels, said reciprocating rocking device comprising:

5 a frame comprising a pair of tracks, each track having a channel therein;
 a bracket comprising two pairs of rollers, each of said two pairs of rollers arranged for rolling engagement within one of said channels, said two pairs of rollers arranged parallel to one another and joined to one another by a first and second drawbar, said first and second drawbars arranged parallel to and spaced apart from one another and perpendicularly to said tracks, said first and second parallel drawbars configured to hold only one of said two pairs of wheelchair wheels;
 15 a linkage connected to said bracket;
 an eccentric connected to said linkage and arranged to move said bracket in a linear, reciprocating manner within said tracks; and,

20 a motor secured to said frame, said motor having a drive shaft operatively arranged to drive said eccentric.

2. The reciprocating rocking device as described in claim 1 further comprising at least one ramp to enable mounting of said only one of said two pairs of wheelchair wheels onto said reciprocating device.

25 3. The reciprocating rocking device as described in claim 1 further comprising a pair of wheelguides extending between said first and second drawbars.

30 4. The reciprocating rocking device as describe in claim 1 wherein said only one of said two pairs of wheelchair wheels held in said device is a front pair of wheelchair wheels.

5. A reciprocating rocking device for the gliding of a wheelchair, said wheelchair having a pair of front wheels said reciprocating rocking device comprising:

35 a frame comprising a pair of tracks, each track having a channel therein;
 a pair of brackets arranged parallel to said channels;
 a first pair of rollers each one of said first pair of rollers in rolling engagement with one of said tracks;
 40 a pair of drawbars, each of said pair of drawbars having a first end and a second end wherein each of said first ends extends through said bracket and is connected to one of said first pair of rollers;
 a linkage connected to each of said second ends of said pair of drawbars;
 an eccentric connected to said linkage and arranged to move said first pair of rollers in a reciprocating linear manner within said tracks;
 50 a second pair of rollers, each one of said second pair of rollers in rolling engagement with one of said tracks;
 a third drawbar having two ends, each end extending through one of said pair of brackets and connected to one of said second pair of rollers;
 55 a fourth drawbar having two ends, each of said two ends attached to one of said pair of brackets;
 a pair of wheelguides adjustably attached to each of said third and fourth drawbars;
 a pair of thumbscrews, one of said pair of thumbscrews arranged to tighten one of said pair of wheelguides against said fourth drawbar; and,
 60 a motor connected to said frame, said motor having a drive shaft operatively arranged to drive said eccentric;
 wherein said wheel guides are configured to be adjustable to form a wheel base ranging from 15 to 30 inches in width.

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