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CRADLE ASSEMBLY

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FIG. 1.

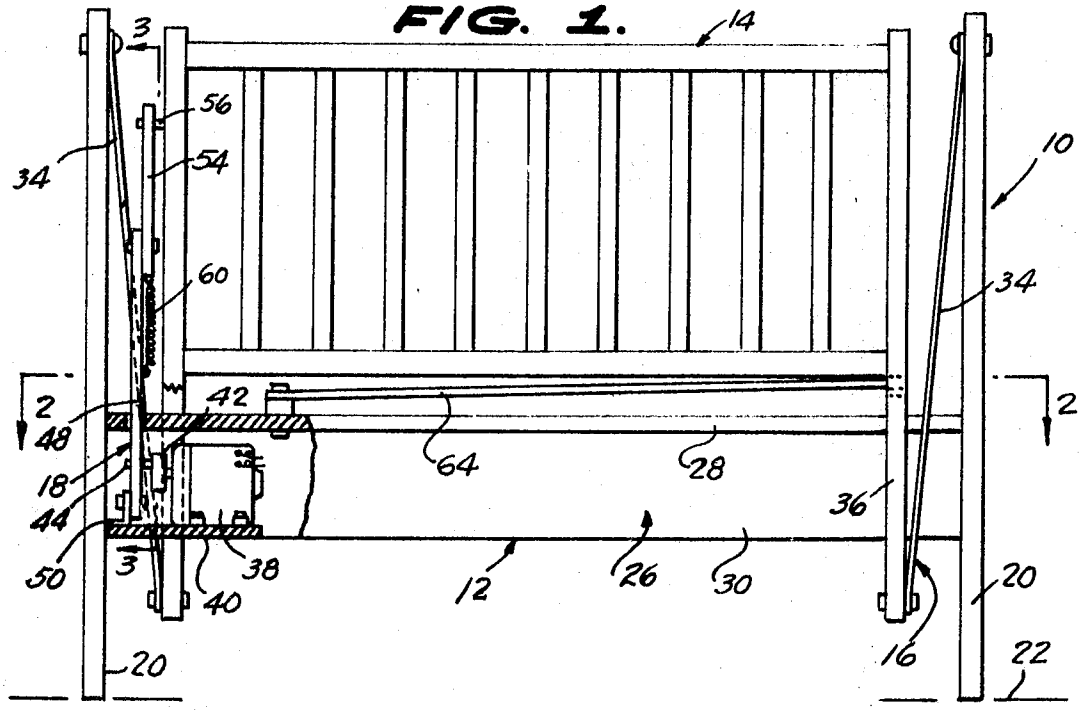


FIG. 2.

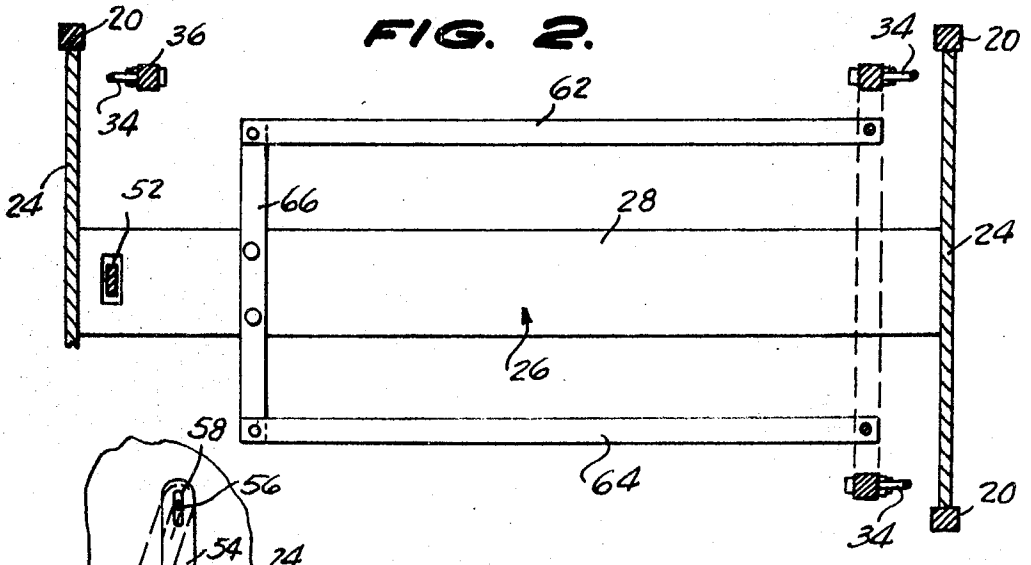
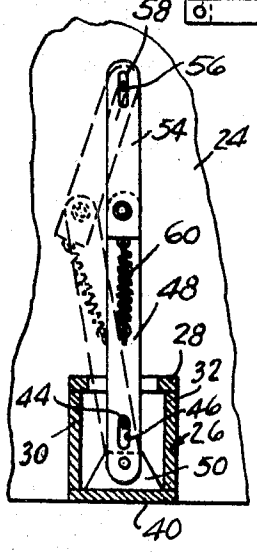


FIG. 3.



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CRADLE ASSEMBLY

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ABSTRACT OF THE DISCLOSURE

A rocking cradle assembly including a main upright frame suspending a cradle for lateral movement in a plane parallel to a support surface. An electric motor imparts reciprocating motion to the cradle through an eccentric cam and linkage. The linkage is disposed between the cam and cradle, and consists of a pair of overlapped, pivotally connected links normally prevented from moving relative to each other by a tensioned coil spring having an end connected to each link. The motor rotates the cam which oscillates the links in unison, which, in turn, imparts motion to the cradle. If the cradle is manually immobilized, one link oscillates and pivots relative to the other, enabling the motor to continue to operate and the cradle to dwell, without any detrimental effects to the drive system. This motion occurs to a lesser extent at the end of each reciprocal stroke of the cradle, thereby cushioning the reciprocal motion of the cradle at the end of each stroke and providing a smooth, gentle rocking effect.

This invention relates to a cradle assembly, and more particularly, a power-operated cradle assembly for automatically rocking infants.

By the use of such a device, the work-load of a mother can be greatly reduced. The cradle will automatically rock an infant to sleep, freeing the mother for other chores.

While assemblies having similar purposes have been proposed heretofore, the novelty in this invention resides in an improved means for imparting motion to the cradle. Accordingly, it is the object of this invention to provide an improved and simplified actuating mechanism for a power-operated, rocking cradle.

Another object of this invention is to provide an actuating mechanism for a power-operated, rocking cradle which imparts a smooth, gentle motion to the cradle and cushions the reciprocal motion of the cradle at the end of each stroke.

A still further object of this invention is to provide an electrically operated actuating mechanism for a rocking cradle which is absolutely safe, and permits the reciprocal motion of the cradle to be manually stalled without shutting down the operation of the mechanism, by merely gripping and holding a side of the cradle.

The foregoing objects are accomplished by suspending a cradle from an upright frame standing upon a support surface. The suspension system permits only lateral, reciprocal motion of the cradle, and, as an overall effect, plane parallel to the support surface. An electric motor is operatively connected through an actuating mechanism to the cradle for laterally reciprocating it. The actuating mechanism includes a linkage connected at one end to the cradle, and at its other end to an eccentric cam driven by the motor. The eccentric cam oscillates the linkage, which in turn drives the cradle. The linkage consists of a pair of overlapped, pivotally connected links, prevented from moving relative to each other by a tensioned coil spring having an end connected to each link. Therefore, the links normally move in unison as a single rigid member, but if the cradle is manually immobilized, one link

pivots relative to the other, enabling the motor to continue to operate. Due to the elasticity of the linkage, the relative movement of the links also occurs to a limited degree at the end of each oscillating stroke, thereby dampening the high acceleration components present when movement of the cradle is reversed, cushioning the reciprocal motion of the cradle, and, as an overall effect, imparting a smooth and gentle rocking motion.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

FIG. 1 is a side view in elevation of the cradle assembly of the present invention, with certain portions shown in section;

FIG. 2 is a fragmentary, cross-sectional view taken substantially along the plane indicated by line 2—2 of FIG. 1; and

FIG. 3 is a fragmentary, cross-sectional view taken substantially along the plane indicated by line 3—3 of FIG. 1, and illustrating the actuating mechanism for the cradle assembly, and its operation.

Referring now to the drawing, wherein like numerals indicate like elements throughout the several views, a cradle assembly **10** is illustrated, and consists of a main frame **12**, a cradle **14**, a suspension system **16**, and a drive system **18**.

The main frame **12** includes four upright corner posts **20**, standing on a floor or support surface **22**, and connected in lateral pairs by frame end panels **24**. End panels **24** are connected by a centrally located, inverted U-shaped bolster **26**, having a top wall **28** and two parallel side walls **30** and **32**.

The cradle **14** is suspended within the confines of main frame **12** by suspension system **16**, and straddles bolster **26**. Suspension system **16** includes four spaced rods **34**. Each rod **34** is pivotally connected to a leg **36** of cradle **14** at its lower end, and to an end panel **24** at its upper end. Each lateral pair of spaced rods **34** forms a parallelogram linkage system, and will permit lateral, reciprocal movement of cradle **14**, only in a plane parallel to support surface **22**.

The main frame **12**, cradle **14**, and suspension system **16**, thus far described, is adequate for manually rocking the cradle. However, a power-operated drive system **18** is provided to automatically rock cradle **14**.

Drive system **18** includes an electric motor **38**, supported upon a platform **40** beneath bolster **26**. As shown in FIG. 1, motor **38** is completely enclosed within the bolster **26** to prevent accidental tampering.

Connected to the shaft of motor **38** is a cam **42**, having an eccentric pin **44**. Pin **44** extends through an elongated slot **46** in a first link **48** of a cradle rocking actuating mechanism. Link **48** is pivotally connected at its lower end to a bracket **50** mounted on platform **40**, and extends upwardly through a laterally elongated slot **52** in the top wall **28** of bolster **26**. Pivotally connected to and overlapping the upper end of link **48**, is a second link **54**. The upper end of link **54** includes an elongated slot **56**, receiving a pin **58** fixed to an end panel of cradle **14**. A coil spring **60**, under tension, is connected between the lower end of link **54** and the middle of link **48**. Spring **60** will normally maintain the longitudinal axes of links **48** and **54** in parallelism, and will prevent relative pivotal movement of the links, so that they will move in unison as a single rigid member or link.

In operation, when electric motor **38** is energized, it will rotate cam **42**. Eccentric pin **44** will ride up and down in slot **46** in link **48**, causing link **48** to oscillate, relative to bracket **50**, in slot **52**. This motion is transmtted to link **54**, whose axis remains parallel to the axis of link **48**, because of the force exerted by spring **60**. As link **54** is oscillated, pin **58**, fixed to cradle **14**, will

ride up and down in slot 56 in link 54, and simultaneously, reciprocate laterally relative to main frame 12. Because of suspension system 16, pin 58 and cradle 14 are constrained to reciprocate laterally in a plane parallel to support surface 22.

Should the cradle 14 become immobilized, for example, by an obstruction, or by a mother manually grasping the side of the cradle to inspect an infant, the links 48 and 54 become a dwell mechanism, ceasing to impart motion to cradle 14, as indicated by the phantom lines in FIG. 3, and electric motor 38 will continue to operate without any detrimental effects, such as stalling, overheating, linkage breaking, etc.

When cradle 14 is held immobile, motor 38 continues to operate and rotates cam 42 and eccentric pin 44. Link 48 continues to oscillate, as described heretofore. However, pin 58 is now stationary. When link 48 oscillates, therefore, link 54 will oscillate about pin 58 and pivot relative to link 48, further elongating spring 60, under the urging of motor 38, as shown in FIG. 3. Thus, the actuating mechanism continues to operate, but without any detrimental effect, because motor 38 is still turning, although it is disconnected from driving engagement with the cradle.

The action of links 48 and 54, just described, occurs to a very limited degree at the end of the normal reciprocal stroke of cradle 14, as well. This action dampens the normally high acceleration components present when motion of the cradle is reversed, so that a cushioning effect is obtained to cause the lateral rocking motion of the cradle to be exceedingly smooth and gentle.

Because of the actuating mechanism used in this invention, an infant may be removed and returned to the cradle, without deenergizing the motor 38. Also, the arrangement of links 48 and 54 permits the cradle to be manually rocked, without any damage to the actuating mechanism, even though pin 44 is stationary. In this case, the action is reversed, and link 48 oscillates relative to drive link 54.

Cradle 14 is further stabilized to eliminate any yawing motion. Parallel, stabilizer bars 62 and 64 are provided, and each are pivotally connected at one end to the bottom of cradle 14. At their other ends, bars 62 and 64 are pivotally connected to the opposite ends of a transverse arm 66, fixed to the top wall 28 of bolster 26. This arrangement prevents cradle 14 from yawing while being rocked laterally.

While a specific embodiment of our invention has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore,

it is intended that no limitation be placed on the invention except as defined by the scope of the appended claims.

I claim:

1. A cradle assembly comprising an upright main frame adapted to stand upon a support surface, a cradle, means suspending said cradle from said main frame for lateral movement relative to said frame, and drive means operatively connected to said cradle for imparting motion to it, said drive means including motor means and means for automatically disconnecting said motor means from driving engagement wth said cradle when said cradle is held immoblie.

2. A cradle assembly in accordance with claim 1 wherein said disconnecting means includes a linkage mechanism between said motor means and cradle permitting the motor means to continue to operate while the cradle is at dwell.

3. A cradle assembly comprising an upright main frame adapted to stand upon a support surface, a cradle, means suspending said cradle from said main frame for lateral movement relative to said frame and drive means operatively connected to said cradle for imparting motion to it, said drive means including a motor, cam means including an eccentric pin adapted to be rotated by said motor, a pin fixed to said cradle, and a linkage between said cam means and cradle pivotally connected to said frame, said linkage including a first elongated slot at one end receiving said eccentric pin and a second elongated slot at its other end receiving said cradle pin.

4. A cradle assembly in accordance with claim 3 wherein said linkage includes a first link, a second link pivotally connected to said first link, and tensioned spring means between said first and second links.

5. A cradle assembly in accordance with claim 4 wherein said linkage includes a first link, a second link pivotally system between each end of said cradle and upright main frame for restricting the movement of said cradle to lateral, reciprocal motion relative to said frame in a plane parallel to said support surface.

6. A cradle assembly in accordance with claim 5 including means extending between said main frame and cradle for stabilizing said cradle by preventing it from yawing while being rocked laterally.

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JAMES C. MITCHELL, Primary Examiner