

AN IMPROVED STRUCTURE OF A HAMMOCK TYPE INFANT CRADLE

BACKGROUND OF THE INVENTION



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(A) Field of the Invention



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The present invention relates to hammock type infant cradle, and in particular, to an improved structure of a hammock type infant cradle, which provides stable up-down rocking movement to the cradle to sooth relief to infant for lulling the infant to sleep.

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(B) Description of the Prior Art

There are numerous of different designs for infant beds, hammocks and cradles available in the market and the function of these designs is to hold an infant with security and to provide comfort. Naturally, it is of great important that these designs have the advantages of low cost, portability, convenience in use, and providing consistent up and down reciprocating movement. Prior art cradles suffer from numerous deficiencies, for examples, the cradle provides an up-and – down motion in addition to the side-to-side motion.

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US Patent No. 5,097,545 discloses an infant cradle comprising an infant engaging base member, an upright member extending upwardly at an inclined angle in relation to the base member, and a support member extending away form the upright member, a spring suspended from said support member, and a hammock suspended

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from the lower end of the spring. This cradle can only provide an up and down motion when a force is applied to the spring. Someone needs to attend to the cradle in order to keep the cradle moving.

5 US Patent No. 4,550,456 entitled "Infant Cradle Assembly" discloses an infant assembly comprising a cloth sling sewn around the interconnecting tubes of a rectangular plastic frame. This design has the advantages of lightweight, inexpensive infant assembly and is of capable of carrying an infant with safety, security, and comfort
10 while permitting physical stimulation. However, the drawback of this design is that the cradle may swing randomly and is not in an up-and-down motion.

US Patent No. 5,307,531 entitled "Rocking Cradle Aided By
15 Magnets" discloses a rocking cradle allowing for a hanging cradle contained within a supporting frame to be aided in its cyclical transverse displacement by magnetic attraction and repelling forces. Central magnets are mounted onto the hanging cradle and are attracted and repelled by a pair of magnets mounted on the
20 supporting frame. This design provides only a rocking motion and an up-and-down motion cannot be produced.

Other shortcomings of other conventional infant cradle such as that disclosed in US Patent No. 5,097,545, issued to Ambrose C S Hooi,
25 24 March 1992, is that the cradle is needed to be pushed frequently which is very inconvenient, and the cradle must be mounted between fixed posts as this will generally inconvenient and restrictive. Accordingly, it is an object of the present invention to provide an

improved structure of a hammock type infant cradle which capable of providing a safe and consistent up and down motion so that an infant contained in the cradle is soothed and comfort to sleep.

5 Fig. 1 is a conventional electronic cradle, which provides a reciprocating movement to a cradle 16. The conventional cradle device comprises a pulley means 10 operated by current to provide oscillatory movement. The pulley translates the oscillatory movement into linear reciprocating movement that effects the up and
10 down movement of the fabric cradle. The drawback of such conventional cradle device is that if different tension springs are used, the height of oscillation will be different. Accordingly, if the user requires similar oscillation height, the oscillator has to be re-adjusted for different tension spring.

15 As the conventional cradle requires oscillation movement for the pulley, it is a waste of energy and the parts are frequently wore out after an extended period of time.

20 Fig. 2 is another conventional cradle for infant wherein frequent manual pull is required and the vertical movement of the cradle has to be observed all the time in order to keep the cradle moving all the time. This conventional infant cradle 10 comprises a support stand 11, spring means 12 and a hammock type cradle 13. In this
25 conventional cradle structure, the cradle 13 may be swung in a circle instead of an up-down motion.

SUMMARY OF THE PRESENT INVENTION

An object of the present invention is to provide an improved structure of a hammock type infant cradle which is operated electrically and the produced up-and-down motion is always constant.

Another object of the present invention is to provide an improved structure of a hammock type infant cradle, wherein the structure is simple and lightweight and is capable of holding an infant safely.

A further object of the present invention is to provide an improved structure of a hammock type infant cradle, wherein the structure can be mounted onto a suspension and is capable of conveniently portability.

An aspect of the present invention is to provide an improved structure of a hammock type infant cradle comprising a tracking mechanism connected to a plurality of tension springs by a suspension bar having a top hook and a bottom hook at the end thereof, and a fabric cradle mounted to the tension springs by means of a support, wherein the tracking mechanism is provided with a movable level mounted at one end to a first gear mounted on a base, the other end of the movable level is connected to a cord for connection to the support of the cradle, a spring is connected at one protrusion positioned on the movable level and the other end of the spring is connected to the base, a pointer is urgingly mounted to the first gear of the tracking mechanism such that the up and down movement of the movable level as a result of the rotation movement

of the first gear drives the pointer to touch either contact A or B of a switch device positioned on the base, thereby the downward movement of the cradle pulls the cord downward and the pointer touches contact A which cut OFF the current to the motor driving the second gear, and when the pointer touches contact B the motor is ON and the movable level moves upward as the second gear rotates clockwise.

The advantages of the present invention are as follows:

1. The up-down motion of the infant cradle is always constant;
2. The present infant cradle does not need a frequent push and is somewhat convenient following the first up-down motion of the cradle; and
3. The present infant cradle is independent of source of electricity, i.e., it is operable by AC and DC.

The invention described and claimed herein may be better understood with reference to the accompanying drawings, which depict a preferred embodiment of the invention and which are intended merely to illustrate rather than limit the invention in scope.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of a conventional electronic cradle.

Fig. 2 is a perspective view of another conventional hammock type cradle disclosed in US Patent No. 5,097,545.

Fig. 3A is a schematic view showing the driving mechanism of the hammock type infant cradle in accordance with the present invention.

Fig. 3B is a schematic view showing the driving mechanism of the hammock type infant cradle of another preferred embodiment in accordance with the present invention.

Fig. 4 is a schematic view showing the structure of the hammock type infant cradle in accordance with the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Detailed embodiment of the present invention is disclosed herein. However, it is to be understood that the disclosed embodiment is merely exemplary of the present invention which may be embodied in various systems. Therefore, specific details disclosed herein are not to be interpreted as limiting, but rather as a basis for the claims and as a representative basis for teaching one of skill in the art to variously practice the invention.

Referring now to Fig. 3A, and 4, there is shown the structure of the hammock type infant cradle comprising a tracking mechanism 100, a plurality of tension springs 200, and a cradle 300 made from fabric or the like. Fig. 3A is a schematic view showing the tracking mechanism 100 of the cradle in accordance with the present invention. The tracking mechanism 100 is capable of precisely changing of actuation direction by having a contact on a switching device 126 which is connected to an electric circuit producing signals. In accordance with one preferred embodiment of the present

invention, referring now to Fig. 3A, the tracking mechanism 100 comprises a base 102, a first gear 128, a second gear 106, a first urging plate (not shown), and a second urging plate (not shown) enclosing a compression spring (not shown) there between, and a contacting pointer 124, and a switching device 126 having a first contact B, and a second contact A being connected to a printed circuit board (not shown). As shown in Fig. 3A, the rear surface of the base 102 is mounted with a suspension bar 122 having a top hook 112, and a bottom hook 114 at the ends thereof. The suspension bar 122 is riveted or screwed to the rear surface of the base 102 such that the base 102 is firmly secured to the suspension bar 122. On the front surface of the base 102, it can be seen that the first gear 128 is mounted with a movable level 108 and the bar 108 moves either clockwise or counterclockwise synchronously with the rotational movement of the first gear 128 driven by the second gear 106 which is rotated by a motor (not shown). A spring 110 is connected to a fixing point such as a screw or the like positioned on the base 102 at one end and the other end of the spring 110 is connected to an appropriate position on the movable level 108.

In another preferred embodiment in accordance with the present invention, as shown in Fig. 3B, the tracking mechanism 100 comprises a base 102, a first gear 128, a second gear 106, a first urging plate (not shown), and a second urging plate (not shown) enclosing a compression spring (not shown) there between, and a contacting pointer 124, and a switching device 126 having a first contact B, and a second contact A being connected to a printed circuit board (not shown). As shown in Fig. 3B, the rear surface of

the base 102 is mounted with a suspension bar 122 having a top hook 112, and a bottom hook 114 at the ends thereof. The suspension bar 122 is riveted or screwed to the rear surface of the base 102 such that the base 102 is firmly secured to the suspension bar 122. On the front surface of the base 102, it can be seen that the first gear 128 is mounted with a movable level 108 and the bar 108 moves either clockwise or counterclockwise synchronously with the rotational movement of the first gear 128 driven by the second gear 106 which is rotated by a motor, a magnetic driving means or the like (not shown). A spiral spring 110' is disposed at the center of the first gear 104 in such a way that the spiral spring 110' has a function as that of the spring 110. In other words, the spiral spring 110' is functioned to life up the movable level 108 when the pointer 124 touches the contact B. In this case, one end of the spiral spring 110' is secured to a fixed point on the base 102 and the other end of the spiral spring 110' is connect to the movable level 108.

As shown in Fig. 4, the tension springs 200 is positioned to the bottom hook 114 of the suspension bar 122 and the fabric cradle 300 for holding or carrying an infant is positioned to a support 302 at the lower end of the tension springs 200. A cord 120 of an appropriate length connects the support 302 with one end of the cord 120 and the other end of the cord 120 is connected to the end of the movable level 108. In accordance with the preferred embodiments of the present invention, the cradle 300 may be made from fabrics, and/or plastic or the like materials which can hold the infant in place.

In using the present hammock type infant cradle, the cradle 300 is first manually pulled downward (being easily pulled downward due to the weight of the infant) and when the cradle 300 moves downward, the movable level 108 moves downward and the pointer 124 will touch the contact A at the switch device 126. The switch device 126 is designed in such a way that when the contact A is touched the current to the motor is cut OFF. When the contact A is touched and the motor is cut OFF, the cradle 300 will go downward freely without restriction. Next when the cradle 300 has reached to the lowest point permitted by the cord 120 and the tension springs 200, the tension springs 200 on top of the cradle 300 will spring upward. At this instance, the spring 110 connecting the movable level 108 to the base 102 will pull the movable level 108 upward such that the pointer 124 touches the contact B of the switch device 126. When the contact B is touched, the motor is switched ON and the movable level 108 is further lifted up as a result of the rotation movement of the second gear 106 driving the first gear 128, and the movable level 108 will in turn lift up the cradle 302.

In the process of cradle 302 being lifted up, when the cradle 302 has reached the maximum height permitted by the tension spring 200 and the cord 120, as a result of gravitational force and the weight of the infant, the cradle 300 will move downward and at the same time, the movable level 108 will move downward. Consequently, the pointer 124 touches A and the motor is again being cut OFF.

In view of the above, the up and down movement of the cradle 300 is repeated and the contacts A and B on the switching device 126 are

touched alternatively. This process enables the cradle 300 to move up and down (oscillation) at a consistent force and of constant motion. In other words, the present device provides a continuation of oscillation motion for the infant cradle 300 without diminishing the oscillation strength.

As shown in Fig. 4, the cord 120 is loosely mounted to the support 302 holding the cradle 300 at the top end thereof.

In accordance with the preferred embodiments of the present invention, the motor is operated by AC or DC, and the second gear 106 is directly mounted to the motor. The shape of the base 102 is not a restrictive in accordance with the present invention. However, the base 102 is of an appropriate size so that the entire tracking device 100 is mounted within a box or shell or the like.

While the invention has been described with reference to a preferred embodiment, it will be understood by those skilled in the art that various changes may be made and equivalents may be substituted for elements thereof without departing from the scope of the invention. In addition, many modifications may be made to adapt a particular situation departing from the essential scope thereof. Therefore, it is intended that the invention not be limited to the particular embodiment disclosed as the best mode contemplated for carrying out this invention, but that the invention will include all embodiments falling within the scope of the appended claims.

WHAT IS CLAIMED IS:

1. An improved structure of a hammock type infant cradle comprising a tracking mechanism connected to a plurality of tension springs by a suspension bar having a top hook and a bottom hook at the end thereof, and a fabric cradle mounted to the tension springs by means of a support, characterized in that the tracking mechanism is provided with a movable level mounted at one end to a first gear mounted on a base, the other end of the movable level is connected to a cord for connection to the support of the cradle, a spring is connected at one protrusion positioned on the movable level and the other end of the spring is connected to the base, a pointer is urgingly mounted to the first gear of the tracking mechanism such that the up and down movement of the movable level as a result of the rotation movement of the first gear drives the pointer to touch either contact A or B of a switch device positioned on the base, thereby the downward movement of the cradle pulls the cord downward and the pointer touches contact A which cut OFF the current to the motor driving the second gear, and when the pointer touches contact B the motor is ON and the movable level moves upward as the second gear rotates clockwise.

2. The improved structure of a hammock type infant cradle of claim 1, the spring connecting the movable level at one end to the base pulls the movable level when the cradle is positioned at the lowest vertical position.

3. The improved structure of a hammock type infant cradle of claim 1, wherein the tracking mechanism is controlled by a circuit connected to the switching device positioned on the base.
- 5 4. The improved structure of a hammock type infant cradle of claim 1, wherein the motor drives the first and the second gear is operated by AC and/or DC.
- 10 5. The improved structure of a hammock type infant cradle of claim 1, wherein the cradle is made of fabric.
- 15 6. The improved structure of a hammock type cradle of claim 1, wherein the cradle is made of plastic which can hold or carry an infant.
- 20 7. The improved structure of a hammock type cradle of claim 1, wherein the tracking mechanism is contained in a box or shell of various design.
- 25 8. The improved structure of a hammock type cradle of claim 1, wherein the second gear is in engagement with the first gear and the first gear is driven by a motor.
9. The improved structure of a hammock type cradle of claim 1, wherein the cord is loosely mounted to the support holding the cradle at one end.

10. An improved structure of a hammock type infant cradle

comprising a tracking mechanism connected to a plurality of
tension springs by a suspension bar having a top hook and a
bottom hook at the end thereof, and a fabric cradle mounted to
5 the tension springs by means of a support, characterized in that
the tracking mechanism is provided with a movable level
mounted at one end to a first gear mounted on a base, the other
end of the movable level is connected to a cord for connection to
the support of the cradle, a spiral spring is connected at the
10 center of the first gear in such a way that one end of the spiral
spring is secured to a fixed point and the other end of the spiral
spring is connect to the movable level, a pointer is urgingly
mounted to the first gear of the tracking mechanism such that the
up and down movement of the movable level as a result of the
15 rotation movement of the first gear drives the pointer to touch
either contact A or B of a switch device positioned on the base,
thereby the downward movement of the cradle pulls the cord
downward and the pointer touches contact A which cut OFF the
current to the motor driving the second gear, and when the
20 pointer touches contact B the motor is ON and the movable level
moves upward as the second gear rotates clockwise.