

A SWING CRADLE

Technical Field

5 The present invention relates to cribs, and more particularly, to a swing
cradle which can minimize a force of driving a motor when the crib is swung even
with the reduction of the number of components therein, while the crib is not in a
back and forth swing motion but in left and a right swing motion, adjust a quantity
of swing of the crib by use of a plurality of holes that are provided on a lever and a
10 connecting rod, and provide substantially stable power transmission and large
speed ratio application by driving a timing belt connecting a small gear pulley
mounted on a shaft of the driving motor with a large gear pulley mounted on a
crank shaft, whereby a large decelerating ratio is obtained, while a structure is
greatly simple, and driving is carried out even at small power application.

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Background Art

In conventional practices, in case of a swing cradle that is operated
manually, swing should take place continuously by a parent or other person until a
20 child enters deep sleep. In this case, the swing cradle is generally being in a back
and forth swing movement, not in a left and right swing movement, which makes
the child feel uncomfortable, and a minimum speed of swing the crib is relatively

fast, which also makes the child feel uncomfortable and uneasy. Furthermore, the crib is swung horizontally, which makes the child feel that he lies on the flat ground while his body and the crib are moved horizontally.

As one of the prior arts, there is disclosed in Korean Utility Model
5 Registration No. 0138503 that relates to an electromotive swing cradle including a
crib body supported by four strings on a supporting frame, being swung by a
predetermined width to a horizontal side to side motion by use of an electromotive
mechanism. In more detail, the crib body is supported by the four strings that are
10 tied on the supporting frame, and a protruding shaft is provided on the lower side
of the crib body. And, a decelerator is attached on an electric motor on which a
timer mechanism and safety means are provided, and a crank shaft is attached on
an electromotive shaft that is rotated under the control of the decelerator. A rod
through which a plurality of connecting holes are provided connects the crank
shaft with the protruding shaft of the crib body. In such the case, however, the
15 crib is operated at a substantially rapid reciprocating motion speed and works in
almost horizontal swing motion since a driving lever on the crank shaft is attached
on the bottom of the crib body that is connected by the four strings on the
supporting frame, such that the infant or child in the swing cradle does not
completely feel comfortable and feels uneasy about the reciprocating motion.

20 As another example of the prior arts, there is disclosed Korean Patent
Laid-open Publication No. 1989 that relates to an infant swing cradle using neural
network algorism. In more detail, the infant swing cradle compares voice

information of the infant outputted from an A/D converter that converts an analog signal of the voice sounded from the infant that is inputted from a microphone mounted on a prescribed position of a crib body into a digital signal with infant state information detected from the microphone, and based upon the compared
5 results, it operates them in accordance with the neural network algorism to obtain optimal swing information with which swing takes place. In this manner, however, much concern is applied to the control system for implementing the optimal control for the device and the structure is embodied in a driving manner using a rack and a pinion that are just attached on the crib itself, such that it is
10 operated, undesirably making noises and vibration. Moreover, the device works in a back and forth swing motion, which makes the comfortable feeling decreased, and it is driven by means of the rack and pinion, which causes the minimum motion speed to be substantially fast.

As still another example of the prior arts, there is disclosed Korean Utility
15 Model Registration No. 20-0196281 that relates to a generally rectangular infant crib that is bent at the upper portion thereof. In more detail, the conventional crib includes generally semicircular swing guiding and operating plates, a vertical support bar provided on the bottom surface of the infant crib for connecting the infant crib with the swing operating plate, the swing guiding plate being connected
20 with the swing operating plate by means of a horizontal support bar, and an operating switch of an electric motor provided at one side of the infant crib, whereby the infant crib is swung along the semispherical surfaces of the swing

operating plate and the swing guiding plate. In this manner, however, the crib is swung at a substantially fast minimum reciprocating speed and as the crib works in a horizontal motion, the child in the crib does not feel completely comfortable and feels uneasy about the reciprocating motion.

5 As another example of the prior arts, there is disclosed in Korean Utility Model Publication No. 606 that relates to an infant crib that is provided with a semicircular swing member that is detachably mounted on the bottom surface thereof. In more detail, swing ropes hang on the infant crib and put on a horizontal bar. They are connected to a driving motor, and as the driving motor
10 is activated, the infant crib is automatically swung, without the application of force continually exerted by a user.

In this manner where the semicircular swing member is mounted on the infant crib, however, the crib works in a back and forth swing motion, which makes the infant feel uncomfortable. Furthermore, the structure is substantially
15 unstable. Also, in case of using the swing ropes, the horizontal bar that is provided above the crib inhibits the infant from coming into and out of the crib. Moreover, the crib itself is divided into two parts, but the two parts are not maintained at a proper horizontal relation with each other. The driving motor is embodied to move the bottom surface of the crib back and forth and also
20 connected to the swing ropes, such that it is hard to implement the swing motion. In this embodiment, especially, the driving motor is embodied with general one, but its decelerating technique for the driving speed is not suggested in the

disclosure, which is not really available.

Disclosure of Invention

Accordingly, the present invention has been made to solve the above-
5 described problems, and it is an object of the present invention to provide a swing
cradle that can minimize a force of driving a motor when the crib is swung even
with the reduction of the number of components therein, the crib being not in a
back and forth swing motion but in a left and right swing motion, whereby a large
decelerating ratio is obtained, while a structure is greatly simple, and driving is
10 carried out even at small power application.

To achieve this and other objects, according to the present invention, there
is provided a swing cradle that includes a crib assembly support frame having four
bottom support bars provided in the form of a general rectangle, four collars
provided at the corners of the four bottom support bars, and left and right side
15 connecting beams connecting the top end portions of the four collars, and a crib
assembly having a base plate, an upper crib and a lower crib, the crib assembly
being coupled with the crib assembly support frame by use of bolts, and the crib
assembly being in a left and right swing motion as a driving motor is activated.

In conventional practices, as noted above, in case of a swing cradle that is
20 operated manually, swing should take place continuously by a parent or other
person until a child enters deep sleep. In this case, the swing cradle is generally
being in a back and forth swing motion, not in a left and right swing motion,

which makes the child feel uncomfortable, and a minimum speed of swing the crib is relatively fast, which also makes the child feel uncomfortable and uneasy. Furthermore, the crib is swung horizontally, which makes the child feel that he or she lies on the flat ground while his or her body and the crib are moved
5 horizontally.

To solve these problems, the present invention provides the swing cradle that is capable of automatically operating a crib assembly in a left and right swing motion by use of the rotary motion of a driving motor and easily adjusting a quantity of swing. Also, the structure is very simple and the power transmission
10 is achieved in a very stable manner, such that it is good to 3 to 4-year-old children as well as newborn infants.

Brief Description of the Drawings

15 Further objects and advantages of the invention can be more fully understood from the following detailed description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a front view of a swing cradle according to the present invention;

FIG. 2 is a plan view of the swing cradle of FIG. 1;

20 FIG. 3 is a right side view of the swing cradle of FIG. 1;

FIG. 4 is a view of the swing cradle viewed at the line C;

FIG. 5 is a sectional view taken along the line A-A of FIG. 1;

FIG. 6 is a front view of the upper crib lifted up; and

FIG. 7 is a view of the assembling state of the lever of the swing cradle.

Best Mode for Carrying Out the Invention

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Now, an explanation of the preferred embodiment of the present invention will be in detail given with reference to attached drawings.

As shown in FIGS. 1 to 4, a swing cradle according to the present invention includes: a crib assembly support frame having four bottom support bars 10 21, 22, 28 and 29 provided in the form of a general rectangle, four collars 7, 13, 26 and 27 provided at the corners of the four bottom support bars 21, 22, 28 and 29, a left side connecting beam 19 provided on the top end portions of the collars 7 and 27 for connecting the two collars, having a hole provided on the middle portion thereof, and a right side connecting beam 20 provided on the top end 15 portions of the collars 13 and 26 for connecting the two collars, having a hole provided on the middle portion thereof; a crib assembly having an L-shaped base plate 8 connected to the hole of the left side connecting beam 19 by means of a bolt 6, a basket type of upper crib 1 housed on the upper portion of the base plate 8, being opened at one side thereof, a basket type of lower crib 3 housed on the 20 upper portion of the upper crib 1, being opened at one side thereof, the upper crib 1 provided with a hinge 4 at the both upper sides thereof, respectively, for coupling with the sides of the lower crib 3 such that the upper crib 1 is lifted up

and functioned as a back, and the lower crib 3 located on the base plate 8 at the opened one end thereof and connected to the hole of the right side connecting beam 20 by means of a bolt 14 at the other end thereof, having a pin 16 provided at one side of the middle portion thereof; and a crib swing assembly having a lever 5 17 inserted into a female ball joint 160 formed on the end portion of the pin 16 and connected to a driving motor 11 formed at one side of the lower portion of the crib, the lever 17 having a male ball joint 170 coupled with the female ball joint 160 on the top portion thereof and a plurality of holes 12 formed in a row on the lower portion thereof, a small gear pulley 36 mounted on a shaft 18 of the driving 10 motor 11, a large gear pulley 33 connected to the small gear pulley 36 by means of a timing belt 37, a crank shaft 34 having the large gear pulley 33 mounted at one side thereof and supported by two bearings 32 and 35, a connecting rod 24 connected to the middle portion of the crank shaft 34 and having a plurality of holes 23 formed in a row on the upwardly extruded portion thereof, and a pin 9 15 connecting each of the holes 23 of the connecting rod 24 and each of the holes 12 of the lever 17.

In this embodiment, the lever 17 and the pin 16 protruded on the lower crib 3 are assembled in such a manner that the male ball joint 170 on the top portion of the lever 17 is inserted into the female ball joint 160 formed on the end 20 portion of the pin 16, thereby enabling the rotary angle of the lever 17 to be enlarged.

Referring to the assembling and the operation state of the swing cradle

according to the present invention, the four bottom support bars 21, 22, 28 and 29 are coupled in the shape of a general rectangle, and the four collars 7, 13, 26 and 27 are then provided at the corners of the four bottom support bars 21, 22, 28 and 29. After that, the top end portions of the collars 7 and 27 are connected by means of the left side connecting beam 19, and the top end portions of the collars 7 and 27 are connected by means of the right side connecting beam 20. Each of the left and right side connecting beams 19 and 20 has the hole at the middle portion thereof, and thus, the base plate 8 is connected via the bolt 6 on the hole of the left side connecting beam 19. Next, the upper crib 1 and the lower crib 3 that are connected to each other by means of the hinge 4 such that the upper crib 1 is lifted up as a back are disposed on the base plate 8. In this manner, the lower crib 3 is located on the base plate 8 at the opened one end thereof and connected to the hole of the right side connecting beam 20 by means of the bolt 14 at the other end thereof. Also, the lower crib 3 has the pin 16 provided at one side of the middle portion thereof. The lever 17 connected to the driving motor 11 makes the male ball joint 170 on the top portion thereof fixedly inserted into the female ball joint 160 formed on the end portion of the pin 16. The small gear pulley 36 is mounted on the shaft 18 of the driving motor 11, and the large gear pulley 33 is mounted on the crank shaft 34 supported by the two bearings 32 and 35. In this manner, the large gear pulley 33 is connected to the small gear pulley 36 by means of the timing belt 37. Then, the plurality of holes 23 are provided in a row on the connecting rod 24 connected to the middle portion of the crank shaft 34, and each

of the holes 23 is connected with each of the holes 12 of the lever 17 by means of the pin 9.

If the driving motor 11 is activated, the small gear pulley 36 that is connected to the shaft 18 is activated and thereby, the large gear pulley 33 that is
5 connected to the timing belt 37 is rotated. This causes the crank shaft 34 connected to the large gear pulley 33 to be rotated, and at the same time, as the lever 17 that is mounted on the connecting rod 24 connected to the middle portion of the crank shaft 34 is moved to the left and right, the lower crib 3 connected to the lever 17 by the use of the pin 16 is moved such that the crib is in a left and
10 right swing motion.

FIG. 6 is a front view of the upper crib lifted up. The upper crib 1 that is coupled to the lower crib 3 through the hinge 4 is lifted up relative to the hinge 4 by means of an upper crib fixing part (which is not shown in the drawing) that is typically provided on the lower portion thereof, such that the upper crib 1 is
15 functioned as a back.

As clearly mentioned above, the swing cradle according to the present invention completely solves the problems the conventional practices have had. In other words, in case of the swing cradle that is operated manually, swing should take place continuously by a parent or other person until a child enters deep sleep.
20 In this case, the swing cradle is generally being in a back and forth swing motion, not in a left and right swing motion, which makes the child feel uncomfortable, and a minimum speed of swing the crib is relatively fast, which also makes the

child feel uncomfortable and uneasy. Furthermore, the crib is swung horizontally, which makes the child feel that he lies on the flat ground while his body and the crib are moved horizontally. However, to solve these problems, the present invention provides the swing cradle that is capable of automatically operating the

5 crib assembly in a left and right swing motion by use of the rotary motion of the driving motor and easily adjusting a quantity of swing. Also, the structure is very simple and the power transmission is achieved in a very stable manner, such that it is good to 3 to 4-year-old children as well as newborn infants.

While the present invention has been described with reference to a few

10 specific embodiments, the description is illustrative of the invention and is not to be construed as limiting the invention. Various modifications may occur to those skilled in the art without departing from the true spirit and scope of the invention as defined by the appended claims.

What Is Claimed Is:

1. A swing cradle comprising:

a crib assembly support frame having four bottom support bars (21, 22, 28
5 and 29) provided in the form of a general rectangle, four collars (7, 13, 26 and 27)
provided at the corners of the four bottom support bars (21, 22, 28 and 29), a left
side connecting beam (19) provided on the top end portions of the collars (7 and
27) for connecting the two collars, the left side connecting beam (19) having a
hole provided on the middle portion thereof, and a right side connecting beam (20)
10 provided on the top end portions of the collars (13 and 26) for connecting the two
collars, the right side connecting beam (20) having a hole provided on the middle
portion thereof;

a crib assembly having an L-shaped base plate (8) connected to the hole of
the left side connecting beam (19) by means of a bolt (6), a basket type of upper
15 crib (1) housed on the upper portion of the base plate (8), the upper crib (1) being
opened at one side thereof, a basket type of lower crib (3) housed on the upper
portion of the upper crib (1), the lower crib (3) being opened at one side thereof,
the upper crib (1) provided with a hinge (4) at the both upper sides thereof,
respectively, for coupling with the sides of the lower crib (3) such that the upper
20 crib (1) is lifted up and functioned as a back, and the lower crib (3) located on the
base plate (8) at the opened one end thereof and connected to the hole of the right
side connecting beam (20) by means of a bolt (14) at the other end thereof, the

lower crib (3) having a pin (16) provided at one side of the middle portion thereof;
and

a crib swing assembly having a lever (17) inserted into a female ball joint (160) formed on the end portion of the pin (16) and connected to a driving motor (11) formed at one side of the lower portion of the crib, the lever (17) having a male ball joint (170) on the top portion thereof and a plurality of holes (12) formed in a row on the lower portion thereof, a small gear pulley (36) mounted on a shaft (18) of the driving motor (11), a large gear pulley (33) connected to the small gear pulley (36) by means of a timing belt (37), a crank shaft (34) having the large gear pulley (33) mounted at one side thereof and supported by two bearings (32 and 35), a connecting rod (24) connected to the middle portion of the crank shaft (34) and having a plurality of holes (23) formed in a row on the upwardly extruded portion thereof, and a pin (9) for connecting the holes (23) of the connecting rod (24) and the holes (12) of the lever (17).