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3,568,362

ANIMATED DOLL

Filed Feb. 14, 1969

2 Sheets-Sheet 1

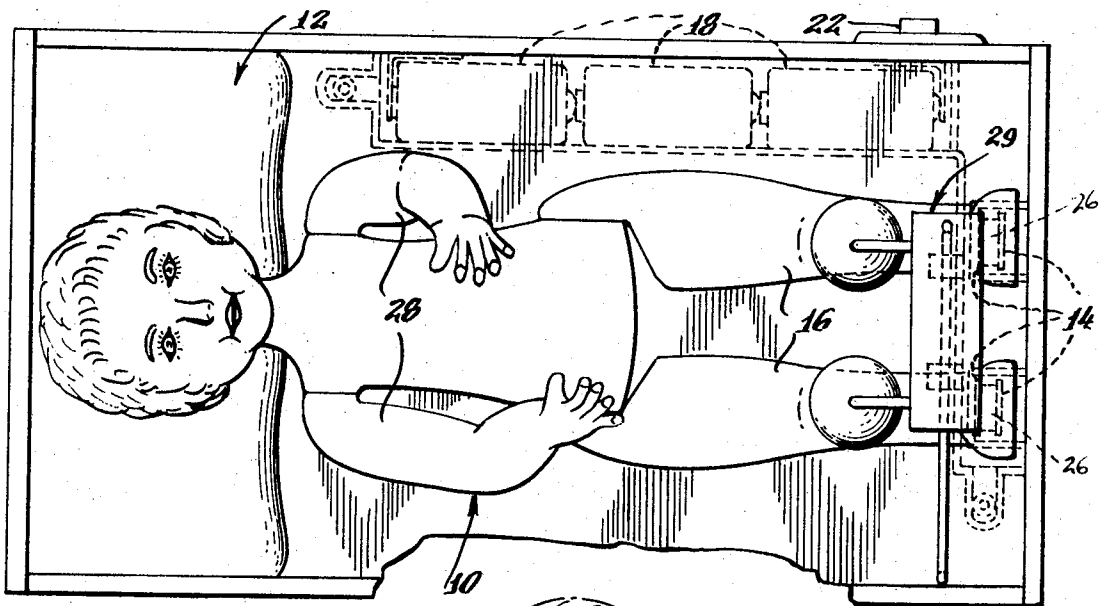


Fig. 1.

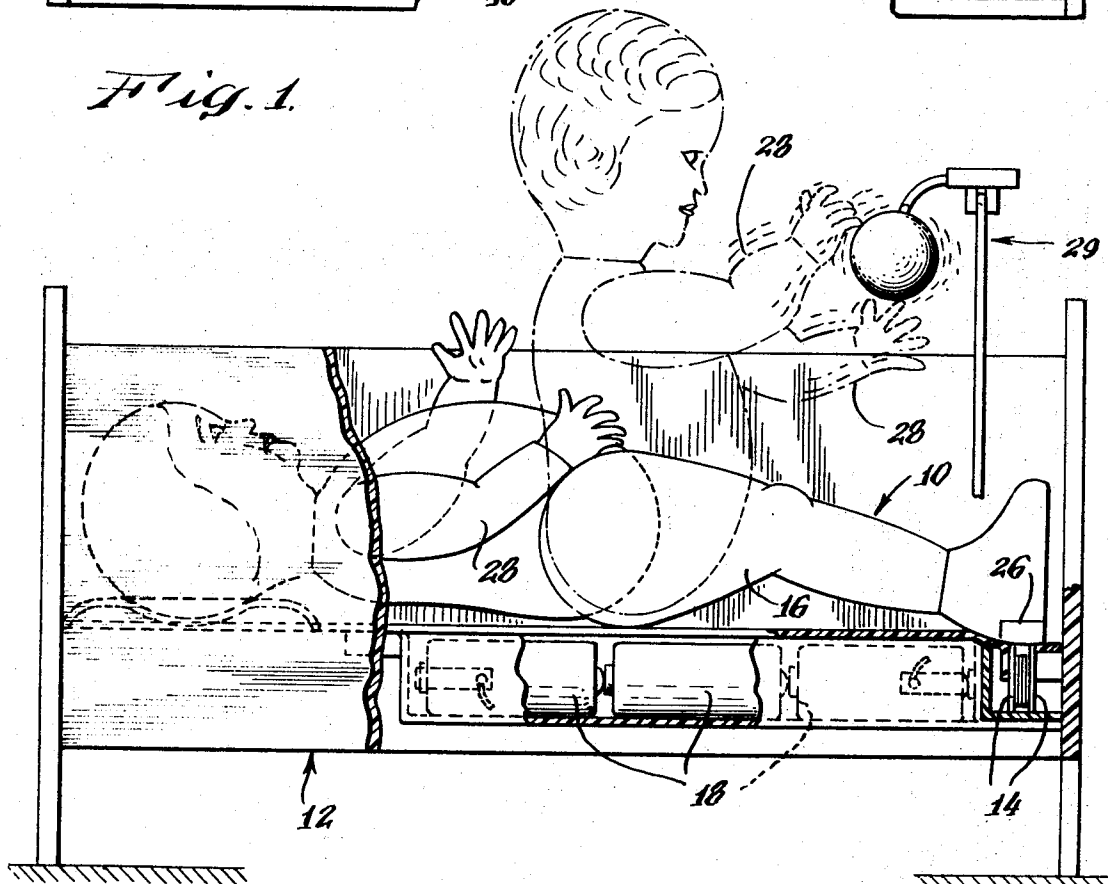


Fig. 2.

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2 Sheets-Sheet 2

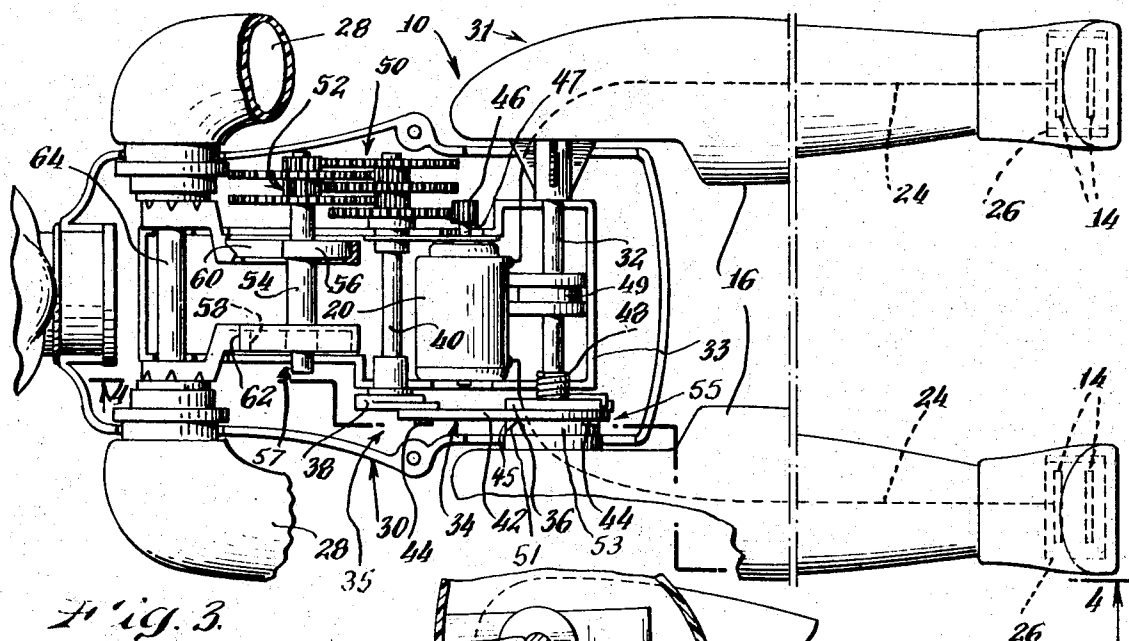


Fig. 3.

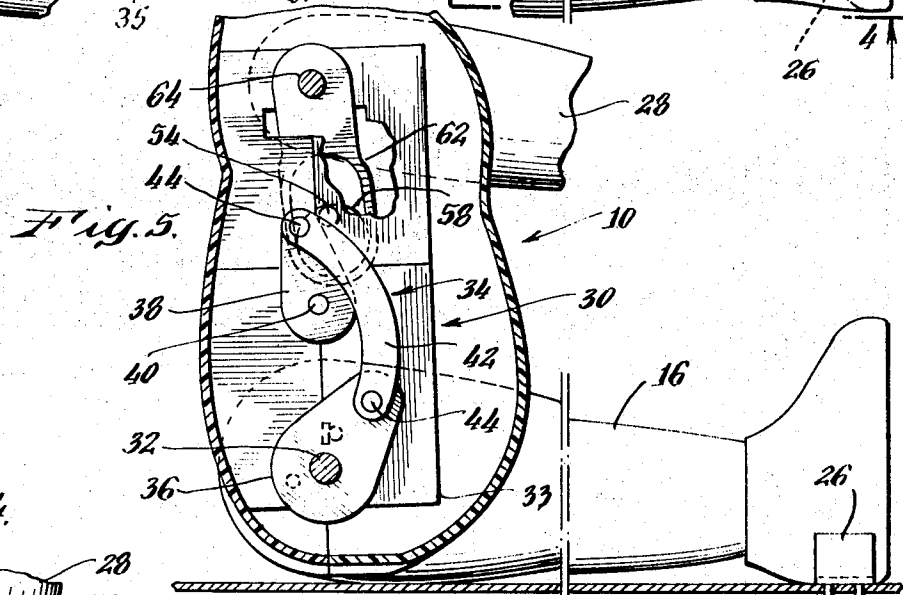
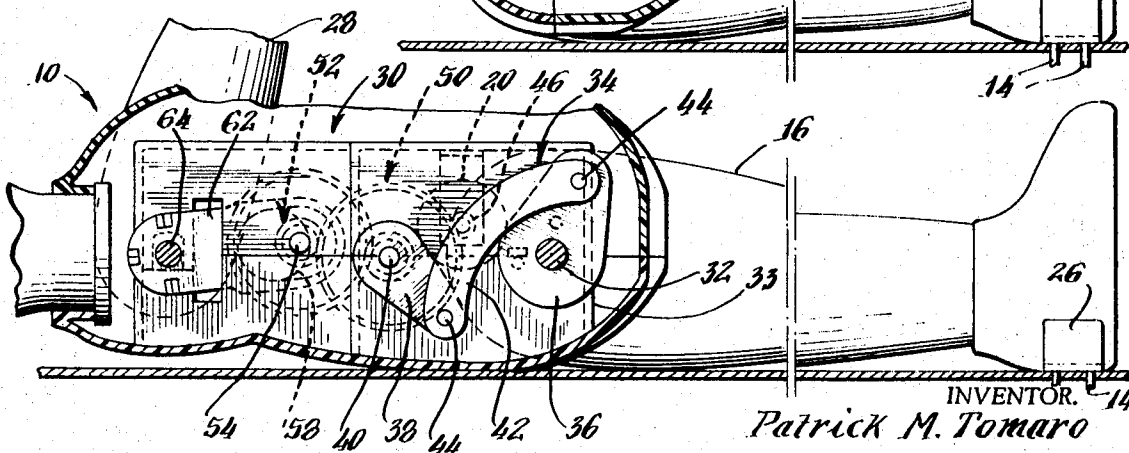


Fig. 5.

Fig. 4.



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ANIMATED DOLL

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9 Claims

ABSTRACT OF THE DISCLOSURE

This invention discloses a doll capable of moving from a reclining position to a sitting position with simultaneous movement of the doll's arms. When in the sitting position the moving arms can contact flexible rattles and the like to more closely imitate the movements of a baby. A spring torque producer aids a power actuator which includes a motor and three-piece crank arm; the motor is operatively associated with the three-piece crank arm and arranged to pivot the upper portion of the doll with respect to its lower portion. On the heels of the doll there are metallic plates electrically connected to the motor. Magnetic contacts are located in a crib or other foundation. A power source located in the foundation is electrically connected to the magnetic contacts. When the metallic plates and magnetic contacts engage one another a switch is actuated causing energy to flow from the power source to the motor, thereby actuating the three-piece crank arm causing the doll to begin to move toward a sitting position.

BACKGROUND OF THE INVENTION

Various dolls have been developed which will assume a sitting position. These dolls have employed cam, piston, or suction means to provide a sitting motion. Problems in establishing reliability and lifelike movement have inhibited the effectiveness of such dolls. The motion of the doll is often stiff and it is difficult for a child to play with the doll when it is not being actuated. Various sitting means are disclosed in Kinberg 2,596,491; Berger 2,906,059; Oberg 3,225,491; Ostrander 3,229,421; and Gardel et al. 3,287,847.

SUMMARY OF THE INVENTION

This invention includes a mechanism for moving a doll from a reclining position to a sitting position, while simultaneously causing movement to the arms of the doll.

The mechanism includes a motor operated three-piece crank arm arranged to rotate the upper portion of the doll with respect to its lower portion. The doll is made to sit-up as the crank arm rotates raising the upper portion of the doll forward with respect to the lower portion. A spring torque producer operatively associated with the crank arm assists the crank arm in providing a smooth steady movement to the doll. The spring torque producer being biased toward the sitting position.

Cam means operatively associated with the crank arm cause the arms of the doll to move simultaneously up and down out of phase with one another to impart a more realistic movement to the doll as it moves toward a sitting position.

Metallic plates mounted on the legs of the lower portion of the doll are electrically connected to the motor located within the doll. The plates are so arranged to contact magnetic contacts in a crib or other foundation. The magnetic contacts are electrically connected to a power source located in the crib or other foundation.

When the metallic plates and magnetic contacts are engaged the lower portion of the doll is held in a fixed position in the crib. A switch is then activated, supplying energy to the motor from the external power source

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whereby the crank arm is actuated causing the doll to sit-up with the aid of the torque producer.

The spring torque producer is arranged to assume a normal relaxed state when the doll is in a sitting position, but assume a tension extended state when the doll is reclining. With such an arrangement of the spring, it is biased toward the sitting position which is the position toward which the doll will move. The reclining position being a tension extended state acts as a reset position for the spring torque producer.

A clutch means operatively with the first piece of the three-piece crank arm and one leg fixes their relative positions. The engagement of the clutch means when the position of the lower portion of the doll is fixed in the crib enables the first piece to act as a fulcrum whereby any motion of the first piece results in a torque being applied to the upper portion of the doll causing the upper portion to move forward relative to the lower portion.

The mechanism provided by the present invention enables a doll to be placed in a crib or other foundation and controlled by external means located in a crib whereby the doll is capable of undergoing a reliable smooth sitting or reclining movement. Further, as the doll is made to sit-up its arms move simultaneously up and down. This arm movement enables the doll to contact rattles and the like located on the crib or other foundation. Thus, novel lifelike movements are achieved.

The various aspects, features and advantages of the present invention will be more fully understood from the following detailed description when considered in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is a top view of the doll in a reclining position in the crib.

FIG. 2 is a side partial sectional view of the doll and crib, illustrating the relative movement of the doll from a reclining position (solid lines) to a sitting position (dotted lines).

FIG. 3 is a top partial sectional view showing the arrangement of the mechanism within the doll's body when in a reclining position.

FIG. 4 is a side partial sectional view of the doll showing the mechanism when in a reclining position.

FIG. 5 is a side partial sectional view of the doll showing the mechanism when in a sitting position.

DETAILED DESCRIPTION

A doll 10 which when used in conjunction with a crib 12 or other foundation is capable of undergoing a smooth lifelike sitting or reclining movement while its arms 28 simultaneously move up and down is herein disclosed.

The crib 12 or other foundation is arranged to receive the doll 10. Spaced magnetic contacts 14 are mounted in the crib 12. A battery power source 18 located within the crib 12 is electrically connected to the magnetic contacts 14.

The doll 10 has an upper portion 30 and a lower portion 31 including legs 16. The upper portion 30 is pivotally mounted to the lower portion 31 through a pivoting shaft 32. Metallic plates 26 located on the legs 16 of the doll 10 are electrically connected through leads 24 to a motor 20 mounted to housing 33 located within the upper portion of the doll 10. When the metallic plates 26 engage the magnetic contacts 14, a switch 22 is closed by the child supplying energy to the motor.

When energized the motor 20 rotates a motor shaft 47 having a spur gear 46 mounted thereon. The rotating spur gear 46 rotates a first and second set of gears 50 and 52. The meshing of the gears 50 and 52 turns an upper shaft 40 having a second piece 38 of a three-piece

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crank arm 34 rigidly attached thereto. The rotation of the upper shaft 40 turns the three-piece crank arm 34 whereby the clutch means 55 causes the first piece 36 of the crank arm 34 to act as a fulcrum forcing the upper portion 30 of the doll 10 to pivot upward into a sitting position while the lower portion 31 remains fixed in the crib 12 under the force of the magnetic attraction between the plates 26 and contacts 14. Simultaneously the rotating of gears 52 turns a cam means 57 operatively associated with the arms 28 imparting an up and down motion to the arms 28 of the doll 10.

A spring torque producer 48 aids the crank arm 34 in moving the doll into a sitting position. The body of spring 48 is mounted on the pivoting shaft 32, its ends attached to the housing 33 located in the upper body 30 and the first piece 36 of the three-piece crank arm 34 respectively. This arrangement of the spring 48 within the doll 10 enables the moving crank arm 34 to exert pressure on the end of the spring 48 attached thereto, as that the spring 48 is extended as the doll 10 moves toward a reclining position placing the spring 48 under tension. When the crank arm 34 moves in the opposite direction and the doll 10 begins to sit up the tension extended spring 48 naturally moves toward a relaxed position, whereby the spring 48 exerts a force on the crank arm 34 aiding the motor 20 in moving the crank arm 34, thereby helping the upper portion 30 of the doll 10 to assume a sitting position.

Simultaneously with the rotation of the crank arm 34 the cam means 57 including a cam shaft 54, two cams 56 and 58, and cam followers 60 and 62 is activated. When rotated the spur gear 46 meshed with gears 50 attached to one end of an upper shaft 40. The gears 50 then rotate and mesh with gears 52 attached to one end of a cam shaft 54. The cam shaft 54 has two cams 56 and 58 rigidly mounted thereon and movable therewith. Cam followers 60 and 62 attached to the arms 28 through shoulder shaft 64 circumscribe the cams 56 and 58 and move therewith so that the movement of the cams 56 and 58 forces the arms 28 to move up and down out of phase with one another. Rattles, rubber balls or the like 29 can be positioned on the crib 12 proximate to the moving arms 28 so that the arms 28 contact the rattles 29 to more closely simulate the actions of a baby.

Referring to FIG. 1, a doll 10 is shown in a reclining position in a crib 12. Magnetic contacts 14 located on the bottom of the crib 12 engage metallic plates 26 located on the doll's legs 16 holding the legs 16 in a fixed position. The magnetic contacts 14 are electrically connected to batteries 18 located in the crib 12, see FIG. 2. The motor 20 is electrically connected through leads 24 to the metallic plates 26 as shown in FIG. 3. When the metallic plates 26 engage the magnetic contacts 14 the doll is in a position to be actuated. A child can then control the sitting or reclining position of the doll 10 by closing a switch 22. Closing of the switch 22 energizes the motor 20 turning the crank arm 34 causing the upper portion 30 of the doll 10 to begin to move forward into a sitting position.

FIG. 2 shows the doll initially in a reclining position (solid lines). When the switch 22 is closed current flows from the batteries 18 to the motor 20 through leads 24 connected between the metallic plates 26 located on the doll's legs 16 and the motor 20, see FIG. 3, causing the doll to sit-up. The dotted figure shows the arms 28 of the doll simultaneously moving as the doll is made to assume a sitting position. When in the sit-up position, the arms 28 engage a rattle 29, rubber ball or the like.

Referring to FIG. 3, the legs 16 of the doll are connected to the upper portion 30 of the doll through a pivoting means, here being a pivoting shaft 32. The leg 16 having the clutch means 55 associated therewith is rotatable mounted to the shaft 32 while the other leg 16 is rigidly mounted to the shaft 32.

A power actuator 35 including a motor 20 and three-piece crank arm 34 is located within the upper portion

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30 of the doll. The first piece 36 of crank arm 34 is rotatably connected to the pivoting shaft 32, but rigidly connected to one leg 16 through hip extension 53 when the clutch means 55 is engaged; the second piece 38 is rigidly attached to the upper shaft 40; and the third piece 42 pivotally connected to the first and second pieces 36 and 38 at their respective joints by pins 44. (See FIGS. 4 and 5.)

A spring torque producer 48 is mounted on the pivoting shaft 32. Spring 48 aids the power actuator 35 in moving the doll into a sitting position and resists its movement into a reclining position. The spring 48 has one end attached to housing 33 located within the upper portion 30 of the doll 10 and the other end attached to the first piece 36 of the crank arm 34. As the doll moves toward a reclining position the first piece 36 turns exerting pressure on the end of the spring 48 attached thereto, thereby extending the spring 48 placing it under tension. When the motor 20 is actuated and the crank arm 34 is rotated in the opposite direction forcing the upper portion 30 of the doll 10 forward, the spring 48 exerts a force against the first piece 36 of the crank arm 34 aiding the movement of the crank arm 34 in moving the doll 10 into a sitting position. Further, the spring torque producer 48 is automatically biased toward the sitting position in that it assumes this tensioned or reset position whenever the doll is moved toward a reclining position.

When the doll is located in the proper position in the crib 12 and the switch 22 activated, the motor 20 is energized, rotating the motor shaft 47 and a spur gear 46 attached thereto. The spur gear 46 meshes with gears 50 mounted on upper shaft 40 which mesh with gears 52 causing the rotation of the upper shaft 40. This rotation of the shaft 40 causes the second piece 38 of the three-piece lever arm 34 attached thereto to move in a clockwise manner causing the attached third and first pieces 42 and 36 of the three-piece crank arm 34 to turn therewith. This actuation of the crank arm 34 combined with the force exerted by spring 48 on the first 36, when the clutch means 55 is engaged applies sufficient torque to the upper shaft 40, located in the upper portion 30 of the doll 10, relative to the legs 16 to cause the upper portion 30 of the doll's body to begin to move upward into a sitting position (see FIG. 5). The spring 48 assists the movement of the crank arm 34 in moving the doll to a sitting position, the relaxed position of the spring 48, as explained above.

The clutch means 55 includes a detent 45 located on the first piece of the crank arm 34. The detent 45 is positioned to normally engage a slot 51 located in a hip extension 53 rigidly attached to one leg 16. This normal engagement of the detent 45 within the slot 47 fixes one of the legs 16 relative to the first piece 36 causing the leg to turn therewith. If sufficient torque is exerted on this leg 16 by a child the hip extension 53 will move away from the detent 45 causing the detent 45 to become disengaged from the slot 47 so the leg 16 can move freely of the first piece 36 of the crank arm 34. This is desirable should a child want to remove the doll from the crib 12 and manually manipulate both of its legs 16.

When the clutch means 55 including the detent 45 located on the first piece 36 of crank arm 34 engages the slot 47 in hip extension 53 rigidly attached to one leg 16, the movement of the first piece 36 and the one leg 16 is fixed relative to one another. Thus when the legs 16 are fixed in position in the crib 12 the first piece 36 will act as a fulcrum whereby any movement of the first piece 36 imparts a torque to the upper shaft 40 connected to the remaining pieces 38 and 42 of the crank arm 34. Since the upper shaft 40 is connected to the upper portion 30 of the doll 10 through housing 33, the applied torque will cause the upper portion 30 to move forward relative to the legs 16.

A flexible grommet supporting means 49 is wedged between the motor 20 and housing 33 to aid in disengaging

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the clutch means 55. The grommet 49 provides support to the motor 20 holding spur gear 46 in contact with gears 50 when the child applies torque to the one leg 16 whose position is fixed relative to the first piece 36 of the crank arm 34 allowing the detent 45 to disengage slot 47 and the leg 16 of the doll to move freely.

The upper shaft 40 to which the second lever arm 38 is attached has a first set of gear 50 attached thereto at its opposite end. When rotated, these gears 50 mesh with a second set of gears 52 loacted on the cam shaft 54. This second set of gears 52 rotates the cam shaft 54 having two cams 56 and 58 rigidly mounted thereon. Cam followers 60 and 62 rigidly attached to a shoulder driving shaft 64 circumscribe the circumference of the cams 56 and 58. As the cam shaft 54 rotates the cams 56 and 58 engage cam followers 60 and 62, which are rigidly attached to arms 28 through the shoulder driving shaft 64, thereby causing the arms 28 to move up and down out of phase simulating a baby's arm motion.

FIG. 4 shows the doll in a reclining position. The relative position of the three pieces 36, 38, and 42 comprising the crank arm 34 is illustrated.

FIG. 5 shows the relative position of the three pieces 36, 38, and 42 comprising the crank arm 34 when the doll has assumed a sitting position.

An important feature of the present mechanism is that the doll moves smoothly into a sitting or reclining position. The interaction between the three-piece crank arm 34, clutch means 55, and spring torque producer 48 provides a smooth lifelike movement of the upper portion 30 of the doll 10 into a sitting position.

From the foregoing, it is apparent that the present mechanism is well suited to move a doll reclining in a crib into a sitting position while simultaneously moving its arms to contact rattles and the like.

It should also be apparent that the various features of the present mechanism may be used in oher toys without departing from the scope of the present invention.

What is claimed is as follows:

1. An animated doll capable of sitting and reclining motion, said doll having a body, legs pivotally connected to said body and movable arms on said body, a power actuator for pivoting said body relative to said legs, to provide a sitting or reclining motion of said body when said legs are held in a fixed position, a torque producer associated with said pivotable connection of said body and said legs biased toward causing said doll to sit but of insufficient torque to enable said doll to sit without assistance of said power actuator, said torque producer opposing movement of said doll into a reclining position, and cam means operatively associated with the power actuator and arranged to enable said arms to move simultaneously up and down out of phase with one another whereby said torque producer will assist the power actuator in moving said doll into a sitting position and will be reset when said power actuator moves said doll into a reclining position with said arms being moved up and down out of phase with each other.

2. An animated doll capable of sitting and reclining motion, said doll having a body, legs pivotally connected to said body, a power actuator for pivoting said body relative to said legs, to provide a sitting or reclining motion of said body when said legs are held in a fixed position, a torque producer associated with said pivotable connection of said body and said legs biased toward causing said doll to sit but of insufficient torque to enable said doll to sit without assistance of said power actuator, said torque producer opposing movement of said doll into a reclining position, said torque producer assisting the power actuator in moving said doll into a sitting position and being reset when said power actuator moves said doll into a reclining position and releasable clutch means operatively located between one of said legs and said power actuator to enable the actuator

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to impart sitting and reclining movements to the doll body with said one leg retained by the clutch means in a fixed position and enable said legs to be independently moved upon release of the clutch means by a child playing with the doll.

3. An animated doll capable of sitting and reclining motion, said doll having a body, legs pivotally connected to said body, a power actuator including a motor, for pivoting said body relative to said legs, to provide a sitting or reclining motion of said body when said legs are held in a fixed position, a torque producer associated with said pivotable connection of said body and said legs biased toward causing said doll to sit but of insufficient torque to enable said doll to sit without assistance of said power actuator, said torque producer opposing movement of said doll into a reclining position, said doll being located on a foundation, said foundation housing magnetic contacts in electrical contact with a power source located in the foundation, said doll legs being provided with metallic plates for electrical contact with the magnetic contacts, said metallic plates being in electrical contact with motor in the power actuator to provide energization thereof by the electrical power source to move said doll into sitting and reclining positions

4. An animated doll capable of sitting and reclining motion, said doll having a body, legs pivotally connected to said body, a power actuator for pivoting said body relative to said legs, to provide a sitting or reclining motion of said body when said legs are held in a fixed position, a torque producer associated with said pivotable connection of said body and said legs biased toward causing said doll to sit but of insufficient torque to enable said doll to sit without assistance of said power actuator, said torque producer opposing movement of said doll into a reclining position, said power actuator including a motor and a three-piece crank arm, operatively located between the motor and the torque producer to enable the motor operated three-piece crank arm and torque producer to coact in concert in moving said doll into sitting and reclining positions.

5. An animated doll capable of sitting and reclining motion said doll having a body designated as the upper portion, legs designated as the lower portion pivotally attached to said body, a shaft connecting said upper and lower portions and allowing said upper portion to pivot relative to said lower portion, a three-piece crank arm having one piece attached to said shaft and another piece attached to said upper portion of said doll, a motor located within said doll, said motor when energized imparting torque to said three-piece crank arm providing rotation of the upper portion of the said doll with respect to the lower portion, a torque producer having a spring mounted on said shaft and arranged to be biased toward causing said doll to sit but having insufficient tension to enable said doll to sit without assistance of said crank arm.

6. An animated doll capable of sitting and reclining motion in a crib, said doll having a body, legs pivotally connected to said body and having metallic plates located thereon, a power actuator including a three-piece crank arm for pivoting said body relative to said legs to provide a sitting or reclining motion of said body when said legs are held in a fixed position, magnetic contacts located in said crib whereby said legs of said doll are caused to remain in a fixed position when said metallic plates engage said magnetic contacts, a torque producer operatively associated with said three-piece crank arm and said body biasing said legs toward causing said doll to sit but of insufficient torque to enable said doll to sit without assistance of said power actuator, said torque producer opposing movement of said doll into a reclining position, whereby said torque producer will assist the power actuator in moving said doll into a sitting position and will be reset when said power actuator moves said doll into a reclining position.

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7. An animated doll capable of sitting and reclining motion as set forth in claim 6 wherein said body includes arms having cam means including cam followers and cams operatively associated therewith such that when said power actuator is activated said cams engage said cam followers causing said arms to move simultaneously up and down out of phase with one another, said crib having rattles positioned thereon to be contacted by said moving arms.

8. An animated doll capable of being placed in crib, said doll including an upper portion having arms located thereon, said upper portion having a motor arranged therein, a cam means operatively associated with said motor and connected to said arms such that when said motor is energized said arms move up and down out of phase with one another, said crib having rattles located therein arranged proximate to said arms such that said moving arms cam engage said rattles.

9. An animated doll capable of being placed in a crib, said crib having a power source located therein, contacts arranged on said crib and electrically connected to said power source, a switch interposed between said contacts and said power source, said doll including an upper portion and lower portion, said upper portion having arms mounted thereon and a motor located therein, said lower

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portion having plates located thereon electrically connected to said motor such that when said plates engage said contacts and said switch is closed said motor is energized, a movable cam shaft operatively associated with said motor and having cams fixed thereto and movable therewith, cam followers attached to said arms and arranged to circumscribe said cams such that the movement of said cams causes said cam followers to move said arms up and down out of phase, said crib having rattles located thereon proximate to said arms such that the moving arms will engage said rattles.

References Cited

UNITED STATES PATENTS

2,774,184	12/1956	Hefferan et al.	46—234
2,990,646	7/1961	Berger	46—234X
3,287,847	11/1966	Gardel et al.	46—241X

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U.S. Cl. X.R.

46—119, 234