ANIMATED DOLL

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ABSTRACT OF THE DISCLOSURE

An animated doll is described as comprising a doll body, a head movably mounted on the body for complex motion and legs for walking motion. The motion of the head and legs is provided by a motor which rotates a drive shaft. The drive shaft terminates at one end in an angularly offset shaft extension projecting into the head of the doll and at the other end as the axis of a crank. The crank cooperates with a crank arm which has a crank pin movable by the rotating action of the crank in an elongated slot in the base of a body housing. Harnesses and C-springs depend into each leg, the springs mounting the legs and the harnesses loading the springs for flexure alternately by means of their attachment to the crank pin.

FIELD OF THE INVENTION

The present invention relates generally to dolls and more particularly to an animated doll which is adapted to simulate the complex motions of a human infant.

PRIOR ART

A wire variety of mechanisms have been suggested and used for imparting animation to the head, body, and limbs of a doll. Such mechanisms are usually relatively complicated and require the provision of specially constructed components for the doll. These mechanisms usually produce a repetitive sequence of movements which, after a relatively short period of use become well known to the child playing with the doll, thereby detracting from the play value of the doll to the child.

SUMMARY OF THE INVENTION

Accordingly, it is a primary object of the present invention to provide an improved doll for simulating the movement of an infant, which embodies relatively simple mechanisms for attaining animation.

A further object of the present invention is to provide an animated doll employing essentially conventional components and/or techniques for the manufacture of the doll proper.

A still further object of the present invention is to provide an animated doll for producing a random motion which is virtually non-repetitive and thereby has the capability for maintaining the interest of the child during prolonged periods of play.

Another object is to provide an animated doll of rugged construction to withstand anticipated abuse and yet be functional for its intended purposes.

These and other objects are accomplished in accordance with one illustrative embodiment of the present invention by an animated doll which comprises a doll's body having a head movably mounted on the doll's body and actuating means within the doll's body for imparting complex motion including rotation and flexion to the head. Further means are provided for imparting the rotation motion of the actuating means to a crank proximate the legs of the doll, the crank in turn providing rotation to an eccentric crank arm with harnesses attached thereto to provide lifting and falling motion to the doll's legs. Lifting is accomplished by said harnesses loading C-springs in each leg alternately, with subsequent flexure of the springs providing the falling motion. The actuating means includes a motor, which may be either spring or battery operated having a drive shaft which terminates at one end in an angularly offset shaft extension projecting into the head of the doll. At the other end, the drive shaft terminates as the axis of the crank.

The doll body may be fabricated from a body-forming skin having a yieldable stuffing at least partially filling the same such that the body will have a soft feeling to the child. Further the arms preferably include molded semi-rigid extremities which are connected to the doll's body proper by molded extensions of the body such that the arms are loosely and hingedly joined and readily respond to the complex motion of the head and legs in contact with the supporting surface underlyng the doll. The complex motion provided by the head alone and other features useful herein are described in U.S. Patent 3,029,552, Animated Doll, A. M. Katz, Inventor. The legs are formed by molding semi-rigid extremities connectable to the body proper by sewing to the garments of the doll and by being affixed to the motor housing by said springs and leg harnesses or the like.

The above brief description, as well as further objects, features and advantages of the present invention will be more fully appreciated by reference to the following detailed description of the preferred, but nonetheless illustrative embodiment and construction when taken in conjunction with the accompanying drawings, wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a pictorial representation of an animated doll in rest position embodying features of the present invention and showing illustrative motion capabilities;

FIG. 2 is a pictorial representation of the doll in standing and walking position with parts of the body skin broken away;

FIG. 3 is a partial pictorial view of the top portion of the motor housing and motion imparting mechanisms for the head and legs of the doll;

FIG. 4 is an enlarged perspective view of the top portion of the motor, its loading means and the angularly offset shaft extension from the motor extending into the head of the doll;

FIG. 5 is a front view sectional representation of the motor housing and motion imparting mechanisms for the head and legs of the doll;

FIG. 6 is a side view sectional representation of FIG. 5;

FIG. 7 is a sectional representation of the mechanism for imparting motion to the legs taken along line 7-7 of FIG. 5; and

FIG. 8 is a sectional representation of the neck and mechanism for imparting motion to the head of the doll taken along line 8-8 of FIG. 5.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

Referring now specifically to the drawings, there is shown a doll generally designated by the reference numeral 10, which demonstrates features of the present invention and includes a doll body 12, a head 14 movably mounted on the doll's body for a relatively complex movement including components of rotation and flexion, and limbs including a pair of arms 16 which are of substantially identical construction and are hingedly connected to the body 12, and a pair of legs 18, which are likewise of identical construction, whose inner structure 19 is hingedly connected to the motor housing 20 by springs 22 and to the leg operating mechanism by spring loading leg harnesses 24.

In this preferred, but nonetheless illustrative embodiment, doll body 12 includes a body-forming material formed by the stitching together of a number of panels or
in a unitary skin which may be of any appropriate material including either a synthetic fabric of a flesh color or a garment fabric for the doll. The body-forming garment 12 terminates at its upper end in neck structure 26. The marginal portion of the neck structure 26 which bounds the neck opening is folded back on itself and is stitched in its folded-back condition to form a neck opening for receiving a tie member 21 of the body garment 12 and on its reverse side an insert 36 for the neck portion 30. The neck insert 36 may be fabricated of any rigid material such as wood or plastic. The diameter and wall thickness of the neck 30 is such as to enable the neck to yield and receive the neck insert 36 in a preliminary sub-assembly. Similarly, the fastening of the head assembly to the doll body 12 involves a relatively simple operation since after the insertion of the actuating mechanisms into the cavity of the doll body 12 and engagement with the doll's head 14, the marginal portions of the body garment 12 are affixed to the head by wire 21 to hold the head to the body.

The resulting assembly mounts the head 14 on the body 12 for rotation, lateral flexion and upward and downward extension in a manner calculated to simulate the function of a neck joint of a human. The mechanism for providing this motion to the head comprises a motor housing 20 having a motor 40 therein, the motor being actuated by means of actuating means in the form of a pull string 42 for a spring operated motor. (Other actuating means such as a switch is usable when the motor is battery operated.) The pull string 42 may be wound or unwound to change the position of the head. The shaft 44 is provided with an angularly offset extension 46 extendible into the doll's head 14. As may be seen most clearly from FIG. 5, the offset extension 46 is insertable through a hole 48 in the insert member 36 of the neck portion of the doll. The hole 48 is offset from center in order to provide the complete assembly with the offset shaft extension 46. Upon reference to FIG. 4 it will be appreciated that the shaft extension 46 rotating in the non-rotatable insert 36 serves as the generatrix of a conical surface about which a central axis of the head 14 moves (with the insert 36) in response to rotation of the drive shaft 44.

Inspection of FIGS. 5 through 7 illustrates the leg-motion mechanism, which in combination with the head-motion mechanism provides complex motions for the doll as well as a simulated walking capability when hand assisted. The bottom-most part of the shaft 44 of the motor 40 provides a drive and an axis for crank 50 and hole 52 is provided near the periphery of the crank 50 for receiving the drive pin 54 of a crank arm 56. The motion of the crank arm 56 is determined by its first and second crank pins 54 and 58, the latter of which is the driven pin and depends into an elongated slot 59 (see FIG. 7) in the bottom wall of the housing 20. The driven pin 58 has affixed thereto tie members 24 which extend into legs 18 of the doll through eyelets 60 in holes in the base of the housing. A spring 22 is affixed in each leg at its upper extremity to the motor housing by eyelet 60 and at its lower extremity to a pin 64 in the rigid insert 19 of the leg 18. The springs 22 are generally C-shaped and each includes an upper, generally horizontal portion 82 operatively connected to the doll body, a lower, generally vertical portion 84 operatively connected to a leg and a generally C-shaped middle portion 86 between the upper and lower portions 82, 84. The spring 22 being C-shaped is compressible by upward motion of the harness 24 which is affixed to the spring at point 66 near the lower extremity of the spring. The harness 24 is free to move upward and downward through the eyelet 60 to thereby provide compression of the spring 22 to hold it in a flexure to complete the upward and downward motion sequence for the leg 18. At the election of the manufacturer, the C-springs may be either flexed (normal position of spring) or loaded when the legs are in standing position.

In operation, the crank 50 rotates about shaft 44 to thereby rotate the crank arm 56 providing left to right (FIG. 5) motion of the crank pin 58 in a confined linear path determined by the slot 59. The left to right motion of the crank pin 58 provides a sequence of alternate lifting of the lower portion of the spring 22 in the legs, first one leg and then the other. This lifting is accomplished by pulling of the harnesses affixed to crank pin 58 and depending to each leg.

In order to facilitate a more thorough understanding of the present invention, reference will now be made to the drawings for a description of the action of the doll. Referring now to FIGS. 8 and 9, it will be appreciated that by pulling the actuating means 42 away from the body 12, the motor 40 will be "loaded" by winding the spring therein. The motor spring (not shown) will immediately start to unwind to provide rotation to main shaft 44. The conical rotative motion of the extension 46 will provide complex rotation to the head 14. At the same time, rotation of the crank 50 will provide sequential compression (loading) of springs 22 in each of the legs. As stated previously, after each compression of spring 22 there will immediately follow a downward extension or flexure of the spring. Therefore, complex motion of the head and up and down motion of the legs will occur at the same time. As shown in FIG. 1, this motion will produce lifelike complex movement of the doll. For example, if the doll is placed substantially in a lying-down position as shown in FIG. 1, depending upon the initial attitude of the limbs, a complex motion will be imparted to the limbs and body by means of the head and legs beating against the underlying surface. Of course, it will be appreciated that there is a continuing and varying movement of the body and extremities of the doll as the head and legs assume different positions in relation to each other, to the underlying support and to the body. The motion will be essentially non-repetitive and will thereby maintain the interest of the child.

Alternatively, as shown in FIG. 2, a walking motion of the doll is produced by holding the arms 16 of the doll so that the alternate extension of the legs 18 of the doll bear it will provide a lifelike walking motion. At the same time, motion of the head 14 as hereinafore described will further enhance the lifelike appearance to the child.

It should also be understood that accessories such as walkers or the like may be used in association with the doll and its motion as described in the preceding paragraph.

It is to be emphasized that the positions shown and described are merely illustrative of the many and varied positions which can be obtained for an animated doll constructed in accordance with the present invention. Basically, the doll is of relatively simple and rugged construction and is capable of withstand abuse for long periods of use yet remaining operable in operation. It will be appreciated that the head and extremities of the doll are sculptured to simulate a relatively young infant or newborn baby, which coupled with the general feel of the soft and yielding body and extremity material and the animation imparted to the doll, will give the doll exceptionally lifelike properties.

What is claimed is:

1. An animated doll comprising a doll body, a pair of arms hingedly connected to said doll body, a head mount-
ed on said doll body, a pair of legs, individual springs operatively connected to said legs and movable mounting said legs on said body for walking motion, actuating means within said doll body for imparting said walking motion to said legs, said means including a drive and connecting means for coupling said legs to said drive, said drive and connecting means comprising a crank, a motor having a drive shaft terminating at its lower end as the axis of said crank, a housing for said motor with an elongated slot in the base thereof, said crank being operatively connected to said shaft, a crank arm having a first crank pin and a second crank pin, a first pin rotatably connected to said crank near the periphery of said crank and said second pin depending into said slot for confined motion therein and a pair of harnesses attached to said second pin, each harness depending into a leg and being attached to the lower portion of one of said springs to load said spring for flexure, said loading being provided by motion of said second pin in said slot away from the leg into which said one spring depends.

2. An animated doll comprising a doll body, a pair of arms hingedly connected to said doll body, a head mounted on said doll body, a pair of legs, individual C-springs operatively connected to said legs and movable mounting said legs on said body for walking motion, and actuating means within said doll body for imparting said walking motion to said legs in one direction only, said C-springs themselves providing actuation for walking motion in the opposite direction and each C-spring including an upper generally horizontal portion operatively connected to said doll body, a lower, generally vertical portion operatively connected to one of said legs and a generally C-shaped middle portion between said upper and lower portions, said means including a drive and connecting means for coupling said legs to said drive.

3. The invention according to claim 1 wherein said drive shaft terminates at its other end in an angularly offset shaft extension projecting into said head, said shaft extension serving as the generatrix of a conical surface about which a central axis of said head moves in response to rotation of said drive shaft, and means for coupling said

4. The invention according to claim 1 wherein said springs are C-springs.

5. The invention according to claim 4 wherein said motor housing further comprises first and second holes in the base thereof and an eyelet affixed in each hole, said C-springs being attached to said housing by said eyelets at their upper portions.

6. The invention according to claim 1 wherein said harnesses and second pin are provided in an orientation to produce alternate loading of said springs.

7. The invention according to claim 1 wherein said springs are flexed when providing a standing position for said legs in relation to said body.

8. The invention according to claim 1 wherein said springs are loaded when providing a standing position for said legs in relation to said body.

9. The invention according to claim 1 wherein said motor is a spring operable motor.

10. The invention according to claim 1 wherein said motor is a battery operable motor.

11. The invention according to claim 9 wherein said motor comprises a motor spring with a pull string in operable engagement therewith and said motor spring is loaded by extending said pull string.

References Cited

UNITED STATES PATENTS

2,288,371 6/1942 Rothschild 46—119
2,565,603 8/1951 Fraysur 46—118
2,760,303 8/1956 Del Mas 46—161
2,804,721 9/1957 Cohn 46—163
3,350,065 7/1967 Gardel et al. 46—120

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