United States Patent

Gardel et al.

[15] **3,672,097**

[45] **June 27, 1972**

[54] CRANK OPERATED DANCING DOLL

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[21] Appl. No.: **80,890**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 866,953, Oct. 16, 1969, Pat. No. 3,609,909.

[52] **U.S. Cl.** **46/120**, 40/106.34, 46/138

[51] **Int. Cl.** **A63h 11/00**

[58] **Field of Search** 46/120, 121, 138, 126, 139, 46/136, 147, 149, 150, 142, 143; 40/106.34, 106.33, 106.35

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[57] **ABSTRACT**

A doll having animated torso, arms and head movement. The torso is comprised of an upper and lower portion, the upper portion of which gyrates with respect to the lower portion. The arms swing alternately in a forward and backward movement. The head gyrates at the same time the torso is gyrating. A crank is provided for manually moving the arms, torso, and head of the doll.

2 Claims, 8 Drawing Figures

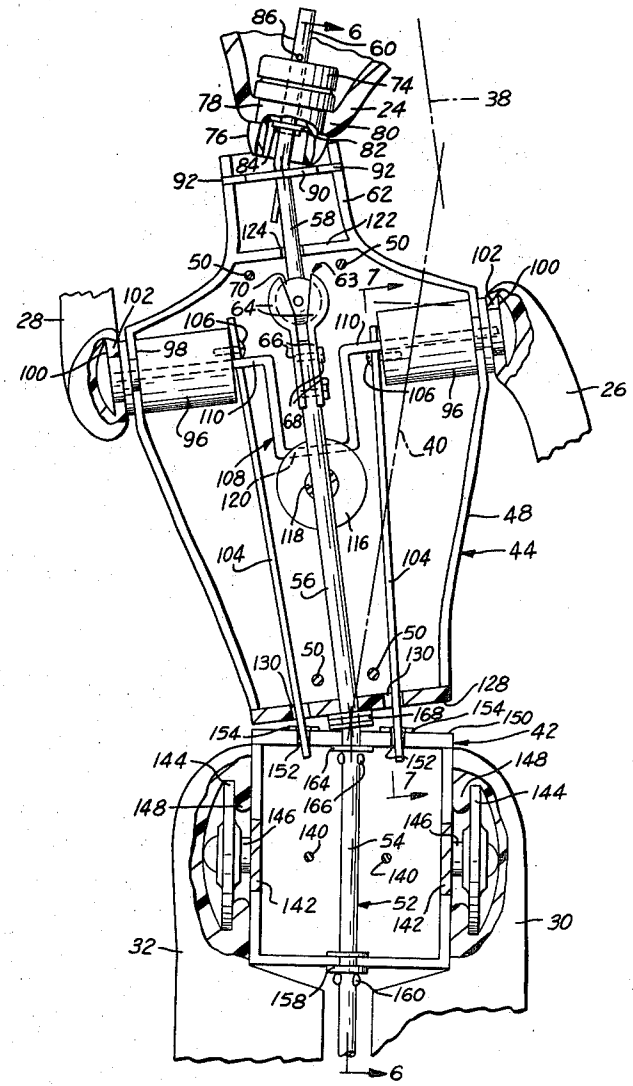


FIG. 1

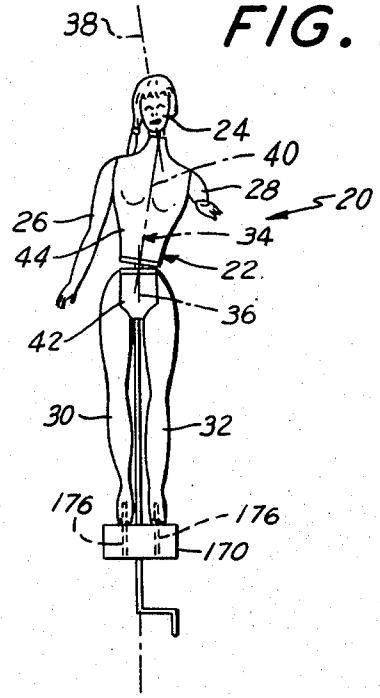


FIG. 2

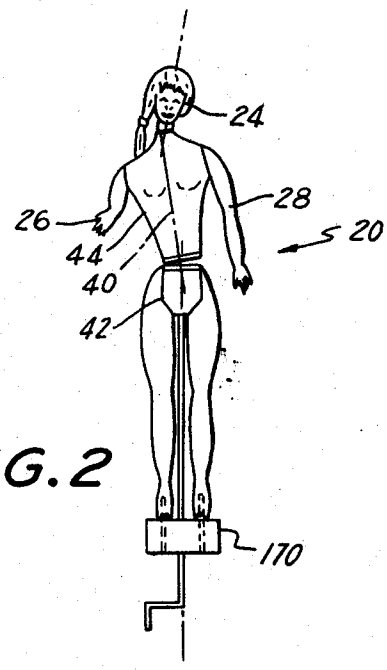


FIG. 3

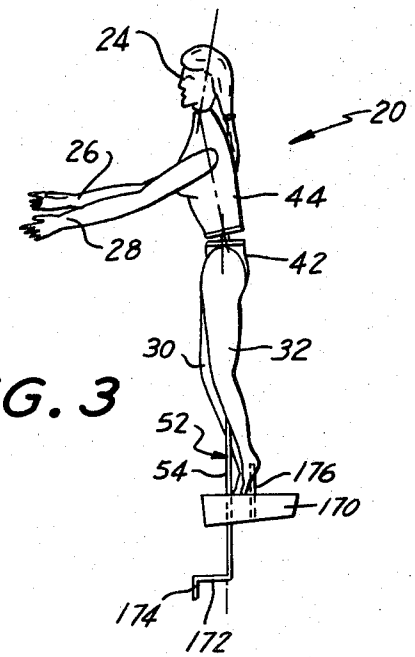
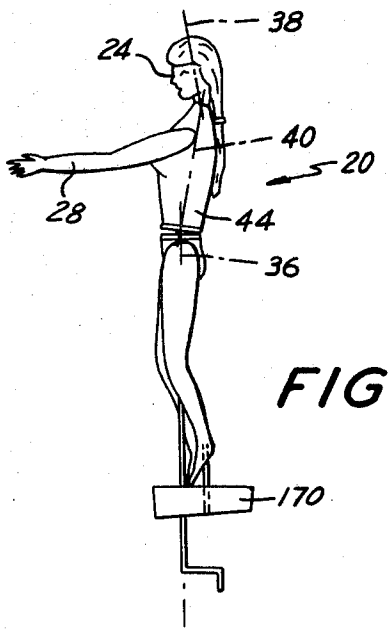


FIG. 4



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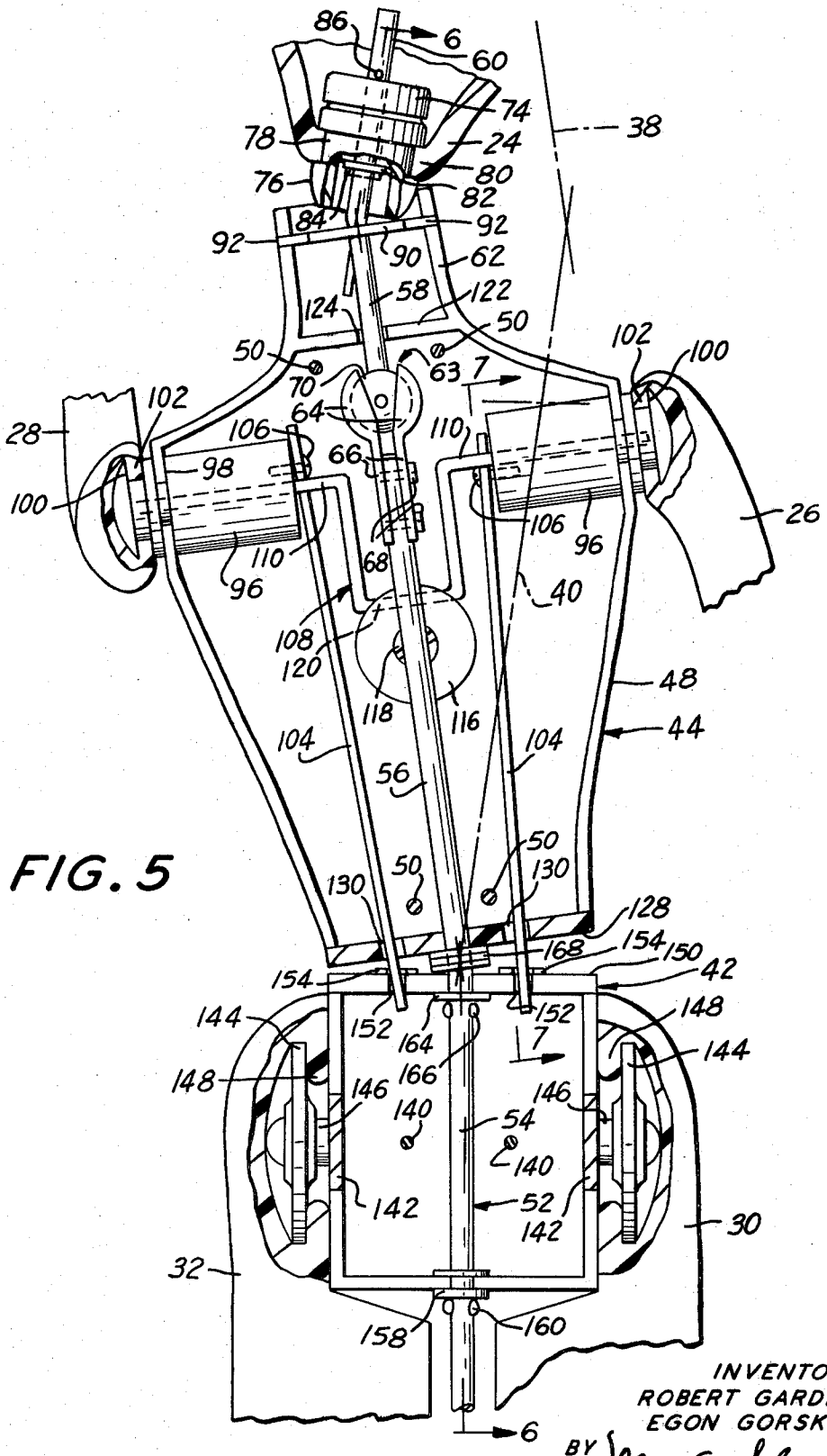

FIG. 5

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FIG. 6

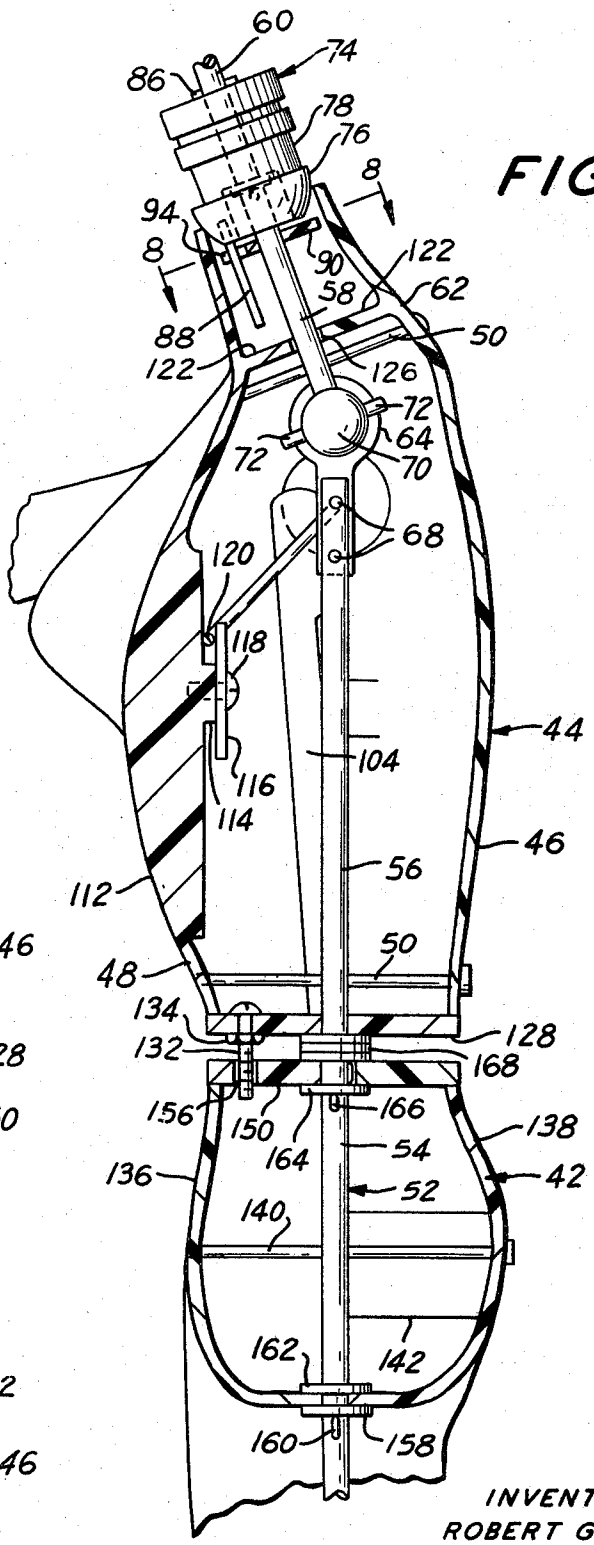
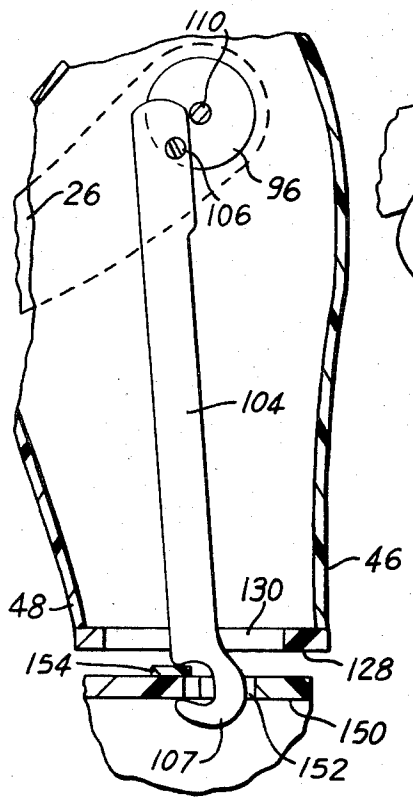


FIG. 7



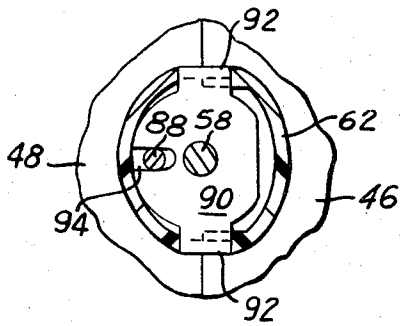


FIG. 8

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CRANK OPERATED DANCING DOLL

This application is a continuation-in-part of our co-pending application Ser. No. 866,953, filed Oct. 16, 1969 and titled "Animated Doll" now U.S. Pat. No. 3,609,909.

This invention relates to an animated doll, and more particularly to a dancing doll that is hand actuated by a crank.

There are various types of animated dolls available which can accomplish varying actions. Among the actions accomplishable among the prior art dolls is a walking action. Thus, these dolls are capable of moving forwardly when they are actuated through a power source, such as a battery powered motor.

An improved embodiment of the battery powered walking doll is disclosed and claimed in our aforementioned co-pending application Ser. No. 866,953. The doll of this invention includes many of the linkages of the doll disclosed in application Ser. No. 866,953. However, the doll of this invention is supported on a platform, and is crank operated rather than battery operated. Additionally, the motion of the doll gives the appearance of a dancer going through a number of gyrating motions during which the torso, head and arms all move. During these motions, the legs of the doll remain fixed to the platform.

It is accordingly an object of this invention to provide a new and improved animated doll.

It is another object of this invention to provide a new and improved animated doll that goes through a dancing motion and is crank operated.

These and other objects of this invention are accomplished by providing an animated doll comprising a torso, a pair of arms, a head, a pair of legs vertically depending from said torso, and means for gyrating said torso, said gyrating means comprising a hand-operated crank.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

FIG. 1 is a front elevational view of the doll embodying the present invention in a first position;

FIG. 2 is a front elevational view of the doll in a second position;

FIG. 3 is a side elevational view of the doll in a third position;

FIG. 4 is a side elevational view of the doll in a fourth position;

FIG. 5 is an enlarged fragmentary rear elevational view of the doll of this invention, with the rear portions of the torso shell removed, and portions shown in vertical section for purposes of clarity;

FIG. 6 is a sectional view taken along the line 6—6 of FIG. 5;

FIG. 7 is a sectional view taken along the line 7—7 of FIG. 5; and

FIG. 8 is a sectional view taken along the line 8—8 of FIG. 6.

Referring now in greater detail to the various figures of the drawings wherein like reference characters refer to like parts, a crank operated dancing doll embodying the present invention is generally shown at 20 in FIGS. 1 to 4. The doll 20 basically comprises a torso 22, a head 24, a pair of arms 26 and 28 and a pair of legs 30 and 32 which depend from the torso.

The axis of the body of the doll is illustrated in phantom at 34 in FIGS. 1 to 4, which shows four of the positions of the doll during a complete dancing cycle. The axis 34 of the doll basically includes a vertically extending portion 36, an upper offset portion 38 and a central offset portion 40. As is apparent in FIG. 1, portion 38 is offset in the opposite direction to the direction of offset portion 40.

The torso 22 of the doll is comprised of a lower torso portion 42 and an upper torso portion 44. The lower vertical portion 36 of the axis 34 extends through the lower torso portion 42. The offset portion 40 of the axis extends through the upper torso portion 44 and the upper offset portion 38 of the axis extends through the head 24.

The lower portion 36 of the axis remains stationary with respect to the lower portion 42 of the torso and with respect to the legs 30 and 32. The offset portion 40 of the axis rotates about the vertical axis portion 36 when the doll is set in motion. The upper offset portion 38 of the axis follows the rotation of the offset portion 40.

Accordingly, the movement of the offset portion 40 stays within a conical configuration, thereby gyrating the upper torso portion 44 during the movement of the doll. Likewise, the head 24 will gyrate about the axis 38 when the doll is in motion.

Viewing the doll from above, the offset portions 38 and 40 rotate in a clockwise direction about the lower vertical portion 36 of the axis 34. Thus, the axis of the doll shown in FIG. 1 is rotated 90° to arrive and be disposed at the position shown in FIG. 3. The rotation of the axis an additional 90° in a clockwise direction causes the doll to be disposed in the position shown in FIG. 2. Rotation of the axis another 90° in a clockwise direction causes the doll to be in the position shown in FIG. 4. Rotation of the axis for an additional 90° brings the doll back to the position shown in FIG. 1.

During the movement of the doll, the upper torso, head and arms go through a series of movements. Thus, as seen in FIG. 1, in one position of the doll, the upper torso portion 44 leans to the left, the arm 28 is raised and the head 24 leans to the right, relative to the torso. In the next position of the doll, which is shown in FIG. 3, both arms 26 and 28 are raised, the upper torso portion 44 leans forwardly and the head 24 leans rearwardly relative to the torso.

In the third position of the doll, which is shown in FIG. 2, the upper torso portion 44 leans to the right of the doll, the right arm 26 is raised and the head 24 leans to the left relative to the upper torso portion. In the final position of the doll, as shown in FIG. 4, the upper torso portion 44 leans rearwardly, the head 24 leans forwardly relative to the upper torso portion, and both arms 26 and 28 are raised.

It should be understood that the movement of the doll is not sequential, as indicated by FIGS. 1 to 4, but is a continual movement of raising and lowering of the arms and a gyration of the upper torso portion 44 relative to the lower torso portion 42. Likewise, there is a gyration of the head 24 relative to the upper torso portion 44. In this way, a continuous motion is given to the arms, torso and head. The combined effect of the movements of these body parts gives the doll the appearance of a dancer.

The construction of the doll 20 is best seen in FIGS. 5 to 8. As seen in FIGS. 5 and 6, the upper torso portion 44 comprises a rear shell 46 and a forward shell 48, which shells are preferably made of molded plastic. The forward shell 48 is releasably secured to the rear shell 46 by four screws 50 that are threadedly received in the forward shell. Alternatively, the forward shell can be secured to the rear shell by integrally molded pins and sockets, such as those shown in our aforementioned application Ser. No. 866,953.

A shaft 52 passes through the center of the doll 20. Shaft 52 includes a lower vertical portion 54, a central offset portion that comprises a lower leg 56 and an upper leg 58 and an upper offset portion 60. As best seen in FIG. 6, the lower vertical portion 54 is provided in the lower torso portion 42. The leg 56 is received within the upper torso portion 44, and the leg 58 is also received in the upper torso portion 44 and extends into the neck 62 of the doll. As seen in FIG. 6, the neck 62 extends angularly from the balance of the upper torso portion 44, and is unitary therewith. The upper offset portion 60 extends into the head 24 of the doll, as best seen in FIG. 5.

As seen in FIG. 5, a socket 63, formed from a pair of spaced hemispherical members 64, is positioned at the top of leg 56 of the center portion of shaft 52. Each hemispherical member 64 has a longitudinal extension 66 projecting therefrom. The extensions 66 are arcuate, abut leg 56, and are secured to the leg by screws 68. A ball 70 is formed at the base of leg 58 of shaft 52, and is received in socket 63. A pin 72 passes through ball 70, and has a pair of ends that project outwardly of members 64 in the space between them (see FIG. 6). This structure constitutes a universal joint.

Shaft section 60 is received in a cylinder 74 which is freely rotatable on the shaft section. Cylinder 74 includes an arcuate base 76 to facilitate free rotation of the cylinder within the neck member 62. An annular groove 78 is formed in cylinder 74 adjacent base 76. Head 24 is secured on cylinder 74 by the snapping of a lower annular lip 80 of the head into groove 78 (FIG. 5).

The cylinder 74 is secured on shaft section 60 at its bottom by a washer 82 and a pin 84 (FIG. 5). A pin 86 passes through the upper portion of shaft section 60 and abuts the top of cylinder 74. Cylinder 74 is rotatable about shaft section 60 between washer 82 and pin 86. Accordingly, the cylinder 74 is placed vertically with respect to shaft section 60 by the washer and pin.

A pin 88 projects vertically downward from cylinder 74, and has one end secured therein. As best seen in FIG. 8, a plate 90 is mounted in neck 62. Plate 90 includes a pair of tabs 92 that are received in slots formed in the neck. Pin 88 is received in an elongated slot 94 in plate 90. Plate 90 also includes a central opening through which leg 58 of shaft 52 will pass. The slot 94 and the pin 88 form a limiting means to prevent rotation of the head 24 at the time the shaft section 60 is rotated, as will be explained hereinafter.

As best seen in FIG. 5, a shoulder cylinder 96 is provided for each arm 26 and 28. Cylinders 96 include an annular groove 98 which receives the upper torso shell sections 46 and 48. The cylinders 96 are accordingly rotatable within the shell sections. A second annular groove 100 is formed in each of the cylinders 96. Arms 26 and 28 include annular lips 102 that are received in grooves 100. The lips 102 are frictionally held within the grooves, and the position of each of the arms can be varied by rotating the arms in the grooves 100. Once the arms have been rotated to a set position, they will retain this position in view of the frictional grip of the walls of grooves 100 on the lips 102.

A bar 104 is pivotally linked to each cylinder 96 by a pin 106 that passes through each bar and into its associated cylinder (see FIG. 7). Each bar 104 includes a hook 107 at the bottom thereof, which hook is received in the lower torso section 42. A U-shaped rod 108 (FIG. 5) is positioned in the forward torso section 48. Rod 108 includes a pair of horizontally extending rod portions 110 that pass through the centers of cylinders 96. Cylinders 96 are in turn rotatably mounted on rod portions 110.

The forward torso shell 48 includes an integrally molded, vertically extending rib 112 (FIG. 6). Rib 112 includes an integral enlarged boss 114. A disc 116 is mounted on boss 114 by a screw 118. The bridging section 120 of U-Shaped rod 108 is received between disc 116 and rib 112 (FIG. 6).

The neck sections 62 of the forward and rear torso shells 48 and 46 each includes a semi-circular plate 122 having a semi-circular opening 124 at the center thereof. In the assembled condition of the doll, the semi-circular openings 124 join to form a central hole 126 (FIG. 6) through which leg 58 of shaft 52 passes. As best seen in FIG. 6, leg 58 is rotatably mounted in plate 90 and plates 122. However, these aligned plates prevent any lateral movement of the leg 52 during the operation of the doll.

A plate 128 is adhesively secured to the bottom of the upper torso shell 44. As seen in FIGS. 5 and 7, plate 128 includes a pair of longitudinally extending slots 130 through which bars 104 pass. A screw 132 (FIG. 6) passes through plate 128 and is secured thereon by a nut 134.

Lower torso section 42 includes a forward shell 136 and a rear shell 138 (FIG. 6). Shells 136 and 138 are releasably held together by a pair of screws 140. As seen in FIG. 6, the side walls of the forward shell 136 include rearwardly projecting tabs 142 which are received in slots in the rear shell 138. A pair of discs 144 is provided which discs are spaced from the side walls of the lower torso shell 42. Each disc is integral with a shaft 146 which is in turn integrally molded to the side wall of the forward torso shell 136. As seen in FIG. 5, legs 30 and 32 are mounted on the lower torso section 42 by the snapping of annular lips 148 of the legs into the annular grooves formed by discs 144 and the side walls of the lower torso shell.

A top plate 150 is adhesively secured on the lower torso shell 42. Top plate 150 includes a pair of openings 152 through which the hooks 108 of bars 104 project (FIG. 7). The hooks are secured in place by a pair of bars 154 which are adhesively secured on plate 150 adjacent openings 152. A forward hole 156 (FIG. 6) is formed in plate 150, through which the shaft of screw 132 projects.

As best seen in FIGS. 5 and 6, the lower shaft section 54 passes through the lower torso shell 42. A bearing washer 158 is held against the base of lower torso shell 42 by crimping the shaft section 54 as shown at 160 in FIG. 5. A second bearing washer 162 is positioned within torso section 42 at the base thereof. A bearing washer 164 is held against the underside of plate 150 by crimping, as shown at 166. Three washers 168 are positioned between plate 150 and plate 128.

As seen in FIGS. 1 to 4, a rigid plastic base 170 is provided for the doll. Base 170 can be made of any moldable plastic, such as nylon or polymethyl methacrylate. The lower shaft section 54 passes through an opening in plate 170. A pair of arms 172 and 174 is formed at the base of shaft section 54. Arms 172 and 174 serve as a crank handle for rotating the shaft 52, as will be explained hereinafter. A pair of pins 176 projects downwardly from the ends of legs 30 and 32. Pins 176 are received in openings in the base 170.

The doll of this invention is operated by grasping the plastic base 170 in one hand and grasping the arm 174 between the thumb and forefinger of the other hand. The arm 174 acts as a crank arm in rotating the shaft 52, which in turn operates the doll.

Referring to FIGS. 5 and 6, it is apparent that the rotation of shaft 52 by rotating the arm 174 will cause the offset leg 56 (FIG. 5) to move in a conical path about the top of shaft section 54, with the apex of the cone being lowermost. The position of the leg 56 of shaft 52 shown in FIG. 5 is equivalent to the position shown for the axis 34 of the doll in FIG. 1. In this connection, it should be recalled that FIG. 5 is a rear elevational view of the doll with the rear torso shell 46 removed. Continued rotation of the shaft 52 will move the leg 56 through the four positions shown in axis section 40 in FIGS. 1 to 4.

As pointed out above, leg 58 of shaft 52 is rigidly fixed within the torso shell 44 insofar as lateral movement is concerned. Accordingly, the only movement of the leg 58 is rotational movement within plates 90 and 122. Accordingly, as the shaft leg 56 is rotated through its conical path, the upper torso 44 will follow this path since the engagement of the pin 72 of ball 70 with the socket 64 will force the torso to move in the direction of the shaft leg 56. The rigid mounting of the shaft leg 58, in a lateral sense, eliminates the necessity of securing a bearing plate to the torso through which the shaft leg 56 passes. In the doll disclosed in our aforementioned co-pending application Ser. No. 866,953 it was necessary to utilize such a bearing plate.

The necessity of using the ball and socket arrangement with the split shaft sections 56 and 58 is apparent from FIG. 6. Thus, as seen therein, it would not be possible to utilize a rigid shaft completely within torso shell 44 since such a shaft would abut the neck 62 which projects at an angle to the remainder of the torso shell. Accordingly, a flexible shaft is necessary, and such a shaft is provided through the use of legs 56 and 58 and the ball and socket arrangement. Thus, the ball 70 will swivel within the socket formed from hemispheres 64. The spacing of the hemispheres as shown in FIG. 5, permits this swiveling movement. The use of the pin 72 insures rotation of shaft leg 58 by shaft leg 56.

The necessity of rotating shaft leg 58 resides in the fact that the doll of this invention also embodies a gyrating head movement at the same time the torso is gyrating. This is accomplished by the rotation of shaft leg 60 within cylinder 74. As is apparent from FIGS. 1 to 4, the head 24 always projects at an angle, and in the opposite direction to the inclination of the torso. This is accomplished by offsetting shaft section 60 in a direction opposite to shaft sections 56 and 58, as is apparent from FIG. 5. Thus, the head 24 will also gyrate through a conical path.

It should be understood that the axis **34** of the doll (FIG. **1** to **4**) coincides with the axis of the shaft **52**. It can therefore be seen that the axis **34**, as shown in FIGS. **1** to **4**, follows the axis of the shaft. Thus, shaft portion **60** corresponds to axis portion **38**. Similarly, axis portion **40** corresponds to shaft leg **56**, and axis portion **36** corresponds to shaft portion **54**.

The function of the pin **88** projecting from the head cylinder **74** is to prevent the rotation of the head **24** when the shaft section **60** is rotating. Thus, although the head will follow a conical path, it will always be facing forward, as is apparent from FIGS. **1** to **4**. This is accomplished because the pin **88** rides back and forth in slot **94** (FIG. **8**) as the head is gyrated.

The gyrating movement of the torso is also limited to the extent that the torso will always face forward, as is apparent from FIGS. **1** to **4**. This is accomplished through the engagement of screw **132** in slot **156** (FIG. **6**). Thus as the torso is gyrated through the rotation of shaft sections **56** and **58**, the screw **132** will ride back and forth in slot **156**. However, rotational movement of the torso **44** will be prevented by the engagement of the screw in the slot.

While the torso and head are gyrating, the arms **26** and **28** are alternately raised and lowered, as is apparent from FIGS. **1** to **4**. This is accomplished because the bars **104** are alternately raised and lowered vertically with respect to upper torso section **44** by the engagement of the hooks **108** in the plate **150** and the gyration of the torso. Thus, for instance, when the shaft section **56** is in the position shown in FIG. **5**, the bar **104** pivotally linked to cylinder **96** on which the left arm **28** is mounted, will rotate cylinder **96** upwardly. This will in turn cause the rotation of the arm **28** upwardly, as seen in FIG. **1**. When the rotation of the shaft is continued another 90° the left arm **28** will be slightly lowered and the right arm **26** will be raised, as is apparent from FIG. **4**.

The rotation of the shaft an additional 90° will lower arm **28** and maintain arm **26** in a rest position, as seen in FIG. **2**. Rotating the shaft another 90° will again raise both arms, as seen in FIG. **3**.

It is thus seen that with the rotation of the shaft pressure is alternately brought to bear and released from the bars **104**, thereby pivoting the cylinders **96** around the axles formed from flanges **110** on U-shaped rod **108**. The bars **154** (FIG. **7**) provide a bearing surface for the top leg of the hooks **107** and the under surface of the plate **150** provides a bearing surface for the lower legs of the hooks **107**.

The torso, legs, arms and head of the doll can be formed from any of the plastics known to the doll art. Resilient plastics can be used which have the feel of human skin. Various wardrobes can also be provided for the doll, as is well known to the art.

It is thus seen that the doll of this invention will simulate the motions of a dancer. The torso will gyrate, the head will gyrate and the arms will be alternately raised and lowered during the operation of the doll. The legs remain fixed in their position shown in FIGS. **1** to **4** by the engagement of the pins **176** in holes in block **170**.

Without further elaboration, the foregoing will so fully illustrate our invention, that others may, by applying current or future knowledge, readily adapt the same for use under various conditions of service.

What is claimed as the invention is:

1. An animated doll comprising a torso and a head, said torso comprising a lower torso portion and an upper torso portion, a shaft, said shaft including a lower portion, a central portion which is angularly offset relative to said lower portion, and an upper portion angularly offset relative to said central portion, said lower portion of said shaft being rotatably mounted in the lower portion of said torso, said central portion of said shaft being rotatably mounted in the upper portion of said torso and said upper portion of said shaft being rotatably mounted in said head, means to rotate said shaft, thereby causing said upper portion of said torso and said head to gyrate, said upper portion of said torso including a neck, said neck projecting angularly with respect to a vertical axis through said torso, and said central portion of said shaft comprises an upper leg in said neck and a lower leg, said upper and lower legs being flexibly connected by universal joint means.

2. The doll of claim **1** wherein said upper leg includes a ball at the bottom thereof and said lower leg includes a socket formed at the top thereof, said ball and socket comprising said universal joint means said socket being formed from a pair of spaced hemispheres, said ball having a pin projecting therethrough and through the space between said hemispheres with sufficient clearance between said pin and hemispheres, whereby said ball can swivel in said socket, and whereby said upper leg is rotated by said lower leg by the contacting of said pin by said hemispheres.

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