United States Patent

[11] 3,583,098

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[73] Assignee **Mattel, Inc.**
Hawthrone, Calif.

[54] **DANCING WALKING DOLL**
19 Claims, 13 Drawing Figs.

[52] **U.S. Cl.** **46/247,** 46/119, 46/121
[51] **Int. Cl.** **A63h 33/26**
[50] **Field of Search** ..... 46/245, 247, 119—121, 136, 149, 150

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Assistant Examiner—Robert F. Cutting
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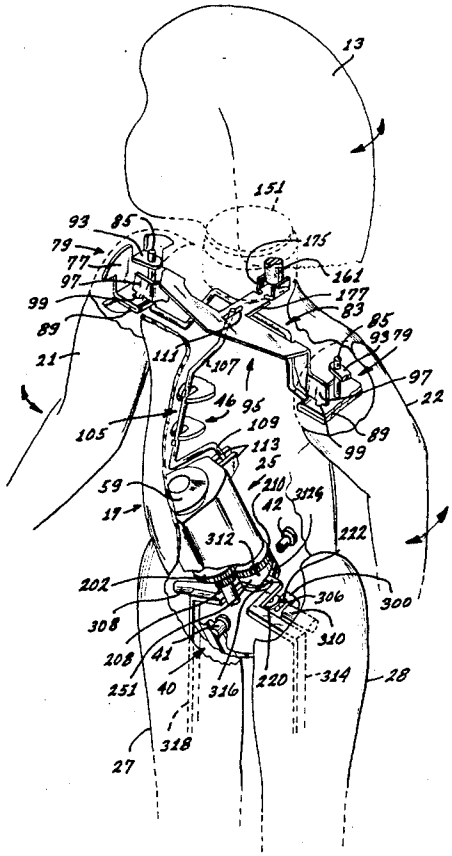
ABSTRACT: A doll which can walk forward while swinging its arms, and head or can dance in place with its arms and head swinging like a go-go dancer. The doll includes a driving unit within the doll torso which oscillates to sway the torso from side to side, and which pivots the legs back and forth to take a step at each oscillation. A linkage couples the driving unit to the arms so that the unit also pivots the arms and head as it oscillates within the torso. Switching from the walking mode to the dancing mode is accomplished by merely operating a switch to reverse the motor in the driving unit.



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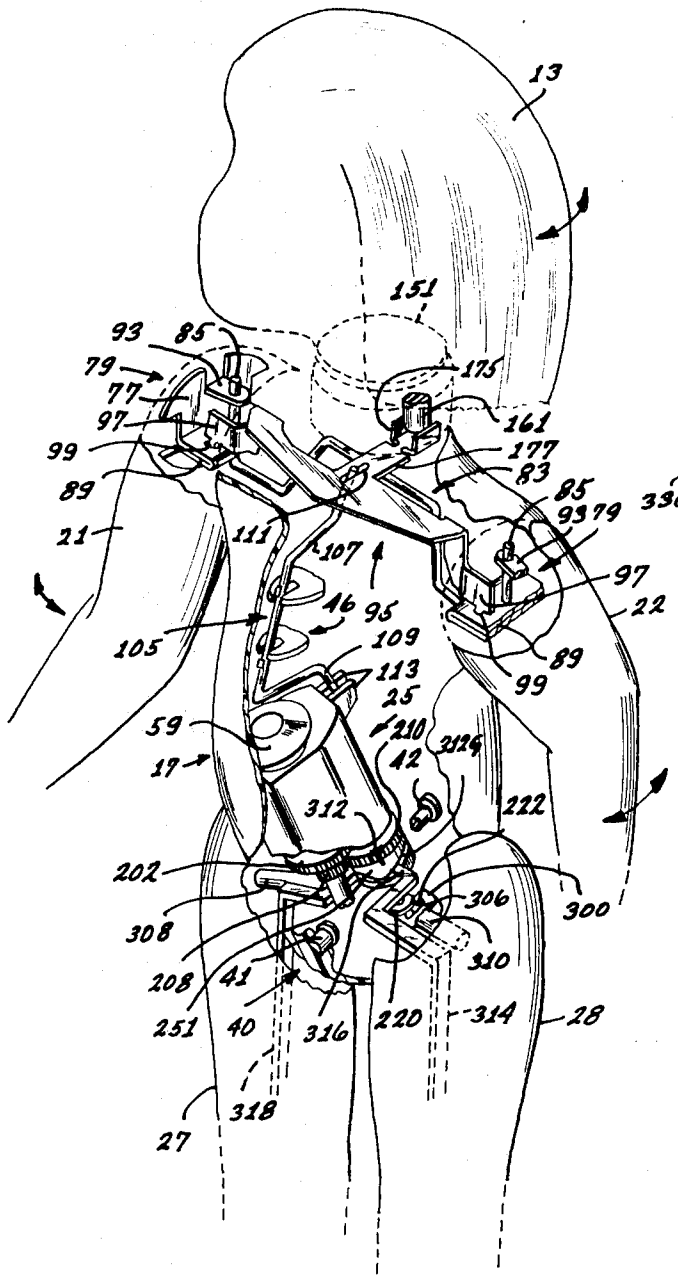

Fig. 1

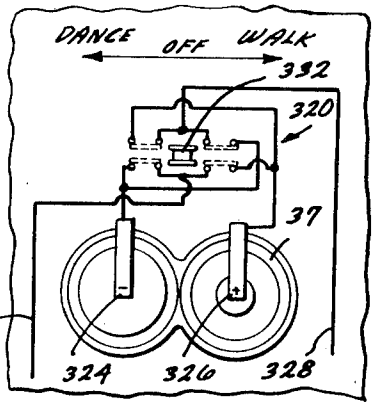

Fig. 1A

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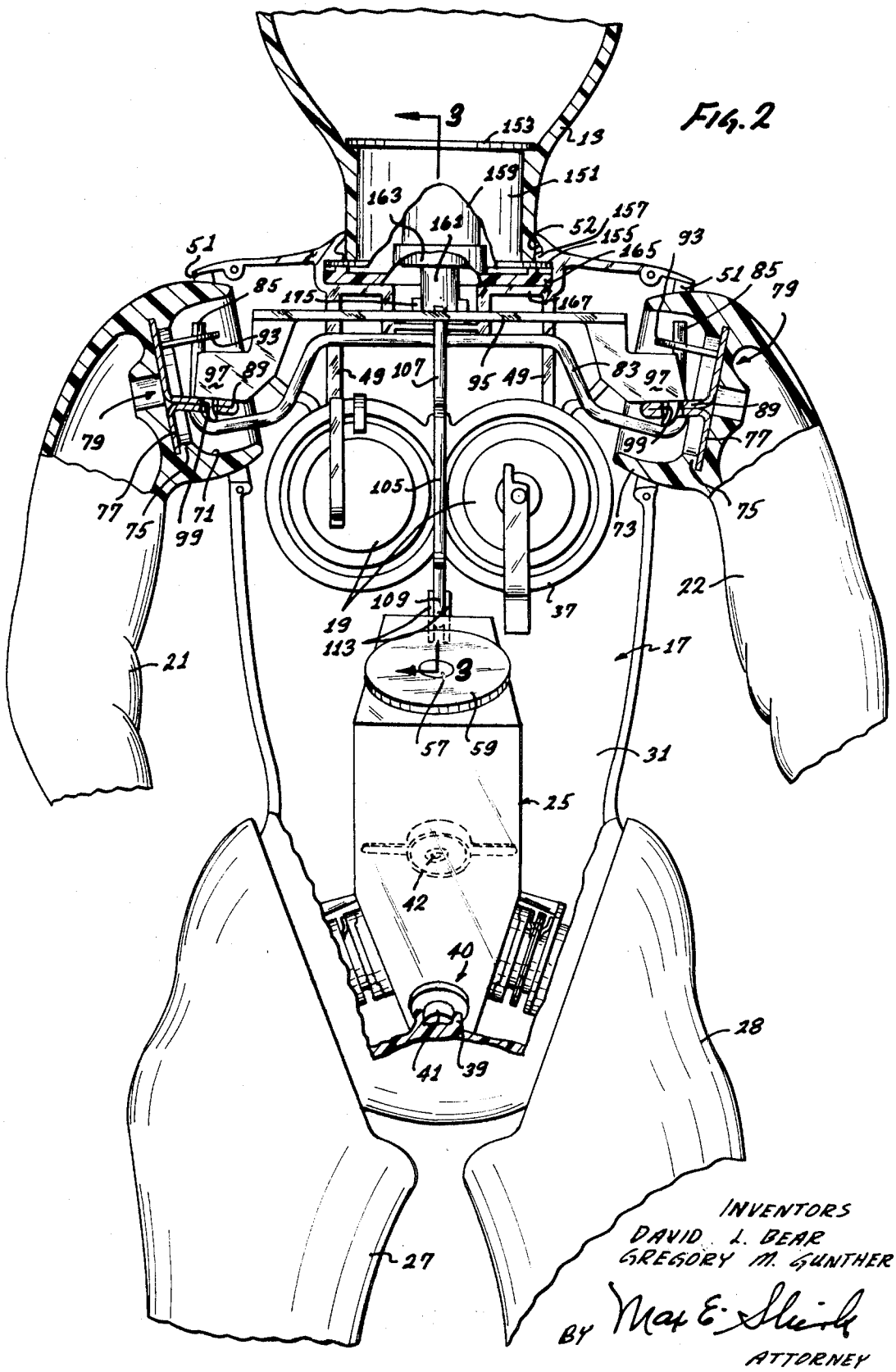

Fig. 2

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Fig. 3

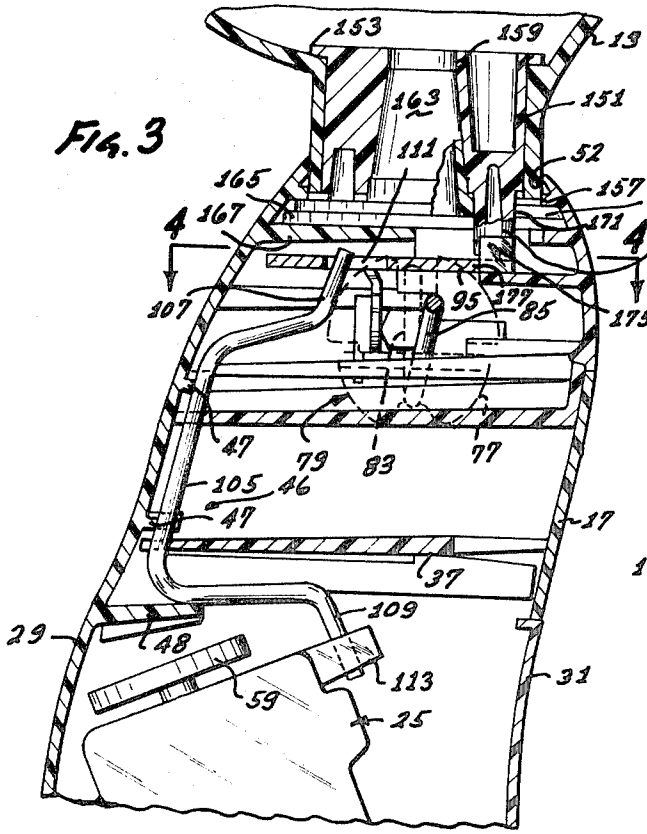


Fig. 7

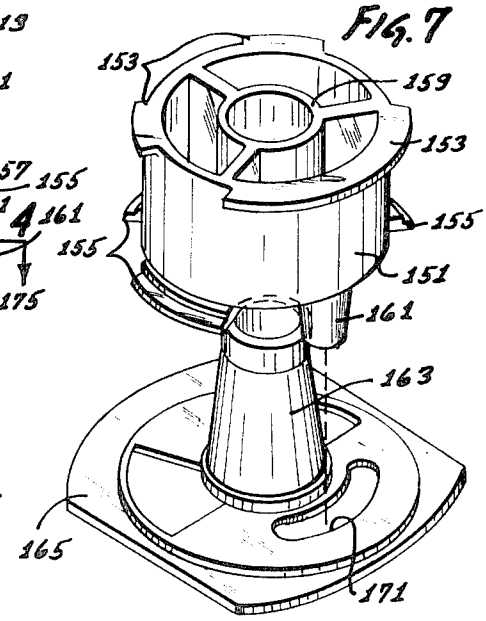
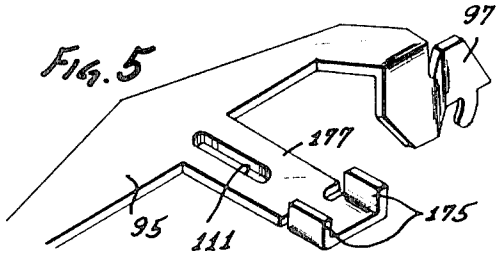


Fig. 5



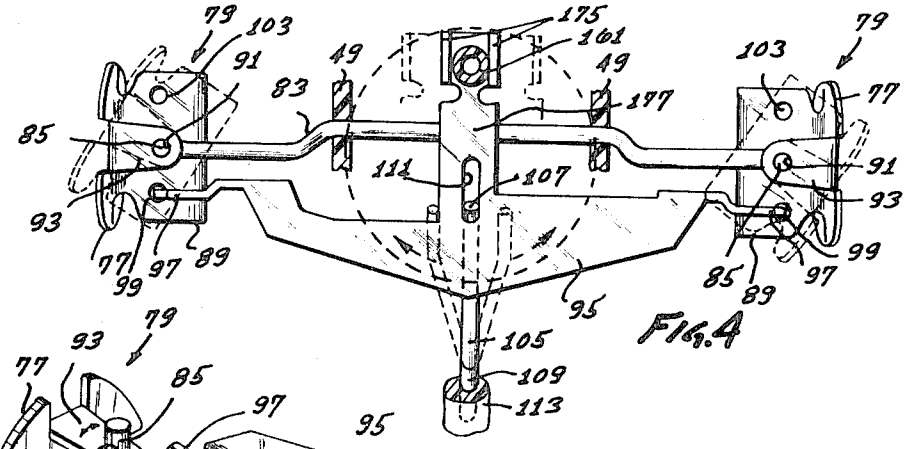


Fig. 4

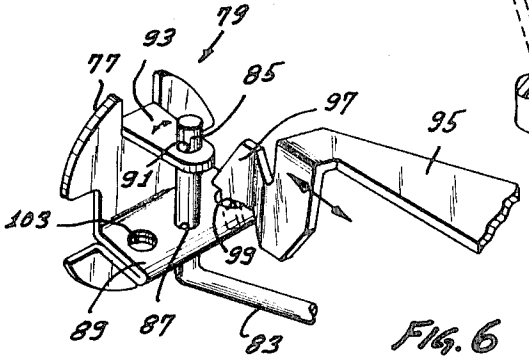


Fig. 6

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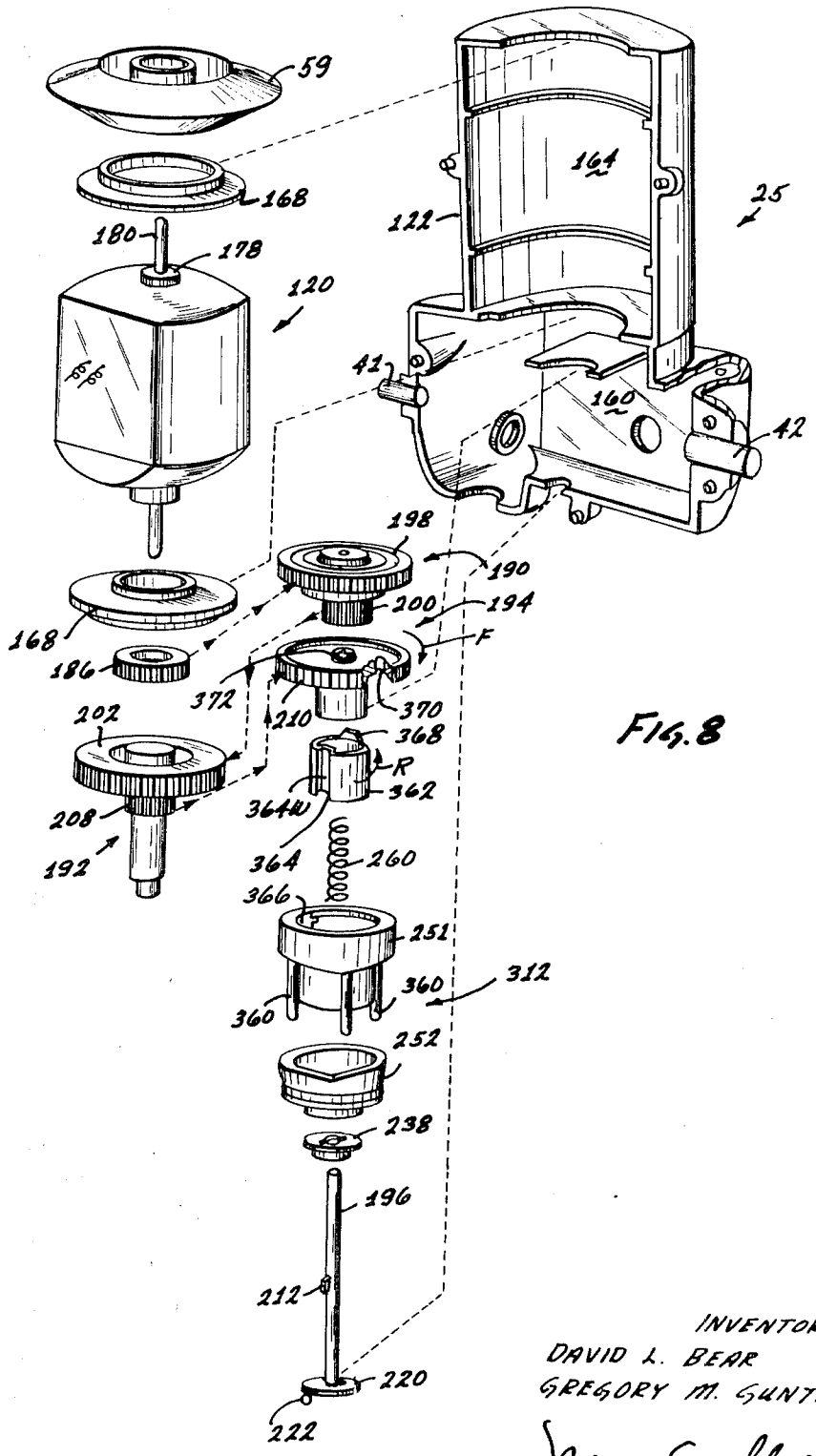

Fig. 8

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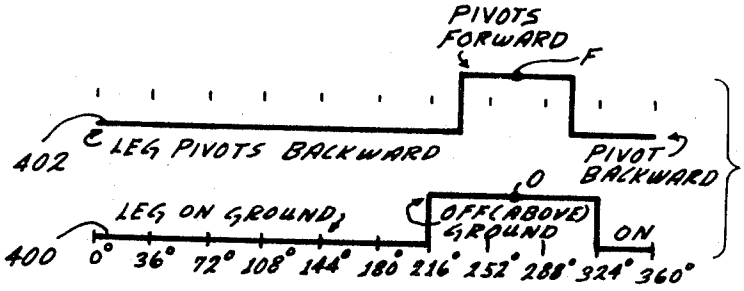

FIG. 9

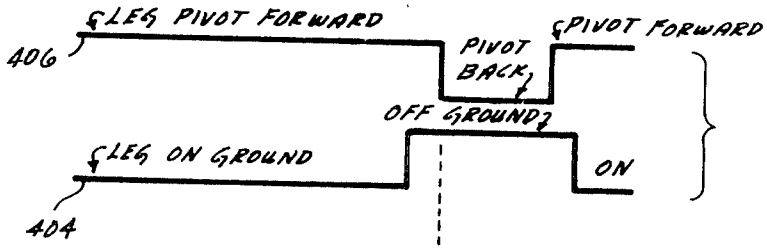

FIG. 10

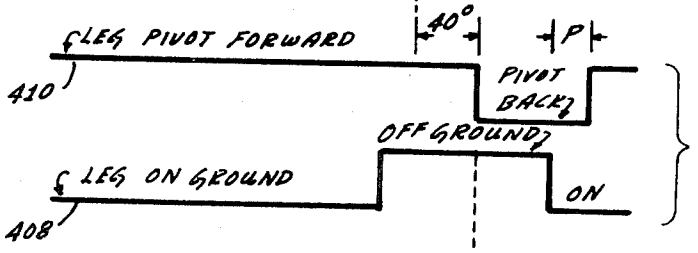

FIG. 11

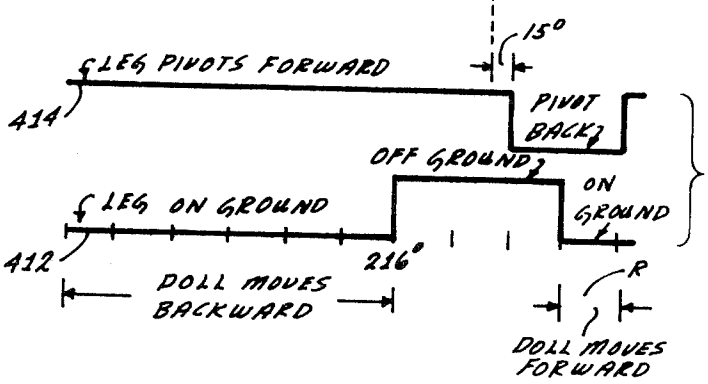

FIG. 12

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DANCING WALKING DOLL

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to dolls, and more particularly to an improved walking doll.

2. Description of the Prior Art

The toy industry has made many attempts to create dolls that walk in a manner simulating the motion of people. Finally, a walking doll was invented which accomplished this to a considerable degree, and U.S. Pat. No. 3,267,608, assigned to the assignee of the present application, was granted.

The aforementioned patent describes a walking doll with a driving unit within the torso which oscillates toward either side of the torso, to rock the torso from side to side so that the legs are alternately lifted off the ground. The legs of the doll are pivotally mounted on the unit, and are driven to pivot back and forth in synchronism with the torso swaying, to cause the doll to walk forward. The rocking motion produces leg and torso motion simulating that of a person, particularly a small child who is just learning to walk. Additional body motions could, if properly synchronized, make the doll movement more natural. Furthermore, the leg and torso movement, plus any other added motions, could provide highly entertaining dancing or wiggling motions if properly synchronized for this function. However, any such additional motions must be produced with a relatively simple mechanism in order that the parts can fit into the limited space available, and to permit the doll to be produced at moderate cost.

OBJECTS AND SUMMARY OF THE INVENTION

An object of the present invention is to provide a walking doll of minimum complexity, whose arms and/or head, as well as its torso and legs, move in a natural manner.

Another object is to provide a doll of minimum complexity which can dance in an entertaining manner as well as walk in a natural manner.

In accordance with the present invention, an improved walking doll is provided, of the type which includes a drive unit for oscillating the torso while the legs pivot back and forth to take steps. The doll includes apparatus for coupling the drive unit to the arms and/or head to pivot them back and forth in synchronism with torso and leg movements, in a manner that produces a walking motion of even more natural appearance. The apparatus can be constructed so that, when it runs in reverse, the doll lifts its legs and rocks from side to side without walking, this motion plus pivoting of the arms and/or head producing an entertaining motion which appears like a toddler imitating a go-go dancer. A reversing switch can be included to allow a child to readily switch between the walking and dancing modes of operation.

In one embodiment of the invention, the arms and head are pivotally connected to the torso. A crank pivotally mounted on the torso has one end engaged with the housing of the drive unit, which oscillates within the torso, and an opposite end coupled to the arms and head. As the drive unit housing oscillates from side to side within the torso, the crank pivots the arms so they oscillate in synchronism with the walking movements of the doll. This produces a livelier walking motion.

The drive unit is connected to the legs to pivot them back and forth. When the doll operates in a walking mode, each leg pivots forward after it lifts off the ground and the torso has swayed to the opposite side, and pivots back after the torso sways to its side, thereby causing the doll to advance in a forward direction. A reversing switch is provided that runs the oscillating mechanism in the reverse direction for the dancing mode. Reverse operation could cause backward stepping instead of stepping in place. However, stepping in place is desired instead of backward walking, to produce a dancing effect. Stepping substantially in place is generally assured by a slight phase change between torso oscillating and leg pivoting during reverse operation. This is achieved by employing a loose or large backlash coupling in the driving train.

The novel features of the invention are set forth with particularity in the appended claims. The invention will be best understood from the following description when read in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective sectional view of an arm swinging, walking and dancing doll constructed in accordance with the invention;

FIG. 1A is a partial rear view of the doll of FIG. 1, showing the reversing switch thereof;

FIG. 2 is a partial, front cross-sectional view of the doll of FIG. 1;

FIG. 3 is a partial, cross-sectional view taken along the lines 3–3 of FIG. 2;

FIG 4 is a sectional plan view taken on the lines 4–4 of FIG. 3;

FIG. 5 is a partial, perspective view of the cross link of the linkage arrangement of FIG. 4;

FIG. 6 is a partial perspective view of the linkage arrangement of FIG. 4;

FIG. 7 is an enlarged, perspective view of the pivoting neck arrangement shown in FIGS. 2 and 3;

FIG. 8 is an exploded view of the drive unit of the apparatus of FIG. 2;

FIG. 9 is a graph showing the relationship between pivoting of a leg and the periods of its contact with the ground, during a cycle of operation when the doll walks forward;

FIG. 10 is a graph similar to that of FIG. 9, but with the motor reversed and assuming no backlash in the transmission;

FIG. 11 is a graph similar to that of FIG. 10, but taking into account a typical amount of backlash; and

FIG. 12 is a graph similar to that of FIG. 11, wherein additional backlash has been added to produce a mode more closely resembling dancing.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

As shown in FIG. 1, the doll comprises a torso **17**, a pair of legs **27**, **28**, a pair of arms **21**, **22** and a head **13**. The legs are pivotally supported on an electric motor drive unit **25** that lies within the torso. The drive unit **25** oscillates the torso to sway it from side to side relative to the unit and the legs to pivot them back and forth. The leg pivoting is synchronized with the swaying of the torso, so that each leg pivots forward after it lifts off the ground and the torso has swayed to the opposite side. When the torso sways back over the leg so that the leg is supporting it, the leg pivots backward to advance the doll by a step. In this way, the doll takes steps as it sways from side to side, to walk like a small child.

The drive unit **25** is pivotally mounted on the torso housing by fore-and-aft bearings **40**, **42**, so the unit can pivot relative to the torso. Swaying of the torso relative to the drive unit is accomplished by a torso-engaging member on the drive unit that pushes from side to side against a slotted torso bracket **300** that is fixed to the torso housing. The torso-engaging member is a ball **222** mounted near the periphery of a wheel **220**, and the ball being engaged with a slot **306** on the torso bracket. As the wheel **220** is rotated by the motor in the drive unit **25**, the ball **222** forces the unit to oscillate about the bearings **40**,**42**.

The legs are pivotally mounted on leg shafts **308**, **310** that project from opposite sides of the drive unit. Pivoting of the legs is performed by a cam **312** with a cam groove **312G**, the cam being rotated by the motor in the drive unit. The left leg **28** has an armature **314** with one end fixed to the leg housing and the other end forming a cam follower **316** that is engaged with the cam groove **312G**. The right leg **27** is similarly constructed, with an armature **318** having a cam follower thereon engaged with the cam groove. As the cam **312** rotates, it moves the cam followers up and down, thereby causing the leg

armatures to pivot the legs back and forth about the leg shafts **308, 310**. The cam **312** rotates at the same speed as the wheel **304** that oscillates the torso, and they are synchronized to cause doll walking when the motor within the drive unit rotates in a forward direction.

As the doll walks, the arms **21, 22** and head **13** pivot, to create a more interesting and natural doll movement. The driving power for arm and head movement is obtained from the same drive unit **25** used to oscillate the torso and pivot the legs, and is transmitted to the arms and head through a drive crank linking means **105**. The crank is pivotally mounted on the torso housing the by several bearing portions **46** formed in the torso housing. The lower end **109** of the crank is engaged between a pair of ears **113** on the drive unit. As the drive unit pivots within the torso, the ears push the lower end of the crank from side to side to oscillate it. The opposite upper end **107** of the crank is engaged with a cross link member **95** that is coupled to the arms and head to pivot them.

An arm support member **83**, which is fixed to the torso housing, serves to pivotally support the arms on the torso. The arm support member has vertically extending ends **85**, and the inner end of each arm **21, 22** is pivotally supported on these ends. The cross link **95** has end portions **97** which are also engaged with the inner ends of the arms. As the crank **105** pivots, it shifts the cross link **95** from side to side, causing the end portions **97** of the cross link to pivot the arms about the support member ends **85**.

The head **13** has a neck plug **151** which is pivotally mounted on the torso housing, to permit turning of the head relative to the torso. A rearwardly extending arm **177** of the cross link **95** is pivotally engaged with a pin **161** on the neck plug. As the cross link shifts from side to side, it pivots the neck plug to turn the head so it faces from side to side. Thus, the drive unit is coupled to the legs, torso, arms, and head so as to move all of them in a manner producing an entertaining walking motion.

The doll walks forward only when the motor in the drive unit **25** is turning in a forward direction. If the motor is driven backwards, the doll generally does not walk either forward or backward, but primarily steps in place. When combined with the rhythmic back and forth arm swinging and head turning, the stepping-in-place operation produces a motion somewhat simulating the dancing of a go-go dancer. The overall effect of the swaying and arm swinging motion of the doll, is that of a young child imitating a go-go dancer.

In order to permit a more rapid change between walking and dancing modes of operation, a reversing switch **320**, shown in schematic form in FIG. **1A**, is included to reverse the direction of rotation of the drive unit motor. The motor is driven by a pair of batteries which are received in a battery case shown at **37** with the cover removed. A pair of battery case terminals **324, 326** can be connected to leads **328, 330** from the motor in the drive unit, to power the doll. When a switch knob **332** is moved to the right to the "walk" position, the battery terminal **324, 326** are connected to the motor leads **328, 330**, respectively, to drive the motor in the forward direction. When the switch knob is moved to the left to the "dance" position, a reverse of connections occurs and the motor runs backward. At an inbetween "off" position, the switch does not connect the battery and motor leads, and the motor is not energized. Thus, by merely operating the switch **320**, the doll can be made to walk, dance, or stop.

FIGS. **2—8** illustrate the doll in greater detail. As shown in FIGS. **2** and **3**, the torso housing **17** has a front wall **29** and rear wall **31**, the rear wall forming the battery case **37** for housing a pair of batteries **19**. The female part of the bearings **40, 42** which pivotally support the drive unit are formed in a lower part of the torso housing by bosses **39** with bearing holes, to engage the male part or pins **41** on the drive unit. The front torso housing wall has bearing portions **46** formed thereon that pivotally support the drive crank **105**, the bearing portions including retaining ears **47** and a support porch **48**. Also formed in the torso housing near the top thereof, are brackets **49** that hold the arm support member **83** which pivotally supports the arms. The torso housing is also provided with arm-receiving apertures **51**, a neck aperture **52**, and leg-receiving apertures (not shown).

As described above, and shown in detail in FIG. **4**, each arm is pivotally supported on an end of the arm support member **83**, and is driven to pivot about its pivot point by the cross link **95**. In order to couple the arms to the support member and cross link, each arm is provided with an arm plug **79** that lies in a recess **71** (shown in FIG. **2**) in the arm and is retained by a lip portion **75** that has been forced over to hold a flange portion **77** of the arm plug. As shown in the rear perspective view of FIG. **6**, the plug has lower and upper tabs **89, 93** with apertures **87, 91** for receiving an outwardly extending end **85** of the arm support member **83**. The arm support member **83**, which is rigidly held by the torso housing brackets **49**, therefore pivotally supports the arms in a swinging motion about substantially vertical axes.

As best illustrated in FIG. **4**, the cross link **95** which drives the arms in pivoting motion, is driven from side to side by the upper end **107** of the crank, which engages a slot **111** in the link. The ends **97** of the link are coupled to the arms by engagement with the arm plugs **79**. Each end **97** of the link has a hook portion that projects through an aperture **99** in the lower tab **89** of an arm plug. As the cross link **95** is oscillated from side to side within the torso, it pushes and pulls on the arm plugs to pivot the arms. Both ends **97** of the cross link engage the forward parts of the arm plugs, so that the arms pivot in opposite directions. This helps retain the doll's balance and simulates the usual manner of arm motion in twist-type dancing. It may be noted that the arm plugs have additional holes **103** which are not used, these being provided so that identical plugs can be used for the right and left arms to simplify manufacturing. It may also be noted that the cross link which drives the arm plugs, is supported by the plugs.

As shown in FIG. **2**, the head housing of the doll is fixed to the neck plug **151** which extends down through the neck aperture **52** of the torso. FIG. **7** shows the neck plug **151** which is pivotally supported on the torso by a pivot plate **165** in the torso housing, the plate having an upwardly extending shaft **163** that is received in a bearing aperture **159** at the center of the neck plug. The plate is supported on the torso housing by a projection **167** formed in the housing.

The neck plug is driven to oscillate about its axis of pivoting by the arm **177** of the cross link. As shown in FIG. **5**, the arm has a pair of tabs **175** at its outer end that engage a drive pin **161** which is fixed to the neck plug. As the cross link oscillates from side to side, the tabs push the pin **161** from side to side to pivot the neck plug about the shaft **163**. The drive pin **161** which couples the neck plug to the arm, extends through a slot **171** in the pivot plate, the slot being wide enough to allow the pin to oscillate freely.

The neck plug **151** is retained in the head by upper flanges **153** of the plug that lie within the head, and which engage slots (not shown) in the head to prevent relative rotation of the head and plug. The plug also has lower flanges **155** which are retained in the torso by lips **157** on the torso housing. The lips are positioned for loose engagement with the neck plug, so the head can turn freely on the torso.

FIG. **8** shows the details of construction of the drive unit **25**. The unit includes an electric motor **120** mounted on rubber grommets **168** within an upper portion **164** of a frame or housing **122**, the motor having an armature shaft **178** which extends from opposite ends thereof. One end **180** of the motor shaft carries the fly wheel **59**, while the opposite end carries a driving gear **186**. The driving gear **186** drives a gear reduction system which includes first, second, and third gear assemblies **190, 192** and **914**, respectively, all located within a lower housing chamber **160** of the drive unit. In detail, power is transmitted from motor shaft **178** through the following order of elements: gear **186**, gear **198**, gear **200**, gear **202**, gear **208**, and gear **210**. The gear train is designed to obtain a speed of the third gear assembly **194** and gear **210** thereon in the range

of 80 to 120 r.p.m., and to provide rotation in the forward direction indicated by arrow F during the walking mode.

The third gear assembly 194 drives the cam 312, which pivots the legs back and forth, through a clutch member 362. The clutch member has a protuberance 368 which engages a hole 370 in the third gear assembly, and the clutch member has a slot 364 which engages a lug 366 on a half part 251 of the cam. The cam is formed by two cam half parts 251 and 252, which are held together by pins 360 to form the cam groove. The cam 312 rotates at the same speed as the third gear assembly 194, to drive the legs in back and forth pivoting motion. The projection 368 of clutch member 362 is maintained in engagement with the walls of hole 370 by a spring 260, but if the leg imposes too great a load, the clutch can slip. After one cycle however, the protuberance 368 again falls into hole 370 to resume attempting to pivot the legs.

The third gear assembly 194 also drives the torso pivoting wheel 220 with the ball 222 thereon, which pivots the drive unit from side to side within the housing. The wheel is fixed to a shaft 196 which extends through a cam support bearing 238, the cam 312, and the clutch member 362. The shaft has a key 212 that engages a slot 372 on the third gear assembly 194, to enable the gear assembly 194 to drive the wheel 220. Thus, the wheel 220 and the ball thereon which engages a bracket 300 on the torso (shown in FIG. 1) to oscillate the drive unit relative to the torso, rotates at the same speed as the leg-pivoting cam 312. The ball 222 is fastened at a position on the wheel to obtain the proper phase relationship between torso pivoting and leg pivoting for proper doll walking.

In previous walking dolls similar to the type described above, but without arm or head pivoting, it was found that the doll would not walk either forward or backward when the motor was reversed, but would merely step in place. However, with the inclusion of the arm- and head-pivoting features of the type described herein plus various minor alterations found necessary to make the doll walk forward properly, it was found that the doll tended to walk backwards when the motor turned in the reverse direction, although it walked backwards badly. Such backward walking can be undesirable in a go-go dancing doll, which preferably substantially steps in place. It has been found, however, that a shift in the phase relationship between torso oscillation and leg pivoting during reverse operation substantially eliminates backward walking.

The slight phase shift between rotation of the leg-pivoting cam 312 and rotation of the torso-oscillating wheel 220 required to prevent backward walking, is achieved by widening the slot 364 in the clutch element 362 to provide substantial backlash between the clutch element and cam. The widening is accomplished at the wall 364W of the slot, so that when the clutch element turns in the reverse direction of arrow R, there is a phase lag on the order of 15° before the wall 364W engages the lug 366 in the cam to drive the cam in the reverse direction. The coupling between the slot 372 in the third gear assembly and the key 212 on the wheel shaft is much tighter, there being only several degrees play or backlash between them. Thus, the transmission means between the motor and leg-pivoting cam gains more backlash than the transmission means between the motor and torso-oscillating wheel. The loose coupling provided by the clutch member slot 364 causes the leg-pivoting cam 312 to lag by about 15° behind the torso-oscillating wheel 220, in addition to the lag which would occur without widening of the slot wall, which prevents backward doll walking in the dancing mode of operation.

In order for the doll to walk forward properly, each leg must pivot backward when it is on the ground to propel the doll ahead, and conversely, each leg must pivot forward when it is off the ground to return the leg to a forward position. The phase relationship required for proper forward walking is shown in FIG. 9 wherein graph 400 shows the level of a leg with respect to the ground during a cycle of operation, and graph 402 shows the forward and backward pivoting or stepping of the same leg with respect to the doll body during corresponding times in the cycle. It should be understood that the graphs of FIG. 9 are only rough approximations to the actual operating cycle. Also, when it is stated that a leg is on the ground, this indicates that the doll weight has been shifted to that leg in an amount that tends to prevent moving of that leg with respect to the ground.

The graph 400 shows that the leg is on the ground for about seven-tenths of a cycle, while it is off the ground for about three-tenths cycle. Graph 402 shows that the leg pivots backward for about eight-tenths cycle while it pivots forward for about two-tenths cycle. It can be seen that at all times when the leg is on the ground, the leg pivots backwards to propel the doll ahead. Forward leg pivoting occurs while the doll leg is off the ground, to return the leg to the forward position. In order to allow good forward walking with maximum production tolerances, the center point F of forward leg pivoting coincides with the center point O of the period when the leg is off the ground.

If the motor were reversed, but there were no backlash in the transmission, the operation of the doll would be as shown on graphs 404 and 406 of FIG. 10. In this case, forward leg pivoting with respect to the doll body occurs when the leg is on the ground. The result of this is that the doll would walk backward.

Actually, when the motor is reversed, but no extra 15° phase shift is introduced (i.e. the walls of clutch member 362 are not widened), the relationship between leg pivoting and contact with the ground is as shown in FIG. 11. FIG. 11 is identical to FIG. 10 except that there is a 40° phase lag of leg pivoting. This is believed due primarily to large clearance of the leg-pivoting cam follower in the slot of cam 312, in relation to the total movement of the cam follower by the cam. This phase lag results in some backward leg pivoting occurring when the leg is on the ground, for the period P.

The situation described in the graphs of FIG. 11 starts to approach the dancing mode because the leg pivots both backward (during period P) and forward when it is on the ground, thereby moving the doll both to the front and to the rear. However, during the entire seven-tenths cycle when the leg is on the ground, it pivots forward (and moves the doll to the rear) further than it pivots back. As a result, the doll tends to walk backward, although badly.

In order to provide operation more closely representing dancing, a somewhat greater phase lag is required so that there is a longer period when the leg pivots backward while in contact with the ground (i.e. period P should be increased). This is accomplished by widening the slot in cam 364, as described above, to obtain a further phase lag. The relationship then existing between leg height above the ground and leg pivoting is illustrated by the graphs 412 and 414 of FIG. 12. During the period R when the leg pivots backward while on the ground, it tends to move the doll in a forward direction. The leg movement during this period R is rapid since the leg pivots rapidly backward when the motor is in reverse. The other leg is also on the ground during this period R and is slowly pivoting forward, so the two legs tend to pivot the doll body or torso. The doll tends to remain approximately in place, taking irregular steps and pivoting. Irregularity of movement is partly due to the fact that rapid leg pivoting while the leg is on the ground requires greater torque than slow pivoting. As a result, the clutch member 362 is likely to slip, and leg pivoting ceases until the clutch engages again at the same point of the next cycle. At the attainment of this point in the next cycle, however, the sideward position of the doll may be shifted from its position of the same point in the previous cycle, partly due to the large arm swinging. The irregular stepping and pivoting of the doll while it remains largely in place, produces an entertaining effect.

In the doll described above, the change from the forward walking mode to the dancing mode is accomplished by reversing the motor. However, the change to a dancing mode could be accomplished by other means for changing the phase relationship between leg pivoting and contact of the leg with the ground. For example, a mechanical phase shifting

mechanism could be employed which allowed the cam 312 to shift about 55° on its shaft, to result in a substantial portion of the rapid forward leg pivoting to occur while the leg is on the ground. In that case, the motor would not have to be reversed. The use of motor reversal to change to the dancing mode is desirable, however because the same switch used for on-off control can be used, instead of requiring an additional switch and connections to it.

Although particular embodiments of the invention have been described and illustrated herein, it is recognized that modifications and variations may readily occur to those skilled in the art, and consequently, it is intended that the claims be interpreted to cover such modifications and equivalents.

What we claim is:

1. In a walking doll having head, arm and leg members extending from the torso, and drive means oscillating within the torso and coupled to the leg members for oscillating them relative to the torso, the improvement comprising:
- arm-bearing means for pivotally mounting at least a first of said arm members on said torso;
- linking means coupled to said drive means for movement by said drive means as it oscillates within said torso; and
- means for coupling said linking means to said first arm member to pivot it whereby to pivot said arm member as the leg members oscillate.

2. The improvement described in claim 1 including:
- head-bearing means for pivotally supporting said head on said torso; and
- means for coupling said linking means to said head to pivot it.

3. The improvement described in claim 1 wherein:
- said drive means comprises a housing pivotally mounted on said torso and means for oscillating said housing relative to said torso; and
- said linking means comprises a member pivotally mounted on said torso and coupled to said housing of said drive means.

4. The improvement described in claim 1 wherein:
- said drive means includes a motor constructed to operate in predetermined forward and reverse directions; and
- said drive means includes means for pivoting said legs at the same rate as the oscillation of said torso and in a predetermined phase relationship when said motor operates in said forward direction, to cause forward doll walking; and including
- reversing switch means for operating said motor in said reverse direction.

5. The improvement described in claim 4 wherein:
- said drive means includes means for substantially altering the phase relationship from a reverse of said predetermined forward phase relationship, when said motor operates in said reverse direction, to prevent substantial backward walking of said doll.

6. The improvement described in claim 4 wherein:
- said drive means includes first transmission means for coupling said motor to said torso to pivot said drive unit relative to said torso, and second transmission means for coupling said motor to said legs to pivot them; and
- at least one of said transmission means includes substantially more backlash than the other, to provide a substantial change of phase relationship between torso and leg pivoting when said motor operates in said reverse direction from the relationship that would exist with zero backlash.

7. The improvement described in claim 1 wherein:
- said arm bearing means is constructed to pivotally support both of said arm members for pivoting about a substantially vertical axis when said doll is upright;
- said drive means is constructed to operate in a dancing mode wherein said doll substantially steps in place; and
- said means for coupling is connected to both of said arm members to pivot them in unison so that one pivots back while the other pivots forward, whereby to simulate a go-go dancer when said drive means operates in said dancing mode.

8. The improvement described in claim 1 wherein:
- said arm-bearing means comprises means for pivotally supporting both of said arm members on said torso;
- said linking means comprises a member pivotally mounted on said torso and having an end portion coupled to said drive means; and
- said means for coupling comprises a crossmember having opposite end portions coupled to said arm members, and a portion between said end portions which is coupled to said member which is pivotally mounted on said torso.

9. A dual mode figure toy having a walking mode and a dancing mode, comprising:
- a substantially upright torso;
- a pair of legs depending from said torso to support it on the ground;
- means for shifting the weight of said torso from one leg to the other;
- means for cyclically pivoting said legs in back and forth motion in predetermined phase relation to said weight-shifting means; and
- means for selectively altering the phase relationship between shifting of the weight of said torso between said legs and pivoting of said legs, between a first mode wherein each leg moves in substantially only one direction of pivoting during the period when the weight of said torso is on that leg, and a second mode wherein each leg pivots both back and forth during the period when the weight of said torso is on that leg.

10. The figure toy described in claim 9 including:
- a motor; and wherein
- said means for shifting and said means for pivoting comprise first and second transmission means coupled to said motor, one of said transmission means having substantially more backlash than the other; and
- said means for selectively altering the phase relationship comprise means for reversing said motor.

11. A doll comprising:
- a torso, head, and pivoted arm and leg members extending from said torso;
- drive means for oscillating said torso from side to side relative to said legs while pivoting said legs alternately in a fore-and-aft direction;
- means pivotally mounting said arm members on said torso;
- means coupling said drive means to said arms to pivot them relative to said torso;
- said drive means including means coupled to said legs and torso for pivoting said legs in a predetermined phase relationship with respect to oscillations of said torso to cause said doll to walk forward; and
- manually operable switch means for altering said phase relationship so that said doll does not substantially walk forward, whereby to cause said doll to dance.

12. The doll described in claim 11 wherein:
- said drive means comprises a housing pivotally mounted within said torso and means for oscillating said housing about its axis of pivoting; and
- said means for coupling comprises a crank member pivotally mounted on said torso and having a first end coupled to said housing of said drive means and a second end, and a crossmember having opposite ends coupled to said arm members and a portion between said opposite ends which is coupled to said second end of said crank member.

13. The doll described in claim 11 wherein:
- said drive means includes an electrically energizable motor for running in forward and reverse directions; and
- said switch means comprises means for connecting said motor to a current source to energize it selectively to run in said forward and reverse directions.

14. The doll described in claim 13 wherein:

said means coupled to said legs and torso comprises first and second transmission means coupled to said legs and torso, respectively, one of said transmission means having substantially more backlash than the other.

15. A self-propellable, self-supportable toy figure comprising:

a torso having a pair of legs appended thereto;

first means coupled to said toy figure for cyclically shifting from side to side a major portion of the supported weight of said doll alternately between one and the other of said pair of legs; and

second means coupled to said toy figure for causing each of said pair of legs to cyclically more with respect to said torso in alternate forward and backward stepping motions with respect to said torso;

said second means being constructed to phase the cyclical motions of said legs relative to said cyclic shifting of weight between said legs, so that each leg normally supports said major portion of the weight of said doll during substantial portions of both the forward and reverse stepping motions of each leg to cause the said legs during their motion to intermittently push against each other and to twist and turn said toy figure, thereby causing said toy figure to execute dancing motions.

16. The toy figure described in claim 15 wherein:

said first means include apparatus for pivotally swinging said torso from side to side with respect to said legs.

17. The toy figure described in claim 16 wherein:

said second means includes clutch means for temporarily interrupting the cyclical movements of said legs.

18. The toy figure described in claim 15 including:

third means coupled to said toy figure for cyclically rocking the figure's head; and

fourth means coupled to said toy figure for cyclically swinging the figure's arms, the cyclical movements of said third and fourth means interacting dynamically in the motions of said toy figure with the cyclical movements of said first and second means to further enhance the unpredictability of the dancing motions of said toy figure.

19. The toy figure described in claim 15 including:

manually actuable mode switching means for altering the phasing between said first and second means so that thereafter each leg is normally free of weight during a predetermined one of said forward and backward motions of said leg, whereby said toy figure is thereafter propelled in a predetermined backward or forward walking motion.