Aug. 26, 1969 R. L. MAY 3,462,875

MOVING-EYE, WALKING FIGURE TOY

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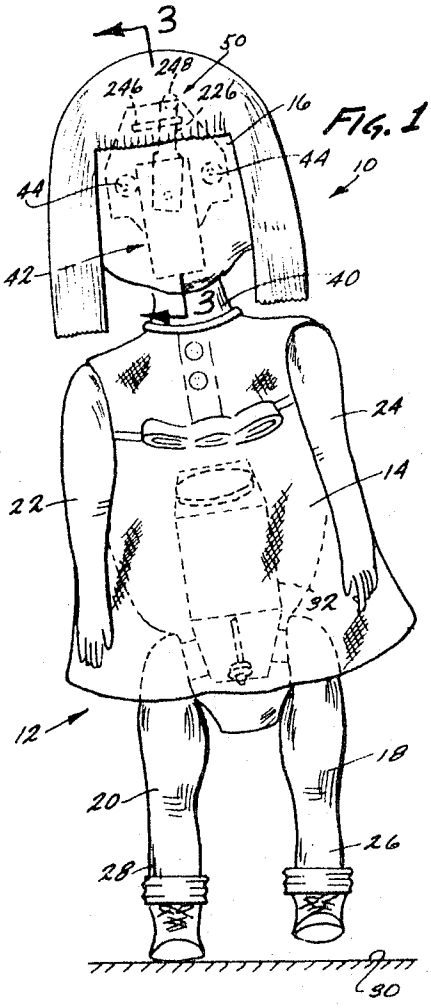


FIG. 1

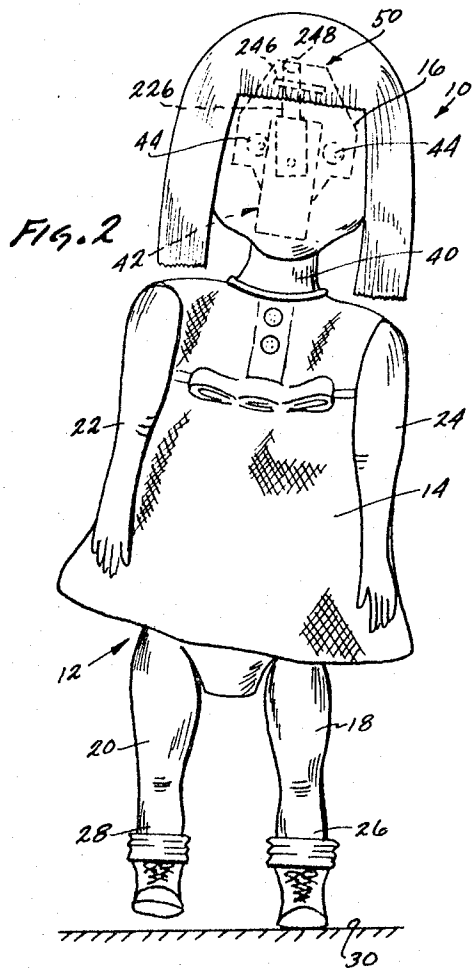


FIG. 2

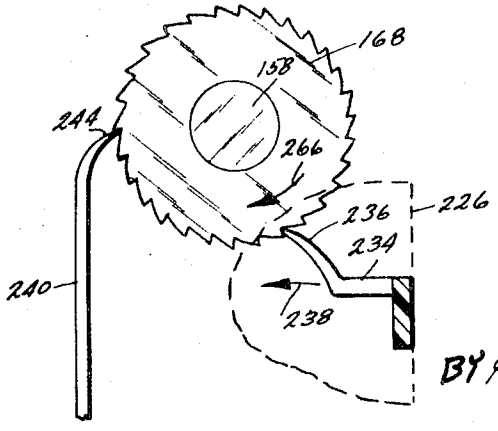


FIG. 5

INVENTOR

RICHARD L. MAY

BY Herzig, Walsh & Blackham

ATTORNEYS

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MOVING-EYE, WALKING FIGURE TOY

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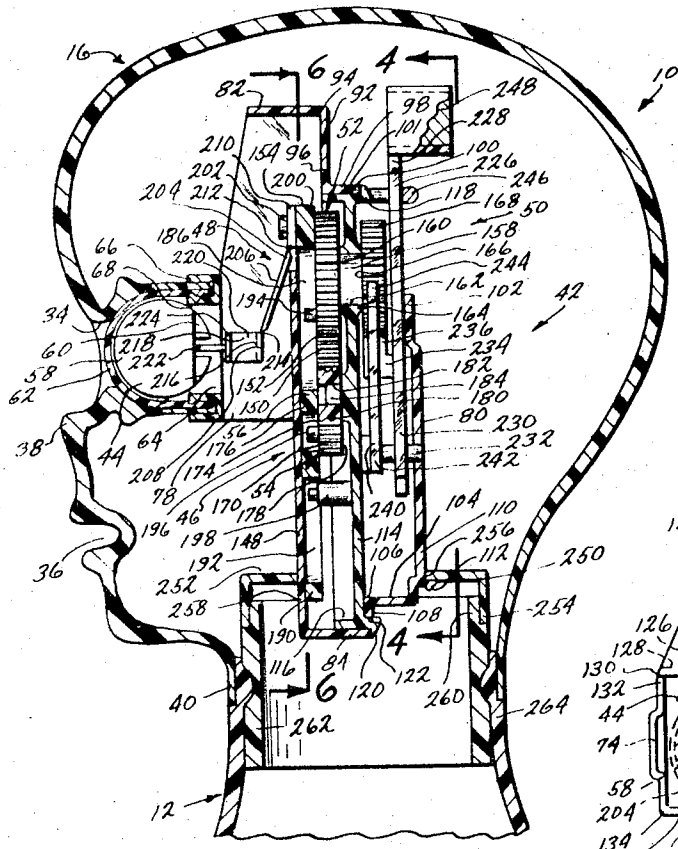


FIG. 3

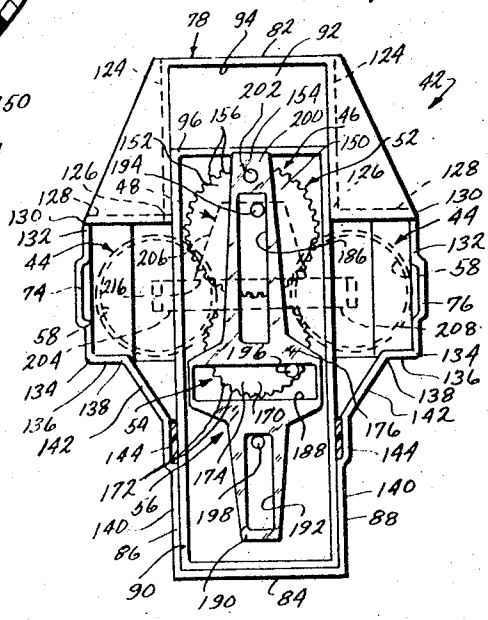


FIG. 6

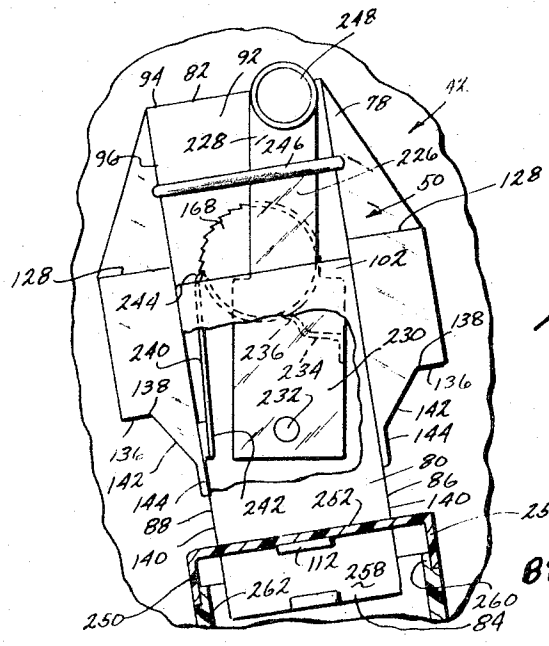


FIG. 4

INVENTOR

RICHARD L. MAY

BY Herzig, Walsh & Blackham

ATTORNEYS

Aug. 26, 1969 R. L. MAY 3,462,875

MOVING-EYE, WALKING FIGURE TOY

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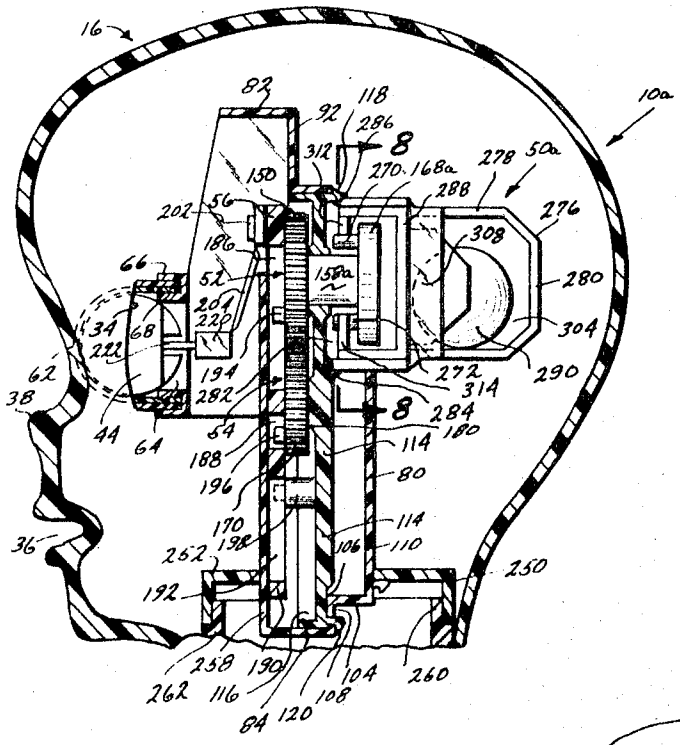


FIG. 7

FIG. 8

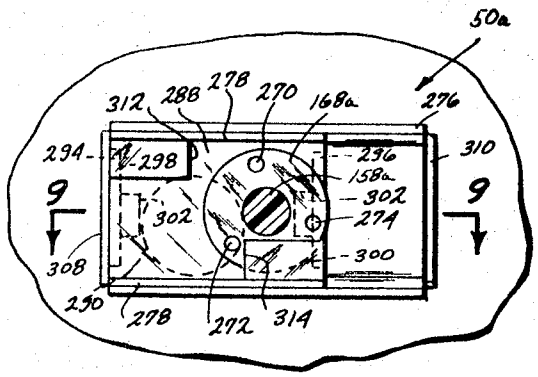
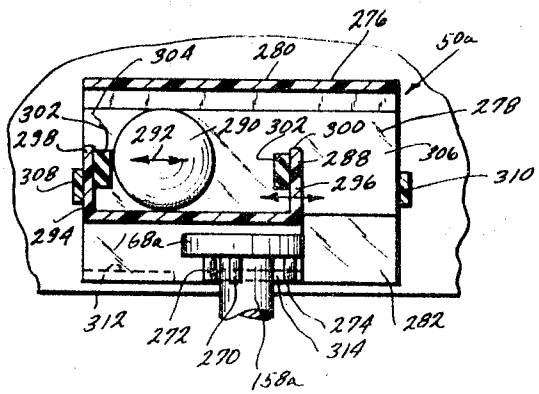


FIG. 9



INVENTOR
RICHARD L. MAY

BY Herzig, Walsh & Blackham
ATTORNEYS

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3,462,875

MOVING-EYE, WALKING FIGURE TOY

Richard L. May, Manhattan Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif., a corporation of California

Filed May 23, 1967, Ser. No. 640,525
Int. Cl. A63h 3/22, 3/40
U.S. Cl. 46—120 5 Claims

ABSTRACT OF THE DISCLOSURE

A walking doll of the type which is rocked from side-to-side is provided with eyes which are caused to move through simulated, realistic eye-sweeping movements by a driving arrangement which includes a pair of gears each imparting a different output motion to a crank pin. The crank pins are connected to the doll's eyes by a connector which combines the separate output motions of the gears into a single, composite output motion. The gears are automatically rotated when the doll is rocked during walking action by a weight moving from side-to-side in operative association with the gears.

CROSS-REFERENCE TO RELATED APPLICATION

The apparatus for simulating eye-sweeping movements in figure toys which is shown and described in the instant application for purposes of illustration, but not limitation, is also shown and described as one embodiment in copending application Ser. No. 599,569, filed Dec. 6, 1966 and assigned to the assignee of the instant application.

BACKGROUND OF THE INVENTION

The background of the invention will be set forth in two parts.

Field of the invention

The present invention pertains generally to the field of moving-eye mechanisms in figure toys and more particularly to such mechanisms in combination with walking figure toys.

Description of the prior art

Moving-eye mechanisms and walking figure toys are known in the prior art. In addition, United States Patent No. 1,764,330 discloses a so-called walking mannequin which includes a pair of eyes which may be swung about a horizontal axis by a rod driven by a crank.

The mannequin disclosed in this patent has the disadvantage that it is incapable of exhibiting realistic walking and eye movements.

SUMMARY OF THE INVENTION

In view of the foregoing factors and conditions characteristic of moving-eye mechanisms in figure toys, it is a primary object of the present invention to provide a new and useful moving-eye mechanism in combination with a walking figure toy not subject to the disadvantages enumerated above and having means for simulating realistic eye-sweeping movements in response to walking movements.

Another object of the present invention is to provide means for automatically imparting simulated, realistic, eye-sweeping movements to the eyes of a figure toy when the figure toy is caused to walk by being rocked from side-to-side.

Yet another object of the present invention is to provide a moving-eye mechanism of the type described which includes a weight-actuated, power supply means operatively associated with eyeball driving means in combination with a walking figure toy of the type which is caused to walk by being rocked from side-to-side, whereby said weight-actuated means is caused to move to-and-fro in said figure toy and thereby actuate said driving means.

According to the present invention, a walking figure toy of the type which is rocked in such a manner that the toy's feet leave the ground on successive alternate sides of the toy is provided with an apparatus for simulating realistic eye-sweeping movements which is automatically actuated by rocking of the toy.

The apparatus includes eyeball means mounted in the figure toy and drive means for driving the eyeball means through simulated, realistic eye-sweeping movements. The drive means includes a first output means having a first predetermined output motion and a second output means having a second predetermined output motion differing from the first output motion. The apparatus also includes means connecting the drive means to the eyeball means with no intervening supports of connections. The connecting means includes means for combining the first and second output motions into a single, composite output motion.

The drive means receive power from a weight-actuated power-supply means operatively associated with at least one of the output means for operating the output means during rocking of the toy. The weight-actuated means is movably mounted in the toy and moves to-and-fro when the toy is rocked for automatically operating the drive means when the toy is caused to walk.

The features of the present invention which are believed to be novel are set forth with particularity in the appended claims. The present invention, both as to its organization and manner of operation, together with further objects and advantages thereof, may best be understood by reference to the following description, taken in connection with the accompanying drawings in which like reference characters refer to like elements in the several views.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a front elevational view of a walking figure toy which includes a moving-eye mechanism constituting a first embodiment of the present invention and showing the toy after it has been rocked by its walking mechanism in such manner that the left foot has left the ground;

FIGURE 2 is a front elevational view similar to FIGURE 1, but showing the figure toy with the right foot elevated;

FIGURE 3 is an enlarged, partial cross-sectional view taken along line 3—3 of FIGURE 1;

FIGURE 4 is an enlarged, partial cross-sectional view taken along line 4—4 of FIGURE 3;

FIGURE 5 is an enlarged, partial elevational view, with parts shown in cross-section, of the portion of the moving-eye mechanism shown in broken lines in FIGURE 4;

FIGURE 6 is a partial cross-sectional view taken along line 6—6 of FIGURE 3;

FIGURE 7 is a cross-sectional view similar to FIGURE 3 showing a moving-eye mechanism constituting a second embodiment of the present invention;

FIGURE 8 is a cross-sectional view taken along line 8—8 of FIGURE 7; and

FIGURE 9 is a cross-sectional view taken along line 9—9 of FIGURE 8.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring again to the drawings and more particularly to FIGURES 1–6, a moving-eye, walking figure toy constituting a first embodiment of the present invention, generally designated **10**, includes a walking doll **12** having a torso **14**, a head **16**, a left leg **18**, a right leg **20** and a

pair of arms 22, 24. The left leg includes a ground-engaging end 26 and the right leg includes a ground-engaging end 28 defining feet means for the doll 12 causing it to walk upon a flat surface 30 when the doll 12 is rocked from side-to-side by a suitable walking means 32. The walking means 32 is indicated herein schematically and may comprise the drive means shown at 122 in FIGURE 33 of United States Patent No. 3,267,608, if desired. The walking means 32 imparts walking action to the figure toy 10 by rocking it in such a manner that the feet means 28, 26 leave the surface 30 on successive alternate sides of the toy 10, as shown in FIGURES 1 and 2. Alternatively, the walking means 32 may be of the type disclosed in Patent No. 3,168,794 wherein the doll is pulled and rocked by hand during walking action.

The head 16 includes a pair of eye sockets, like the ones shown at 34 in FIGURE 3, a mouth 36, a nose 38 and a cylindrical neck 40. An apparatus for simulating realistic, eye-sweeping movements, generally designated 42, is mounted in head 16 and includes a pair of eyeball means 44, a drive means 46, a connecting means 48 and a weight-actuated inertial power-supply means 50.

The drive means 46 includes a first output means 52 having a first predetermined output motion and a second output means 54 having a second predetermined output motion different from the first output motion.

The eyeball means 44 are connected to the drive means 46 by the connecting means 48 which includes a composite-output-motion transmitting means 56 for combining the first and second output motions into a composite-output-motion.

The eyeball means 44 each includes a hollow, subsantially hemispherically-shaped member 58 in which a pair of plates, like the one shown at 60, are mounted at right angles to each other. The eyeball means 44 are each floatingly mounted in a transparent plastic bubble 62 which is clamped into position within an associated eye socket 34 by a bridge member 64 having a pair of clamping rings, like the one shown at 66, clamping the eye sockets 34 and associated bubbles 62 together at the open ends 68 thereof. The bridge member 64 includes a pair of clips (not shown) which may be engaged in a pair of lugs 74, 76 provided on a housing 78 in which the drive means 46, connecting means 48 and power-supply means 50 are mounted.

The housing 78 includes a back or rear wall 80, a top wall 82, a bottom wall 84 and a pair of matching, spaced-apart side walls 86, 88 forming an open front 90 in the housing 78. The rear wall 80 includes an upper, substantially vertical portion 92 having an upper end 94 connected to the top wall 82 and a lower end 96 connected to a substantially horizontal portion 98 of back wall 80. The horizontal portion 98 includes an end 100 which is provided with a slot 101. The rear wall 80 also includes a portion 102 depending into engagement with a horizontal portion 104 having an end 106 from which a substantially vertical portion 108 depends. The depending portion 102 includes a lower end 110 which is provided with a lug 112. A plate member 114 is provided with a peripheral flange 116 and is maintained in position in the housing 78 by upper and lower clips 118, 120, respectively, engageable in the slot 101 and a slot 122, respectively.

Each side wall 86, 88 includes an upper, substantially vertical portion 124 having a lower end 126 from which a substantially horizontal, outwardly-extending portion 128 extends. The portions 128 each includes an outboard end 130 from which a substantially vertical portion 132 depends into engagement with an end 134 of a substantially horizontal, inwardly-extending portion 136 having an end 138 which is connected to a lower, vertical portion 140 by a downwardly and inwardly directed portion 142. Each depending portion 132 is provided with one of the previously mentioned lugs 74 for connecting the bridge member 64 to the housing 78. Each lower vertical portion 140 is provided with a lug 144 engageable by an associated clip 146 provided on a cover plate 148 for retaining the cover plate 148 in position within the housing 78. The plate 148 maintains the transmitting means 56 in sliding engagement with the first and second output means 52 and 54.

The first output means 52 comprises a large-diameter gear 150 having a front face 152 against which the upper portion 154 of the transmitting means 56 is engaged for sliding motion with respect thereto. The gear 150 is provided with a plurality of teeth 156, a hollow, cylindrical spindle 158 and a rear face 160. The spindle 158 is rotatably mounted in an aperture 162 provided in a thickened portion 164 of the member 114. The thickened portion 164 forms bearing surfaces for the rear face 160 of the gear 150 and for the front face 166 of a gear 168 which is connected to the spindle 158 for imparting rotation thereto.

The second output means 54 comprises a small-diameter gear 170 having a plurality of teeth 172 meshing with the teeth 156 on a large-diameter gear 150. The gear 170 includes a front face 174 slidably receiving the lower portion 176 of the means 56 and a rear face 178 bearing against a circular land 180 provided on the plate member 114. The gear 170 is provided with an aperture 182 rotatably mounting the gear 170 on a pin 184 extending from the land 180.

The transmitting means 56 appears in front elevation substantially as shown in FIGURE 6 and is provided with a substantially vertical, rectangular opening 186 in its upper portion 154 and a substantially horizontal, rectangular opening 188 in its lower portion 176. These openings function as output-motion interrupting means, as will be more fully described hereinafter. The transmitting means 56 includes a tongue 190 which depends from the portion 176 and which is provided with a substantially vertical, rectangular opening 192. The transmitting means 56 is connected to the first output means 52 by a crank pin 194 which is provided on the face 152 of the gear 150 and which is disposed within the opening 186 for working engagement with the upper portion 154 during rotation of the first output means 52 by the gear 168 which, in turn, is driven by the power-supply means 50 through means and in a manner to be hereinafter described. The second output means 54 is operatively associated with the transmitting means 56 by a crank pin 196 which is carried by the face 174 of gear 170 and which is disposed within the opening 188 for working engagement with the lower portion 176 upon rotation of the gear 170 by the gear 150. The tongue 190 is limited in movement by a pin 198 which is affixed to the member 114 and which is disposed within the opening 192. The transmitting means 56 also includes an upper end 200 which carries a pin 202 for connecting the transmitting means 56 to a link means 204 forming a part of the connecting means 48.

The link means 204 may be made of a suitable plastic material, such as polypropylene, and is substantially T-shaped having a stem portion 206 extending upwardly from a crossbar portion 208. The stem portion 206 includes an upper end 210 which receives the pin 202 and is provided with a first live hinge 212, which is formed in the upper end 210 by reducing the cross section thereof. A second live hinge 214 is formed by reducing the cross section of the stem portion 206 at its junction with the crossbar portion 208. The crossbar portion 208 includes a substantially horizontal bar 216 and a pair of forwardly extending arms, such as the one shown at 218 in FIGURE 3, mounted on the ends of the bar 216 at right angles thereto. Each arm 218 includes a free end 220 to which a link 222 is connected by a live hinge 224. The links 222 are connected to associated eyeball means 44 by frictional engagement of the links 222 with associated plates 60.

The power-supply means **50** includes a drive member **226** which has a first end **228** and a second end **230** and which is swingably mounted in the housing **78** by a pin **232** carried by member **114**. The drive member **226** carries an upwardly-extending finger **234** having an end **236** engageable with the gear **168** for imparting an increment of rotation thereto each time the drive member **226** is swung to the left in the direction of arrow **238**, as shown in FIGURE 5. Reverse rotation of gear **168** is prevented by a resilient finger **240** having one end **242** affixed to member **114** and another end **244** engaging gear **168**. The end **228** of drive member **226** is retained in position in housing **78** by a bar **246** affixed thereto and is provided with a weight **248** which stores energy for swinging drive member **226** when the toy **10** is rocked back and forth between its FIGURES 1 and 2 positions by the drive means **32** during walking operations. The housing **78** is supported in head **16** by a first transition member **250** having a top wall **252** and an encompassing side wall **254**. The member **250** is provided with an aperture **256** in the top wall **252** for receiving the lower end **258** of housing **78** which is retained in position therein by the clip **112**. The side wall **254** of the member **250** frictionally engages a reduced-diameter portion **260** of a second transition member **262** which connects the housing **78** to neck **40** of head **16** and a cylindrical neck **264** provided on torso **14**.

Operation of the first embodiment of the present invention will be readily understood. The walking means **32** may be energized to impart walking action to doll **12** causing it to rock from side-to-side lifting its feet means **26**, **28** on successive alternate sides. This swings drive member **226** back-and-forth under the influence of weight **248** causing finger **234** to rotate gear **168** in a clockwise direction, as indicated by arrow **266** in FIGURE 5.

Rotation of the gear **168** imparts rotation to the crank pins **194** and **196** through associated gears **150** and **170**, respectively, giving each of them a predetermined, different output motion which is combined by the member **56** into a single output motion which is intermittent because the openings **186** and **188** are of sufficient size to result in lost motion of the output means **52** and **54** with respect to the member **56**. The output of the member **56** is transmitted to the eyeball means **44** by the link means **204** for simulating realistic, eye-sweeping movements wherein the doll's eyes appear to become fixed on an object for a short period of time and then sweep on realistically to another object, as the toy **10** walks along surface **30**.

Referring now more in particular to FIGURES 7–9, a figure toy constituting a second embodiment of the present invention, generally designated **10***a*, may be identical to the figure toy **10** except that the weight-actuated, inertial power-supply means **50** shown in connection therewith is replaced by a modified power-supply means **50***a* and the gear **168** is replaced by a wheel **168***a* having three pins **270**, **272** and **274** provided thereon. In addition, the spindle **158** on gear **150** is replaced by a spindle **158***a* having sufficient length so that the pins **270**, **272** and **274** fit between wheel **168***a* and plate member **114**.

The power-supply means **50***a* includes a housing **276** having an encompassing side wall **278**, a closed end wall **280** and an open end **282**. The open end **282** is affixed to plate **114** and to housing **78** by weldments **284** and **286**, respectively. The power-supply means **50***a* also includes a carrier **288** which is reciprocally mounted in housing **276** for rotating wheel **168***a* through means and in a manner to be hereinafter described. The carrier **288** is reciprocated when the toy **10***a* is rocked (by the walking means **32** shown in FIGURE 1) by a spherical weight **290** which is mounted in carrier **288** and which is free to roll to-and-fro, as indicated by double headed arrow **292**, from one end **294** of carrier **288** to its other end **296**. The carrier **288** is provided with walls **298**, **300** at its ends **294**, **296**, respectively, which each carry a resilient bumper **302** engageable by the weight **290** for subjecting the carrier **288** to a sufficient impact to reciprocate it between the open sides **304**, **306** of housing **276**. A bar **308** is provided across the open side **304** and a bar **310** is provided across the open side **306** for engagement by the walls **298**, **300**, respectively, to prevent the carriage **288** from leaving the housing **276**.

The carrier **288** is provided with a depending tab **312** adapted to engage the uppermost of the pins **270**, **272** or **274** when carriage **288** is moved to the right, as viewed in FIGURES 8 and 9, for imparting an increment of clockwise rotation to wheel **168***a* and an upstanding tab **314** engageable with the lowermost of the pins **270**, **272** or **274** when carriage **288** is moved to the left, as viewed in FIGURES 8 and 9, for imparting an increment of clockwise rotation to the wheel **168***a*.

Rotation of the wheel **168***a* imparts rotation to the crank pins **190** and **196** through associated gears **150** and **170**, respectively, giving each of them a predetermined, different output motion which is combined by the member **56** into a single output motion. This single output motion is intermittent because the openings **186** and **188**, described in connection with the first embodiment of the present invention, are of sufficient size to result in lost motion of the output means **52** and **54** with respect to the member **56**. As described in connection with the first embodiment, the output of the member **56** is transmitted to the eyeball means **44** by the link means **204** for simulating realistic, eye-sweeping movements wherein the doll's eyes appear to become fixed on an object for a short period of time and then sweep on realistically to another object as the toy **10***a* walks along a surface, like the surface **30** shown in connection with the first embodiment.

While the particular moving-eye, walking figure toys herein shown and described in detail are fully capable of attaining the objects and providing the advantages hereinbefore stated, it is to be understood that they are merely illustrative of the presently preferred embodiments of the invention and that no limitations are intended to the details of construction or of design herein shown other than as defined in the appended claims, which form a part of this disclosure.

What is claimed is:

1. In a walking figure toy having a head, feet means and walking means, said walking means imparting walking action to said figure toy through rocking of said toy in such a manner that said toy and head rock from side to side, moving-eye means, the combination comprising;

eyeball means rockably mounted in said head;

drive means connected to said eyeball means for rocking said eyeball means relative to said head through simulated realistic eye-movements during said walking action; and

inertial means in said figure toy, mounted for side to side movement therein and responsive to the rocking movement of said toy during said walking action, said inertial means being operatively connected to said drive means for rocking said eyeball means.

2. A combination as stated in claim **1** wherein said drive means includes first and second output means having predetermined output motions and means for combining said first and second output motions into a single, composite output motion, and wherein said inertial means comprises a weight movably mounted in said toy, said weight being operatively connected to at least one of said output means for transmitting movements of said weight to said output means.

3. A combination as stated in claim **1** wherein said drive means includes first and second output means having predetermined output motions and means for combining said first and second output motions into a single, composite output motion, and wherein said drive means includes a powered gear means operatively associated with one of said first and second gear means, said weight being operatively connected to said output means by a weight-carrying member swingably mounted adjacent said powered

gear means and finger means extending from said weight-carrying member for engaging said powered gear means to impart rotation thereto when said weight-carrying member is swung by said rocking of said figure toy.

4. A combination as stated in claim 3 wherein said drive means includes a powered wheel means operatively associated with one of said first and second gear means, said weight being operatively connected to said output means by a carriage operatively associated with said wheel means for imparting rotation thereto upon reciprocation of said carriage, said weight comprising a spherical member rollingly mounted in said carriage.

5. In a walking figure toy having drive means for imparting walking motion to said toy including rocking said figure from side to side, the combination comprising:

a movable element mounted in said toy for actuating animation means;

inertial means mounted in said toy for side to side movement therein in response to said side to side rocking thereof; and,

drive means drivingly connecting said intertial means to said movable element.

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LOUIS G. MANCENE, Primary Examiner

H. DINITZ, Assistant Examiner

U.S. Cl. X.R.

46—150