SELF-PROPELLED FIGURE TOY COMBINATION

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ABSTRACT OF THE DISCLOSURE

A toy torso, which may comprise a doll, is supported in a sitting position on a movable, transportable means, which may comprise a wheeled hobby horse. Limb means, which may comprise a doll's legs, are connected to the torso and are capable of engaging a surface adjacent the movable means. Suitable drive means reciprocates the limb means in selective engagement with the surface so as to move the toy with respect to the surface.

BACKGROUND OF THE INVENTION

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

Field of the invention

The invention pertains generally to the field of self-propelled figure toys and more particularly to such toys which include a torso, transportable means supporting the torso in a sitting position a predetermined distance above a surface supporting said transporting means, limb means connected to the torso and drive means connected to the limb means for reciprocating the limb means in selective engagement with said surface so as to move said figure toy combination with respect to said surface.

Description of the prior art

United States Patent No. 2,850,839 is one example of a prior art publication disclosing a self-propelled figure toy combination. However, this patent does not suggest to support a toy torso on a transporter means, connect limb means to the torso and connect drive means to the limb means for reciprocating the limb means in selective engagement with a suitable surface so as to move the figure toy combination with respect to the surface.

United States Patent No. 2,896,371 discloses a doll and walker toy wherein a wheeled walker pivotally supports a doll in a standing position with the body of the doll leaning forward. The doll has rigid legs which are driven in such a manner that the doll tends to toddle along in an unsteady manner simulating a baby that has not yet learned to walk alone.

United States Patents Nos. 2,827,733 and 3,077,052 each discloses a toy combination wherein a toy torso is supported by a toy baby carriage. Each torso has limb means connected thereto and drive means are connected to the limb means for reciprocating them. However, these toy combinations are not self-propelled. On the contrary, the limb means are supported above the surface and the drive means is connected to the movable means for actuation thereby when the movable means is pushed by a child-user of the toy combination.

SUMMARY OF THE INVENTION

In view of the foregoing, it is a primary object of the present invention to provide a new and useful self-propelled figure toy combination.

It is another object of the present invention to provide such a toy combination which includes a toy torso supported by a movable means and having driven limb means for moving the toy combination with respect to a suitable surface when the limb means are reciprocated in selective engagement with the surface.

It is yet another object of the present invention to provide a toy combination of the type described which includes a doll mounted astride a simulated, wheeled hobby horse in such a manner that the legs of the doll selectively engage a surface adjacent the hobby horse for moving it with respect to the surface when the legs are reciprocated by a drive means provided in the doll in operative association with the legs.

A further object of the present invention is to provide a new and useful battery compartment in a figure toy of the type which includes a battery-operated motor.

Another object of the present invention is to provide a self-propelled figure toy combination which includes a toy torso supported by a movable means and having a head connected to the torso by a pivot means in such a manner that the head will be rocked by a drive means which also reciprocates limb means connected to the torso.

According to the present invention, a self-propelled figure toy combination comprises a toy torso having a lower portion, transporter means engaging the torso a predetermined distance above a surface which, in turn, supports the transporter means, limb means connected to the torso and including means capable of engaging the surface and drive means connected to the limb means for reciprocating the engaging means in selective engagement with the surface so as to move the figure toy combination with respect to the surface. The transporter means includes means engaging the lower portion of the torso for supporting the torso in a sitting position on the transporter means.

The toy combination also includes a head which is pivotally connected to the torso by a suitable pivot means. A link means connects the head to the drive means for rocking the head during reciprocation of the limb means.

The toy combination is shown herein for purposes of illustration, but not of limitation, as comprising a doll which is mounted astride a wheeled, simulated hobby horse. The doll includes power-driven legs which are driven by a battery-operated motor mounted in the doll's torso. The legs are reciprocated in fore-and-aft swinging movements and are articulated at the knees in such a manner that the legs will be rigid during aft movement and will buckle during forward movement. Each leg carries a foot which is connected thereto on such an angle that only the ball of each foot engages the surface along which the hobby horse is adapted to be propelled by the reciprocation of the doll's legs.

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 perspective view of a self-propelled figure toy combination constituting a presently preferred embodiment of the invention;

FIGURE 2 is an enlarged, vertical cross-sectional view of a doll forming part of the combination shown in FIGURE 1;

FIGURE 3 is a reduced, exploded perspective view of the doll shown in FIGURE 2;

FIGURE 4 is a partial cross-sectional view taken along line 4—4 of FIGURE 2; and
FIGURE 5 is a partial cross-sectional view taken along line 5-5 of FIGURE 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring again to the drawings and more particularly to FIGURE 1, a self-propelled figure toy combination constituting a presently preferred embodiment of the invention, generally designated 10, includes a toy torso 12 supported by a movable, transporter means 14 a predetermined distance D above a surface S supporting the movable means 14. The torso 12 includes a lower portion 15 engaging transporter means 14 for supporting torso 12 in a sitting position thereon.

The toy combination 10 also includes limb means 16 connected to the torso 12 and including means 18 capable of engaging the surface S.

The toy combination 10 also includes drive means (as indicated generally at 20 in FIGURE 4) connected to the limb means 16 for reciprocating the engaging means 18 in selective engagement with surface S so as to move toy combination 10 with respect to surface S.

The toy torso 12 is shown herein for purposes of illustration, but not of limitation, as comprising a doll 22 having a head 24 rockably connected to torso 12 and drivingly connected to drive means 20 in such a manner that head 24 will rock from side-to-side when drive means 20 is actuated to reciprocate limb means 16.

The doll 22 includes a pair of arms 26, 28 which are swingingly connected to torso 12 and are formed integrally with hands 30, 32 (FIGURES 1 and 3). The hands 30, 32 each have the shape shown for the hand 32 in FIGURE 3 and are made of a suitable flexible plastic material so that hands 30, 32 may be placed in gripping relation with a suitable hand-gripping means 34.

The torso and limbs 12, 14 may comprise any vehicle, wheeled or otherwise, which is capable of supporting torso 12 in a sitting position and is shown herein for purposes of illustration, but not of limitation, as comprising a simulated, wheeled hobby horse having a body portion 36 to which outwardly and downwardly extending struts 37 are attached. Each strut 37 has a wheel 38 rotatably connected to the free end thereof by an axle 42 for movably supporting movable means 14 on surface S. Body portion 36 is formed with a seat 44 adapted to support doll 22 astride transporter means 14. Doll 22 may be maintained in position on seat 44 by engaging hands 30, 32 with hand-gripping means 34 which includes a pair of bands, like the ones shown in FIGURE 1, extending outwardly from body portion 36 adjacent a simulated horse's head 48 formed integrally therewith.

Referring now to FIGURES 2-5, torso 12 includes a front torso half 50 and a rear torso half 52 having mating edges 54, 56, respectively, which are engageable with each other for securing torso halves 50, 52 together with a suitable adhesive means (not shown). The torso halves 50, 52 may each be formed from suitable, semi-rigid plastic material by molding techniques which produce hollow members having an exterior portion contoured to resemble a horse. During this molding operation, the housing half 50 may be provided with upper, intermediate and lower horizontal partitions 58, 60, 62, respectively, adapted to mate with upper, intermediate and lower partitions 64, 66 and 68, respectively, provided in housing half 52. Upper partitions 58, 64 carry a switch plate 70 rotatably connected thereto by a pivot pin 72 and including a switch lever 74 extending through an opening 76 provided in housing half 52. Opening 76 affords access to a chamber 78 defined by the space existing within torso 12 between upper partitions 58, 64 and intermediate partitions 60, 66. A pair of dry cells 80, 82 may be housed therein under 78 and are located in operative association with switch plate 70 and a pair of electrical contacts 84, 86, respectively, which are affixed to partition 60, by a piece of webbing 88 having a first end 90 secured to housing half 52 adjacent opening 76 by a pair of rivets 92, 94 and a second end 96 secured to a door 98 by a pair of rivets 100, 102. Door 98 is adapted to close opening 76 and may be retained in position therein by a pair of lugs 104, 106 and a catch 108.

The positive electrode 110 of battery 80 (FIGURE 2) is preferably placed in chamber 78 in an "up" position and the positive electrode 112 of dry cell 82 is preferably placed therein in a "down" position. The webbing 88 is marked to indicate this positioning, as shown at 114 and 116 in FIGURE 3 for battery 80 and 82, respectively. The dry cell 80 may be placed over marking 114 and pushed through opening 76 into chamber 78 pulling a portion of webbing 88 into chamber 78 bringing marking 116 into a suitable position to receive dry cell 82. Dry cell 82 may then be pushed into position in chamber 78 pulling the remaining portion of webbing 88 into chamber 78 so that door 98 will be brought into position adjacent opening 76. It will be apparent to those skilled in the art that webbing 88 reduces the cost of manufacturing torso 12 by eliminating shaped battery-retaining chambers. This, in turn, makes it possible to make torso 12 somewhat smaller in length than the webbing 88.

The dry cells or batteries 80, 82 supply electrical current to an electric motor 118 which is mounted in housing half 52 between partitions 66 and 68 and is secured in position therein by a hollow boss 120 and a bracket 122. Motor 118 is connected to contact 84 by an electric lead 124 having an end 126 affixed to a rivet 128 securing contact 84 to partition 66. Motor 118 is connected to contact 86 by a lead 130 having an end 132 connected to a rivet 134 securing contact 86 to partition 66. A circuit may be completed to motor 118 by moving switch lever 74 in the direction of arrow 136 (FIGURE 5) bringing a first protuberance 138 (depending from switch plate 70) into engagement with electrode 110 and a second protuberance 140 into engagement with the bottom of battery 82. This energizes motor 118 causing its output shaft 142 to rotate imparting rotation to a gear 144 through a worm 146 affixed to output shaft 142. Gear 144 is affixed to a shaft 148 having a first end 149 journaled in an aperture 150 provided in partitions 60 and 66 and a second end 152 journaled in an aperture 154 provided in partitions 62 and 68. Shaft 148 includes a small-diameter portion 156 to which matching cam lobes 158, 160 are affixed. Shaft 148 gears 144 and cam lobes 158, 160 may be integrally formed from a suitable plastic as indicated in FIGURE 1, extending outwardly from body portion 36 adjacent a simulated horse's head 48 formed integrally therewith.

The life portion 12 includes a front half 170 and a rear half 172 twelve and nine half degrees upwardly and twelve and a half degrees downwardly from a mid-position, as indicated by arrow 174 in FIGURE 4, thereby reciprocating limb means 16 through means and in a manner to be hereinafter described.

The limb means 16 includes a pair of legs 176, 178 each having an upper leg portion 180 and a lower leg portion 182 pivotally connected together by an associated pivot pin 184. Each upper portion 180 includes a lower end 186 encompassing the upper end 188 of an associated lower portion 182. Each lower end 186 includes a front portion 190 (FIGURE 2) preventing lower portion 182 from swinging rearwardly, as indicated by arrow 196 in FIGURE 3. Each lower portion 182 has a rear portion 198 which carries a foot 200, as shown for the leg 178 in FIGURE 3, having a heel 202 and a set of toes 204 which are designed and arranged so as to make the ground-engaging means 18 (corresponding to the ball of...
foot 200) the lowest point on leg means 16. A resilient pad 206 is affixed to the underside of ground-engaging means 18 and toes 204 for increasing friction between foot 200 and surface S during rearward movement of foot 200 in the direction of arrow 196. Each upper portion 180 is hollow and may be made from suitable semi-rigid plastic materials by suitable molding operations which include forming an inverted flange 208 at the upper end 210 thereof. The legs 176, 178 are driven by drive means 20, which includes motor 118, gear 144, cam lobes 158, 160 and crank arms 170, 172, through the medium of crank shafts 212, 214, respectively. The crank shafts 212 and 214 each includes a first end 216 affixed to its associated crank arm 170, 172 and a second end 218 which carries an enlarged head 220 and a plate 222, as shown for the shaft 214 in FIGURE 2. Each plate 222 is affixed to a flange 208 of an associated leg 176, 178 so that oscillation of shafts 212, 214 will reciprocate their associated legs 176, 178. The shafts 212, 214 are journaled in an associated bushing 224 having a first end 226 seated in an aperture 230 provided in a portion 228 of the leg 176, 178, and outwardly and upwardly from partition 62 and a second end 232 seated in an aperture 234 provided in edges 54, 56 of housing halves 50, 52. The end 232 of each bushing 224 carries a flange 236 having detent means 238 engageable by a detent means 240 on an associated plate 222, as shown in FIGURE 2 for one sleeve 224. The detent means 238, 240 are biased into operative association with each other by a spring means 242 encompassing end 218 of each shaft 212, 214, as shown for shaft 214 in FIGURE 2. The torso 12 carries a post 244 to which head 24 is pivotally connected by a shaft 246 having an intermediate portion 248 (FIGURE 3) journaled in a bracket 250 and end portions 252, 254 journaled in apertures 256, 258 provided in the portions of neck post 236 carried by housing halves 50, 52 respectively. Shaft 246 constitutes a fore-and-aft axis about which head 24 may rock from side-to-side when driven by crank arm 172 through a link 260 having an upper end 262 received in a bracket 264 carried by head 24 and a lower end 266 received in a bracket 268 carried by crank arm 172. A resilient pad 270 is affixed to the upper surface of neck post 244 and engages a plate 272, which is provided in head 24 and which carries brackets 250 and 264, to prevent plate 272 from engaging neck post 244.

Referring now more in particular to FIGURES 2 and 3, the arms 26, 28 may be made from a suitable soft plastic by well-known molding techniques and are of hollow construction. The arms 26, 28 each includes a shoulder portion 274 having a circular flange 276 adapted to engage an associated circular boss 278 provided on torso 12 and a characterized face 280 which facilitates engaging flange 276 over boss 278.

Although a child-user of toy combination 22 will undoubtedly find the most enjoyment using the doll 22 in combination with the movable means 14, however, the child may also enjoy playing with doll 22 apart from movable means 14. For example, the doll 22 may be placed on its back and the legs 176, 178 may be swung forwardly normal to torso 12. These legs will be maintained in this position by engaging detent 240 with a detent 238 which is provided on plate 236 90° from the detent 238 shown in FIGURE 2. Willower may then be moved in the direction of arrow 136 (FIGURE 5) energizing motor 118 causing worm gear 146 to rotate gear 144 which, in turn, rotates cam lobes 158, 160. Rotation of lobes 158, 160 swings crank arms 170, 172 up-and-down causing legs 176, 178 to reciprocate while crank arm 172 and link 260 rock head 24 from side-to-side simulating a baby lying on its back and kicking its feet while rolling its head.

Alternatively, legs 176, 178 may be swung to their FIGURE 2 positions. Doll 22 may then be placed astraddle movable means 14 and retained in position thereon by engaging hands 30, 32 with hand-gripping means 34. In this position, ground-engaging means 18 will just barely engage surface S when legs 176, 178 depend substantially straight downwardly from torso 12. Thus, legs 176, 178 have a predetermined length based upon the predetermined distance D.

Once the doll 22 is in position on movable means 14, switch lever 74 may be moved in the direction of arrow 136 (FIGURE 5) swinging switch plate 70 clockwise until protuberance 138 engages positive electrode 110 and protuberance 140 engages the bottom of battery 82. This completes a circuit to motor 118 through contacts 84, 86 and leads 124, 130. Motor 118 then operates drive means 20 in the manner previously described causing legs 176, 178 to reciprocate. The portion 190 of each leg 176, 178 prevents pivoting thereof about pivot pin 184 during rearward movement of legs 176, 178 (in the direction of arrow 282 in FIGURE 1) so that frictional engagement of pad 206 in the vicinity of ground-engaging means 18 with surface S moves movable means 14 forwardly in the direction of arrow 284. Cam lobes 158, 160 are designed and arranged so as to cause selective engagement of ground-engaging means 18 with surface S by moving one of the legs 176, 178 rearwardly while the other one is moving forwardly.

During forward movement of legs 176, 178, lower leg portion 182 pivots about pin 184 permitting ground-engaging means 18 to move forwardly without exerting pressure on surface S.

While the particular self-propelled figure toy combination herein shown and described in detail is fully capable of attaining the objects and providing the advantages hereinbefore stated, it is to be understood that it is merely illustrative of the presently preferred embodiment of the invention and that no limitations are intended to the details of construction or design herein shown.

What is claimed is:

1. In a combination, a figure toy and a vehicle therefor, said figure toy having a hollow torso, normally depending legs including articulated knee-simulating joints swingably mounted on said torso, and powered drive means in said torso drivingly connected to said legs to swing the same in generally fore and aft planes relative to said torso; said vehicle being movable over a supporting surface and having a seat portion, said figure toy being releasably seated on said vehicle seat portion with said torso resting thereon in a generally upright position and said legs on opposite sides of said vehicle in straddling relation thereto; releasably interengageable means on said vehicle and figure toy spaced from said seat portion and holding said torso in said generally upright position; and means on said legs responsive to powered swinging movement of said legs for propelling said vehicle along said supporting surface.

2. A combination as stated in claim 1 including a head rockably mounted on said torso and link means connecting said head to said drive means for rocking said head during swinging of said limb means.

3. A combination as stated in claim 2 wherein said head is mounted on a fore-and-aft axis so as to rock from side-to-side.

4. A combination as stated in claim 1 wherein said drive means includes: a shaft rotatably mounted in said torso; a gear carried by said shaft for rotation therewith; first and second cam lobes formed on said shaft integrally therewith; first and second crank arms affixed to said legs; a pair of fingers carried by each crank arm and straddling one of said cam lobes, whereby rotation of said shaft moves said crank arms up-and-down; and...
motor means mounted in said torso in driving engagement with said gear.

5. A combination as defined in claim 4 wherein each of said legs comprises an upper portion and a lower portion freely pivotally mounted thereon by said articulated knee simulating joint limiting swinging movement of said lower portion to an angular range rearwardly of a substantially linear downward continuation of said upper portion;

said means responsive to said powered swinging movement of said legs comprising means at the lower ends of said lower portions for frictionally engaging said supporting surface.

6. A combination as stated in claim 1 wherein said drive means includes an electric motor and wherein said torso includes a chamber adapted to receive dry-cell means for supplying electric current to said motor, said combination including webbing means adapted to encompass said dry-cell means for retaining said dry-cell means in position within said torso and facilitate renewal thereof.

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