SHAPE-CHANGING FIGURE TOY

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References Cited

UNITED STATES PATENTS

2,669,063 2/1954  Lang ...................... 46/119

2,741,870 4/1956 Lang .......................... 46/119

3,101,102 12/1937 Schaeffer .................. 46/135 R

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ABSTRACT

A figure toy has a skeleton-like body member, such as an armature, covered with a flexible covering material beneath which a mechanical shape-changing mechanism is movably mounted for movement from a normal position to a material-bulging position where the shape of a selected area, such as a simulated bicep, is changed from a first condition to a second, bulged condition.

11 Claims, 9 Drawing Figures
SHAPE-CHANGING FIGURE TOY

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 animated figure toys and more particularly to a shape-changing figure toy wherein the shape of a selected area of the figure toy may be changed from a first condition to a second, bulged or expanded condition.

DESCRIPTION OF THE PRIOR ART

U.S. Pat. Nos. 2,669,063; 2,741,870 and 3,153,881 illustrate three prior art examples of animated figure toys wherein the shape of at least one selected area of a figure toy may be changed by stretching a flexible covering material. The first two patents disclose growing figure toys wherein the shape of the figure toy is changed by elongating a mechanism inside a flexible covering causing it to stretch. The third patent illustrates an animated doll wherein air-expandable bladders are used to simulate cheek movement, lip movement and chest expansion and contraction, and the like.

However, none of these patents discloses mechanical means for changing the shape of at least one selected area by causing the flexible covering material to bulge upon movement of a mechanical means from a normal, non-material-bulging position to a position where the material covering the mechanical means is caused to bulge by the mechanical means.

OBJECTS AND SUMMARY OF THE INVENTION

In view of the foregoing, it is a primary object of the present invention to provide a new and useful animated figure toy having mechanical means for changing the shape of the figure toy in at least one selected area.

It is another object of the present invention to provide a shape-changing figure toy including a non-inflatable, shape-changing member movably mounted on a skeleton-like body member and covered by a flexible covering material with the shape-changing member including a portion having substantially the shape which the selected area will assume after the flexible covering material is bulged by the shape-changing member.

A further object of the present invention is to provide a shape-changing figure toy simulating a muscular male doll having a simulated bicep which automatically expands when the forearm of the doll is moved from an extended position to an upright position.

According to a first embodiment of the present invention, a shape-changing figure toy is provided which includes a pair of arms having skeleton-like body members or armatures covered with flexible material.

A non-inflatable, shape-changing member is movably mounted on the body member or armature and is covered by the flexible material. The shape-changing member includes a portion having substantially the shape of an upper-arm bicep during flexure. The shape-changing member is swung into engagement with the flexible material causing it to bulge when the forearm portion of the arm is swung from an extended position to an upright position normal to the upper arm.

In a second embodiment of the present invention, means are provided inside the torso of a doll for changing its appearance from a young girl to a teenage doll by squeezing its waist to actuate a shape-changing mechanism which reduces the size of the waist, lengthens the torso and expands the bust line.

Additionally, a mechanism is included in the head of the doll for lengthening the face by causing the jaw to jut downwardly and forwardly while the cheeks are drawn inwardly.

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

FIG. 1 is a front, elevational view, with parts broken away to show internal construction, of a shape-changing figure toy constituting a first embodiment of the present invention;

FIG. 2 is an enlarged, exploded perspective view of the skeleton-like, body member or armature portion of one arm of the figure toy shown in FIG. 1;

FIGS. 3 and 4 are side-elevational views of the armature shown in FIG. 2 in two different positions of use;

FIG. 5 is a cross-sectional view of a shape-changing figure toy constituting a second embodiment of the present invention;

FIG. 6 is a front elevational view, with parts broken away to show internal construction, of the toy shown in FIG. 5;

FIG. 7 is a view similar to FIG. 5, but showing the internal shape-changing mechanism in a different operating position;

FIG. 8 is a partial elevational view similar to the upper portion of FIG. 6, but showing the parts in a different operating position; and

FIG. 9 is an enlarged, partial cross-sectional view taken along line 9-9 of FIG. 7.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring again to the drawings, and more particularly to FIG. 1, a shape-changing figure toy constituting a presently preferred embodiment of the invention, generally designated 10, includes a torso 12 to which a head 14, and pair of arms 16, 18 and a pair of legs 20, 22 are articulately connected by any suitable means, such, for example, as pin connector 24 connecting arm 18 to a fixed rib or plate 26 provided in torso 12.

Referring now to FIGS. 1-4, arm 18 includes a skeleton-like body member or armature 28 having an upper arm portion 30 and a forearm portion 32 swingably connected together by a pin 34 integrally formed on an end 36 of upper arm portion 30 and engaged in an aperture 38 provided in end 40 of forearm 32.

Forearm 32 includes a strut portion 42 and a hollow tubular portion 44. A hard-carrying pin 46 (FIGS. 3 and 4) is rotatably mounted in tubular member 44 and carries a hand 48 (FIG. 1). A circular rack 50 (FIG. 2)
is provided on end 40 of forearm 32 and is maintained in operative engagement with a circular rack 52, which is provided on end 36 of upper arm 30, by a spring means 54, which may be of the type shown at 243 in FIG. 15 of U.S. Pat. No. 3,277,601 and which includes a crossbar 56 having a pair of fingers 58, 60 extending therefrom. These fingers 58, 60 each includes a loop 62 positioned around pin 34 for bearing against the outer sides of racks 30, 52 forcing them into mutual engagement. The position of spring means 56 on armature 28 is maintained by an ear 64 carried by finger 58 for engaging a protuberance 66 (FIG. 2) provided on the upper arm portion 30.

Upper arm portion 30 includes a strut 68 having an outer face 70, which carries protuberance 68, and an inner face 72, which carries a shelf member 74. The end 76 of strut 68 which is remote from end 36 thereof carries a U-shaped member 78 to which pin 24 is swingingly connected by a crossbar 59.

Body member 28 also includes a non-inflatable, shape-changing member 82 swingably connected to forearm 32 by a pin 84 which engages an aperture 86 provided on end 40 of forearm portion 32.

Shape-changing member 82 is provided with a bulbous portion 88 simulating a shape of a flexed bicep and normally assuming the position shown in FIG. 3 wherein member 82 rests on shelf 74. Member 82 may be moved to the position shown in FIG. 4 by swinging forearm 32 in a counterclockwise direction (as viewed in FIG. 4) until forearm 32 is normal to upper arm portion 30 causing pivot pin 84 to move downwardly so that the bulbous portion 88 is elevated due to the turning of member 82 upon a fulcrum 90 formed by shelf 74.

Arm 18 is covered with a flexible covering material 92 (FIG. 1) which may be molded from a suitable plastisol material encapsulating body member 28. Covering material 92 normally assumes the shape shown in FIG. 3 and is caused to bulge, as shown at 94 in FIG. 4, when member 82 is swung to its FIG. 4 position for simulating a flexed bicep.

In use, a child-user of figure toy 10 may cause the figure toy to flex its biceps automatically by swinging the forearms of the doll from an extended position to a position wherein the forearms are normal to their associated upper arms.

Referring now to FIGS. 5-9, a shape-changing figure toy constituting a second embodiment of the present invention, generally designated 100, includes a torso 102 having a lower torso portion 104 slideably connected to an upper torso portion 106 by a substantially cylindrical waist member 108 on lower torso portion 104 which is telescopically mounted inside a waist portion 110 on upper torso portion 106.

Waist portion 110 is hinged, as shown at 112 and 114 in FIG. 6, and is connected to a pair of front actuator links 116, 118 and a pair of rear actuator links 120, 122 each having an end 124 pivotally connected to a fixed post 126 by a pin 128. Additionally, the end 130 of links 116 and 120 are connected to waist 110 by a pin 132 and the end 136 of links 118 and 122 are connected to waist 110 by a pin 134.

Post 126 is supported by a block 138 seated in lower torso portion 104 and extends upwardly through upper torso portion 106 where the upper end 140 of post 126 is positioned just beneath the neck portion 142 of upper torso portion 106. A frusto-conical block 144 is slideably mounted on post 126 and is adapted to be moved from the position shown in FIG. 5 to the position shown in FIG. 7 when pressure is applied to waist 110 in the direction of arrows 146, 148 causing ends 130, 134 of links 116, 120, 122 and 118 to move upwardly in the direction of arrows 150, 152 (FIG. 6) for moving upper torso portion 106 upwardly with respect to lower torso portion 104.

Block 144 carries an upstanding collar 154 having an upper end 156 against which the lower end 158 of a compression spring 160 is seated. The upper end 162 of spring 160 is seated against a shoulder 164 provided on the upper end 160 of post 126, whereby spring 160 biases block 144 and waist 110 to the positions shown in FIGS. 5 and 6. Block 144 and waist 110 may be maintained in elevated positions, such as shown in FIG. 7, by pawl 166 pivotally mounted on collar 154 by a pin 168 and is biased into engagement with teeth 170 on post 126 by a spring 172. When block 144 reaches the upper limit of its travel, pawl 166 is relieved so that spring 160 will automatically return block 144 to its FIG. 5 position.

A pair of shape-changing links 174, 176 have lower ends 178 connected to block 144 by pins 180, 182, respectively, and ends 184, 186 connected to links 188, 190, respectively, by a pin 192.

Links 188, 190 each includes an upper end 194 pivotally connected to the upper end 140 of post 126 by a pin 196 which pivotally receives the end 198 of a bifurcated link 200 having its slotted end 202 resting on a fixed pin 204, carried by upper torso portion 106, and straddling a pin 206 carried by an actuating rod 208 extending upwardly through neck 142 into the head portion 210 of figure toy 100.

Actuating rod 208 has a bifurcated upper end 212 to which a finger 214 is pivotally connected by a pin 216. Finger 214 extends through an aperture 218, which is provided in neck 142, so that finger 214 will be moved from the position shown in FIG. 5, wherein end 220 of finger 214 engages lower lip 222 of head 210, to the position shown in FIG. 7, where finger 214 is freed from lower lip 222, when pushrod 208 is moved in the direction of arrow 224 (FIG. 8) by the rocking of bifurcated link 200 about fixed pin 204 when block 144 moves upwardly swinging links 174, 176 counterclockwise, as viewed in FIG. 5. As links 174, 176 swing incrementally counterclockwise, as indicated by the broken lines in FIG. 5, during the stepping of pawl 166 in teeth 177 as waist 110 is incrementally squeezed in the direction of arrows 146, 148, a bulbous protrusion on ends 184, 186 of links 174, 176, respectively, engage a hinged flap 226, forming part of upper torso portion 106 and swing it from the position shown in FIG. 5 to the position shown in FIG. 7 simulating development of figure toy 100 from a small child to a teenage child.

Flap 226 is hinged to upper torso portion 106 by a hinge 228 formed by reducing the cross section of the plastic material forming upper torso portion 106.

The upper end 212 of pushrod 208 includes camming surfaces 230, 232 which control the movement of cheek-engaging blocks 234, 236 (FIGS. 6 and 9) so that block 234, 236 will move from the position shown in FIG. 6 wherein cheek 238, 240 of head 210
simulate the fat cheeks of a small child to the position shown in FIG. 8 wherein block 234, 236 have moved in the direction of arrows 242, 244, respectively, permitting cheeks 238, 240 to move inwardly simulating the longer, less pudgy face of a teenager.

While the particular shape-changing figure toy 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 other than as defined in the appended claims which form a part of this disclosure.

What is claimed is:

1. A figure toy having relatively pivotable body portions, a skeleton-like body member in said body portions and covered with a flexible covering material, mechanical means for changing the shape of the figure toy in at least one selected area by causing said flexible covering material to bulge, comprising:
a non-inflatable, shape-changing member pivotally mounted on said body member and covered by said flexible covering material said member having an end swingable generally normal to said covering material on one of said body portions at said selected area, said end having substantially the shape said selected area will assume after said flexible member is bulged, said shape-changing member being normally disposed beneath said flexible material in a non-material bulging position; and
means connected to the other of said body portions and to said shape-changing member for swinging it outwardly into a material-bulging position in response to relative pivoting of said body portions, whereby the shape of said figure toy is changed in said selected area.

2. A figure toy as stated in claim 1 wherein said selected area is a simulated bicep.

3. A figure toy as stated in claim 1 wherein said selected area comprises a simulated bust line in a doll.

4. A combination as stated in claim 1 wherein:
said body member comprises an arm armature;
said selected area comprises a simulated bicep;
said shape-changing end having substantially the shape of a flexed bicep; and
said body member includes an upper arm portion having a shelf and a pivoted forearm portion having means rotatably receiving said shape-changing member, said shape-changing member normally resting upon said shelf when said forearm is extended and rocking about said shelf to an elevated position which when said forearm is swung to a position normal to said upper arm.

5. A combination as stated in claim 1 wherein said body member is a limb armature having an upper arm portion rotatably connected to a forearm portion, each of said portions including a circular rack and spring means for maintaining each portion in angularly ad-

justed positions and wherein said shape-changing member is swingably connected to one of said portions and is rocked about the other of said portions when said portions are moved to a predetermined angular position with respect to each other.

6. A shape-changing figure toy, comprising:
a torso including an upper torso portion and a lower torso portion, said lower torso portion being telescopically received in said upper torso portion one of said torso portions including a shape-changing member hingedly mounted on said one torso portion; and
linkage means inside said torso pivotally engaging said shape-changing member and the other torso portion to swing said shape-changing member about said hinge when said torso portions are telescopically moved relative to each other.

7. A figure toy as stated in claim 6 wherein said shape-changing member is configured to simulate a bustline.

8. A figure toy as stated in claim 6 wherein said shape-changing member is configured to simulate a waist portion on said one torso portion.

9. A figure toy as stated in claim 6 including a neck portion on said upper torso portion and a head on said neck portion, said figure toy also including a pushrod means connected to said linkage means and extending through said neck means into said head and cheek-engaging means mounted in said head in engagement with said pushrod means for expanding said cheeks laterally in one position of said pushrod means.

10. A shape-changing figure toy, comprising:
a torso including an upper torso portion having a neck post formed integrally therewith on the upper end thereof, a simulated bustline hingedly connected thereto and a waist section hingedly connected thereto, a lower torso portion telescopically received in said upper torso portion;
a fixed post seated in said lower torso portion and extending up through said upper torso portion;
a block slideably mounted on said post and affixed to said upper torso portion;
link means pivotally connected to said post and to said hinged waist section for contracting said waist section and sliding said upper torso portion upwardly with respect to said lower torso portion;
shape-changing linkage means swingably connected to said block and including a portion engageable with said simulated bustline for swinging said simulated bustline to an outwardly-extended position when said upper torso portion is moved upwardly.

11. A figure toy as stated in claim 10 including a pushrod extending upwardly through said neck post into said head, said pushrod having one end connected to said linkage means for actuation thereby and a second end extending into said head and including a cheek-engaging means for expanding the cheek area of said head in one position of said pushrod, said push-rod being reciprocated by movement of said upper torso portion with respect to said lower torso portion.