ABSTRACT

Motion responsive toys having deformable body segments. The toy includes a first body segment constructed from elastically deformable materials and a second body segment operatively coupled to the first body segment. In some embodiments, movable appendages are mounted to the body segments, with one appendage adapted to drive the motion of the other.
Attracting Speech Counter Reset

Attracting Speech Sound File

Switch Activated?

N -> To Fig.5B

Y

EYE SQUEEZE

Eye Squeeze Sound File

Last Sound File in Sequence?

N -> Counter +1

Y -> Counter Reset

SHAKING

Shaking Sound File

Last Sound File in Sequence?

N -> Counter +1

Y -> Counter Reset

Any Switch activated?

N -> Switch Sequence

Y -> SLEEP MODE

FIG. 5A
From Fig. 5A

134 ATTRACTING SPEECH MODE

136 Counter +1

138 Attracting Speech Sound File

140 2 seconds (delay)

142 Last Sound File in Sequence?

N 144 Counter +1

Y 146 Counter Reset

148 SLEEP MODE

150 5 Seconds (delay)

152 (Phrase 1)

154 (Phrase 2)

156 2 Seconds (delay)

158 Any Switch activated?

Y 160 Switch Sequence

N 162 2nd sound file?

N

Y

164 (Phrase 1) Power Down

166 (Phrase 2) Power Down
ELASTIC SOUND-MAKING TOY WITH ROTATABLE APPENDAGES

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority under 35 U.S.C. 119 (c) to U.S. Provisional Patent Application No. 60/467,293 entitled “Elastic Sound-Making Toy With Rotatable Appendages,” filed May 1, 2003, the disclosure of which is herein incorporated by reference.

BACKGROUND

[0002] Motion-responsive, sound-producing toys may include sounds designed to attract a child, sensors for audio responses, and extensible or moving appendages. Various types of sensors may be used to produce an audio response, such as those discussed in U.S. Pat. Nos. 6,210,278, 6,193,580, 6,159,101, 6,149,490, 6,086,478, 5,029,214, 5,011,449, 4,766,275, 4,751,353, 4,740,186 and 4,318,245, the disclosures of which are incorporated herein by reference. These toys may further be constructed to allow for squeezing or stretching the toy, such as discussed in U.S. Pat. Nos. 6,360,615, 6,053,797, and 4,169,336, the disclosures of which are incorporated herein by reference.

SUMMARY

[0003] The present disclosure relates to deformable toys such as those that may be stretched or squeezed. In some embodiments, interaction with the toy activates internal electronics that provide custom audio responses to each possible form of play. Additionally, the toy may include movable limbs that are coupled with one another to provide a greater range of play options.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] FIG. 1 is an isometric view of an illustrative example of the external components of a toy, according to the present disclosure, including a body having an upper body segment and a lower body segment with several appendages, such as eyes, a nose, a tongue, clothing, arms, and legs.

[0005] FIG. 2 is an isometric view of the toy of FIG. 1 showing movement of an appendage in response to a stimulus, such as movement of the clothing in response to raising of an arm.

[0006] FIG. 3 is an isometric view of the toy of FIG. 1 showing movement of facial features, such as the eyes and tongue in response to deformation of the upper body segment.

[0007] FIG. 4 depicts stretching of the upper body segment, the nose, and the arms of the toy of FIG. 1.

[0008] FIG. 5 is a flow chart of various play modes and events that the toy may possess.

DETAILED DESCRIPTION

[0009] As depicted in FIG. 1, toy 10 includes a body 12 that is subdivided into a plurality of body segments including a first, or an upper body segment, 14 and a second, or a lower body segment, 16. Upper body segment 14 may be constructed from an elastically deformable material including soft rotocast materials, such as urethane or polyvinyl chloride, thus upper body segment 14 may be resiliently deformable. Lower body segment 16 may be injection molded and substantially more rigid. The lower body segment may therefore house and protect internal components and electronics as will later be described. It should be appreciated that these materials may be reversed such that the upper body segment is rigid while the lower body segment is resiliently deformable. The first and second body segments may be operatively coupled to one another. Alternatively, a rigid compartment may be contained within one of the body segments, both of which may be deformable.

[0010] As shown in FIGS. 1-3, upper body segment 14 is in the form of a sea sponge that represents a character from the SpongeBob™ Cartoon on Nickelodeon. However, numerous other embodiments may be used in place of a sponge without substantially changing the functionality of the toy or otherwise departing from the scope of the disclosure.

[0011] As shown in FIG. 1, a plurality of appendages 18 are coupled to one or both of the upper and lower body segments. Some embodiments may include a movable first appendage 20, such as arms, 22 and hands 24. This first appendage may be pivotable relative to a body segment, such as upper body segment 14, and configured to be selectively placed in a user-defined position. Although the illustrative example shows first appendage 20 mounted to upper body segment 14, it should be appreciated that first appendage 20 may be mounted to any body segment without departing from the scope of the disclosure.

[0012] A movable second appendage 26, such as clothing 28, is also included in the embodiment shown in FIG. 1. Movement of second appendage 26 is triggered by movement of first appendage 20. In some embodiments, first appendage 20 is adapted to move second appendage 26 in tandem with the first appendage. Thus, first appendage 20 may drive movement of second appendage 26 when the user-defined position of the first appendage is altered. In some embodiments, movement of the second appendage alternately conceals and reveals a portion of one or more of the body segments. For example, the arms may be adapted to cause at least a portion of clothing 28, such as the front of the shirt and pants, to move downward when either of arms 22 is rotated, as shown in FIG. 2. This downward movement may be accomplished by a translation of the cloth segment away from lower body 16 or a counter-rotation of the clothing segment relative to the arm.

[0013] Toy 10 may further include a movable third appendage 30, such as eyes 32, mounted to upper body segment 14 with movement of the third appendage being driven by deformation of first body segment 14. Upper body 14 may house a mechanism that actuates the eyes to extend from the upper body when upper body 14 is squeezed or otherwise deformed, as shown in FIG. 3. This mechanism may be an air-bladder that pushes the eyes out of, or away from, upper body segment 14. Alternatively, or additionally, the mechanism may be spring-loaded. In such a configuration, the appendage may not return to its first configuration until acted upon by an external force sufficient to compress the spring. The mechanism may take the form of a latch that secures the appendage in its unreleased configuration until it is released by subsequent deformation of the body segment.
[0014] Toy 10 may possess additional body segments and/or appendages that may be moveable or resiliently deformable including, but not limited to, facial features such as a nose 34, a mouth 36, and a tongue 38. In some embodiments, the lower body segment further includes legs 40 and feet 42. The legs and feet may be rigid and of the same material as the lower body segment to provide a base of support for the toy to stand upon, or they may be resiliently deformable.

[0015] In the illustrative example shown in FIG. 3, tongue 38 is also capable of extending from the upper body segment when the upper body segment is squeezed and may therefore be considered a movable third appendage 30, much like eyes 32. This may be accomplished using a mechanism that is the same or different from that used to move eyes 32. In other embodiments, tongue 38 may be considered a second appendage 26 that moves when first appendage 20 is moved by a user.

[0016] Moving on to FIG. 4, the pliancy of the resiliently deformable body segments and/or members allows the toy to be stretched, squeezed, and/or twisted as desired by a user while returning to an original configuration when released. As shown in FIG. 4, a user may pull, and thereby stretch, the upper body segment 14, arm 22, and nose 34. That depicted is intended as an example only and it should be appreciated that any portion of toy 10 may be made of a resiliently deformable material.

[0017] Additionally, toy 10, such as in upper body segment 14, may house a speech assembly that triggers generation of sounds associated with the movement of any of the appendages. The lower body is typically used to house these internal components, which may include an on/off switch, a printed circuit board, one or more speakers, one or more batteries, a shake sensor, such as a cage switch, and a sound generator chip.

[0018] Various modes and events of play are depicted in FIG. 5. Once powered on, toy 10 may use attracting speech mode to automatically produce sounds and phrases to attract a child to play with it. Thus, this attracting speech does not require any input from the child once the toy has been turned on. During play, shaking toy 10 or squeezing it upper body segment to make the eyes pop out may activate the toy. Movement of the eyes may also activate a series of eye popping sounds and phrases. Shaking the toy may cause the toy to emit a series of shaking sounds and phrases.

[0019] As shown in FIG. 5A, once the toy is powered on at 100, an attracting speech counter is reset at 102 and an attracting speech sound file is accessed at 104. If the switch or shake sensor is activated at 106, such as by squeezing the upper body of the toy to actuate the eyes at 108, then an eye squeeze sound file is played at 110. If the played sound file is the last one in the sequence at 112 then a counter is reset at 114, otherwise the counter is incremented at 116. Thus, if a switch is activated at 118, then an appropriate speech sequence is accessed at 120, and otherwise the toy enters a sleep mode at 122. If the sensor determines that a toy is being shaken at 124, then a shaking file is accessed at 126. Again, if the played sound file is the last in the sequence at 128, then a counter is reset at 130, otherwise the counter is incremented at 132.

[0020] In some embodiments, as shown in FIG. 5B, if the sensor has not been activated, the toy may enter an attracting speech mode at 134. A counter is incremented at 136 to access a particular attracting speech sound file at 138. After a slight delay at 140, such as two seconds, the toy evaluates whether the sound file played was the last in the sequence at 142. If the sound file was the last, then the counter is reset at 144, otherwise the counter is incremented at 146. The toy may enter another sleep mode once the counter has been reset at 148. After another delay at 150, the toy may “awaken” and emit a first phrase at 152 or a second phrase at 154 in an attempt to attract a child to play with it. After another delay at 156, the toy may check its sensor to determine if any parts of the toy have been activated at 158. If yes, the toy enters its switch sequence loops at 160, as shown in FIG. 5A. If the sensor has not been activated then the toy determines if there is another available sound file at 162. If there is another available sound file, the toy will play either the first sound file at 164, or the second sound file at 166, before powering itself down.

[0021] It is believed that the disclosure set forth above encompasses multiple distinct inventions with independent utility. While each of these inventions has been disclosed in its preferred form, the specific embodiments thereof as disclosed and illustrated herein are not to be considered in a limiting sense as numerous variations are possible. The subject matter of the inventions includes all novel and non-obvious combinations and subcombinations of the various elements, features, functions, and/or properties disclosed herein. Similarly, where any claim recites “a” or “a first” element or the equivalent thereof, such claim should be understood to include incorporation of one or more such elements, neither requiring nor excluding two or more such elements.

[0022] Inventions embodied in various combinations and subcombinations of features, functions, elements, and/or properties may be claimed through presentation of new claims in a related application. Such new claims, whether they are directed to a different invention or directed to the same invention, whether different, broader, narrower or equal in scope to the original claims, are also regarded as included within the subject matter of the inventions of the present disclosure.

We claim:

1. A deformable toy comprising:

   a first body segment constructed from an elastically deformable material; and

   a second body segment operatively coupled to the first body segment, wherein a movable first appendage is mounted to one of the first and second body segments and a movable second appendage is mounted to the other of the first and second body segments, the first appendage adapted to be placed in a user-defined position and drive movement of the second appendage when the user-defined position of the first appendage is altered, wherein movement of the second appendage alternately conceals and reveals a portion of the first body segment or the second body segment.

2. The toy of claim 1, wherein the first appendage and second appendage are adapted to counter-rotate with respect to one another.
3. The toy of claim 1, further including a movable third appendage mounted to the first body segment, wherein movement of the third appendage is driven by deformation of the first body segment.

4. The toy of claim 1, wherein the first appendage represents an arm and is mounted to the first body segment, and the second appendage represents an item of clothing and is mounted to the second body segment.

5. The toy of claim 1, wherein the first body segment represents a sea sponge.

6. The toy of claim 1, further including a speech assembly adapted to emit sound upon activation of a sensor, wherein the sensor is adapted to sense deformation of the first body segment.

7. A toy figure that is transformable between first and second configurations, the toy figure comprising:

   a body segment made of a resiliently deformable material;

   a plurality of appendages coupled to the body segment and adapted to move from a first configuration to a second configuration by extending away from the body segment in response to deformation of the body segment, wherein at least a portion of the appendage remains extended from the body segment after the body segment has returned to its undeformed state;

   a sensor adapted to sense deformation of the body segment; and

   a sound generator operatively coupled to the sensor and thereby adapted to emit sound upon deformation of the body segment.

8. The toy figure of claim 7, wherein the appendage configured to extend away from the body segment represents eyes.

9. The toy figure of claim 7, wherein the plurality of appendages includes a first appendage adapted to be placed in a user-defined position and drive movement of a second appendage when the user-defined position of the first appendage is altered.

10. The toy of claim 9, wherein movement of the second appendage alternately conceals and reveals a portion of the body segment.

11. The toy of claim 9, wherein the first appendage represents an arm and the second appendage represents an item of clothing.

12. The toy of claim 9, wherein the first appendage and the second appendage counter-rotate with respect to one another.

13. A deformable toy comprising:

   an elastically deformable upper body;

   a rigid lower body; and

   a clothing region mounted to the lower body, wherein the clothing region is adapted to move relative to the lower body and thereby alternately conceal and reveal a portion of the lower body.

14. The toy of claim 13, further including at least one arm operatively coupled to the clothing region and adapted to be placed in a user-defined position.

15. The toy of claim 14, wherein the at least one arm drives movement of the clothing region.

16. The toy of claim 15, wherein the at least one arm and the clothing region counter-rotate with respect to one another.

17. The toy of claim 13, further including at least one eye mounted within the upper body and adapted to extend from the upper body upon deformation of the upper body.

18. The toy of claim 13, further including a tongue mounted within the upper body and adapted to extend from the upper body upon deformation of the upper body.

19. The toy of claim 13, further including a speech assembly adapted to periodically emit sound.

20. The toy of claim 13, further including a speech assembly adapted to emit sound upon movement of at least one of the clothing region, the at least one arm, the at least one eye, and the tongue.

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