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[54] ADJUSTABLE HAIR DOLL

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[52] **U.S. Cl.** **46/135**

[51] **Int. Cl.** **A63h 11/00**

[58] **Field of Search** 46/135, 172, 22, 151, 146

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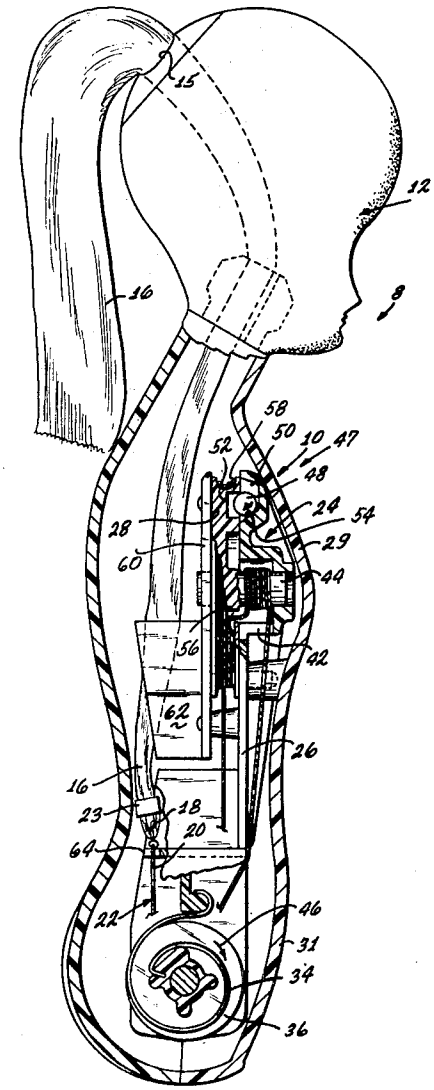
[57] **ABSTRACT**

A fashion doll with a fall-type hairpiece which can be adjusted in length without the necessity for knobs, buttons, or the like on the outside of the doll. The apparatus includes a string having an inner end wound on a wheel within the doll and an outer end tied to an end of the hairpiece which is within the doll. A spring urges the wheel to rotate in a direction to shorten the apparent length of the hairpiece. The wheel has several recesses spaced about its axis of rotation, and a ball is normally disposed partially within a recess on the wheel and another recess on a wheel-supporting frame, to lock the position of the wheel when the doll is up-right. However, turning of the doll to a face down position causes the ball to fall completely into the frame recess, to release the wheel so it can retract the hairpiece into the head as far as it is allowed to retract by a child who holds the outer end of the hairpiece. The wheel which winds up the string is located in the chest of the doll, and the string extends downwardly therefrom, around a second wheel in the abdomen portion of the doll and upwardly to the hairpiece, to enable a long hairpiece to be received in a small doll without tangling.

18 Claims, 6 Drawing Figures



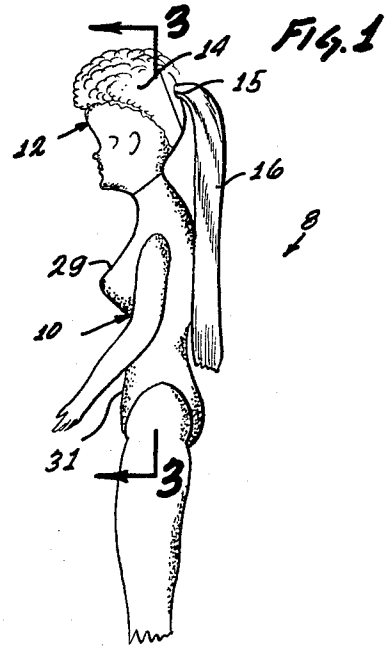


Fig. 1

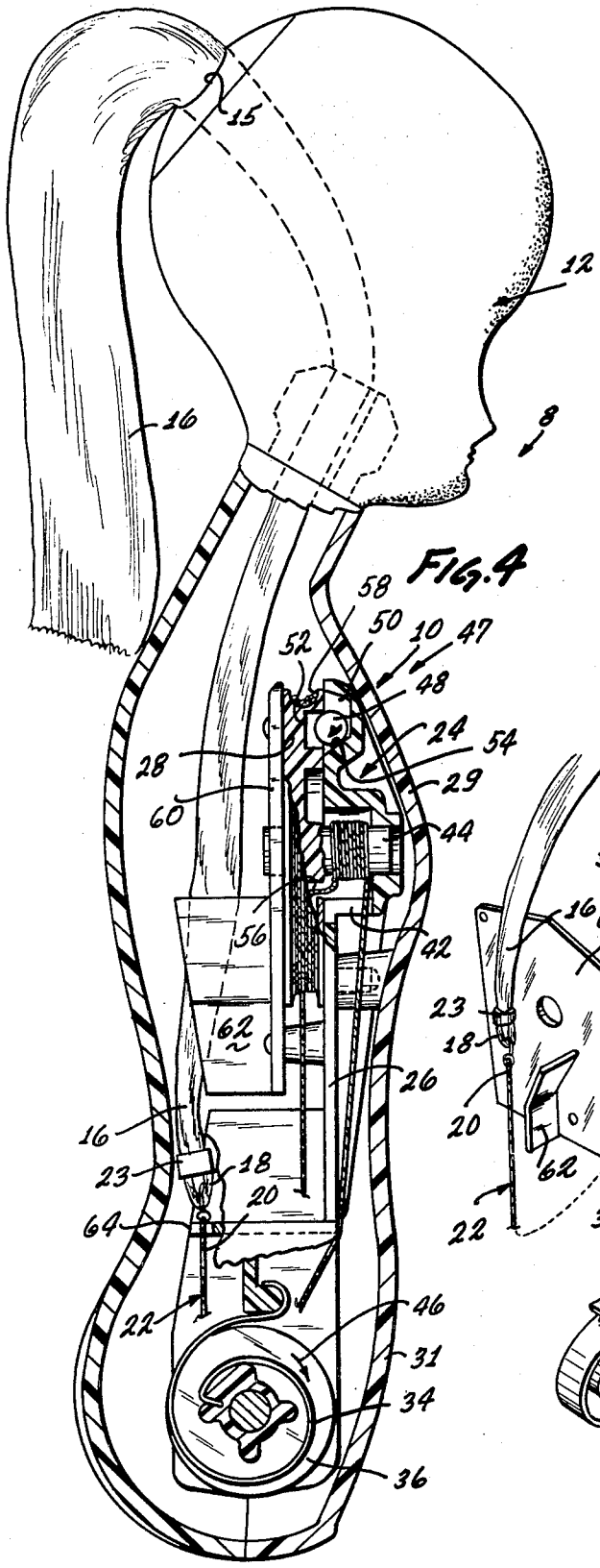


Fig. 4

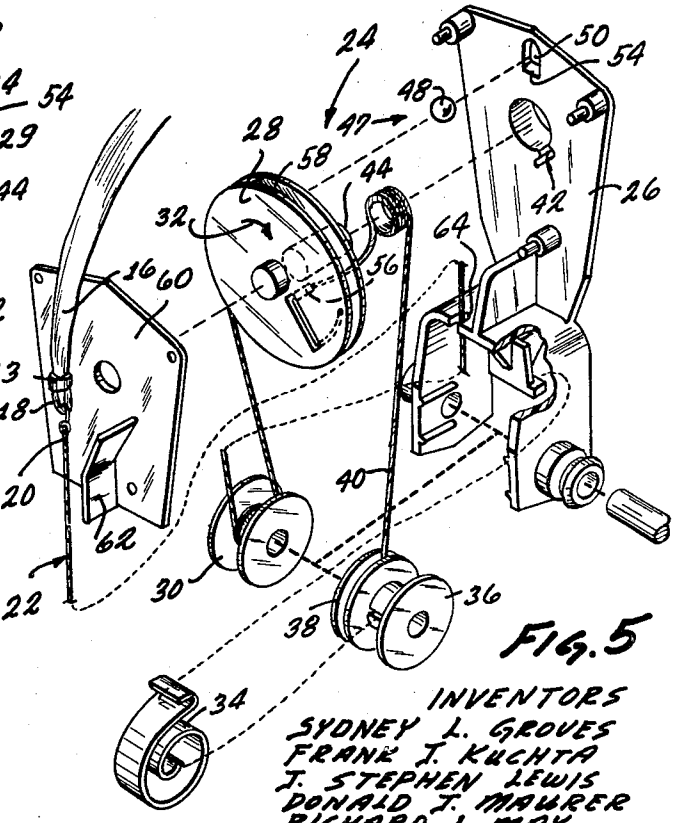


Fig. 5

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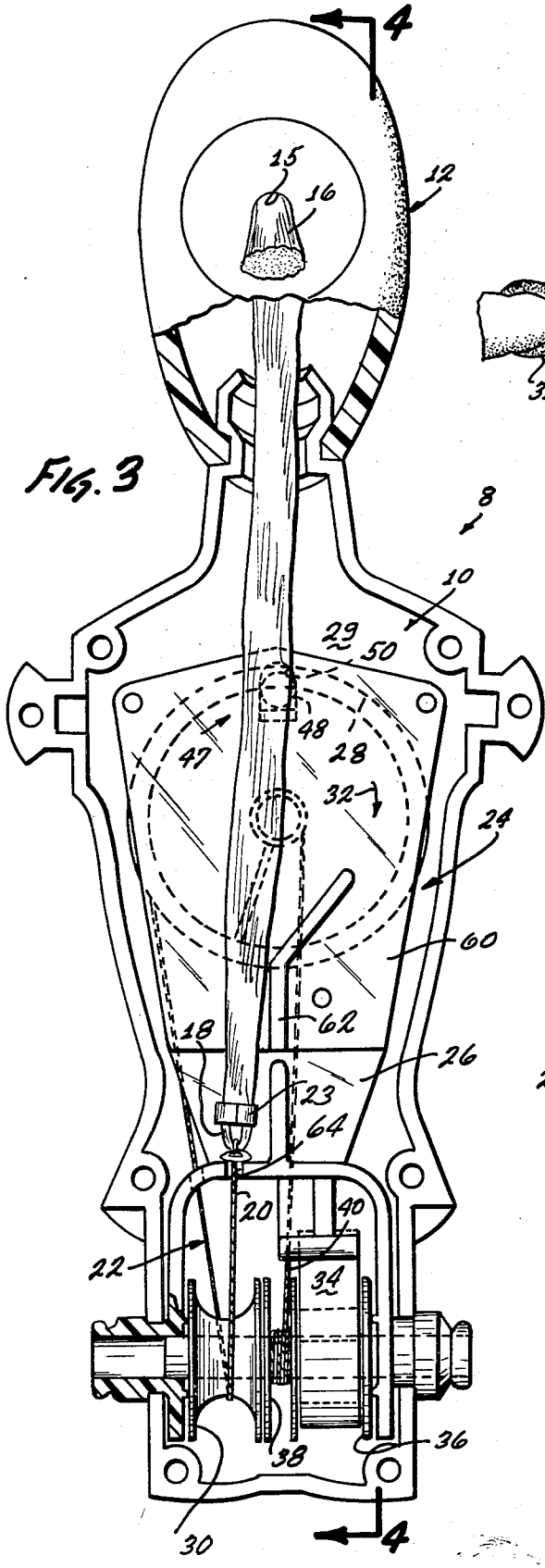

FIG. 3

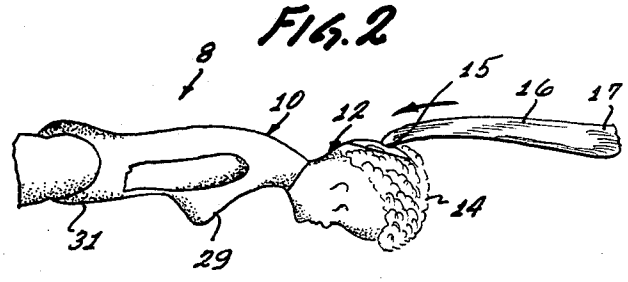

FIG. 2

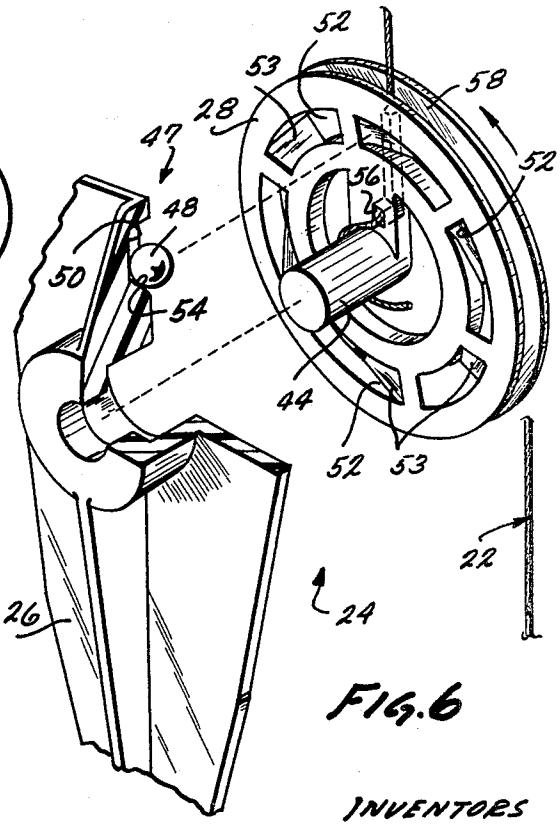

FIG. 6

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ADJUSTABLE HAIR DOLL

BACKGROUND OF THE INVENTION:

1. Field of the Invention

This invention relates to dolls with hair of adjustable length.

2. Description of the Prior Art

The entertainment value of fashion dolls can be enhanced by providing means for varying the hair length of the doll. Mechanisms available for controlling the length of the hair have generally included knobs, buttons, or the like which protrude from the doll's body. Such apparatus is undesirable in a fashion doll which is designed to provide a realistic appearance.

An interesting type of hairpiece for fashion dolls is a fall, which is a long tress of hair that hangs behind a woman. It would be desirable to provide a fall that could be lengthened greatly for an extreme fashion appearance, or shortened so that it is hardly noticable. However, the space within a fashion doll is limited, and care must be taken to prevent tangling of the strands of the fall.

OBJECTS AND SUMMARY OF THE INVENTION:

An object of the present invention is to provide a doll with a hairpiece that can be reliably lengthened and shortened without the necessity of artificial mechanisms on the exterior of the doll.

Another object is to provide a hair growing doll with a hairpiece that can be lengthened by a great distance with respect to the size of the doll body.

In accordance with one embodiment of the invention, a doll is provided with adjustable hair which can be pulled out to different lengths, and which can be retracted by orienting the doll to face downwardly. A spring within the doll body urges the hair inwardly, while a gravity actuated latching means prevents inward hair movement unless the doll is prone and facing down. The use of a gravity actuated latch eliminates the need for knobs, buttons, or the like on the outside of the doll body, which would provide an unnatural appearance, particularly in the case of fashion dolls.

In order to enable a hairpiece to be extended or retracted, a large distance, with a doll body of limited size, a mechanism is provided which efficiently utilized the space available within a small doll body. The mechanism includes a first wheel in the chest portion of the doll and a second wheel in the abdomen portion. A string whose outer end is tied to the hair, has an inner portion wound about the first wheel and a middle portion extending downwardly to the second wheel and around it to the hair. This provides a long distance within the doll along which the hairpiece can be moved without being wound on a drum where it could become entangled.

The novel features of this 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 side elevation view of a doll constructed in accordance with the invention, shown in an upright position;

FIG. 2 is a side view of the doll of FIG. 1, with the doll in a downwardly facing prone position for enabling retraction of a hairpiece into the doll;

FIG. 3 is an enlarged, partial sectional rear view of the doll of FIG. 1, taken on the line 3—3 thereof;

FIG. 4 is a sectional view taken on the line 4—4 of FIG. 3;

FIG. 5 is a rear perspective exploded view of the retracting mechanism of FIG. 3; and

FIG. 6 is a partial front perspective exploded view of the mechanism of FIG. 5.

DESCRIPTION OF THE PREFERRED EMBODIMENTS:

FIG. 1 illustrates a figure toy or doll 8 having a body or torso 10, a head 12, a fixed hair portion 14 and a long fall-type hairpiece 16 extending downwardly from an opening 15 at the top of the head. The doll 8 is a fashion type with a relatively narrow diameter torso 10. The hairpiece 16 is mounted to be pulled out or retracted into doll 8 so that it is of any desired length within a wide range. The hairpiece 16 enables doll 8 to assume unusual fashion appearances by varying the length of the hairpiece, which may be lengthened at any time by merely pulling it further out of head 12. However, retraction of hairpiece 16 requires that doll 8 be oriented in a prone, downwardly facing position, as shown in FIG. 2. A child retracts the hairpiece by holding the outer end 17 thereof in her hand while orienting the doll in the position shown in FIG. 2. Hairpiece 16 then automatically retracts, the child holding it at a preferred retracted position and then again orienting the doll in an up-right position to fix the length of the hairpiece.

As shown in FIG. 3, the body 10 and head 12 are hollow and communicate with each other. The hairpiece or fall 16 has an inner, looped end 18 which is tied to the outer end 20 of cable means in the form of a string 22. A metal clip 23 may be attached to end 18 near its junction with string 22 to prevent end 18 from fraying and expanding due to the action of string 22. The string 22 may be pulled inwardly to shorten the hairpiece, and allowed to be pulled outwardly to lengthen it, by a hair retracting mechanism 24 mounted within body 10. The mechanism 24 includes a frame 26 mounted within the body, a first wheel 28 rotatably mounted on an upper portion frame 26 in the chest portion 29 of doll 8, and a second wheel 30 rotatably mounted on the frame 26 at a lower, or abdomen portion 31 of the doll. The string 22 extends downwardly from the hairpiece 16, around the second wheel 30 and upwardly to the first wheel 28. When the first wheel 28 is rotated in the direction of arrow 32, the inner end of string 22 winds further around the first wheel 28, causing the fall or hairpiece 16 to be further retracted into the doll. On the other hand, when the hairpiece 16 is pulled outwardly, the string 22 can unwind from the first wheel 28, allowing the fall to assume a greater length.

As shown in FIGS. 3, 4 and 5, the first wheel 28 is biased in the direction of arrow 32 by a coil spring 34, which is held on a spring drum 36. A string pulley 38, which is fixed to the spring drum 36, receives a biasing string 40. The biasing string 40 extends from the pulley 38, through an opening 42 in the frame 26, and around a shaft 44 to which the first wheel 28 is fixed. The spring 34 constantly urges the spring drum 36 in the direction of arrow 46, (FIG. 4) thereby urging the biasing string 40 to wind further on the string pulley 38. This urges the first wheel 28 to turn in the direction of arrow 32 (FIG. 3) to cause the hairpiece 16 to retract further in to the doll body 10.

Referring now to FIGS. 4, 5 and 6, the hair-retracting mechanism 24 includes a gravity responsive mechanism 47 for preventing the first wheel 28 from turning in a direction to retract the hairpiece 16 into the doll. The mechanism 47 includes a ball 48 which can be fully received in a recess 50 formed in the frame 26. The first wheel 28 is constructed with several recesses 52, which move in a circular path as the wheel rotates, to bring the wheel recesses opposite the recess 50 in the frame. Each of the recesses 52 slopes to a maximum depth which enables receiption of a substantial part of the ball 48 therein. When the ball 48 is partially received in one of the recesses 52 of the wheel, its other part remains in the recess 50 in the frame. The ball then locks the wheel 28 against turning in the direction of arrow 32 to prevent further retraction of the hairpiece into the doll. However, the wheel 28 can be turned in the opposite direction, since the ball is then forced out of the wheel recess 52 by a sloping wall 53 therein.

The lower wall 54 of the frame recess 50 is sloped so that when the doll is up-right, the ball 48 tends to fall into once of the recesses 52 of the first wheel 28 to prevent its rotation. However, when the doll is turned to a downwardly facing prone position, the ball 48 falls to a position completely within the frame recess 50, so it cannot interfere with rotation of the first wheel 28. Then, the first wheel 28 is free to be rotated by spring 34 to retract the hairpiece 16 into the doll.

The hair retracting mechanism **24** is constructed in a simple manner to enable economical manufacture. A single continuous string is used for the string **22** that couples the hairpiece **16** to the first wheel **28**, and for the biasing string **40** that couples the coil spring **34** to the first wheel **28**. The first wheel **28** is provided with a hole **56** which extends from the side where the shaft portion **44** is located, which receives the biasing string **40**, to the large-groove portion **58** of wheel **28** where the inner end of the string **22** is received. The wheel **28** is held in place between the frame **26** and a cover plate **60** that fits over it. The cover plate **60** has a hair guide **62** thereon which helps to guide hairpiece **16** and string **22** with respect to wheel **30**.

Thus, the invention provides a relatively simple mechanism which allows a hairpiece to be pulled out from the doll, and which retracts the hairpiece at a particular orientation of the doll. In order to prevent excessive retraction of the hairpiece, while assuring firm retraction tension up to that point, a stop is provided by having the inner end **18** of fall **16** engage a restricted opening **64**.

The use of the ball **48** as a pawl or latching means that operates on the ratchets or recesses **52** in wheel **28**, enables control of the retracting mechanism **24** by gravity forces. Accordingly, no unsightly knobs, buttons, or the like are required on the outside of the doll. The provision of a path for the hair pulling string **22** which leads around the wheel **30** in the abdomen **31** of the doll and then up to the first wheel **28** in the chest **29** provides a long path for the string **22** and the hairpiece **16**, so that two portions of the hairpiece never lie on one another wherein they could become entangled.

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 is claimed is:

1. A figure toy with hair of adjustable length comprising:
a body including a portion with an aperture therein for passing said hair;
power means within said body for pulling said hair inwardly; and
gravity responsive means for selectively latching and releasing said means for pulling said hair inwardly.

2. The figure toy described in claim **1** wherein:
said means for pulling said hair inwardly comprises a wheel rotatably mounted within said body, said wheel having a plurality of ratchet means thereon, cable means having an inner end coupled to said wheel and an outer end coupled to said hair, and a spring coupled to said wheel to urge it towards a first rotational direction to wind said cable thereon; and
said gravity responsive means comprises pawl means mounted for movement into and out of engagement with said ratchet means as said doll is moved to and away from an up-right position.

3. The figure toy described in claim **1** wherein:
said body includes a hollow torso with chest and abdomen portions; and including
a frame mounted within said torso, including an upper frame portion in said chest portion and a lower frame portion within said abdomen portion; and wherein
said means for pulling said hair inwardly includes a first wheel rotatably mounted on said upper frame portion, a second wheel rotatably mounted on said lower frame portion, and cable means having an inner portion normally wound on said first wheel and portions extending downwardly therefrom, around said second wheel, and up to said hair, whereby to enable reliable deployment of a long hair piece into and out from a small body.

4. The figure toy described in claim **1** wherein:
said means for pulling said hair includes a wheel, and cable means extending from said wheel to said hair, said wheel having a plurality of recesses arranged in a circle; and
said gravity responsive means comprises a member having a ball-receiving recess disposed adjacent to the path of said recesses in said wheel when it rotates, and a ball disposed in said ball-receiving recess, for alternately falling to a position simultaneously in said ball-receiving recess and a recess in said wheel or a position fully in said ball-receiving recess to clear said wheel.

5. A figure toy with hair of adjustable length comprising:
a hollow body having chest and abdomen portions;
a hollow head mounted on said body and in communication with said body, said hair extending slidably into said head;
a frame mounted in said body, said frame having upper and lower portions in said chest and abdomen portions of said body, respectively;
a first wheel rotatably mounted on said upper portion of said frame;
a second wheel rotatably mounted on said lower portion of said frame;
cable means extending from said first wheel, around said second wheel, and to said hair;
means for pulling said cable means to pull in said hair; and
means for locking the position of said cable means.

6. The figure toy described in claim **5** wherein:
said ratchet means comprises walls defining a plurality of recesses in said first wheel spaced in a circle thereon; and
said pawl means comprises a frame recess formed in said upper portion of said frame adjacent to said recesses in said first wheel, and a ball at least partially disposed in said frame recess to interfere with rotation of said first wheel in a direction to move said hair inwardly except when said body is in a predetermined horizontal position wherein said frame recess is below the closest recess in said wheel.

7. The figure toy described in claim **5** wherein:
said means for pulling said cable means comprises a first drum fixed to said first wheel, a second drum rotatably mounted on said lower portion of said frame, second cable means having opposite end portions normally wound about each of said drums, and a spring coupled to said second drum to urge it to rotate in a direction to wind said second cable means further thereon.

8. A figure toy with hair of adjustable length, comprising:
a body including a portion having an aperture therein for passing said hair;
power means within said body for retracting said hair inwardly into said body, said power means including wheel means and spring means connected to said wheel means for winding said wheel means in a hair-retracting direction;
pawl means engageable with said wheel means for holding said wheel means stationary against the bias of said spring means; and
means connecting said hair to said wheel means.

9. In a figure toy having a torso, a head having an aperture provided therein and a lock of hair slidably mounted in said aperture, the improvement comprising:
means for retracting said hair from a first length to a second, shorter length, said retracting means including power means for automatically retracting said hair; and
means wholly within said torso for controlling the operation of said retracting means, said controlling means including latch means mounted in said torso for selectively engaging and disengaging said power means, whereby said power means is selectively restrained and released.

10. The improvement stated in claim **9** wherein said retracting means includes means for automatically releasing said latch means when said hair is moved in a hair-lengthening direction with said figure toy in a predetermined position.

11. The improvement stated in claim **9** wherein said retracting means includes means for automatically locking said power means when said retracting means is moved in a hair-retracting direction with said figure toy in a predetermined position.

12. The improvement stated in claim 9 wherein said retracting means includes a fixed part and a movable part and wherein said latch means includes a gravity-responsive element which may be wedged between said parts to lock said power means.

13. A figure toy having a hollow body portion provided with an opening:

a simulated appendage extending through said opening into said hollow body portion;

power means in said body portion, connected to said appendage, for retracting said appendage inwardly through said opening; and

control means in said body for disabling said power means from retracting said appendage, said control means being responsive to the attitude of said figure toy whereby said control means permits said power means to retract said appendage when said figure toy is in one attitude and restrains said power means when said figure toy is in other attitudes.

14. A figure toy as defined in claim 13 wherein said power means includes a movable member; said control means comprising a gravity-responsive latch element engageable with said movable element to prevent movement thereof in an appendage retracting direction.

15. The figure toy described in claim 1 wherein said power means includes:

a wheel rotatably mounted within said body; and

cable means connecting said hair to said wheel for pulling said hair inwardly when said cable is wound onto said wheel, said gravity responsive means latching said power means by restraining said wheel.

16. The figure toy described in claim 1 wherein said power means includes:

a wheel rotatably mounted within said body;

spring means connected to said wheel for rotating said wheel;

means connected to said spring means for loading said spring means when said hair is pulled outwardly from said body; and

cable means connecting said hair to said wheel for pulling said hair inwardly when said cable is wound onto said wheel upon rotation of said wheel by said spring means, said gravity responsive means latching said power means by restraining said wheel.

17. A figure toy with hair of adjustable length comprising:

a body including a portion with an aperture therein for passing said hair;

a wheel rotatably mounted in said body;

cable means connecting said hair to said wheel;

spring means connected to said wheel for rotating said wheel to wind said cable means thereon for pulling in said hair; and

means for restraining said wheel to control the position of said cable means.

18. A figure toy with hair of adjustable length comprising:

a hollow body having chest and abdomen portions;

a hollow head mounted on said body and in communication with said body, said hair extending slidably into said head;

a frame mounted in said body, said frame having upper and lower portions in said chest and abdomen portions of said body, respectively;

a first wheel rotatably mounted on said upper portion of said frame;

a second wheel rotatably mounted on said lower portion of said frame;

cable means extending from said first wheel, around said second wheel, and to said hair;

means for pulling said cable means to pull in said hair;

means for locking the position of said cable means; said means for locking the position of said cable means including a plurality of ratchet means mounted for movement only when said cable means moves, and gravity actuated pawl means for selectively engaging and disengaging said ratchet means in response to pivoting of said body to and away from an upright position, respectively.

* * * * *