

[54] **PROGRAMMED SELF-PROPELLED TOY**

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 [58] Field of Search46/119, 120, 244 D, 247, 245, 46/103, 104, 105, 110, 122, 149, 222, 134

[57] **ABSTRACT**

A programmed animated toy resembling a robot which has a body portion with a plurality of members mounted for movement relative thereto, such as arms and a head. Power drive means is mounted on the body portion for moving the robot over a supporting surface. A programming cam drum having a plurality of cam tracks is provided and operatively associated with the power drive means for steering the robot as it moves over the supporting surface, for moving the aforesaid members relative to the body portion of the robot, for dismembering said members from the body portion, and for causing the robot to fall over, all in a correlated predetermined timed sequence. The cam drum is replaceable by other programming cam drums having different programs to effect different timed sequences of the aforesaid functions. The members are replaceably mounted on the body portion of the robot.

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17 Claims, 8 Drawing Figures

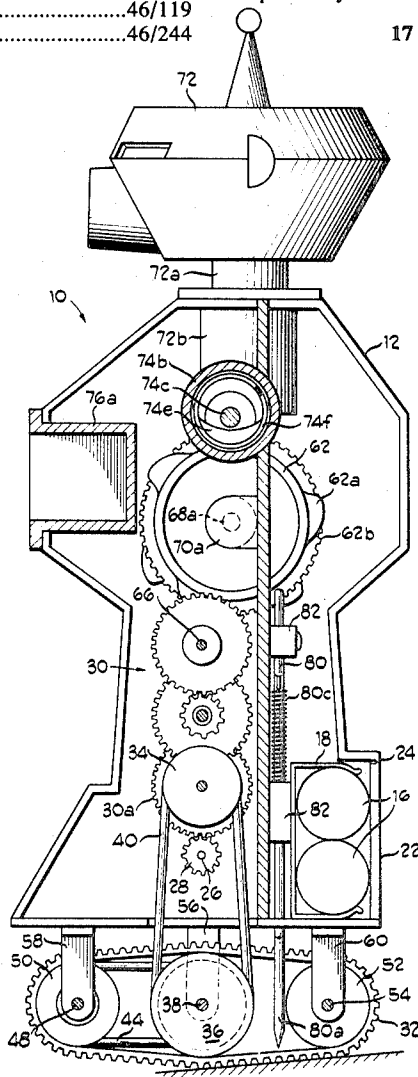


Fig 4

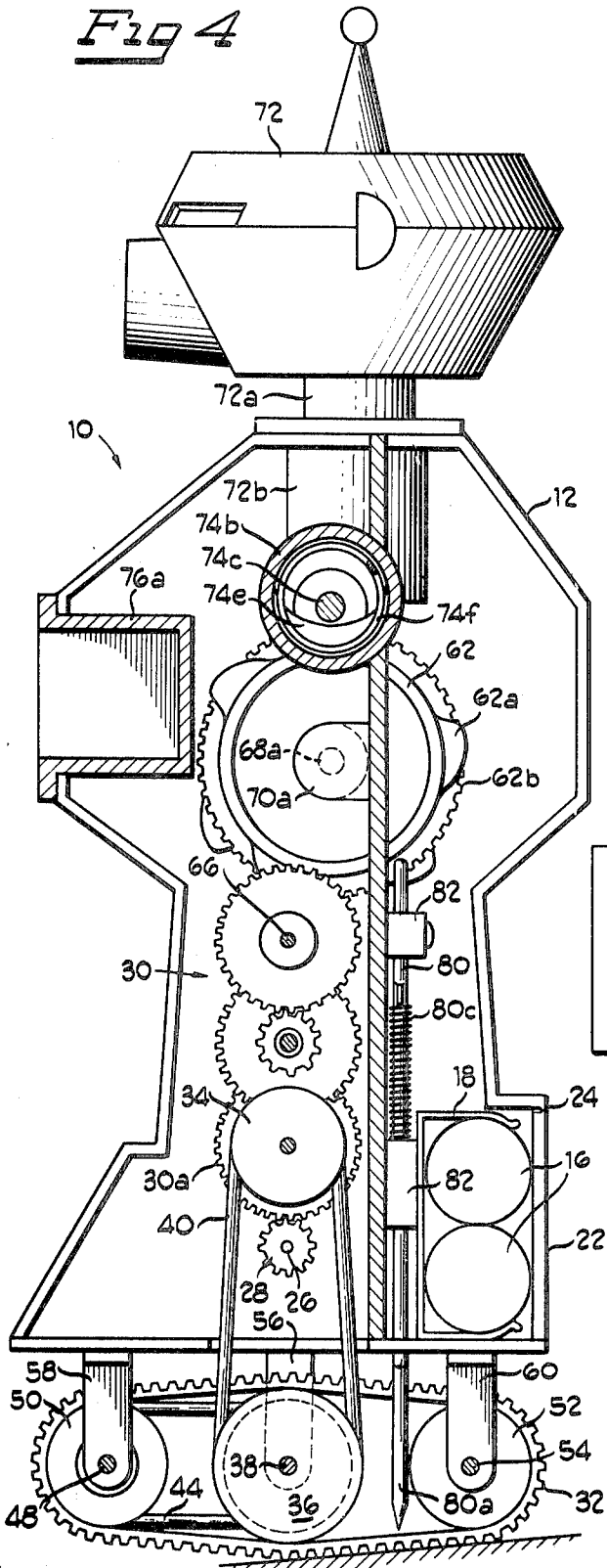


Fig 1

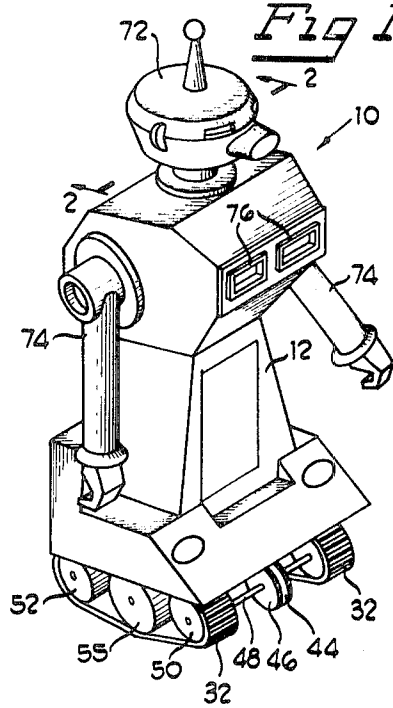


Fig 6

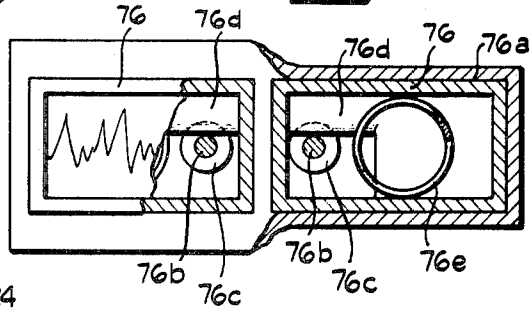
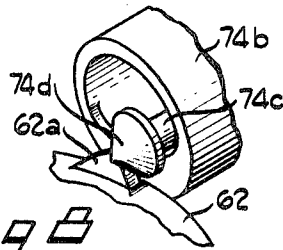


Fig 8



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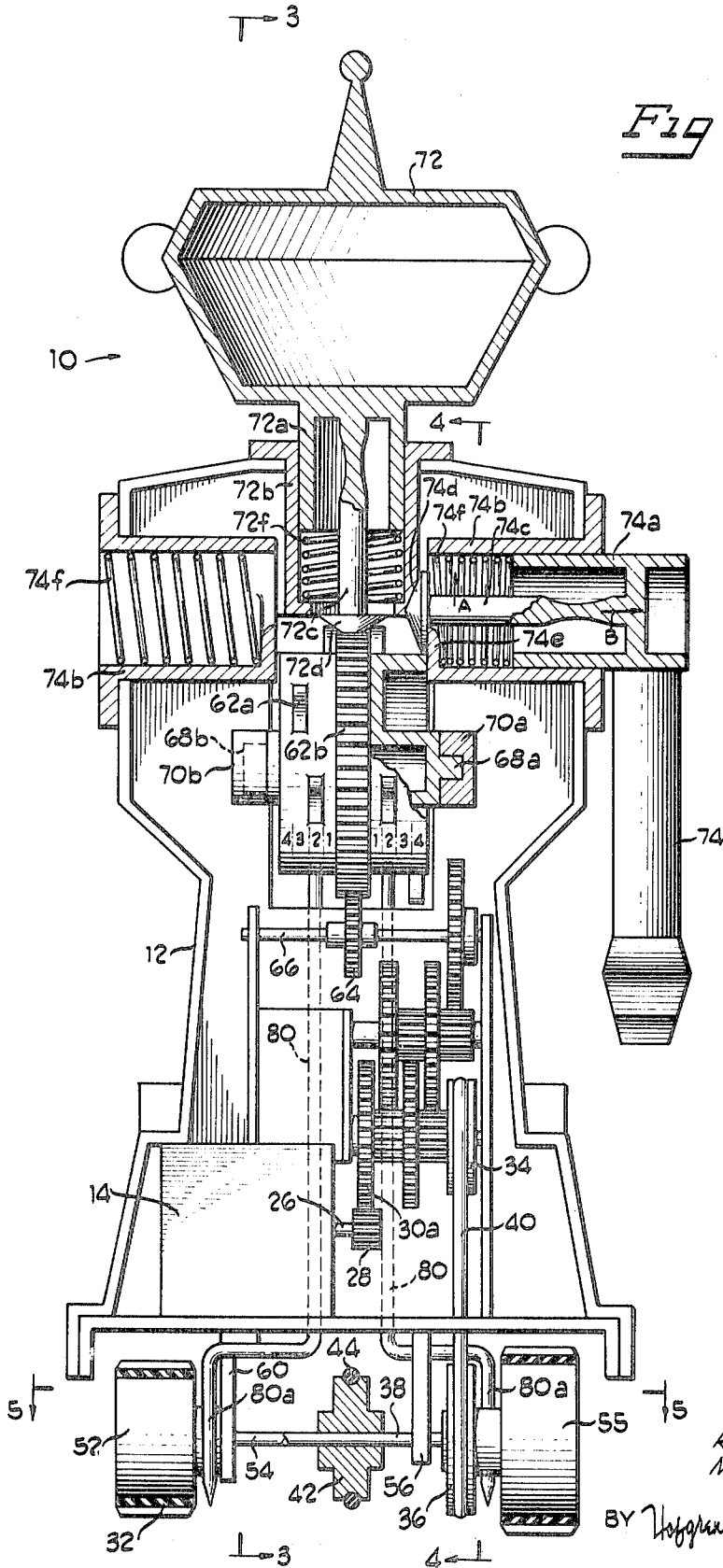


Fig 2

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Fig 3

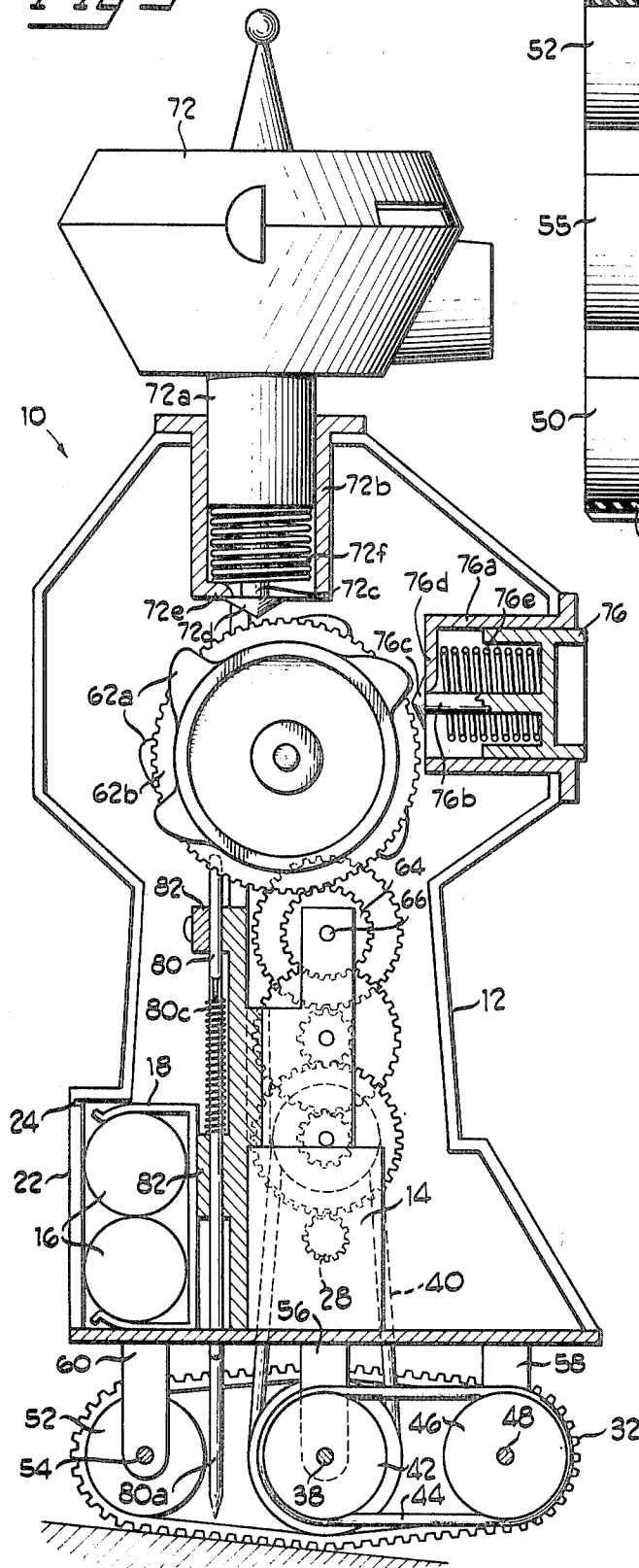


Fig 5

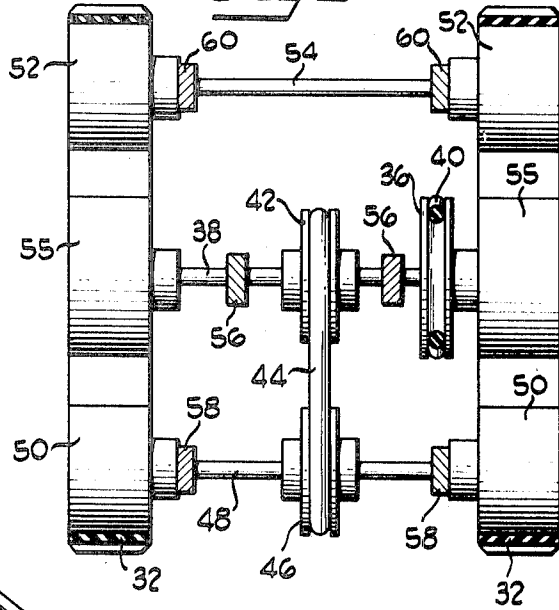
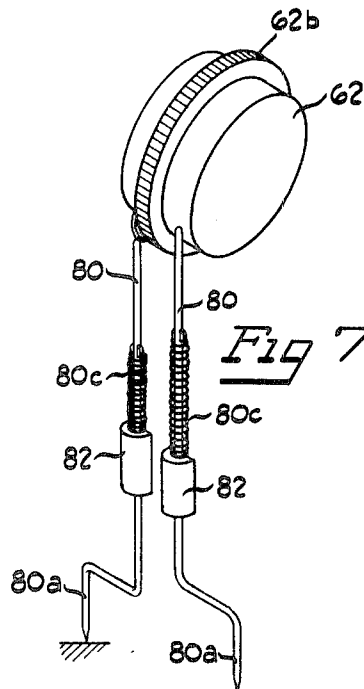


Fig 7



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PROGRAMMED SELF-PROPELLED TOY

BACKGROUND AND SUMMARY OF THE INVENTION

This invention relates to a self-contained, mechanized, animated toy of a programmed type having a plurality of replaceable programming means associated with a drive means to effect various functions of movement and operation of the toy in predetermined timed sequences determined by the particular selected programming means.

Heretofore, robot type toys have been available with relatively movable parts and operable in a predetermined timed sequence, which sequence remained constant or is repeated during operation of the toy. Furthermore, certain vehicle type toys have been designed whereby the vehicle is steered in a particular selected path determined by a plurality of selectable, replaceable programming type means to steer the vehicle in a plurality of different paths of travel determined by the programming means. However, with such programmed vehicles, except for the movement of the wheels for steering, movable members relative to the body portion of the vehicle are not provided. This invention is directed to providing a self-contained mechanized, animated toy which has means for steering the toy in a predetermined path of travel, for moving various portions of the toy relative to a main body portion and for effecting various other functions of the toy, all in a predetermined timed sequence determined by one or more replaceable and interchangeable programming members which effect a plurality of functions of the toy and thereby enhance the ingenuity of the child who uses the toy.

An object of the present invention, therefore, is to provide a mechanized animated toy of the character described.

Another object of the invention is to provide a programmed animated toy which includes a body portion and at least one member mounted on the body portion for movement relative thereto, drive means mounted on the body portion for moving the body portion over a supporting surface, steering means for determining the path of travel of the toy, and a programming means on the toy and associated with the drive means for controlling the steering means and the movement of the member relative to the body portion in a predetermined timed sequence to effectively program the path of movement of the toy and correlate the steering of the toy with the movement of said member.

A further object of the invention is to provide a programmed animated toy of the character described in which the programming means on the toy is releasably and interchangeably mounted on the toy to permit replacement of the programming means by other programming means having different programs.

In furtherance of the aforesaid objects, the toy is designed to resemble a robot having a body portion, with members such as a pair of arms and a head mounted on the body portion and movable relative thereto. The members are replaceably mounted on the body portion and means are provided for causing the members to "pop out" or become dismembered from the body portion, and means are provided for causing the robot to fall over, all in a predetermined timed sequence determined by the replaceable interchangeable programming means.

The programming means illustrated herein comprises a cam drum having a plurality of cam tracks and which is operatively associated with the drive means through a gearing arrangement whereby the steering of the robot, the movement of the body members relative to the main body portion, the dismemberment of the body members from the body portion, and the falling over of the robot are effectively operated in a predetermined timed sequence determinable by the particular cam drum selected for use by the child. The body members are replaceable onto the body portion so that the toy can be operated again by the same or a different programmed cam drum.

A further feature of the invention is to provide means to insure that the programmed cam drums are properly positioned on the toy in operative association with the drive means.

Other objects, features and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawings.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the mechanized animated toy of the present invention, designed to resemble a robot;

FIG. 2 is a vertical section taken generally along the line 2—2 of FIG. 1;

FIG. 3 is a vertical section taken generally along the line 3—3 of FIG. 2;

FIG. 4 is a vertical section taken generally along the line 4—4 of FIG. 2;

FIG. 5 is a horizontal section taken generally in the direction of the line 5—5 of FIG. 2, with the body portion of the toy and other elements removed to facilitate the illustration;

FIG. 6 is a vertical, partial section, through the simulated computer elements of the toy;

FIG. 7 is a perspective view of a cam drum and steering means for the toy, isolated from the remainder of the toy; and

FIG. 8 is a partial, perspective view of a portion of a cam drum shown in its operative association with the inside portion of one of the "pop out" or replaceable body members of the toy, isolated from the remainder of the toy.

DETAILED DESCRIPTION OF THE INVENTION

The animated toy of the present invention is shown herein as incorporated in a self-contained, power operated mechanized unit which resembles a robot and which is designed to move over and upon a supporting surface in a predetermined path, with various body members movable relative to the body portion of the robot, and with other functions to be described hereinafter, all programmed in a timed predetermined sequence.

Referring to the drawings in greater detail, the mechanized animated toy of the present invention, generally designated 10, includes a generally hollow frame or body portion 12 which houses a power drive means, to be described hereinafter, and for mounting various replaceable "pop out" body members, also to be described in greater detail hereinafter.

The power drive means includes a motor 14 (FIG. 2) powered by a pair of dry batteries 16 (FIGS. 3 and 4). The batteries are snap fit into a bracket 18 on the inside of the frame or body portion 12. A door 22 is hinged, as at 24, to provide access to the interior of the body portion 12 to replace the batteries 16 when necessary. The motor 14 has a drive shaft 26 rotatable thereby, with a gear 28 (FIG. 2) on the end of the drive shaft. A gear train, generally designated 30, is provided with a gear 30a in operative engagement with the gear 28 on the end of the motor drive shaft 26 to provide a driving linkage between the motor 14 and the other operative portions of the toy, described hereinafter. A pair of laterally spaced endless track members 32 are provided to drive the toy over a supporting surface, such as a floor, table or the like. A plurality of pulleys and drive cables are provided to power the endless track members 32 to move the toy over the supporting surface. More particularly, a pulley 34 (FIGS. 2 and 4) is provided in operative association with gear train 30. A second pulley 36 is fixed on a shaft member 38 beneath the body portion 12 and is operatively connected by a flexible drive cable 40 to pulley 34. A third pulley 42 is fixed on the shaft member 38 generally centrally thereof, as shown in FIG. 2, and a second flexible drive cable 44 operatively connects the third pulley 42 to a fourth pulley 46 (FIGS. 3, 4 and 5) which is fixed to a shaft member 48 which, in turn, is fixed to and rotates a pair of drive wheels 50 (FIG. 5) for the track members 32. A second pair of wheels 52 (FIG. 5) are connected by a shaft member 54 to support the opposite end of the track members 32. A third pair of supporting wheels 54 are fixed on the shaft member 38. Shaft member 38 is supported by a pair of downwardly extending frame members 56, shaft member

48 similarly is supported by a pair of downwardly extending frame members 58, and shaft member 54 is supported by a pair of downwardly extending frame members 60. All of the frame members 56, 58 and 60 are secured to the bottom of the hollow body portion 12.

Thus, the track members 32 for moving the toy over a supporting surface are operated by the motor 14 functioning through the gear 28 on the end of the motor drive shaft 26, through the drive train 30 and through the various pulleys 34, 36, 42, 46 and the resilient drive cables 40 and 44, all of which function to rotate the drive wheels 50 and 54 to move the endless track members 32 and thereby move the toy over a supporting surface.

Before going into the means for steering the toy and the other relatively movable members of the toy, described hereinafter, it should be pointed out that the toy is controlled and programmed by a programming means in the form of a cam drum or disc 62 which is divided into a plurality of cam tracks numbered 1 through 4 in FIG. 2. Each cam track has at least one projection or rise 62a about the periphery of the cam drive to effect various functions, to be described hereinafter. In the center of the cam drum is a gear position 62b operatively engaging a gear 64 which, through a shaft member 66, is operatively connected to the gear train 30 and thereby operatively rotated by the motor 14. Thus, as the motor operates to move the toy over a supporting surface, the cam drum is also rotated to effect various functions described hereinafter. The cam drums are replaceable by other cam drums having different programs. In order to insure proper positioning of the cam drums, two different sized cylindrical projections 68a and 68b protrude outwardly from opposite sides of the cam drum 62 and are received in complementary bosses 70a and 70b, respectively, on the inside of the frame or body portion 12 for rotatably mounting the cam drum. The different sized projections insure that the cam drum will be properly positioned within the body of the toy so that the cam tracks 1 through 4 are properly oriented to perform their designated function. Indicia, such as arrows or the like may be provided on the cam drum to indicate a starting position.

The toy has a plurality of body members; namely, a head 72, a pair of arms 74 and a pair of simulated computer elements 76; all of which are similarly mounted on the body portion 12 so as to be capable of becoming dismembered therefrom by particular rises 62a on the cam drum 62. Referring to FIG. 2, the arms 74 have a cylindrical portion 74a telescopically received in a cylindrical barrel member 74b which is received in a circular aperture in the body portion 12. The arm has a plunger portion 74c which extends through the barrel member 74b and has a head portion 74d which seats behind a lip 74e at the inner end of the barrel member 74b to form a sort of latch means. A coil spring 74f is positioned within the barrel member between the cylindrical portion 74a of the arm and the lip portion 74e of the barrel member, so as to urge the arm outwardly from the body portion 12 when the head portion 74d becomes unseated from behind the lip 74e. Both arms 74 are similarly constructed. It can be seen from FIG. 2 that the cam tracks numbered 4 on the cam barrel 62 are in line with the head portions 74d of the arms 74 so that at a particular time in the timed programmed sequence of functions for the toy a rise on either of the cam tracks numbered 4 will come into engagement with the head portion 74d of one or both of the arms 74 and cause the head portion 74d to move in the direction of arrow A (FIG. 2) to unseat the head 74d from behind the lip 74e whereby the spring 74f will urge the arms outwardly in the direction of arrow B (FIG. 2) to "pop" the arms out of the barrel member 74b and thereby effectively dismember the arms from the body portion. In addition, smaller rises on the cam tracks numbered 4 may be provided with friction surfaces to engage and rotate the head portion 74d of the arms to cause the arms to move or pivot about the cylindrical portion 74a.

Each of the two simulated computer members 76, similar to the arms 74, are received in sockets 76a, with plunger portions

76b extending completely through the sockets 76a with head portions 76c seated behind lips 76d, and with springs 76e to urge the computer members 76 outwardly from the body portion 12 of the toy. The head portions 76c are positioned in line with the cam tracks numbered 3 on the cam drum 62, and, as explained above in reference to the arms 74, the computer members 76 will be caused to be dismembered from the body portion 12 of the toy when a cam rise 62a on the cam tracks numbered 3 come into engagement with the head portions 76c and cause the head portions to become unseated from behind the lips 76d.

The head 72 is similarly constructed, with a cylindrical portion 72a received in a barrel member 72b, and with a plunger portion 72c having a head portion 72d seated behind a lip portion 72e (FIG. 3) of the barrel member 72b. A spring 72f is provided to urge the head upwardly out of the barrel member 72b when rises 62a in cam tracks numbered 1 of the cam drums 62 come into engagement with the head portion 72d to cause the head portion to become unseated from behind the lip portion 72e of the barrel member 72b. It should be pointed out that in the embodiment illustrated in the drawings, since the gear portion 62b of the cam drum 62 is centrally located, it would require a rise 62a on both cam tracks numbered 1 to unseat the head portion 72d, as illustrated in FIG. 2. As with the arms, smaller rises on cam tracks numbered 1 may be provided on one or both of the cam tracks (but not at the same orientation), and having friction surfaces for engaging the head portion 72d to rotate the head portion and thereby move the head 72. These latter smaller rises, of course, must not be high enough to unseat the head portion 72d of the head 72.

Means are provided for steering the toy as a function of the rises on cam tracks numbered 2 as the programming cam drum 62 rotates. This means comprises a pair of vertical rods 80 having offset pin portions 80a positioned closely to the track members 32, as best seen in FIG. 2. The lower ends of the offset portions 80a of the rods 80 are located closely to, but slightly above, the supporting surface on which the toy moves. When a rise on one of the cam tracks numbered 2 engages the upper end of the rod 80, the rod will be urged downwardly and the lower portion 80a of the rod will lift the adjacent track member 32 off of the supporting surface and form a pivot about which the toy will rotate until the rise 62a on the respective cam track numbered 2 becomes disengaged with the upper end of the rod 80. A spring 80c then urges the rod 80 upwardly to the position shown in FIG. 2 and the toy will continue on a generally straight path.

Referring to FIG. 3, the rods 80 are journaled in bosses 82 selectively positioned close to the center of gravity of the toy. Therefore, by providing aligned rises on the cam tracks numbered 2, the rods and their offset portions 80a may be urged downwardly simultaneously to raise the rear of the toy, shifting the center of gravity sufficient to cause the toy to tilt and fall over.

From the foregoing, it can be seen that the toy may be moved, either arm 74 and/or the head 72 may move, either of the arms 74, the heads 72 and/or the computer member 76 may be caused to become dismembered from the body portion 12, and the toy may be caused to fall over, all in a predetermined timed sequence as a function of the positioning of the rises 62a on the cam tracks 1 through 4 of the programmed cam drum 62. Since the cam drums are replaceable, a wide variety of different programs can be provided for the self-contained, mechanized, animated toy for the present invention.

The foregoing detailed description has been given for clearness of understanding only and no unnecessary limitations should be understood therefrom as some modifications will be obvious to those skilled in the art.

We claim:

1. A programmed animated toy comprising:

a body portion;

at least one body member mounted on the body portion for movement relative thereto;

drive means mounted on the body portion for moving the toy over a supporting surface;

steering means for determining the path of travel of the toy; and

replaceable programming means releasably mounted within the body portion and associated with said drive means for controlling the steering means and the movement of the body member relative to the body portion in a predetermined timed sequence to effectively program the path of movement of the toy and correlate the steering of the toy with the movement of said body member, said programming means including a cam drum having a plurality of cam tracks operatively associated with said drive means for rotation thereby wherein at least one track is for controlling said steering means and at least another track is for controlling the movement of said body member relative to the body portion.

2. A programmed animated toy comprising:

a body portion;

at least one body member mounted on the body portion for movement thereto;

drive means mounted on the body portion for moving the toy over a supporting surface;

at least a pair of laterally spaced members engaging the supporting surface and operable by said drive means for moving the toy over the supporting surface;

steering means for determining the path of travel of the toy, said steering means including a vertically reciprocal pin member adjacent each of said spaced members and movable downwardly against the supporting surface to raise the respective spaced member out of engagement with the supporting surface to render the respective spaced member inoperative; and

programming means associated with said drive means for controlling said steering means by vertically reciprocating said pin member and for controlling the movement of said body member relative to the body portion in a predetermined timed sequence to effectively program the path of movement of the toy and correlate the steering of the toy with the movement of said body member.

3. A programmed animated toy comprising:

a body portion;

at least one member mounted on the body portion for movement relative thereto;

drive means mounted on the body portion for moving the toy over a supporting surface;

means to cause said body member to become dismembered from said body portion; and

programming means associated with said drive means and with said dismembering means for actuating the dismembering means at a predetermined time after commencement of operation of said drive means, said programming means including a cam drum having a plurality of cam tracks operatively associated with said drive means for rotation thereby wherein at least one track is operable to actuate the dismembering means.

4. The toy of claim 3 including steering means for determining a path of travel of the toy wherein said programming means also controls said steering means and the movement of the body member relative to the body portion in a predetermined timed sequence to effectively program the path of movement of the toy and correlate the steering of the toy with the movement and dismemberment of the body member.

5. The toy of claim 4 wherein said cam drum has, in addition to a first track for controlling dismemberment of the body

member, another cam track for controlling the steering means and a third cam track for controlling the movement of said body member relative to the body portion.

6. The toy of claim 1 wherein said means releasably mounting said programming means has means for insuring that the programming means is properly positioned on said toy and precluding any improper positioning.

7. The toy of claim 1 wherein said toy includes a plurality of said body members mounted on said body portion for movement relative thereto so as to perform a plurality of different functions, said programming means being operable to effect movement of said body members in a predetermined timed sequence and correlated with the steering of the toy.

8. The toy of claim 1 wherein said toy is generally vertically elongated and including means to cause said toy to fall over, said last-named means being effectively controlled by said programming means to cause the toy to fall over at a predetermined time in said sequence.

9. The toy of claim 2 wherein said toy is generally vertically elongated with the center of gravity thereof being relatively close to but on one side of a line passing through said pin members, said programming means being operative to cause both of said pin members to raise at least a portion of said spaced members and thereby shift the center of gravity sufficient to cause the toy to fall over at a predetermined time in said sequence.

10. The toy of claim 4 including means releasably mounting said cam drum on said toy to permit replacement of the cam drum by other cam drums having different programs.

11. The toy of claim 3 wherein said toy is generally vertically elongated and including means to cause said toy to fall over, said last-named means being effectively controlled by said programming means to cause the toy to fall over at a predetermined time in said sequence.

12. The toy of claim 11 wherein said programming means is effective to cause said toy to move in said predetermined path while said body member first moves and then becomes dismembered, and then the toy is caused to fall over.

13. The toy of claim 3 wherein said body member is replaceably mounted on the body member.

14. The toy of claim 13 wherein said body member has a portion thereof received in a socket in said body portion, biasing means urging said portion out of the socket and the body member away from the body portion, latch means to hold said member portion in said socket against said biasing means, and means operative by said programming means to release said latch means at a predetermined time in said sequence.

15. The toy of claim 3 wherein said toy includes a plurality of said body members mounted on said body portion for movement relative thereto to perform a plurality of different functions in a predetermined timed sequence controlled by said programming means, and means to cause dismemberment of said body members from said body portion at some time after the member have performed their respective functions.

16. The toy of claim 15 including means to cause said toy to fall over, said last-named means being effectively controlled by said programming means to cause the toy to fall over at a predetermined time in said sequence after all of the body members have performed their respective functions and have been dismembered from the body portion.

17. The toy of claim 16 wherein said toy resembles a robot and said body members comprise at least two arms and a head.

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