

[54] **BALL PASSING TOY**

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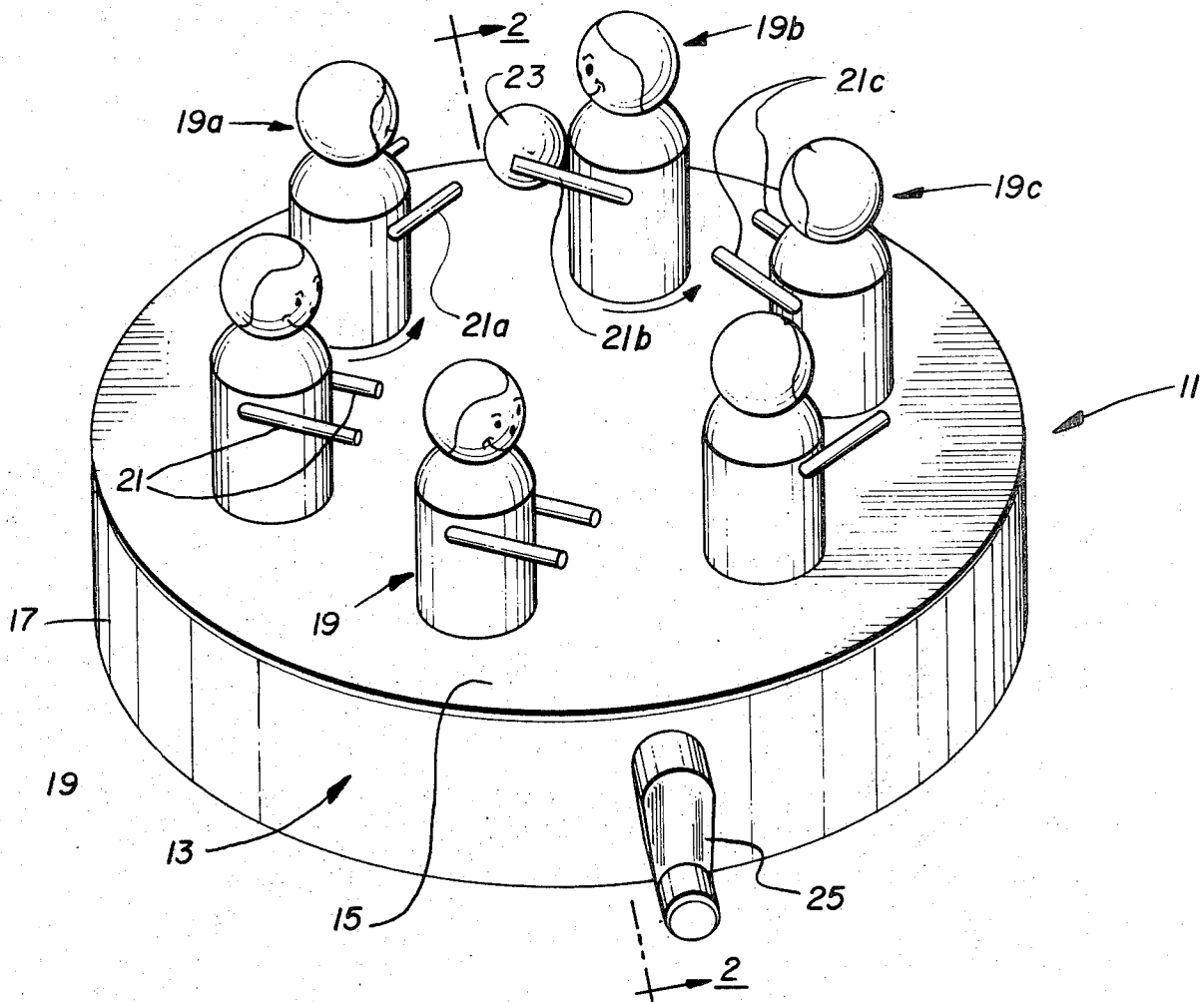
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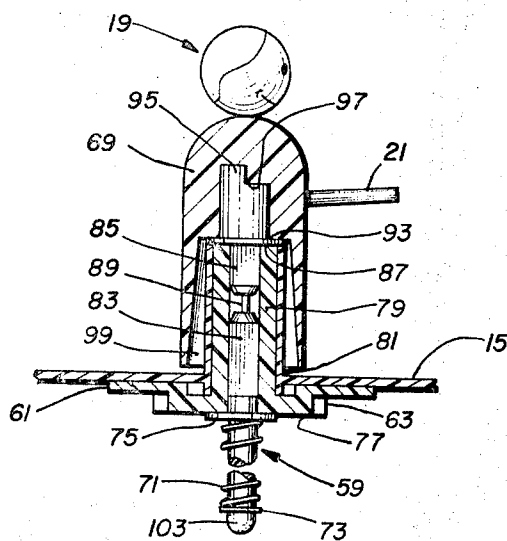
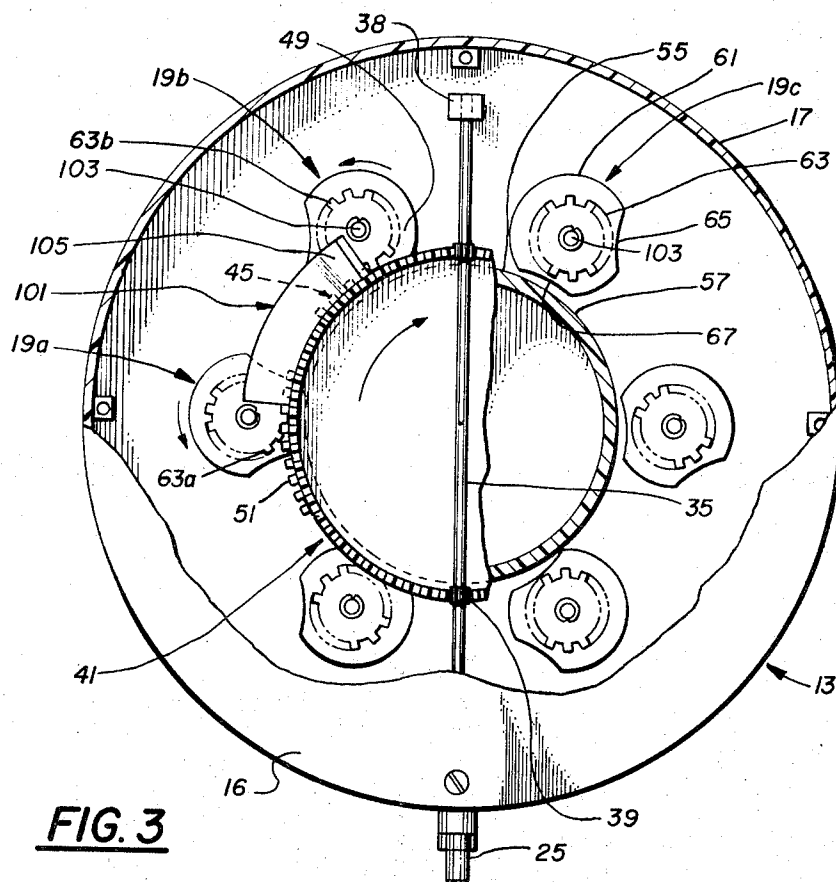
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[57] **ABSTRACT**

A toy comprising a plurality of spaced-apart objects having arm means on which a ball or other discrete object can rest. Upon actuation of a driving mechanism, the objects pass the ball from one to another in a continuous operation.

9 Claims, 4 Drawing Figures





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BALL PASSING TOY

Simple animated toys are particularly fascinating for young, pre-school children. Most animated toys in the past involved an object, or a plurality of objects, that were actuated to perform various feats such as walking, sitting, and the like. Many of the previous animated objects involved complex internal mechanisms to achieve the animation. Thus, the toys were relatively expensive and subject to breakage without the ability to readily repair them. Very few of the past animated toys involved several animated objects in one device which cooperate with one another. Further, the prior art toys generally do not involve the animated objects performing work functions, such as moving or carrying another object about. Additionally, many of the prior art animated objects involved operation by means of a spring wound mechanism to drive a motor, or a battery operated motor. The spring wound mechanism was susceptible to over-winding by a child or alternatively could not be sufficiently wound by a young child to achieve the desired results. Battery operation, of course, involves the potential of leakage as well as the expense of continually replacing the batteries which are often rapidly drained in the operation of the device, particularly since a small child would tend to leave the device running for a long period.

The herein invention involves a plurality of animated figures equidistantly spaced from each other, which in turn pass a ball or other discrete object from one figure to the other in a continuous manner when actuated by a drive mechanism. The device comprises figures each having arms extending therefrom. The arms are spaced apart from each other sufficient to hold an object such as a marble or ball, or the like. Figures can, for example, be disposed about a circle with all of the arms of the figures generally directed in the same direction about the circle. The drive mechanism may be provided, which when actuated, causes one figure having a ball or object to rotate to face a second figure in the circle and release the ball to that second figure, then rotate back to its initial position. The second figure then rotates with the ball to face a third figure and the process continues with the ball or object being passed around the circle in this manner. The entire mechanism and thus, device, can be operated by merely turning a hand crank that serves to drive the mechanism.

It is believed that the invention will be further understood from the following detailed description and drawings in which:

FIG. 1 is a pictorial view of the toy of the invention.

FIG. 2 is a partially sectioned view taken generally along line 2—2 of FIG. 1.

FIG. 3 is a partially sectioned view taken generally along line 3—3 of FIG. 2.

FIG. 4 is an enlarged sectioned view of one of the animated figures of the toy.

Turning now to FIG. 1, there is seen the toy 11 of the invention which can comprise a housing 13 having a circular flat upper wall 15, a bottom wall 16, and a cylindrical side wall 17. Disposed on the top wall 15 of the housing 13 are a plurality of figures 19. In the embodiment shown, six figures 19 are disposed equidistantly around the circumference of a circle on the upper surface 15 of the housing. Each figure has a pair of generally parallel horizontally extending arms 21 emanating therefrom. In FIG. 1, all of the figures 19, except one, 19a, are shown having the arms 21 facing

in the same counterclockwise direction. The figure 19a, and its arms 21a, are facing in the opposite direction to the rest of the figures, it having delivered a ball, marble, or similar object 23 to an adjacent figure 19b. Thus, the ball 23 is shown supported in the arms 21b of figure 19b. As will be further explained, the figure 19a tilted toward the figure 19b to deliver the ball. Figure 19b will then rotate with the ball 23 in its arms 21b toward figure 19c. The figure 19a concurrently will rotate back to its rest position where it is facing in the same counterclockwise direction as the other figures. The ball carrying figure 19b will then be tilted toward figure 19c, releasing the ball into its arms 21c. The ball is thus passed about the circle, with each figure rotating from its normal position approximately 100° to deliver the ball to the next adjacent figure and then rotating back to its normal position. The procedure is continuous as long as a crank 25 is turned by the user. Crank 25 serves to drive the mechanism contained within the housing to achieve the foregoing results, as will be explained in further detail with regard to FIGS. 2-4.

The crank 25 is rotatably supported in the housing side wall 17 and is connected to the outer end of a first horizontally extending axle 27 rotatably supported by in upright interior wall 29 of the housing. A coil spring 31 surrounds and is fixed at one end to the inner end 33 of axle 27. A second horizontally extending axle 35, rotatably mounted in bracket 38 and center post 47 in the housing, has an end 37 freely received within the other end of the spring 31. As the crank 25 is rotated in one direction, the spring 31 is caused to tighten and rotation is imparted to the second axle 35 which is the main driving axle. Rotation of the crank 25 in the opposite direction tends to expand and the spring around the axle 35 so that the axle 27 can rotate freely without imparting any rotation to second axle 35. Thus the spring 31 serves as a clutch mechanism. The use of a spring in this manner is conventional and has been used in prior art devices.

Axle 35 has a first small gear 39 fixed thereon. The small gear 39 engages a much larger downwardly facing ring gear 41 which has a circular side wall 43 that in turn supports a large flat horizontally disposed upper gear 45. The teeth of gear 45 do not extend completely around its circumference but rather are only formed along two portions 49 and 51 as seen in FIG. 3. The remainder of the circumference of the gear 45 is smooth. Disposed above the gear 45 is a large circular disc 55 having a smooth outer circumference 57. The disc 55 is fixed to the gear 45 and turns therewith. The gears 41 and 45 and the disc 55 are rotatably supported on a center post 47 within the housing. The illustrated center post 47 has a lower section 50 fixed to and extending upwardly, from the bottom wall 16 and a rotatable upper section 52 extending down from the upper wall 15. The lower section 50 has a central aperture 53 in its upper end for receiving for rotation therein, a pin 54, which extends downwardly from the lower end of the upper section 52. Section 52 is integrally formed with the disc 55. Thus, gear 39 engages and rotates gear 41 and thereby also causes gear 45 and disc 55 to rotate.

The two toothed portions 49 and 51 of gear 45 serve as a means for rotating a pair of adjacent figures 19, in a manner to be explained, while the smooth circumference 57 of disc 55 maintains the remaining figures in their normal positions prior to their being rotated.

The figures 19 are all the same so only one will be described. In particular, as shown in FIGS. 2, 3 and 4, the figure 19 is rotatably coupled to a horizontally disposed disc 61 located immediately below the upper wall 15 and to a gear 63 of smaller diameter disposed immediately below the disc 61. The disc 61 and gear 63 may be integrally formed. As shown best in FIG. 2, the disc 61 is aligned for engagement with large disc 55 while the ear 63 is aligned for engagement with the toothed portions 49 and 51 of large gear 45. As shown in FIG. 3, the disc 61 has two spaced-apart indentations 65 and 67 formed at its circumference. The indentations 65 and 67 engage with the smooth outer circumference 57 of disc 55 to ride therein as seen in FIG. 3, serving to maintain these discs 61 (and thus the figures) in their proper rotational positions without rotation until the teeth portions 49 and 51 engage the gears 63 of two adjacent figures. When this occurs, the gears 63 (and thus the two adjacent figures) are rotated in a desired relationship. In FIG. 3, it can be seen that the tooth portion 49 is engaged with the gear 63b of the figure 19b, causing that figure (which has the ball 23 in its normal receiving position as seen in FIG. 1) to rotate counterclockwise as viewed in FIG. 1 to face figure 19c. This rotation of figure 19b is about 100°. While the figure 19b is so rotated, tooth portion 51 engages gear 63a to rotate figure 19a counterclockwise as viewed in FIG. 1 to its starting or normal position. This rotation of figure 19a is about 260°. Thus, since a figure 19 must rotate approximately 260° to return to its normal position, while it rotates only about 100° to deliver the ball, the tooth portion 51 is much longer than the tooth portion 49.

As the figure 19a is returning to its starting or normal position, the figure 19b with the ball 23 in its arm 21b rotates to face figure 19c and is ready to dump the ball into the arms 21c of figure 19c. The ball 23 is dumped by effecting tilting of the arms 21b sufficient for the ball to roll therefrom. As can be seen, all of the arms 21 of the figures 19 are normally angled slightly upwardly so that when a ball is dumped thereon, the ball will rest against the body of the figures and be supported by the arms 21. To release the ball, the arms must be tilted downwardly to allow the ball to roll therefrom.

Turning to FIG. 4, there is seen a preferred form of mechanism for effecting tilting of the arms 21. The arms 21 are rigidly affixed to a main housing or body 69 of the figure. In the illustrated toy, the body 69 is tilted, to thereby effect tilting of the arms 21. In general, each body 69 is coupled to the associated gear 63 for common rotation, while the body is mounted so as to permit it to move upwardly. The body 69 is mounted on a center shaft or rod 59 through a flexible connection 89 so that when the body is moved upwardly, it is thereby tiltable, and when it has a ball 23 in its arms 21, the weight of the marble causes the body 69 to tilt in the forward direction to deliver the ball from the arms.

More particularly, as shown in FIG. 4, for each figure 19, the upper housing wall 15 has an upright cylindrical section 81 which extends through and upwardly from the wall 15. In the section 81 there is rotatably received a cylindrical sleeve portion 79 extending upwardly from an associated disc 61 and gear 63. The sleeve portion 79 has a central opening which is square in cross section and receives portion 83 and 85 of the center shaft 59 which have complementary square cross sections. The portions 83 and 85 are connected together

by a thin flexible hinge or connection section 89. The shaft 59 may be of plastic to facilitate the hinge in a unitary shaft structure. Alternately, the hinge section 89 could be provided by a pivoted connection. The shaft 59 also comprises a horizontally extending disc portion 93 connected to the upper end of upper shaft portion 85 and a key portion 95 connected to the disc portion 93 and received in a matching recess 97 in the body 69. Thus, rotation of the gear 63 is transmitted through the sleeve 79 and the shaft 59 to the body 69.

The center shaft 59 is spring loaded downwardly to the normal position shown in FIG. 4. In this connection, there is a spring 71 disposed on the shaft 59 between a disc 73 fixed to the shaft adjacent its lower end 103 and a disc 75 disposed adjacent the under surface 77 of gear 63. When the shaft 59 is raised upwardly (as will be explained below) to the point where the hinge section 89 is above the top end 87 of the cylindrical sleeve portion 79, the figure 19 is free to tilt above the hinge section. When the figure 19 has the weight of a ball 23 in its arms 21 it will tilt forwardly in the direction of the arms so that the arms will tilt downwardly and the ball will be released. In other words, the hinge section 89 is normally retained within the cylindrical sleeve portion 79 so that it cannot bend and the figure will not tilt, even having a ball in its arms. However, when the hinge section is exposed, by being raised above the top end 87 of the sleeve portion, so that it can bend, then the unequal weight distribution on the figure due to the presence of the ball will cause it to tilt or bend over. The tilting is permitted, while its amount is controlled, by the hollow interior space 99 provided within lower end of the housing 69 surrounding the cylindrical section 81.

In order to cause the shaft 59 to rise sufficiently to allow the figure to tilt forwardly to deliver the ball 23, a cam 101 is provided on the outside of the rotatable cylindrical wall 43 and normal thereto so that the bottom end 103 of the shaft 59 can lie thereon and be moved in the desired manner. The highest portion 105 of the cam will initially contact the bottom end 103 of a shaft 59 and raise the associated figure 19 just after it has turned to face the adjacent figure and the ball 23 will be delivered from the raised figure to the other figure. The cam 101 then gradually lets the delivering figure move downwardly to its normal position where it will then be subsequently contacted by tooth portion 51 and rotated back to its normal rest position.

A small gear 107 on the axle 35 engages a larger gear 109 which in turn drives the mechanism within a music box 111 mounted in the housing. Thus, as the toy is operated by turning the crank 25, music will accompany the passing of the ball from figure to figure. The rate at which the crank is turned effects the tempo of the music produced. Therefore, a child can gauge the most preferred rate at which to turn the crank by the music.

Through the description and drawings have referred to the utilization of figures which can assume a shape or configuration of persons or animals, it is to be appreciated that figures can comprise virtually any structure capable of passing a ball in the manner described. Thus, the figures can comprise various geometric shapes, open framework structures, and the like, which have means for holding a ball and subsequently releasing the ball to an adjacent figure in accord with the overall concept of the herein toy.

I claim:

1. A toy comprising:

a plurality of figures, each having a pair of holding means extending therefrom, said figures being initially in a predetermined position relative to one another,

housing means for movably supporting said figures, an object adapted to be held by the holding means of one of said figures at a time and passed from figure to figure,

drive means mounted in said housing means for driving each of said figures in succession to a position facing an adjacent figure, said drive means further actuating said figures to tilt at last portion thereof to cause said object to be passed between the holding means of said pairs of facing figures, and means for driving said drive means to effect the aforementioned drive action thereof.

2. The toy of claim 1 wherein said figures are arranged in a ring.

3. The toy of claim 1 wherein said drive means comprises a gear having toothed portions over only a portion of its extent, said figures having teeth thereon for engaging the toothed portions of said gear, the toothed portions of said gear engaging the gear teeth of only a pair of said figures at a time.

4. The toy of claim 3 wherein said gear is circular and is driven rotatably.

5. The toy of claim 1 wherein said means for driving said drive means comprises a hand crank.

6. The toy of claim 3 wherein there are two toothed portions on said gear, one of said toothed portions operating to drive one of said pair of figures clockwise while the other of the toothed portions drives the other of said pair of figures counterclockwise.

7. The device of claim 1 and further including means for mounting said figures for tiltable motion relative to said housing means, said drive means including cam means for tiltably driving the figure carrying said object to effect the passing of said object.

8. The device of claim 7 wherein said means for mounting said figures for tiltable motion includes a vertical support rod for each of said figures, having a hinged intermediate section, each of said figures being connected to its associated rod above the hinged section, means for retaining the hinged sections of said rods to maintain said rods in an upright position relative to said housing, said cam means successively driving each of said rods relative to said retaining means to allow the hinged section to bend and the body to thereby tilt.

9. The device of claim 8 wherein the retaining means is a sleeve surrounding said hinged section, said rod driving the hinged section out of said sleeve.

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