June 29, 1965 A. E. GOLDFARB 3,191,343

OBJECT PROPELLING MOVABLE TOY

Filed Nov. 12, 1963 2 Sheets-Sheet 1

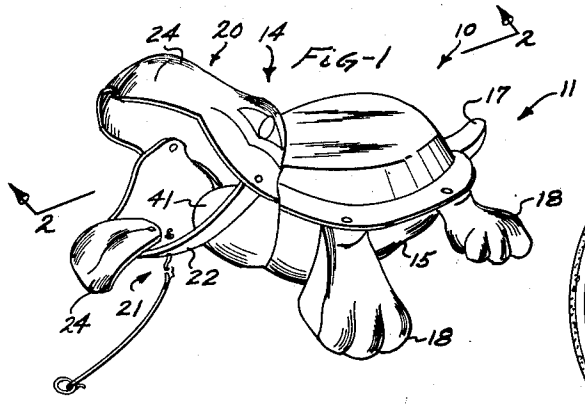


Fig-1

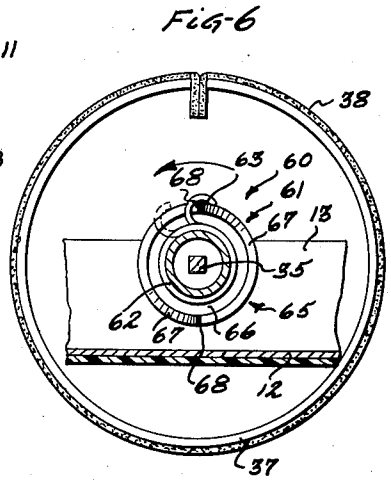


Fig-6

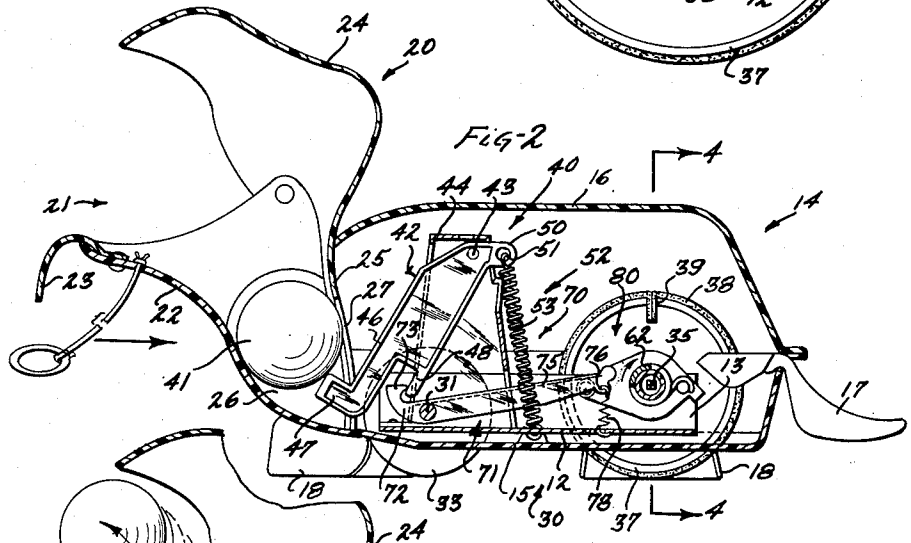


Fig-2

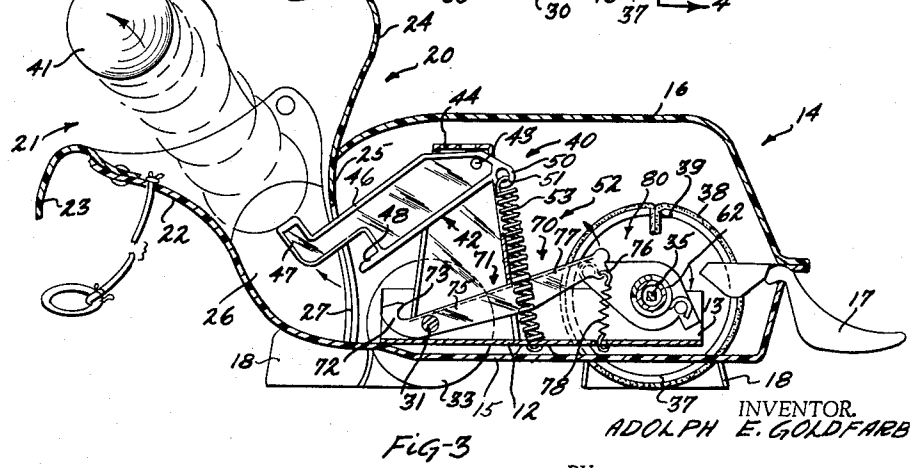


Fig-3

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OBJECT PROPELLING MOVABLE TOY

Filed Nov. 12, 1963 2 Sheets-Sheet 2

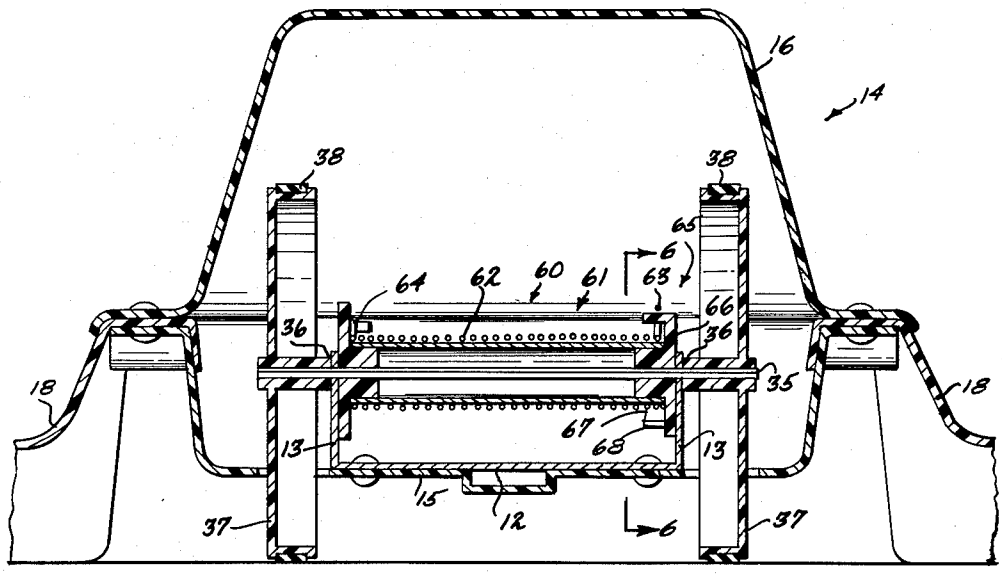



Fig-4

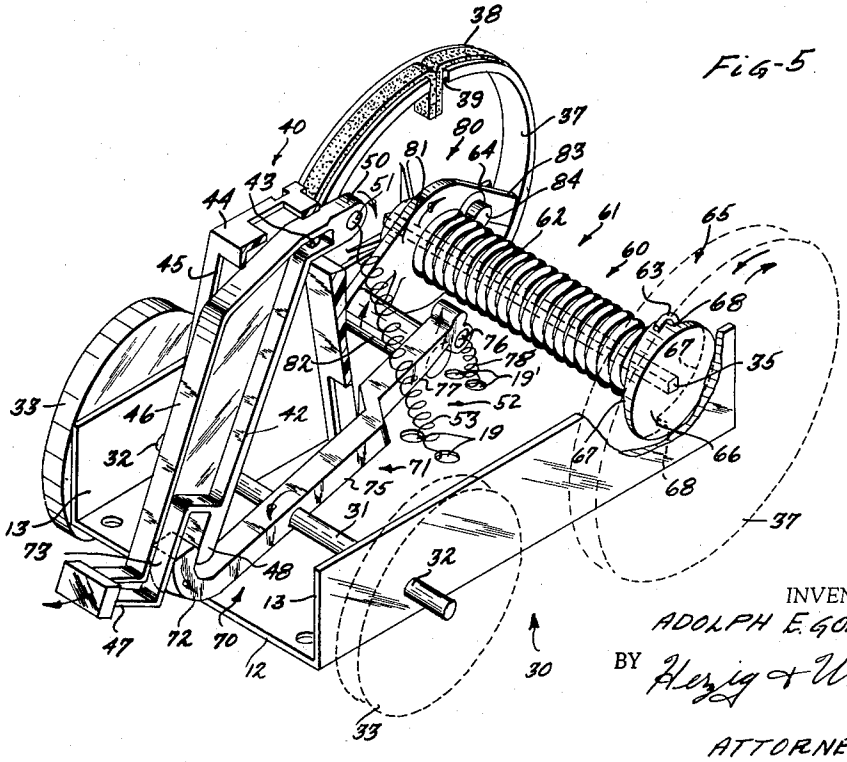



Fig-5

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# OBJECT PROPELLING MOVABLE TOY

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In general, the present invention involves a simply constructed and operated movable toy adapted to propel an object. More specifically, it involves a movable toy adapted to improve a child's coordination during solitary play, while sustaining interest with constant action, but without requiring substantial skill or excessive activity on the part of the child.

A wide variety of movable toys have been produced by the prior art and, in addition, a considerable number of toys have been adapted to propel an object. However, the movable toy, while incorporating the constant activity which maintains the child's interest, also usually involves excessive activity on the part of the child in order to keep up with the toy, so that the child soon becomes physically tired. On the other hand, the usual object propelling toy requires considerable skill on the part of the child, such as the skill of throwing or rolling a ball into an opening spaced a considerable distance away from the child. Such capability is beyond the usual capability of small children, such as children in the age range of about 3–5, so that they usually require the help of a parent in playing with such toy and rapidly lose interest in the toy because of the frustration involved therein. In addition, the usual movable toy or object propelling toy of the prior art normally involved comparatively complicated structures requiring batteries or, at the very least, winding the toy which is also beyond the capability of small children. Also, such relatively complicated structures are particularly vulnerable to the well-known destructive capacity of small children. Also, the usual prior art wind-up toy lacked versatility. Thus, for example, it could not be used as a pull toy, since it was not free-wheeling.

Consequently, a general object of the present invention is a simply constructed and operated movable toy which is adapted to propel an object.

Another object of the present invention is a self-returning movable toy which is wound up by the child rolling the toy away from him and then having a resultant movement back toward the child. Also, if desired, the child can use the toy as a pull toy.

Another object of the present invention is a toy having a propelling means adapted to be cocked by placing of an object by the child on the toy body and to eject the object toward the child when the propelling means is released.

Still another object of the present invention is an object propelling movable toy which is self-returning and which projects the object back toward the child when the child rolls the toy away from him.

Other objects and advantages of the present invention will be readily apparent from the following description and drawings which illustrate a preferred exemplary embodiment of the present invention.

In general, the present invention involves an object propelling movable toy having a body including rolling means for facilitating easy movement of said toy across a supporting surface. Mounted on said body is a propelling means for projecting an object placed on said body and a power means for moving said toy which is charged by rotating said rolling means in a first direction. Also mounted on said body is a trigger means for releasing said propelling means, with the trigger means being actuated by the power means when a set level of power is reached during the charging.

In order to facilitate understanding of the present invention, reference will now be made to the appended drawings of a preferred specific embodiment of the present invention. Such drawings should not be construed as limiting the invention which is properly set forth in the appended claims.



In the drawings:

FIG. 1 is a perspective view of a preferred specific embodiment of the present invention.

FIG. 2 is a cross-sectional view of FIG. 1 taken along line 2—2 of FIG. 1 showing the propelling means in a cocked position during the charging of the power means.

FIG. 3 is a cross-sectional view similar to FIG. 2 showing the propelling means in a released position.

FIG. 4 is a cross-sectional view of FIG. 2 taken along line 4—4 of FIG. 2.

FIG. 5 is a perspective view with the hollow container portion of the invention removed.

FIG. 6 is a cross-sectional view of a portion of FIG. 4 taken along line 6—6 of FIG. 4.

As illustrated in FIGS. 1–5, the present invention involves a toy **10** having a body **11** including rolling means **30** for facilitating easy movement of the toy across a supporting surface. Mounted on the body **11** is a propelling means **40** for ejecting an object **41**, such as a ball, placed in the mouth **21** of the body **11**. When the rolling means **30** is rotated in a first direction, i.e., the toy **10** is rolled backwards, the power means **60** mounted on the body **11** is charged. When a set level of power is reached during charging, a trigger means **70** mounted on the body **11** is activated by the power means **60** to release the propelling means **40**.

The body **11** includes a platform **12** having upwardly extending side flanges **13**. Mounted on the platform **12** is a hollow container **14** formed to simulate the appearance of a living character, i.e., a turtle. The hollow container **14** includes a lower shell **15** riveted to the platform **12**. Mounted on the lower shell **15** is an upper shell **16** and freely pivoted on the rear portion of the lower shell **15** is a tail **17**. Between the lower and upper shells **15** and **16** are freely pivoted feet **18**. The body **11** also includes a head **20** having a forwardly opened mouth **21** which is adapted to receive and aim the object **41**. The head **20** includes a lower jaw **22** formed as an extension of the lower shell **15** and having a tongue **23** attached to its front portion. Attached to the upper portion of the jaw **22** is the upper head portion **24** which includes an extension **25** adapted to form in conjunction with the lower jaw **22** the receiving pocket **26** for the object **41**. The extension **25** has a slot **27** therein through which extends the prong **47** of the propelling means **40** so that the object **41** is seated thereon when received in the pocket **26**.

The body **11** also includes rolling means **30** which are adapted to facilitate easy movement of the toy **10** across the supporting surface. The rolling means **30** include a front axle **31** slidably received in aligned holes **32** in the side flanges **13** of the platform **12**. Rotatably mounted on each end of the axle **31** are front wheels **33** which are adapted to contact the supporting surface for the toy **10**. The rolling means **30** also includes a rear axle **35** which is rotatably mounted in aligned holes **36** in the side flanges **13** of the platform **12**. Preferably, the rear axle **35** has a square cross-section, as illustrated, in order to facilitate fixedly mounting parts thereon. Fixedly mounted on the rear axle **35** are rear wheels **37** which contact the supporting surface for the toy and have circumferential rubber treads **38** to increase the friction of the rear wheels **37** with the supporting surface. The rubber treads **38** may be simply formed by a rubber band stretched around the wheel **37** and received with the ends tucked in a slot **39** in the wheel **37**.

Mounted on the body **11** are propelling means **40** for

ejecting an object 41, such as a ball, placed in the pocket 26 of the body 11. The propelling means 40 are adapted to be cocked by the placement of the ball 41 by the child in the pocket 26 of the mouth 21 and to eject the ball 41 toward the child when released. The propelling means 40 including a throwing lever 42 pivotally mounted on a bar 43 supported by an upright housing 44 mounted on the platform 12. The housing 44 has a front slot 45 through which the front arm 46 of the throwing lever 42 extends. The front arm 46 of the throwing lever 42 has a prong 47 which extends through the slot 27 of the extension 25 of the upper head 24 and against which the ball 41 is seated. The front arm 46 of the throwing lever 42 also has a lip 48 onto which the trigger means 70 is hooked. The rear arm 50 of the throwing lever 42 has a hole 51 to which one end of the lever spring means 52 is attached. The lever spring means 52 is formed from a coil spring 53 which has its other end attached to the body 11 by means of holes 19 in the platform 12. The lever spring means 52 is adapted to store energy, i.e., be placed under tension by the rotation of the throwing lever 42 caused by the insertion of the ball 41 into the pocket 26.

The power means 60 for moving the toy 10 are mounted on the body 11 and charged by rotating the rolling means 30. Thus, by rolling the toy 10 away from the child on the supporting surface, the power means 60 are charged and are adapted to move the toy 10 toward the child whereby the toy is made self-returning. The power means 60 include a drive spring means 61 and a clutch means 65 for connecting the drive spring means 61 to the rolling means 30 during rotation of the rolling means 30 when the toy 10 is rolled away from the child and for permitting disconnection of the drive spring means 61 from the rolling means 30 during the rotation of the rolling means 30 when the toy 10 rolls toward the child. The drive spring means 61 include a coil spring 62 rotatably mounted on the rear axle 35 and having a first hook 63 formed at its first end and a second hook 64 formed at its second end. The clutch means 65 comprises a cam gear 66 fixedly attached to the rear axle 35 and having two sloping tracks 67 each of which terminate in a shoulder 68. When the rear wheels 37 are rotated by moving the toy 10 in a rear direction, the first hook 63 of the coil spring 62 slides on one of the tracks 67 until it engages one of the shoulders 68. Further rotation of the wheel 37 winds the coil spring 62 subjecting it to tension. On the other hand, when the toy 10 moves in a forward direction, the first hook 63 of the coil 62 simply slides on the tracks 67 so that the wheel 37 is free-wheeling.

Also mounted on the body 11 is a trigger means 70 for releasing the propelling means 40 with the trigger means 70 being actuated by the power means 60 when a set level of power is reached during charging, i.e., during rolling of the toy 10 in a rearward direction. The trigger means 70 includes a latching bar 71 pivotally mounted on the front axle 31 and adapted to releasably hold the propelling means 40 in a cocked position. Specifically, the front arm 72 of the latching bar 71 has a hook 73 which catches onto the lip 48 of the throwing lever 42. Attached between the latching bar 71 and the body 11 is a latching spring 75. The latching spring 78 is connected at one end to a hole 76 in the rear arm 77 of the latching bar 71 and attached at the other end to holes 19' in the platform 12. The latching spring 78 is adapted to maintain the latching bar 71 in its holding position, i.e., with the hook 73 engaged with the lip 48 of the throwing lever 42.

Pivotally mounted on the rear axle 35 is a trip bar 80 which operatively connects the power means 60 and the latching bar 71. The trip bar 80 is adapted to oppose the action of the latching spring 75 on the latching bar 71 with the force exerted on the trip bar 80 by the power means 60. The trip bar 80 has a front arm 81 with an inwardly extending boss 82 which extends parallel to the rear axle 35 and below the rear arm 77 of the latching bar 71. The trip bar 80 also has a rear arm 83 having an inwardly extending boss 84 with which the second hook 64 of the coil spring 62 can become releasably engaged. Thus, during the rearward movement of the toy 10, the rotation of the wheel 37 causes the hook 64 to become engaged with the boss 84 of the trip bar 80. As the winding tension increases in the coil spring 62, a corresponding torque is exerted on the trip bar 80 which transmits said torque to the latching bar 71. Such torque when applied to the latching bar 71 would cause the hook 73 to disengage from the lip 48 of the throwing lever 42 except that it is overcome by the countervailing force of the latching spring 78. However, during the course of the rearward movement of the toy 10 a point is usually reached where sufficient energy is charged, i.e., the unwinding tension of the spring becomes sufficiently great so that the torque applied by the trip bar 80 overcomes the tension of latching spring means 78 and the throwing lever 42 is released.

As set forth above, the operation of the toy is purposely very simple. Thus, a child need merely insert the ball 41 manually into the mouth 21 of the toy 10. As the ball 41 is received in the pocket 26 of the mouth 21 it depresses the prong 47 of the throwing lever 42 so that the lip 48 becomes engaged with the hook 73 of the latching bar 71. Such cocked position is maintained by the latching spring means 78. The child then merely rolls the toy 10 away from him with the head 20 facing toward the child. As the toy 10 rolls away from the child, one of the shoulders 68 of the cam gear 66 is engaged by the first hook 63 of the coil spring 62 and the coil spring 62 begins to wind up, exerting a countertorque to the torque impressed on the wheels 37 by the child rolling the toy 10 away from him. The coil spring 62 is wound by the rotation of its hook end 63 by the cam gear 66 because the second hook end 64 engages the lug 84 on the trip bar 80 and the lug 82 on the front part 81 of the trip bar is then braced against the rear arm 77 of the latching bar 71. As the spring 62 builds up winding tension, a correspondingly great leverage is exerted on the rear arm 77 of the latching bar 71, tending to counteract the force exerted by the latching spring 75. At a given point set by the tension of the latching spring 75, the force exerted by the winding tension of the spring 62 exceeds the latching spring 75 tension so that the hook 73 of the latching bar 71 is disengaged from the lip 48 of the throwing lever 42. When this occurs, the tension on the lever spring 53 and the leverage exerted by the short arm length of the rear arm 50 of the throwing lever 42 causes the ball 41 to be forceably ejected from the pocket 26 and propelled through the air toward the child. The toy 10 is designed so that the force of the ejection, coupled with the aiming of the configuration of the pocket 26 is designed to reach the child operating the toy on a substantially horizontal trajectory at the level of about 2 to 3 feet under normal operating conditions. After the release of the propelling means 40 or possibly before or concurrently therewith, the winding tension on the spring 62 exerts sufficient force to overcome the impulse imparted to the toy by the child when he initially rolls the toy away from him. At such point, the toy 10 stops and the energy charged in the spring 62 is then exerted on the shoulder 68 of the cam gear 66 which in turn is translated to the rear wheels 37. The toy 10 then begins to move rapidly toward the child operating the toy. However, the force exerted on the toy 10 by the wound-up spring 62 is soon discharged, leaving the toy with considerable momentum. Under such conditions, the cam gear 66 continues to rotate as the toy rolls toward the child, but the hook 63 becomes disengaged from the shoulder 68 and continues to ride on the tracks 67 so that the toy becomes free-wheeling. In this way, the spring 62 is prevented from acting as a brake as the toy 10 moves toward the child. Thus, if desired, the child, when tired of playing catch with the toy, can use the toy as a pull toy by pulling the cord.

Many other specific embodiments of the present inven-

tion will be obvious to one skilled in the art in view of this disclosure. For example, although both of the rear wheels are fixed to the rear axle, only one of such wheels needs to be fixed to insure movement of the toy. Similarly, although the drive spring means is free to rotate at least at one end and free, to a limited extent at the other end, it may be completely fixed at one end. In addition, although a specific structure for propelling means and trigger means has been set forth, other alternative constructions may be utilized which function in a similar manner.

There are many features in the present invention which clearly show the significant advance the present invention represents over the prior art. Consequently, only a few of the more outstanding features will be pointed out to illustrate the unexpected and unusual results attained by the present invention. One feature of the present invention is a simply constructed and operable movable toy which is adapted to improve the child's coordination during solitary play while sustaining interest with constant action, but without requiring substantial skill or excessive activity on the part of the child. Thus, the only skill required is the skill involved in catching a ball which is constantly thrown on a substantially horizontal path when reaching the child at substantially the same height which is much simpler than trying to throw the ball into an opening spaced a distance away. Further, the child starts to play by manually inserting the ball into the mouth of the toy and rolling the toy away from him, both of which require very simple skills. In addition, the toy is self-returning so that although the child gets the throwing activity and the constant action of the toy to maintain interest, he does not indulge in the excessive activity of constantly running, as normally involved in most moving toys. Another feature of the present invention is the utilization of the rolling motion by the child to wind the toy which eliminates expensive auxiliary power means, such as batteries, or the more complicated arrangement involving winding up manually by keys. Still another feature of the present invention is the utilization of the energy storage function to actuate the ball propelling means of the toy so that the projection of the ball toward the child is delayed until the toy is rolled a substantial distance from the child. Still another feature of the present invention is an efficient energy storing and dispensing means so that the winding up of the toy caused by rolling the toy away from the child is effectively utilized to return the toy to the child and the power means is effectively disengaged when the toy attains such return momentum so that no braking action occurs.

Still another feature of the present invention is a versatile toy which can be used either as a wind-up toy or a pull toy.

It will be understood that the foregoing description and examples are only illustrative of the present invention and it is not intended that the invention be limited thereto. All substitutions, alterations and modifications of the present invention which come within the scope of the following claims or to which the present invention is readily susceptible without departing from the spirit and scope of this disclosure are considered part of the present invention.

I claim:

**1.** A simply constructed and operated movable toy adapted to improve a child's coordination during solitary play while sustaining interest with constant action but without requiring substantial skill or excessive activity on the part of the child, comprising:

(a) a toy having a body including rolling means for facilitating easy movement of said toy across a supporting surface;

(b) a propelling means mounted on said body for ejecting an object placed on said body;

(c) power means for moving said toy mounted on said body and charged by rotating said rolling means in a first direction; and

(d) trigger means mounted on said body for releasing said propelling means, said trigger means being actuated by said power means when a set level of power is reached during charging.

**2.** A toy as stated in claim **1** wherein said power means is charged by the rolling of the toy away from the child and is adapted to move the toy toward the child, whereby the toy is self-returning.

**3.** A toy as stated in claim **1** wherein said propelling means is adapted to be cocked by placement of an object by the child on said body and to eject said object toward the child when released.

**4.** A toy as stated in claim **1** wherein said body comprises a hollow container formed to simulate the appearance of a living character and having a head with a forwardly open mouth which is adapted to receive and aim said object.

**5.** A toy as stated in claim **1** wherein said rolling means includes an axle rotatably mounted on said body, said axle having at least one wheel fixedly mounted thereon which contacts the said supporting surface.

**6.** A toy as stated in claim **1** wherein said propelling means includes a throwing lever pivotally mounted on said body and lever spring means attached between said throwing lever and said body and adapted to store energy by the rotation of said throwing lever in a first direction.

**7.** A toy as stated in claim **1** wherein said power means includes a drive spring means and a clutch means for connecting said drive spring means to said rolling means during the rotation of said rolling means in a first direction and for permitting disconnection between said drive spring means and rolling means during the rotation of said rolling means in a second direction.

**8.** A toy as stated in claim **7** wherein said clutch means comprises a cam gear fixedly attached to said rolling means, said cam gear having a sloping track terminating with a shoulder.

**9.** A toy as stated in claim **1** wherein said trigger means includes a latching bar pivotally mounted on said body and adapted to releasably hold said propelling means in a cocked position, a latching spring means attached between said latching bar and said body for maintaining said latching bar in said holding position and a trip bar pivotally mounted on said body and operatively connecting said power means and said latching bar, said trip bar being adapted to oppose the action of said latching spring means on said latching bar with the force exerted on the trip bar by said power means.

**10.** A simply constructed and operated movable toy adapted to improve a child's coordination during solitary play while sustaining interest with constant action but without requiring substantial skill or excessive activity on the part of the child, comprising:

(a) a toy having a body including rolling means for facilitating easy movement of said toy across a supporting surface;

(b) a propelling means mounted on said body for ejecting an object placed on said body, said propelling means being adapted to be cocked by placement of said object by the child on said body and to project said body toward the child when released;

(c) power means for moving said toy mounted on said body and charged by rotating said rolling means in a first direction, said power means being charged by the rolling of the toy away from the child and being adapted to move the toy toward the child whereby the toy is self-returning; and

(e) trigger means mounted on said body for releasing said propelling means, said trigger means being actuated by said power means when a set level of power is reached during charging.

**11.** A toy as stated in claim **10** wherein said power means includes a drive spring means and a clutch means

for connecting said drive spring means to said rolling means during rotation of said rolling means when the toy is rolling away from the child and for permitting disconnection between said drive spring means and rolling means during the rotation of said rolling means, wherein the toy is moving toward said child.

12. A toy as stated in claim 10 wherein said trigger means includes a latching bar pivotally mounted on said body and adapted to releasably hold said propelling means in a cocked position, a latching spring means attached between said latching bar and said body for maintaining said latching bar in said holding position and a trip bar pivotally mounted on said body and operatively connecting said power means and said latching bar, said trip bar being adapted to oppose the action of said latching spring means on said latching bar with the force exerted on the trip bar by said power means.

13. A simply constructed and operated movable toy adapted to improve a child's coordination during solitary play, while sustaining interest with constant action, but without requiring substantial skill or excessive activity on the part of the child, comprising:

(a) a toy having a body including rolling means for facilitating easy movement of said toy across a supporting surface;

(b) a propelling means mounted on said body for ejecting an object placed on said body, said propelling means being adapted to be cocked by placement of an object by the child on said body and to eject said object toward the child when released;

(c) power means for moving said toy mounted on said body and charged by rotating said rolling means by



rolling the toy away from the child and adapted to move the toy toward the child, whereby said toy is self-returning, said power means including a drive spring means and a clutch means for connecting said drive spring means to said rolling means during the rotation of said rolling means when the toy is rolling away from the child and for permitting disconnection between said drive spring means and rolling means during the rotation of said rolling means when the toy is moving toward said child;

(d) trigger means mounted on said body for releasing said propelling means, said trigger means being actuated by said power means when a set level of power is reached during charging and said trigger means, including a latching bar pivotally mounted on said body and adapted to releasably hold said propelling means in a cocked position, a latching spring means attached between said latching bar and said body for maintaining said latching bar in a holding position and a trip bar pivotally mounted on said body and operatively connecting said power means and said latching bar, said trip bar being adapted to oppose the action of said latching spring means on said latching bar with force exerted on the trip bar by said power means.

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