

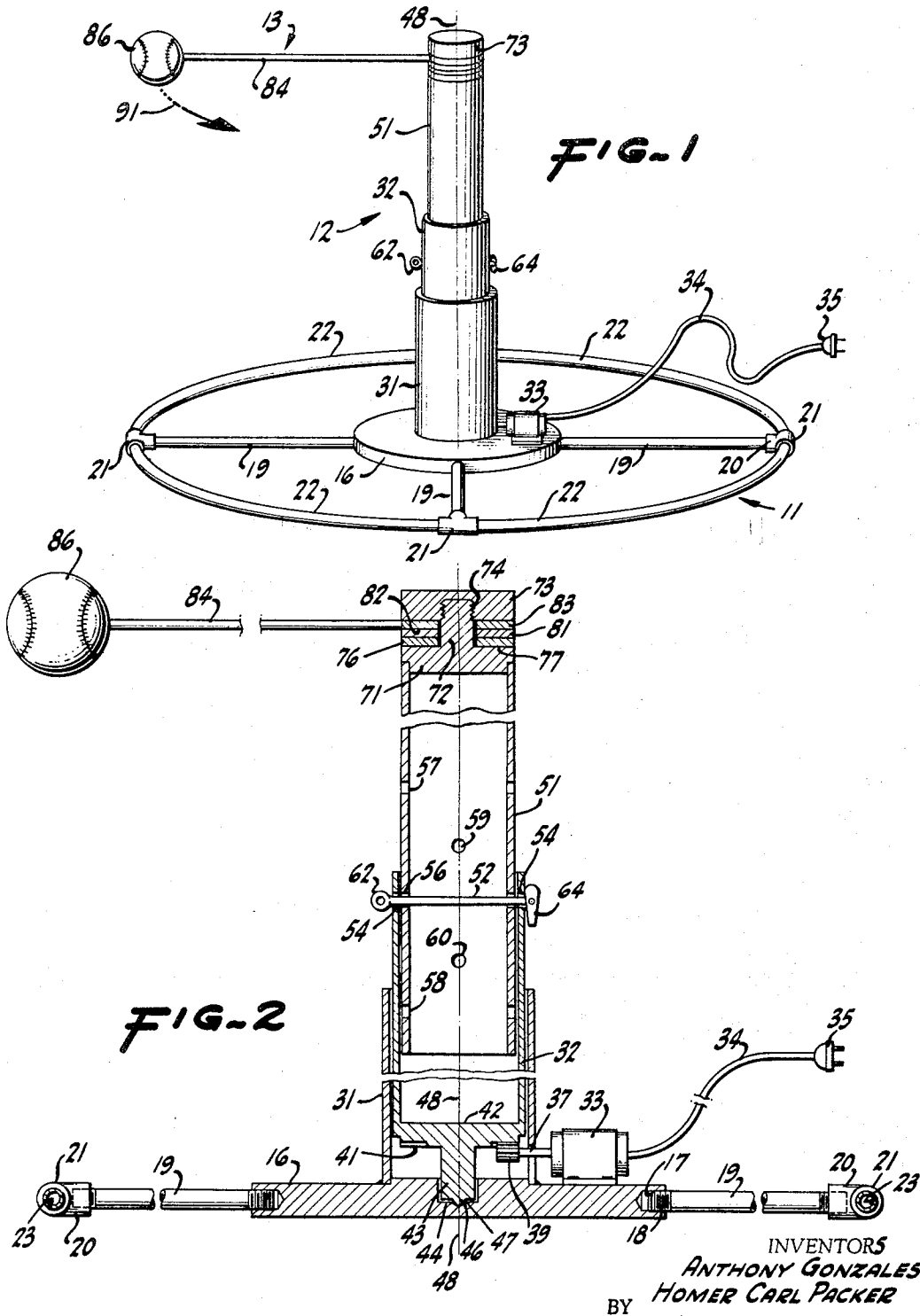
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REVOLVING BASEBALL TOY COMPRISING MAGNETIC CLUTCH MEANS

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REVOLVING BASEBALL TOY COMPRISING MAGNETIC CLUTCH MEANS

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ABSTRACT OF THE DISCLOSURE

A vertically adjustable, upright member is rotated by gears driven by an electrical motor. A radial arm carrying a baseball is clutchably mounted on the upper end of the member, engagement being provided by a magnetic clutch, thereby permitting sudden, temporary directional reversals of the arm and the baseball as the latter is struck by a practicing batter.

The invention relates to toys used in providing baseball batting practice.

Both the market place and the patent literature are replete with devices in which a baseball is moved relative to a batter, thus giving the batter practice in hitting the ball.

One of the problems encountered in a revolving baseball apparatus is that of positively swinging the ball in a circular path yet avoiding damage to the mechanism as the ball's direction is suddenly reversed upon its being struck. Heretofore, many devices have endeavored to solve this problem by tethering the ball on the end of a line, the flexibility of the cord isolating, to some extent, the revolving mechanism from the sudden blow imparted to the ball. While such devices have, in the main, worked moderately well, many have caused inconvenience by a tendency of the cord to wind up on the supporting standard in the nature of a Maypole, with possible entanglement and damage.

It is therefore an object of the invention to provide a revolving baseball toy which avoids any damage to the structure resulting from a sudden reversal of direction as the baseball is struck.

It is another object of the invention to provide a baseball toy which is economical, relatively compact and light in weight, yet which affords a high degree of stability.

It is a further object of the invention to provide a baseball practice toy which is flexible in that it can be used either by left-handed or right-handed batters, and its speed of angular movement can be adjusted to suit the age and skill of the batter.

It is still a further object of the device to provide a toy which develops coordination as well as many hours of enjoyment to the user.

It is an additional object of the invention to provide a baseball toy which can be used either indoors or outdoors and which requires but little floor space while being used.

It is another object of the invention to provide a generally improved revolving base ball toy.

Other objects, together with the foregoing are attained in the embodiment described in the following description and illustrated in the accompanying drawing in which:

FIGURE 1 is a perspective view of the device in operating condition; and

FIGURE 2 is a fragmentary median vertical sectional view of the device, to an enlarged scale.

While the apparatus of the invention is susceptible of numerous physical embodiments depending upon the environment and requirements of use, substantial numbers of the herein shown and described embodiment have been

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made, tested and used, and all have performed in an eminently satisfactory manner.

The revolving baseball toy of the invention broadly comprises a base structure 11, a vertical support structure 12, and a radial arm structure 13.

The base structure 11, supported on the floor or ground, includes a central circular, disc-like, base plate 16 provided with a plurality of radial tapped openings 17 to receive the threaded inner ends 18 of a plurality of radial spokes 19, the threaded outer ends of which are engaged by the corresponding threaded stems 20 of T-fittings 21. Connecting the arms of the T-fittings are arcuate tubular members 22 whose ends form a friction fit with the openings 23 in the arms of the T-fittings for ready assembly and disassembly of the ring and the entire base structure.

Upstanding from the base plate 16 is the vertical support structure 12 including a fixed, vertical bushing 31 having rotatably mounted therein a sleeve 32.

Rotation of the sleeve 32 is effected by an electrical motor 33 connected to a conductor 34 and wall plug 35, the motor 33 being supported on the base plate 16 and including a motor shaft 37 extending through an opening in the bushing wall.

Mounted on the end of the shaft 37 is a pinion gear 39 in engagement with a ring gear 41 formed on the bottom of a horizontal plate 42 closing the bottom end of the rotatable sleeve 32.

A downwardly projecting central boss 43 from the plate 42 extends into a corresponding recess 44 in the base plate, the horizontal interfaces between the bottom of the boss 43 and the bottom of the recess 44 forming a thrust bearing supporting the superposed weight of the rotating members. A small central cone 46 on the bottom surface of the boss 43 projects downwardly into a corresponding small central crater 47 on the bottom of the recess 44 and assists in maintaining the rotatable supporting structure in a truly vertical attitude as the structure rotates about a vertical axis 48.

Upon energizing the motor, the driver pinion gear 39, in engaging the driven ring gear 41, rotates the sleeve 32. If desired, the motor can be of the reversible type, thus driving the sleeve in either direction so as to accommodate either a right-handed or a left-handed batter. Furthermore, a speed control device can readily be attached to the conductor 34 in order to provide the desired velocity of sleeve rotation. In the usual case it has been found that a speed of about 50 r.p.m. is very satisfactory.

Rotation of the sleeve 32 is accompanied by rotation of a tube 51 vertically movable within the sleeve 32 and secured thereto at a predetermined height by a cross-pin 52 extending through a pair of diametrically disposed openings 54 in the sleeve 32 and a registering pair of diametrical openings 56 in the tube 51. An additional upper set 57 and a lower set 58 of openings in the tube enable the tube to be lowered or raised to suit the height of the batter, it being only necessary to withdraw the pin 52, locate the tube 51 vertically at approximately the desired height and reinsert the pin through the nearest registering openings. For convenience, additional pairs of diametrically disposed tube openings 59 and 60 can also be provided.

Also for convenience, the pin 52 is preferably of the kind having an eye 62 at one end, and, at the other end, an off-center, pivoted latch 64 of the kind that requires a positive translational force on the pin 52 to effect withdrawal. This type of pin can readily be inserted through the registering openings and by gravity (as shown in FIGURE 2), the off-center latch drops into its vertical attitude, when the pin is entirely inserted, and thus secures the pin against withdrawal until desired.

On the upper end of the tube 51 there is secured a hori-

zontal circular disc 71 having mounted thereon an upstanding stud 72 threaded on its upper end and engaged by a keeper 73 with an interiorly threaded central recess 74.

The tube 51, the disc 71, the stud 72 and the keeper 73 rotate as a unit. Also rotatable with these members is a ferrous washer 76 mounted on the upper annular surface 77 of the disc 71.

Rotatable relative to these members is an annular magnet 81 securely mounted on the bottom annular surface 82 of an annular plate 83, from which plate extends a radial arm 84 at the distal end of which arm there is mounted a ball 86.

As will be apparent, the magnet and the ferrous washer are interchangeable inter se as to location and, in fact, two annular magnets could be utilized in lieu of a magnet and a washer having para-magnetic properties. The important consideration is that these two elements provide a magnetic affiliation tending to clamp them together, yet which are yieldingly separable when subjected to a superior force so as to permit of relative, slidable, coaxial movement between the interfaces.

In operation, the motor 33 is started and the sleeve 32 and the tube 51, together with all of the superposed structure, commence to turn. The magnetic force between the rotating washer 76 and magnet 81 secured to the annular base of the radial arm revolves the ball 86 about the vertical axis 48 in the direction indicated, for example, by the arrow 91.

The radii of the base ring 22 and the arm 84 are approximately equal, and in the usual case would be about 30 inches. The batter stands outside the base ring and hits the ball 86 as it swings toward him in the direction 91. The blow, of course, imparts a very strong force in the opposite direction. This force is, in fact, sufficient to overcome the magnetic clutching effort between the ferrous washer and the magnet, the result being that the ball 86, the arm 84, the annular arm base 83 and the annular magnet 81 are all whirled around in a clockwise direction, as viewed in FIGURE 1 while the other rotatable elements continue to turn in the original direction 91 under the driving effect of the motor and the gearing.

After making a few revolutions (depending on the force of the blow, the friction between the relatively rotating interfaces and the magnetic force between the magnet and the washer) the ball slows down. Then, as the ball ceases its relative rotation, the magnet and the washer again clamp together and the ball again starts to revolve in the direction 91, preparatory for the next impact.

It has been found in actual practice that the arm 84 is conveniently fabricated from a 1/8 inch diameter fiber-glass rod, or tube, and that the ball 86, simulated to look like a baseball, is preferably of a hollow, plastic material in the interests of reducing inertia. For most youngsters, a hollow plastic bat, shaped like a conventional baseball bat, is also to be preferred in that such a bat is most compatible with a relatively light ball. With such materials, noise is somewhat reduced, as well as the stresses imparted to the structural elements of the device.

In the event, however, it should be desired to construct

the device for use by adults, the same structure is readily adaptable for such use by suitable strengthening of the components.

It can therefore be seen that we have provided an apparatus for batting practice which is not only flexible in its uses, but which is also rugged and durable in that the magnetic clutching and de-clutching effect is automatic in operation and thus protects the motor and the gearing at all times from a counter-rotating force imposed on the impact portion of the structure.

What is claimed is:

1. A revolving baseball toy comprising:

- (a) a horizontal base plate having a vertical recess formed therein;
 - (b) a fixed vertical bushing upstanding from said base plate coaxially with said recess;
 - (c) a vertical sleeve journaled in said bushing;
 - (d) a horizontal member closing the bottom of said sleeve, said member including a ring gear formed on the lower side thereof;
 - (e) a boss projecting downwardly from said horizontal member and being located in said recess, the walls of said recess forming a thrust bearing surface and a journal bearing surface for said boss;
 - (f) a vertical tube carried in said sleeve and projecting upwardly, said tube terminating in an upper disc;
 - (g) means for adjusting the height of said tube;
 - (h) a generally circular magnet mounted on the top of said disc;
 - (i) a generally circular ferro-magnetic member on top of said magnet;
 - (j) means for retaining said magnet and said ferro-magnetic member in substantially coaxial alignment;
 - (k) a horizontal radial arm affixed to said ferro-magnetic member;
 - (l) a ball on the outer end of said arm; and,
 - (m) an electrical motor on said base plate, said motor including a drive shaft and a pinion gear in engagement with said ring gear for normally rotating said sleeve, said tube, said magnet and said ferro-magnetic member, said ferro-magnetic member being capable of rotating relative to said magnet as a super-vening force is imposed thereon by striking said ball.
2. The device of claim 1 wherein said ball is formed of light plastic material to reduce the moment of inertia thereof.

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