# United States Patent [19]

**Kahle**

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[54] **TOY BALL**


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[51] **Int. Cl.**..... **A63b 37/10,** A63b 69/40

[58] **Field of Search**..... 273/26, 58, 63, 60, 128, 273/106 R, DIG. 20; 46/50, 211



[56] **References Cited**

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[57] **ABSTRACT**

A toy ball capable of increasing its own spin velocity so as to achieve a sharply curving trajectory involving a pair of weights mounted in a tube extending from wall to wall inside the ball. Springs urge the weights toward the center of the ball while cords attached to the weights extend outside the ball so the weights may be held in an extended position while throwing the ball.


**4 Claims, 2 Drawing Figures**

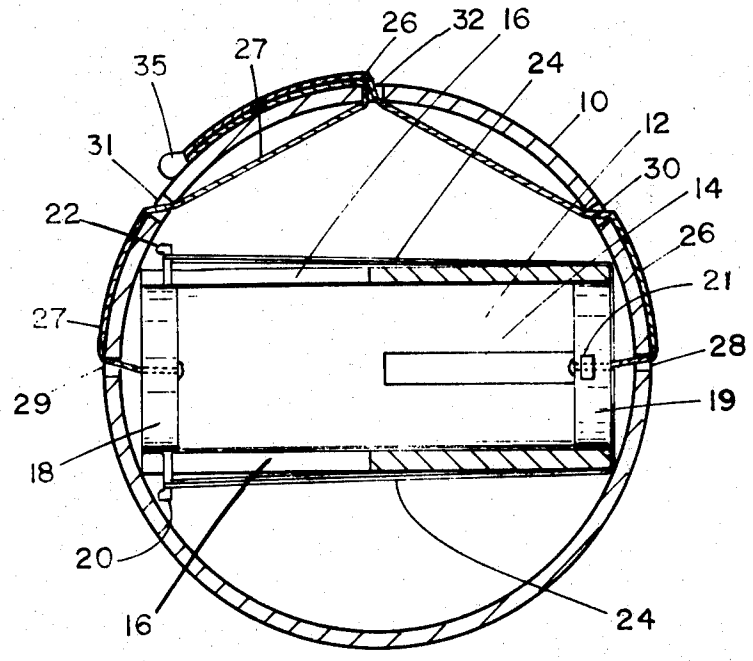

FIG. 1

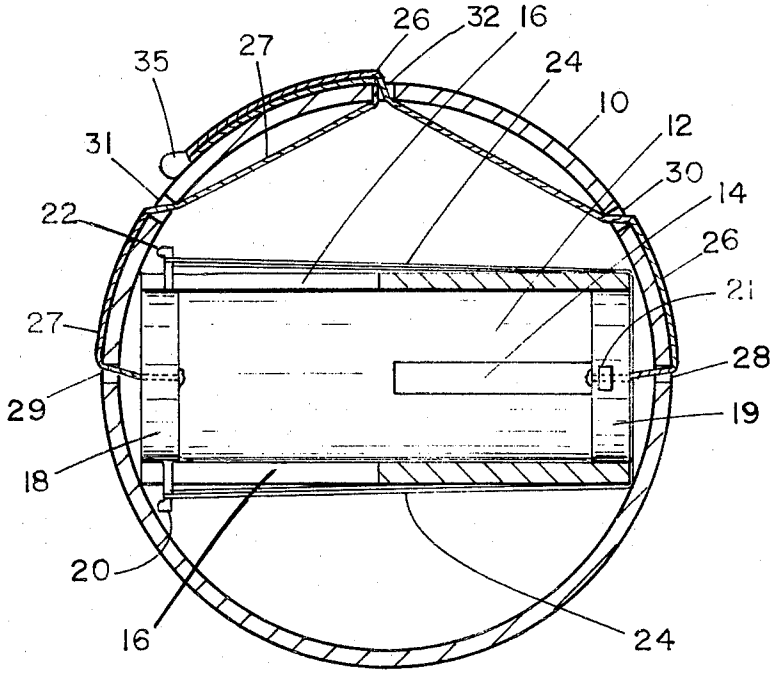
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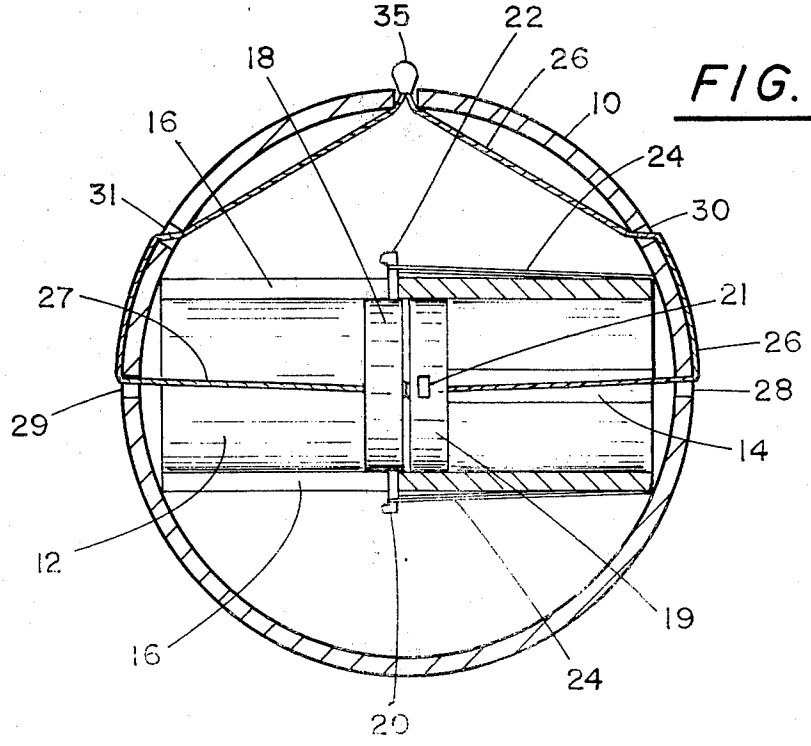
FIG. 2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# TOY BALL

## BACKGROUND OF THE INVENTION

It is well known in the prior art that a ball can be caused to curve in flight if it is given a spin when thrown. The amount of spin and, thus, the curve imparted to the ball is dependent upon the skill of the thrower. If a way could be found to increase the spin of the ball the curving effect would be enhanced. My invention accomplishes this end by providing a mechanism within the ball to increase its rate of spin automatically after it leaves the hand of the thrower. As a consequence, whatever the degree of skill of the thrower it will be substantially increased by using the invention herein described.

## SUMMARY OF THE INVENTION

Briefly, the operation of my new inventive ball utilizes the principle of the conservation of angular momentum. A mechanism is contemplated for changing the distribution of mass within the ball so as to concentrate it near the center after the ball is thrown. This necessitates a corresponding increase in spin velocity for the ball in order to maintain the angular momentum constant. The change in distribution of mass is achieved by mounting weights in a tube extending from wall to wall through the center of the ball. Suitable springs are connected to urge the weights towards the center of the ball. During throwing, the weights are held outward near the periphery of the ball by means of small cords or strings attached to the weights which cords extend out through the surface of the ball to be held in place by the thrower. After the ball is released the springs internal to the ball move the weights to the center and increase the spin and the curving effect. It may be seen therefore that it is an object of my invention to provide a toy ball having a surprisingly large capacity for curving in flight. Further objects and advantages will become apparent upon consideration of the following description and drawings.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a sectional view of the ball of my invention showing the weights pulled by means of cords to their maximum radial positions.

FIG. 2 is a second cross sectional view of the ball of my invention showing the final rest position of the weights as assumed after the ball is thrown.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

In FIGS. 1 and 2 it may be seen that the ball of my invention comprises a hollow spherical shell **10** having a hollow cylindrical tube **12** positioned inside extending from one wall to the opposite wall generally through the center of the ball. Both spherical shell **10** and cylindrical tube **12** may be molded from a suitable plastic in a manner well known to those skilled in the art. Tube **12** is provided with a pair of slots **14** extending in from the right side of the tube in the drawings to a position close to the middle of tube **12.** In FIG. **1** only the rearmost of slots **14** is visible. On the left half of tube **12** a pair of slots **16** are formed similar to slots **14** except in positions rotated 90 degrees about the axis of tube **12.** Slots **14** and **16** provide guide paths for a pair of weights **18** and **19** which are adapted to slide along the length of tube **12.** Weight **18** is provided with a pair



of guide tabs **20** and **22** extending downwardly and upwardly slots **16.** Weight **19** is provided with a similar pair of tabs **21** although only one tab **21** is shown in the drawings. Tabs **20, 21** and **22,** extending outside of the slots, provide suitable anchoring points for a spring mechanism connected to urge both weights toward the center of tube **12.** The spring mechanism for weight **19** is omitted in the drawings for clarity. Weight **18** is provided with a rubber band **24** extending from tab **20** around the right end of tube **12** and back to tab **22** so as to provide a strong force urging weight **18** towards the center of tube **12.** A similar rubber band is mounted around the opposite end of tube **12** and connected to the tabs **21** extending from weight **19** so as to likewise urge the weight **19** towards the center of tube **12.** In the rest position weights **18** and **19** assume the position shown in FIG. **2** with tabs **20, 21** and **22** resting against or near the ends of their respective slots **14** and **16.**

Each weight has a cord connected to it allowing the thrower to hold the weights in their maximum radius positions. In the drawing the cord for weight **18** is shown as a cord **27** extending outside the spherical shell **10** through a hole **29** and back through a hole **31** and thence out again through a hole **32** where it wraps around the ball and is terminated by a tab **35.** The cord **26** for weight **19** extends out through a hole **28** back into the ball through a hole **30** and out again through hole **32** also connecting to securing tab **35.** The thrower grasps the ball in a conventional manner and throws it imparting a spin to it as would be done in throwing any conventional curve ball. The weights, however, are held in their extreme outward positions by pressing the fingers against securing tab **35** and holding it in the position shown in FIG. **1.** After the ball and the tab **35** are released the weights slide to the center of tube **12** and the ball, under the action of rubber band **24** and the other rubber band not shown. This causes cords **26** and **27** to travel inward pulling tab **35** to the position shown in FIG. **2.** As mentioned before, the change of mass distribution caused by weights **18** and **19** moving to the center of the ball causes an increase in spin in accordance with the principle of conservation of angular momentum thus increasing the curve of the trajectory dramatically.

In the preferred embodiment it is contemplated that the outer spherical shell **10** and tube **12** may be constructed from a relatively lightweight plastic whereas weights **18** and **19** could comprise, for example, lead. The ball of the preferred embodiment is also intended to approximate the dimensions of a baseball. With these constructional materials and the dimensions specified it has been found that the ball, after it is released will increase its spin more than three times over thus causing a very substantial increase in the curve of the trajectory. Another variation involves pulling only one weight out while throwing so as to create a temporary imbalance and erratic behavior in the flight of the ball. Still another alternative embodiment is one in which the weights are urged outwards towards the pheriphery of the ball and the cords are reversed in direction so that the weights are held near the center during throwing. This causes the ball to dramatically decrease its spin velocity thus making it easier to throw a knuckle ball. As can be seen, there are many possible variations on the structure of my invention which do no depart from the spirit and scope thereof and thus we intend to be limited only to the appended claims.

I claim:

1. A toy ball having the capability of changing its own spin velocity comprising a generally spherical outer shell and having apertures therein; an elongated tubular passageway mounted inside said outer shell and extending generally from one side of said outer shell through the center of said spherical outer shell and to the other side of said outer shell; movable weight means slidably located in said tubular passageway for altering the angular velocity of said outer shell according to changes of position of said weight means in said tubular passageway; spring means in cooperation with said weight means for urging said weight means towards a position at a first predetermined radius from the center of said outer shell; and tensioning member means connected to said weight means and extending outside said outer shell through said apertures for permitting a thrower to displace said weight means from said predetermined radius position to a second predetermined radius position and hold the weights in the displaced position while throwing the ball, the release of said tensioning member means and the movement of said weight means causing said alteration of angular velocity.



2. The ball of claim 1 in which said first predetermined radius position of said weight means is proximate the center of said ball.

3. The ball of claim 2 in which said tubular passageway is formed from a tube extending from wall to wall inside said outer shell and further includes guide slots therein extending from the wall of the sphere to the center thereof; and said weight means comprise a pair of weights in said tube, each of said pair having tab means extending through an associated one of said guide slots for coupling to said spring means.

4. The ball of claim 3 in which said tensioning member means comprises individual cord means fastened to each weight, each of said cord means arranged for passing along said tubular passageway and through said apertures in said outer shell.

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