July 13, 1954 P. H. GACKENBACH 2,683,603

PROJECTILE FOR ERRATIC FLIGHT

Filed July 31, 1950

Fig. 1.

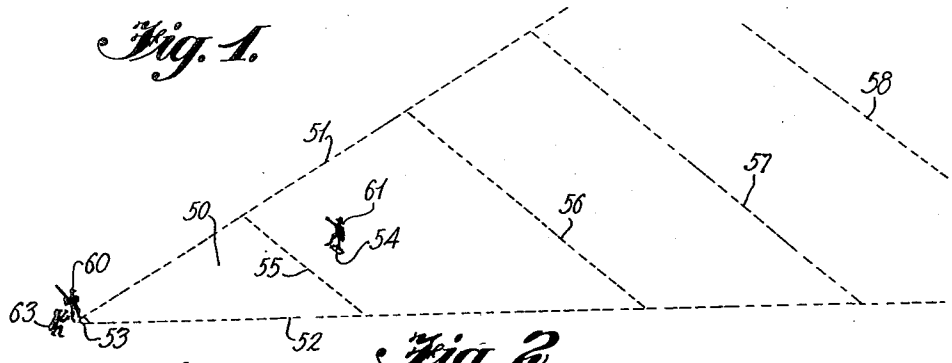


Fig. 2.

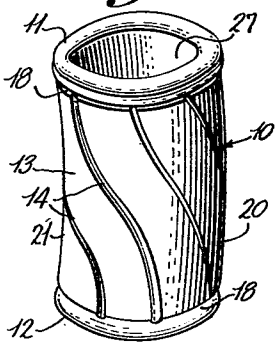


Fig. 3.

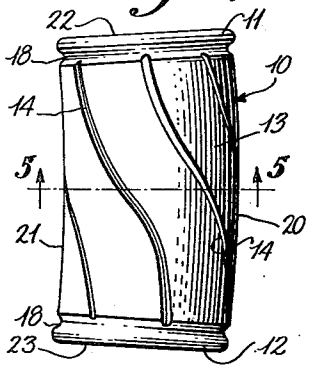


Fig. 4.

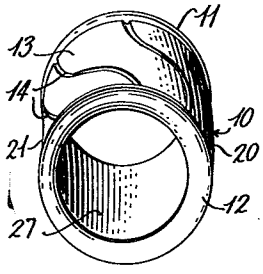


Fig. 5.

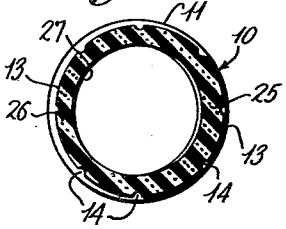


Fig. 6.

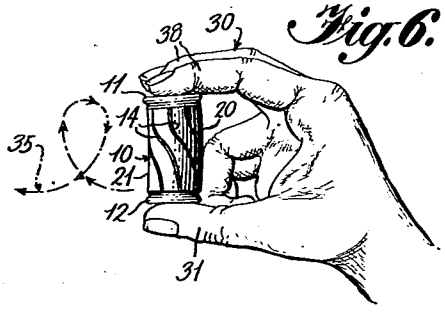
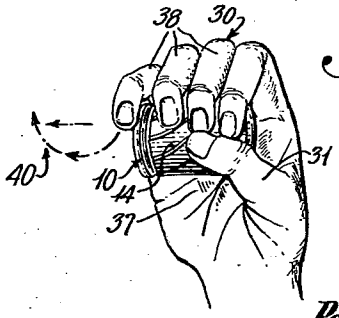


Fig. 7.



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PROJECTILE FOR ERRATIC FLIGHT

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5 Claims. (Cl. 273—106)

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This invention relates to toys and games and more particularly to projectiles which may be used in simulated baseball games, or in other throwing and batting games of a wide variety.

The general object of the invention is the provision of a novel and improved projectile of this class which is durable and safe, and is capable of being thrown in such manner as to give it a most erratic or eccentric flight for the purpose of rendering it difficult for a batter to hit.

In its preferred embodiment, the invention contemplates the provision of a projectile of generally hollow cylindrical or tubular construction, with smoothly rounded contours for comfortable and effective handling, but of a peculiarly warped and eccentric construction, which is designed to give it its erratic flight, not only by virtue of the eccentric weight distribution but also by reason of aerodynamic effects. However, by practice, any player may learn to control the flight of the projectile and produce a variety of fantastic curves—drops, floaters, inshoots, hooks, etc.—which cannot be duplicated by pitching an ordinary ball.

The warping and eccentricity of the projectile also has the effect of preventing it from rolling far when it strikes the ground, which is an advantage in certain games in which the projectile may be used, and which in any game provides an added safety factor, especially for small children, in preventing the projectile rolling out into dangerous streets and thoroughfares.

It is preferred that the projectile be made of rubber or similar semi-soft resilient plastic material so as to prevent injury to the players, but of such size and weight that it may be batted for a distance of well over a hundred feet by the average player. Preferably, also, the rubber-like material may be reinforced with fabric for greater durability in much the same manner as a rubber hose or bicycle tire.

Other objects and features of novelty will be apparent from the following specification when read in connection with the accompanying drawings in which one embodiment of the invention is illustrated by way of example.

In the drawings:

Figure 1 is a perspective view showing the layout of a field on which one game, involving the use of the novel projectile, may be played;

Figure 2 is a view in perspective of a projectile embodying the principles of the invention; the projectile being disposed in a generally vertical position;

Figure 3 is a view in side elevation of the projectile in vertical position;

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Figure 4 is a perspective view of the projectile in a generally horizontal position;

Figure 5 is a sectional view taken on line 5—5 of Figure 3;

Figure 6 is a perspective view illustrating one way of gripping the projectile in throwing it; and

Figure 7 is a similar view showing an alternative method of throwing.

As best shown in Figures 2, 3 and 4 of the drawings, the novel projectile is of a generally cylindrical shape although being warped to a slight degree along its longitudinal axis. The projectile or missile as a whole is indicated by the reference numeral 10.

Preferably, the novel projectile is provided with rounded circumferential beads or flanges 11 and 12 at its respective ends and the intermediate outer wall surface 13 is provided with spiral or helical grooves or indentations 14. Also, by preference, the end beads or flanges 11 and 12 are separated from the intermediate main outer surface of the projectile by circumferential grooves 18.

One important feature of the construction of the projectile which gives it its erratic flight is the longitudinal warping of the cylinder whereby, as clearly seen in Figure 1 of the drawings, the respective opposite side wall portions of the device are made convex as at 20 and concave as at 21. It will also be seen that the plane 22 of the end 11 of the projectile and the plane 23 of the opposite end surface thereof are convergent and will of course meet at a very acute angle if extended to the left-hand side of Figure 3.

Another feature of the invention which permits intricate and puzzling curves to be pitched when using the novel projectile is the eccentric weighting thereof as afforded by making one side of the projectile heavier and longer than the other. This is clearly indicated in the perspective views of Figures 2 and 4 of the drawings but probably best shown in the sectional view of Figure 5 where the wall portion designated 25 is considerably thicker than the opposite wall portion 26, due to the eccentricity of the inside surface 27 of the cylinder and the outside surface 13.

The novel projectile may be made of any suitable resilient material which will not be harmful to the players if struck by the projectile, but it should have sufficient durability and substance to afford considerable use and wear and also to carry for suitable distances when struck by the bat. Preferably the projectile is made of rubber or a rubber-like plastic and may be reinforced

by fabric or cord, somewhat in the same manner as garden hose, bicycle tires, or other similar reinforced rubber or rubber-like articles of commerce.

Although in its broadest aspects, the invention is not to be limited to any particular dimensions, the following general sizes are preferred, at least in playing certain of the suggested games to be presently described. For example, the projectile could be from about 2¼ inches to about 2¾ inches in length, with an outside diameter of from about 1⅜ inches to about 1½ inches, and inside diameter of from about 1⅛ inches to about 1¼ inches. The projectile for this particular suggested purpose can also vary from about one ounce to about 1¼ ounces in weight.

In Figure 6 of the drawings, there is illustrated one method of gripping the projectile to throw it, one or two fingers **30** of the player's hand being hooked over the top end of the projectile and the thumb **31** disposed at the opposite end thereof. This is the best grip for giving a straight pitch of the projectile, the projectile then spinning end over end as suggested by the arrows **35**. A variation can be adopted by using this same grip and throwing the projectile with a horizontal swing of the arm. This is a more difficult pitch for the batter to hit due to the horizontal spin.

Figure 7 illustrates another method of gripping the projectile in which it is placed in the palm of the hand **37** with the fingers **38** wrapped around it as if to hide it, and then the projectile thrown with a spiral motion somewhat like making a forward pass of a football, as suggested by the arrows **40**. This is the best grip for throwing a drop, an outshoot or inshoot, an upshoot, or a floater, various modifications in the direction of movement of the projectile being adopted in each case. For example, in throwing a drop, the nose of the projectile is kept forward but slightly downward, whereupon it will spiral through the air and suddenly dive downward. For an outshoot or an inshoot, the projectile should be thrown with a side arm movement with the nose pointed slightly away from or toward the batter. For an upshoot, the projectile should be thrown from the position of Figure 7 with a spiral movement and with a side arm and under-hand twist with the nose pointed slightly upward. For a floater, the projectile is gripped in the same way as for a drop, but the projectile is released in a horizontal position so that it will sail sidewise toward the batter.

The applicant is not aware of the exact mathematical and physical explanations of the behavior of the novel projectile or missile in its various trajectories, but it has been found as a practical matter, that the warping of the axis of the projectile, the eccentric weighting and shaping of the projectile as shown in Figure 5, and the provision of the grooves in the outer surface all cooperate and lend their various effects to the general functioning of the projectile in flight. Some of these effects can probably be explained by aerodynamic principles and others by gravitational or gyroscopic phenomena.

The novel projectile can be employed for playing a wide variety of throwing and/or batting games, and the invention itself is not to be limited to any particular method of playing. However, a suggestive or exemplary game wherein the projectile may well be used is presented as follows:

In Figure 1 there is shown a playing field **50** with foul lines **51** and **52**, a home plate **53**, and a pitcher's box **54**. At a suitable distance outwardly on the playing field from the plate **53** a transverse marking **55** is made, this distance being approximately thirty feet. Another line **56** may be drawn across the playing field at a distance of from twenty-five to thirty feet from the line **55** and subsequent transverse lines **57** and **58** drawn at similar distances. There is no running in this game, but the batter **60** upon receiving a pitch from the pitcher **61** tries to knock the projectile as far as he can along the playing field. The scoring is based on forced "runs" only, such runs being imaginary and determined by the distance the projectile is hit. For example, if the projectile strikes the ground before reaching the first line **55**, the batter is out. If it falls between the lines **55** and **56** it counts for a single or one-base hit; between lines **56** and **57** a double; between lines **57** and **58** a triple; and beyond the line **58** a home run. If the projectile stops or is stopped by a player within these areas, it counts according to the above designated schedule of hits or outs. If the projectile is caught on the fly by a player, the batter is out and the imaginary men on base do not advance. Otherwise the game may be played in accordance with standard baseball rules.

The game, as suggested above, may be played with any number of players, even as low as two, but in this case it is preferable that there be a back stop in the rear of the plate **53** to eliminate the necessity for the presence of the catcher **63**. If sufficient players are available, they may be divided up into sides and the two teams take the field in succession. Of course, the game may be played with or without an umpire.

Various changes and modifications may be made in the embodiment of the invention illustrated and described herein without departing from the scope thereof as determined by the following claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. An aerodynamic game projectile for erratic flight in projection through the atmosphere above the surface of the ground as in throwing or batting games; said projectile comprising a hollow, tubular, generally cylindrical member of durable but resilient material; open at both ends; and of a size to be readily gripped by one hand for throwing, and for this last named purpose having an axial length for convenient gripping of the cylindrical projectile axially between one or more fingers of the throwing hand at one end and the thumb at the other end; the axial length of the projectile being in any event greater than the diameter thereof; said projectile being warped to a slight degree whereby the longitudinal axis assumes a slight arcuate configuration.

2. An aerodynamic game projectile for erratic flight in projection through the atmosphere above the surface of the ground as in throwing or batting games; said projectile comprising a hollow, tubular, generally cylindrical member of durable but resilient material; open at both ends; and of a size to be readily gripped by one hand for throwing, and for this last named purpose having an axial length for convenient gripping of the cylindrical projectile axially between one or more fingers of the throwing hand at one end and the thumb at the other end; the axial length of the projectile being in any event greater than the diameter thereof; said projectile being warped to

a slight degree whereby the longitudinal axis assumes an arcuate configuration of great radius, the convex side of the projectile being somewhat longer than the concave side, and the planes of the ends of the projectiles if projected intersecting at an acute angle.

3. An aerodynamic game projectile for erratic flight in projection through the atmosphere above the surface of the ground as in throwing or batting games; said projectile comprising a hollow, tubular, generally cylindrical member; open at both ends; and of a size to be readily gripped by one hand for throwing, and for this last named purpose having an axial length for convenient gripping of the cylindrical projectile axially between one or more fingers of the throwing hand at one end and the thumb at the other end; the axial length of the projectile being in any event greater than the diameter thereof; said cylindrical projectile being warped laterally so that its longitudinal axis assumes a slightly arcuate configuration, and having its wall thicker on the convex side of the axis than on the concave side.

4. An aerodynamic game projectile for erratic flight in projection through the atmosphere above the surface of the ground as in throwing or batting games; said projectile comprising a hollow, tubular, generally cylindrical member of durable but resilient rubber-like material; open at both ends; and of a size to be readily gripped by one hand for throwing, and for this last named purpose having an axial length for convenient gripping of the cylindrical projectile axially between one or more fingers of the throwing hand at one end and the thumb at the other end; the axial length of the projectile being in any event greater than the diameter thereof, the annular walls of said projectile being solid, said walls being also relatively thin as compared with the outside diameter of the projectile, in order to afford adequate entry of air into the interior of the projectile during flight to augment the erratic nature of its trajectory, the internal substantially cylindrical surface of the projectile being eccentric to its outer substantially cylindrical surface, the wall of the projectile thus being thicker on one side of the projectile than on the other.

5. An aerodynamic game projectile for erratic

flight in projection through the atmosphere above the surface of the ground as in throwing or batting games; said projectile comprising a hollow, tubular, generally cylindrical member of durable but resilient rubber-like material; open at both ends; and of a size to be readily gripped by one hand for throwing, and for this last named purpose having an axial length for convenient gripping of the cylindrical projectile axially between one or more fingers of the throwing hand at one end and the thumb at the other end; the axial length of the projectile being in any event greater than the diameter thereof, the annular walls of said projectile being solid, said walls being also relatively thin as compared with the outside diameter of the projectile, in order to afford adequate entry of air into the interior of the projectile during flight to augment the erratic nature of its trajectory, the outer substantially cylindrical surface of the projectile being provided with a plurality of helical grooves, which grooves extend substantially from one end of the projectile to the other.

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