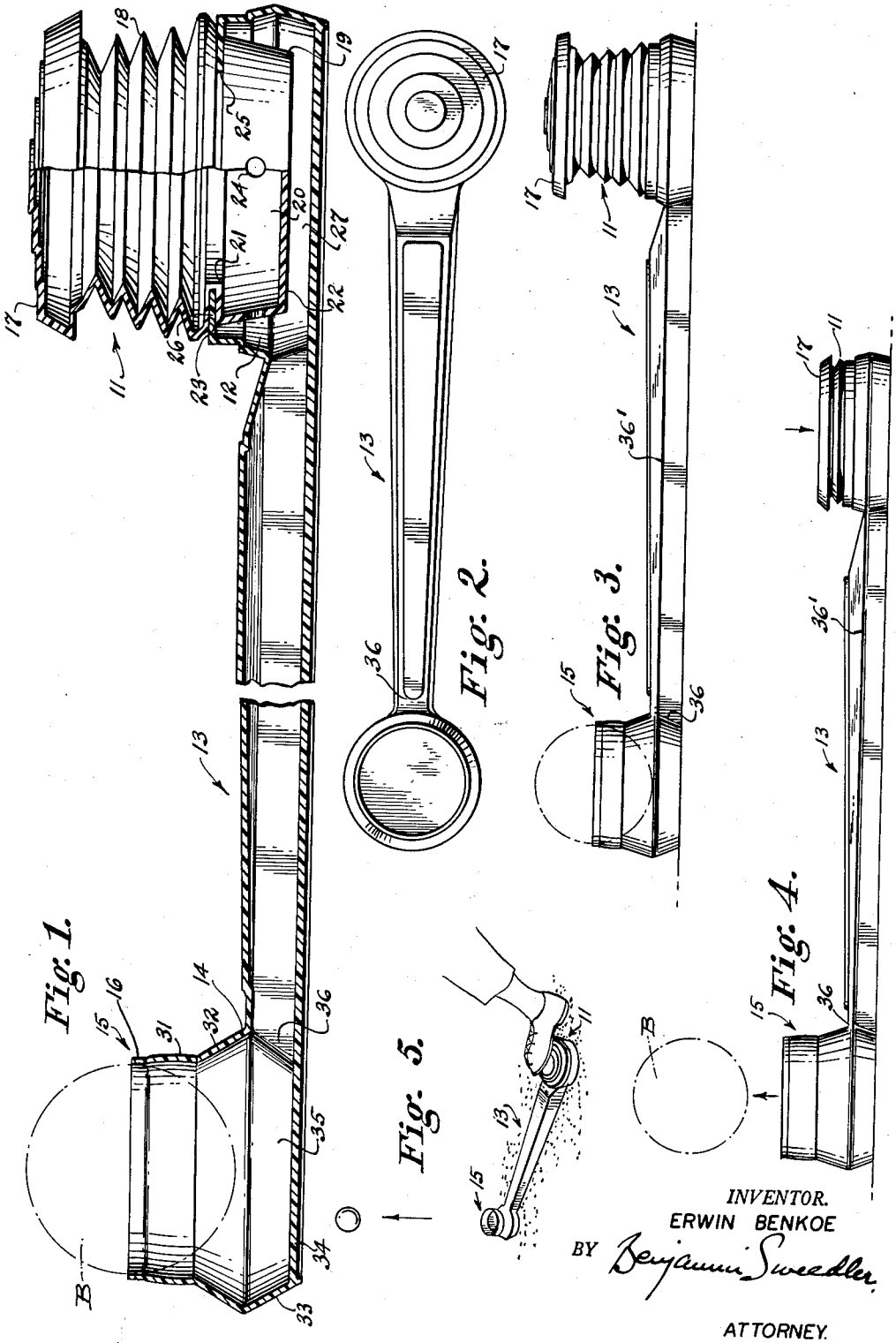
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BALL PROPELLERS

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BALL PROPELLERS

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This invention relates to a ball propeller or thrower for batting practice, or for playing a game simulating the well known fungo game or other games.

It is among the objects of this invention to provide a ball propeller which is simple in design and can be mass-produced, which can be used to propel a ball for batting practice or for playing games involving a ball, for example a game simulating the well known fungo game.

Another object of this invention is to provide such ball propeller useful by one and the same individual to propel or throw a ball leaving the hands and arms free to swing at the ball; thus the ball propeller can be used for batting practice, or for ejecting or throwing a ball to be struck with a bat or paddle in playing a game.

Other objects and advantages of this invention will appear from the following detailed description thereof taken in connection with the accompanying illustrative drawing, in which FIGURE 1 is a fragmentary vertical section through the ball propeller of this invention;

FIGURE 2 is a plan view thereof on a reduced scale, as compared with the scale of FIGURE 1;

FIGURE 3 is a side elevational view thereof showing the ball propeller in the position in which the bellows at one end thereof is expanded and the ball holder at the opposite end has the ball in position to be propelled therefrom;

FIGURE 4 is a side elevational view corresponding to FIGURE 3 with the bellows contracted to effect propulsion of the ball from the ball holder; and

FIGURE 5 is a perspective view illustrating the manner of using the ball propeller to effect propulsion or throwing of the ball for batting practice or other such use by one and the same individual.

The ball propeller comprises a bellows **11**, suitably mounted in end **12** of a longitudinally elongated conduit **13**, having at the opposite end **14** a ball support **15**. These parts may be suitably dimensioned to meet the requirements of the age group fo rwhich the ball propeller is designed and the size of the ball to be propelled. For a ball having a diameter of about 3 inches, the ball support **15** should have substantially the same diameter so that the ball can be disposed thereon, as shown in FIGURES 1 and 3, to make a substantially gas tight seal between the relatively thin cylindrical rim **16** of the ball support **15** and the ball B. Desirably the rim **16** has inherent flexibility to exert an elastic grip on the ball. It is designed to hold the ball as shown in FIGURES 1 and 3 so that about one half of the ball protrudes above the rim **16** and the other half extends therebelow.

The length of the portion of conduit **13** between the ball support **15** and the bellows **11** can be about a foot, more or less. The bellows desirably has a diameter of about 4 inches, more or less. It will be appreciated that these dimensions represent one exemplification and they may be varied as desired.

Preferably, the bellows is made of polyethylene, polypropylene or synthetic or natural rubber so that it has the desired flexibility permitting expansion by the inherent nature of the material and contraction to expel the air therein when force is applied to the top **17** of the bellows. The bellows may be molded in two sections, each forming a half of the bellows, which sections may be joined in a suitable manner; for example, when using thermoplastic materials such as polyethylene or polypropylene, the two sections may be joined by heat and pressure to form a unitary construction.

The bellows consists of any desired number of sections **18**, five being shown in the drawings, which are contracted when a downward force is applied to top **17** and which automatically expand to the position shown in FIGURE 1 when the force is relieved. The base of the bellows is cone-shaped, forming a base air chamber, the side walls of which converge towards the bottom wall **22** of chamber **20** from a neck **21** where the air chamber joins the lowermost of the bellows section **18**. An annular groove **23** is formed just above the chamber **20**. This chamber has a plurality of spaced openings **24** about its periphery. Any suitable number of such openings can be provided, preferably equally spaced about the periphery of the truncated conical chamber **20**. Four such openings, spaced approximately 90° apart, are preferred.

End **12** of conduit **13** is formed with a circular opening **25**, defined by the inner edge of a flange **26** at the top of air chamber **27** positioned at end **12**. Flange **26** is sufficiently flexible and so dimensioned as to enable the truncated conical base **20** of the bellows **11** to be forced into chamber **27** with the flange **26** locking in the annular groove **23** to securely hold the bellows in place in chamber **27**. The bellows **11** can be removed from the chamber **27** by applying sufficient force to remove it and can readily be reinserted by exerting sufficient downward pressure to force it into place with the flange **26** locked within groove **23**. As a practical matter, once assembled there is no need to separate these two members. The above described two part construction is preferred because it simplifies and cheapens construction. The invention, however, in its broader aspects, includes a unitary construction of bellows **11**, joining conduit **13** and ball holder **15**.

Chamber **27** communicates with longitudinally extending conduit **13**, which is shaped as clearly shown in FIGURES 2 and 3 so that it converges from chamber **27** toward opposite end **14**, where the ball support **15** is located. The ball support **15**, as noted, comprises a thin, preferably flexible rim **16** positioned at the top of a generally cylindrical housing **31**, which housing communicates with the downwardly diverging walls **32** in open communication with the discharge end **14** of conduit **13**. These diverging walls **32** are joined to the converging walls **33** which are in turn joined to the base **34**. Walls **32** and **33** define a plenum or propelling chamber **35** which is in constant open communication with the channel **28** through a restricted throat **36**. The assembly of chamber **27**, conduit **13**, propelling chamber **35**, and the ball support preferably is molded in two units, one an upper unit, the lower edges of which lie in a plane passing through line **36** shown in FIGURES 3 and 4, and the other a lower unit constituted of the portion below this plane indicated by line **36'**. Both units can be of rigid polyethylene, polypropylene, hard rubber, vinyl resins and other such plastics, except for the rim **16** forming the upper portion of the ball support, which is of flexible material such as polyethylene or polypropylene. Employing polyethylene or polypropylene, the molding operation can be so conducted as to produce a section having the flexible rim **16**, with the rest thereof rigid. Alternatively, the rim **16** can be joined by heat and pressure to the remainder of the upper section after formation of the latter. The upper and lower sections are suitably joined along the abutting edges as by heat and pressure sufficient to form the desired joint, all as well known in the molding art.

In use, the ball is placed on the ball support **15**; automatically a substantially gas tight seal is produced between the periphery of the ball and the rim **16** due to

the weight of the ball causing it to settle and the yielding pressure exerted by the rim 16. If desired, hand pressure can be exerted on the ball to seat it securely in the ball support. Thereafter, the user applies pressure to the top 17 of the bellows 11. This can be done by the foot of the user, as shown in FIGURE 5, preferably by stepping down sharply on top 17 of the bellows. This results in the forcible ejection of the air within the bellows through the openings 24, into and through chamber 27, conduit 13 which converges to provide the narrow throat 36 through which the stream of air flows into the plenum or propelling chamber 35 where the increased velocity of the air flow as it expands after leaving the throat 36 effects the forcible ejection of the ball from its seat or support. The fact that about half the ball is within chamber 35 provides a large surface of the ball on which the air stream acts and aids in ejecting the ball so that it rises a suitable height depending upon the force exerted on the bellows 11. A sharp application of force as by stamping on top 17 of the bellows will eject the ball upwardly a maximum distance. The user, when the ball propeller is used for batting practice, attempts to bat or strike the ball upon ejection. Since the ejection is effected by the foot of the user as shown in FIGURE 5, the hands and arms are free to wield the bat.

It will be noted that the present invention provides a ball propeller which enables the user to engage in batting practice or to play other games, many forms of which will occur to children and adults using this ball propeller. For example, the ball propeller of this invention can be used as a fungo game to propel the ball for others to bat, or in a game where the object is to catch the ball. The ball used can be a lightweight ball, preferably plastic, having a mass such that it can be propelled to a suitable height. It will be appreciated, however, the invention is not confined to the use of plastic balls, but can be used with other balls.

Since different embodiments of the ball propeller disclosed herein can be made without departing from the scope of this invention, it is intended that all matter contained in the above description, or shown in the accompanying drawing, shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. A ball propeller for ejecting a ball in a substantially vertical direction comprising, in combination, a longitudinally elongated conduit having at least a substantial portion of its underside flat and having one end formed as an air-receiving chamber defined by upstanding walls at said one end of said conduit, and having the other end of said conduit formed as a ball propelling chamber defined by upstanding walls at said other end of said conduit, said upstanding walls of said ball propelling chamber having at their upper edges an upstanding thin rim having a diameter arranged to engage the periphery of the ball at about the diameter thereof to make a substantially gas-tight seal therewith, an upstanding bellows having an air discharge chamber at its lower end positioned in said air-receiving chamber for discharge of air from said bellows when compressed, into said air-receiving chamber, the upper end of said bellows being arranged to receive an energizing force to compress the bellows and effect the discharge of air therefrom into said air-receiving chamber for flow therethrough and through the communicating longitudinally elongated conduit into said ball propelling chamber to effect propulsion of the ball supported on the said upstanding thin rim in a generally upward direction.

2. The ball propeller as defined in claim 1, in which the said air-receiving chamber has an inwardly extending flange at the upper end of the upstanding walls thereof, and the bellows is a substantially cylindrical bellows composed of a plurality of expansible and contractible bellows sections, the lowermost of which communicates with an air discharge chamber having at least one opening therein for discharge of air from the bellows, said bellows having an annular groove positioned between the lowermost bellows section and said air discharge chamber, which annular groove is arranged to receive the inwardly extending flange on the upstanding walls of said air-receiving chamber.

3. A ball propeller for ejecting a ball in a substantially vertical direction comprising, a longitudinally elongated conduit having a substantially flat underside, having one end of the conduit formed as an air-receiving chamber defined by upstanding walls at said one end of said conduit, and having the other end of said conduit formed as a ball propelling chamber defined by upstanding walls at said other end of said conduit, said upstanding walls of said ball propelling chamber having at their upper edges an upstanding thin rim for supporting a ball, said thin rim having a diameter arranged to engage the periphery of the ball at about the diameter thereof to make a substantially gas-tight seal therewith, the side walls of said longitudinally elongated conduit converging from said air-receiving chamber to said ball propelling chamber to provide a relatively narrow throat connection between the said other end of the longitudinally extending conduit and the ball propelling chamber thereat, a bellows having an air discharge chamber at its base, a top surface adapted to receive an energizing force to compress the bellows, and a plurality of expansible and contractible bellows sections between said top surface and said air discharge chamber, said bellows being mounted upright in said air-receiving chamber with the air discharge chamber of said bellows positioned in said air-receiving chamber.

4. The ball propeller as defined in claim 3, in which said air-receiving chamber is substantially circular in cross-section and has at the upper end of said upstanding walls an inwardly extending flange, said bellows is substantially cylindrical in shape and has an annular groove positioned between the air discharge chamber and the lowermost bellows section, said air discharge chamber is of truncated, conical shape and has spaced openings in the side walls thereof for discharge of air therethrough upon compression of the bellows, into said air-receiving chamber, and said inwardly extending flange makes a snap fit with said annular groove in the bellows.

References Cited in the file of this patent

UNITED STATES PATENTS

2,975,779	Pope	Mar. 21, 1961
2,993,297	Bednar et al.	July 25, 1961

FOREIGN PATENTS

243,572	Great Britain	Dec. 3, 1925