PITCHING MACHINE FOR BASEBALL AND SOFTBALL BATTING PRACTICE

Inventors: Kerry K. Paulson, Sherwood, OR (US); Edward DeChenne, Sherwood, OR (US); Gary Krupsky, Farmingdale, NY (US)

Correspondence Address: KOLISCH HARTWELL, P.C., 200 PACIFIC BUILDING, 520 SW YAMHILL STREET, PORTLAND, OR 97204 (US)

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ABSTRACT

Disclosed is a pitching machine arranged specifically to pitch small diameter balls utilized in baseball and softball training and practice exercises for increasing a batter’s proficiency for regular batting play. The pitching machine includes a body housing one or more electric motors to turn one or more wheels which, in turn, can project a ball toward a batter. The pitching machine includes a feeder tube configured to capture and store a number of balls for use with the pitching machine, and which can be reversibly attached to the pitching machine for automatic feeding of stored balls to the one or more wheels. In the illustrated embodiment, the machine is configured to pitch balls smaller than standard baseballs or softballs.
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CROSS-REFERENCE TO RELATED APPLICATION


BACKGROUND

[0002] This disclosure relates to ball throwing machines, and more particularly to an illustrated ball throwing machine that is configured to throw a ball of smaller size than standard baseballs or softballs. The illustrated ball throwing machine is coupled to a detachable ball feeder tube that is configured to pick up and store balls before they are launched by the machine.

[0003] Typical ball throwing machines of this type are generally provided with a bucket or other container used for storing a large number of balls, which buckets or containers must be loaded by hand. The typical machines also have limited adjustability in the way that they throw a ball or how they may be loaded. Ball throwing machines, ball containers, and machines with bucket-like containers are exemplified in U.S. Pat. Nos. 4,883,272; 5,823,894; 6,739,325; and 7,244,198, and U.S. Patent Application Nos. 2006/0236993 and 2008/0185855. The disclosures of each of the above-listed patents and patent application publications are incorporated herein by reference.

SUMMARY

[0004] It has been found that it is advantageous for a batter to practice hitting small sized balls pitched at him, preferably using a reduced-sized bat, in order to refine and hone his skill and batting accuracy. This practice will allow a hitter to learn better to track a ball from a release point at a pitcher to the impact zone. It could also allow an increase in the hitter’s concentration by teaching the hitter to strike a small object with, perhaps, a small bat. Subsequent to this practice with small balls, when again using regulation-sized equipment, it becomes far easier for the batter to accurately hit the larger balls with the larger bats used in regulation play as compared with his practice done with the small balls and bat during training with the machine of this invention.

[0005] To this end, disclosed is a ball throwing machine arranged specifically to pitch small diameter balls utilized in baseball and softball training and practice exercises for increasing a batter’s proficiency for regular batting play. The disclosed ball throwing machine is configured to throw balls that have a diameter approximately similar to that of golf balls and ping-pong balls, though formed of a selected, suitable material having a predetermined hardness and density advantageous for batting purposes.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] FIG. 1 is a side view of a pitching machine according to the present disclosure.

[0007] FIG. 2 is a front view of a pitching machine according to the present disclosure.

DETAILED DESCRIPTION

[0008] The drawings contained herein are renderings of a ball-pitching machine embodying features of the present disclosure, FIG. 1 being a side view and FIG. 2 being a front view.

[0009] As shown in FIG. 1, the illustrated pitching machine includes a housing body 10 mounted on a base support member 12 which in turn is mounted, in the particular embodiment illustrated herein, on an underlying tripod leg mount fixture 14. To facilitate transport of the body portion of the machine, or of the entire machine, the body may be provided with a handle 11 on one of its surfaces. For example, the body 10 may be moved independently of the leg base support 12 by unscrewing or otherwise releasing one or more release knobs 13, which may reversibly secure the body and base. In an exemplary embodiment, release knobs 13 may be provided with screw-like portions that screw into the body 10, much like a tripod may screw into the bottom of a camera to which it is secured.

[0010] At a joining region of the base support member 12 and the leg mount fixture 14, there may be an angle adjustment knob 15 configured to alter orientation and/or engagement of an angle between member 12 and fixture 14. In one arrangement, for example, knob 15 may allow fixation of an angle between base support member 12 and mount fixture 14 so that the body of the pitching machine is angled upward, allowing delivery of fly balls to a practicing fielder. In another arrangement, for example, knob 15 may fix an angle between base support member 12 and mount fixture 14 so that the body of the pitching machine is angled downward, allowing delivery of ground balls to a practicing fielder. Other arrangements are possible.

[0011] As seen in the drawings, the tripod leg mount fixture is arranged to releasably mount three support leg members 16 configured to support the housing body 10 at a predetermined height above an underlying ground surface. In the illustrated embodiment the leg members 16 have a selected length to position the housing body at a first predetermined elevation above ground level, which accurately simulates the typical release point of an average softball pitcher. A second, lower set of leg members 18 may be coupled to the bottom ends of the first leg members 16 of the illustrated embodiment by a quick release connection. For example, the connection may be a snap-fit releasable connection. Alternatively, the connection could be a friction fit connection.

[0012] The second set of leg members 18 may provide sufficient length, when used in combination with the first, upper set of legs 16, to support the housing body 10 at a second predetermined height above the underlying ground support surface. This second height may be greater than the first height, and it may be selected to simulate the typical release point of an average baseball pitcher. In this manner, the pitching machine may be quickly and easily set for either softball or baseball pitching training sessions.

[0013] The base support member 12 may preferably be arranged to support the housing body 10 for rotation about a vertically extending axis whereby the housing may be rotated to the left and right in order to vary the position of balls pitched over the plate. In this manner, balls may be selectively thrown to inside and outside positions over the plate as may be desired by a trainer. Similarly, the housing member is also
preferably supported by the base support member for pivoting about a horizontally extending axis whereby the elevation of the pitched ball over the plate may be varied as desired by the trainer for varying the height of balls pitched within the strike zone of the batter, as noted above in the discussion of angle knob 15. This also permits the use of the pitching machine, if desired, for operation in fielding practice if desired for practicing catching fly balls and even grounders if needed or desired.

The illustrated housing body 10 includes a pair of wheels 24, 26 configured for power-driven counter-rotation relative to each other. For safety of a user, and for prevention of damage to the wheels, the housing of the illustrated embodiment is configured with wheel covers 27 extending over the wheels. The wheels 24, 26 are spaced apart from one another sufficiently for allowing a selected training ball to be frictionally engaged by and passed between the wheels through a pitching gap 25.

In the illustrated embodiment, the wheels are 4-inch polyurethane wheels. The wheels may be standard wheels with a flat outer surface, or they may have a slightly concave or convex outer surface, depending on the desired performance characteristics of the pitching machine. The wheels may be pneumatic or solid wheels. In some embodiments, it may be possible to configure the pitching machine with a single wheel.

The housing 10 of the illustrated embodiment includes a pair of electric motors 20, 22 which are configured to rotate wheels 24, 26. When the motors are powered by electrical connection to a source of AC current or, alternatively, DC current supplied by a battery, they rotate with sufficient velocity to project forwardly a ball entering gap 25, as will be obvious to those skilled in the art. The electric motor DC power supply may be a portable battery (not shown) as may be desired for convenience in the field.

An electronic motor control unit 28 is provided in the illustrated embodiment for selectively controlling and changing the speed of each motor and, hence, the relative speed of rotation of each of the counter-rotating wheels 24, 26. In the illustrated form, the control unit is preset to manipulate the RPMs of the two independent motors to rotate the wheels appropriately to achieve a ball pitch speed of from approximately 25 to 36 miles per hour. When used at appropriate distances from a batter, these speeds can simulate pitches up to 75 miles per hour. These speeds and this speed range may of course be changed as desired for the purpose.

The motor control may be provided as an infinitely adjustable, rheostat-type control or, alternatively, the control may be arranged to provide a variety of predetermined, preset motor speeds and relative speeds between motors which may be selected by the trainer. For either of these purposes, the motor control unit of the illustrated embodiment is provided with a set of control knobs 29 to provide a power on-off function, selection of a pitch type, or manipulation of another performance parameter, as below.

In the illustrated embodiment, the control unit 28 is pre-programmed with four preset options in which the RPM for each independent motor 20, 22 has been selected and preset to achieve the projecting of each of the following types of pitches, or ball flight: a slow fastball type pitch; a fast fastball type pitch; a slow overhand curveball type pitch; and a fast overhand curveball type pitch. In some embodiments, the RPMs of the motors could be variable over a wide range of speeds, allowing manual selection of a pitch having characteristics different from the four listed above. Other and additional preselected pitching variations that are accomplished by varying the relative speeds of rotation of the two counter rotating wheels may be accommodated as may be desired or needed for the particular use of the pitching machine.

In the machine of the present disclosure, a ball delivery tube 30 is provided for delivering balls to be projected into the gap 25 between the counter rotating wheels 24, 26. In the embodiment shown, the ball delivery tube or chute 30 is mounted on the housing 10 and is arranged to receive balls through an open first end (near sleeve 37) or through a manual delivery slot 31. As configured, the ball delivery tube includes an intact tubular portion (to which sleeve 37 is coupled) distal from the ball-projecting wheel and a delivery slot 31 proximal to the ball-projecting wheel.

With either type of ball feeding (through open end or slot), the delivery tube 30 directs the balls through an open outfeed end positioned adjacent the gap 25 between the rotating wheels. This delivery tube, in its most-simple use, is arranged for hand-fed, manual delivery of balls into slot 31, which balls then pass through the tube under the force of gravity once released from the hand of the operator.

Alternatively, an automatic feed arrangement may be provided, as shown, in which a ball feed motor (not shown) engages a feed controlling member, such as a feed wheel 32 or finger member to releasably intercept a ball in delivery tube 30. As a collection of balls passes through tube 30 and reaches feed wheel 32, which typically resides above slot 31, the feed wheel or finger can selectively stop the balls and release them at a time into gap 25. This release can occur on a preselected timed or demand basis during operation of the machine during training practice. In some embodiments, timing of release of a ball past the feed wheel can occur on a user-selectable basis by use of a control knob 29. Typically, balls may be released by the automatic feed arrangement at the rate of one ball every approximately five seconds. Any other timing parameter may be chosen, perhaps depending on the batting requirements of a practicing player, or depending on the skill level of a player.

To supply a collection of small practice balls for delivery into the delivery tube, there may be an automatic feed mechanism including a feeder tube 34. While various types of storage and holding arrangements may be suitable for the purpose, one preferred form is illustrated herein as a substantially hollow, elongated storage feeder tube 34 arranged for releasable, mounted connection to the infeed end of the ball delivery feeder tube 30. In other embodiments, the feeder “tube” could take the form of a bucket, or a sphere, or other suitable shape for storing a multiplicity of balls.

Preferably the feeder tube 34 is configured to contain a desired supply of about 25 practice balls to permit adequate batting practice between down time for refilling the storage feeder. The feeder may of course be arranged to contain a greater or small supply of balls as may be desired. In the illustrated embodiment, the feeder tube is sized to contain approximately 25 5-inch-circumference polyurethane balls having a mass of approximately one-half ounce. Other smaller sizes of balls, having other weights, or other suitable shape for storing a multiplicity of balls.

The feeder tube 34 of the illustrated embodiment couples reversibly to a feeder adapter 36 coupled to the upstream end of delivery tube 30 (i.e. at the end of delivery
tube 30 opposite wheels 24, 26). The feeder adapter of the illustrated embodiment is coupled to delivery tube 30 and feeder tube 34 by adapter sleeves 37. Each of the adapter sleeves functions to provide both a connection between tubes 30, 34 and the curved adapter, and a continuous ball passage-way from feeder tube 34 to gap 25. In some embodiments, adapter sleeves 37 are integral with curved adapter 36 and serve a support function, holding the curved adapter to the housing 10 by way of braces 38. In other embodiments, adapter sleeves 37 are separate components that frictionally slide onto and secure curved adapter 36 to feeder tube 34 and delivery tube 30.

[0026] The illustrated feeder tube 34 is arranged at one of its opposite open ends for one way passage of balls to allow balls to be pushed into the tube while preventing movement of balls in the reverse direction out of the end of the tube. The balls may easily enter the end of the tube (for example, by being easily pushed past a slight restriction in the tube’s diameter, or by passing a simple one-way valve), but the balls may not easily exit the same end of the tube (for example, by gravity not being a great enough force to cause the balls to fall out the restricted end of the tube or pass the one-way valve). In this manner, feeder tube 34, when removed from the machine and held in the hand of a person, may be used to pick up and retain balls retrieved from the field without need of the person having to bend down and pick the balls up from the ground by hand.

[0027] In some embodiments, the feeder tube may be configured with a protective cap 35 at its “picking” end (i.e. the end where balls enter upon use of a pushing force by a user). Cap 35 of the feeder tube may prevent inadvertent entry of debris into the feeder tube and, thus, into the ball delivery gap 25. Alternatively, cap 35 may itself be configured as the restricted entry point into feeder tube 34, such that the cap must be in place to facilitate one-way entry of balls into the feeder tube.

[0028] As shown in the Figures, leg sections 16, 18, storage feeder tube 34, housing body 10 and base supports 12, 14 of the illustrated embodiment are arranged for quick disconnection and reconnection so that the pitching machine may easily be broken down and reassembled. This feature allows the illustrated pitching machine to be conveniently stored and easily transported between uses. Further, it will be apparent to those skilled in the art that various changes other than those already described, may be made in the size, shape, type, number and arrangement of parts disclosed herein without departing from the spirit of this invention.

[0029] A typical use of the illustrated pitching machine involves the following steps: a user may assemble the central portion of the pitching machine in a desired location, with the “central portion” including housing 10 and its associated elements (such as wheels 24, 26 and delivery tube 30), base support plate 12, tripod mount 14, and legs 16. If desired, the user may attach the second legs 18 to elevate the housing to a desired height. The user may also assemble the curved adapter 36 and sleeves and attach them to delivery tube 30. The user may then activate the pitching machine with control knobs 29, powering the unit up and selecting a desired pitching parameter. In this simplest set-up, the user may manually (and, if desired, repeatedly) drop a ball into delivery slot 31 so that the ball can enter gap 25, be engaged by wheels 24, 26 and be projected to a waiting batter or fielder.

[0030] To enable automatic feeding, the user can attach the feeder tube 34 to the upstream end of curved adapter 36, either after the feeder tube has been loaded with balls, or before. A first way to load the feeder tube 34 is for a user to repeatedly pick balls up off the ground with a restricted end of the feeder tube, as describe above. The loaded tube can then be attached to the curved adapter, with the loaded balls then passing into the adapter and following the ball passageway until they hit the restrictive feed wheel 32. A second way to load feeder tube 34 is for a user to attach the tube to the curved adapter and then manually insert balls, repeatedly, into the distal end of the feeder tube until a desired number of balls have been stored.

[0031] In either case, once the balls have been loaded into feeder tube 34 and have passed through curved adapter 36 to delivery tube 30, they will reach feed wheel 32. The feed wheel will restrict, at least temporarily, further passage of the balls. At this point (or earlier, if it is desired), the user may activate the pitching machine, enabling repeated, automated single releases of balls past the feed wheel and into gap 25, from which the balls can be ejected. If desired, a user can continually replenish the ball supply by placing balls in feeder tube 34 (or curved adapter 36) at the same time they are being relatively slowly released by feed wheel 32.

[0032] Although the present invention is shown and described with specific operational principles and preferred embodiments, it is apparent to those skilled in the art that changes in form and detail may be made without departing from the spirit and scope of the invention. The invention is intended to embrace such alternatives, modifications and variations. The subject matter of the invention includes all novel and non-obvious combinations of the elements, features, functions and/or properties disclosed herein. Inventions embodied in various combinations and subcombinations of features, functions, elements, and/or properties may be claimed through presentation of claims in a subsequent application.

We claim:

1. A ball throwing machine, comprising:
   at least one powered ball-projecting wheel;
   a ball delivery tube in close proximity to the at least one ball-projecting wheel, wherein the ball delivery tube includes a first intact tubular portion distal from the ball-projecting wheel and a second cutout tubular portion proximal to the ball-projecting wheel; and
   a feed controlling member, wherein the feed controlling member is configured to control a passage of balls through the ball delivery tube.

2. The ball throwing machine of claim 1, further comprising:
   a feeder tube coupled to the ball delivery tube, wherein the feeder tube and ball delivery tube are configured to provide at least a portion of a ball passageway configured to store a plurality of balls to be ejected from the ball throwing machine.

3. The ball throwing machine of claim 2, wherein the feeder tube is configured for one-way passage of balls, wherein the balls can easily enter a first end of the feeder tube but cannot easily exit the first end of the tube.

4. The ball throwing machine of claim 1, wherein the feed controlling member is a feed wheel configured to restrict passage of a ball through the delivery tube, and further wherein the feed controlling member is configured selectively to allow the ball to pass through the delivery tube and be engaged by the ball-projecting wheel.
5. The ball throwing machine of claim 4, wherein the feed controlling member is positioned in close spatial relation to the cutout tubular portion.

6. A ball throwing machine, comprising:
a pair of powered ball-projecting wheels, wherein the ball-projecting wheels are configured for counter-rotation relative to each other;
a ball delivery tube in close proximity to the pair of ball-projecting wheels, wherein the ball delivery tube includes a first intact tubular portion distal from the ball-projecting wheel and a second cutout tubular portion proximal to the ball-projecting wheel;
a feed controlling member, wherein the feed controlling member is configured to control a passage of balls through the ball delivery tube; and
a feeder tube coupled to the ball delivery tube, wherein the feeder tube and ball delivery tube are configured to provide at least a portion of a ball passageway configured to store a plurality of balls to be ejected from the ball throwing machine, wherein the feeder tube is removably coupled to the ball delivery tube, and farther wherein an end of the feeder tube is configured to allow one-way entry of the balls into the feeder tube.

7. The ball throwing machine of claim 6, wherein the feed controlling member is a feed wheel configured to restrict passage of a ball through the delivery tube, and further wherein the feed controlling member is configured selectively to allow the ball to pass through the delivery tube and be engaged by the ball-projecting wheel.

8. The ball throwing machine of claim 7, wherein the feed controlling member is positioned in close spatial relation to the cutout tubular portion.

9. The ball throwing machine of claim 6, wherein the relative rate of counter-rotation of the wheels can be varied to provide a projected ball with a selected type of ball flight.

10. A method of projecting a ball, comprising:
loading selectively a ball into a ball delivery tube;
allowing the ball to pass through the ball delivery tube;
engaging the ball with a ball-projecting wheel; and
projecting the ball.

11. The method of claim 10, further comprising:
loading a plurality of balls into a feeder tube before loading a ball into the ball delivery tube.

12. The method of claim 11, wherein the step of loading the balls into the feeder tube includes causing the balls to enter the tube through a restrictive opening in the tube that allows easy passage in only a single direction.

13. The method of claim 11, wherein the feeder tube is configured to be removably coupled to the ball delivery tube.

14. The method of claim 10, wherein the balls are lightweight balls having a circumference of approximately 5 inches.

15. The method of claim 10, wherein the step of projecting the ball includes projecting the ball with one of a plurality of selectable ball flights.

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