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3,333,847

BATTING PRACTICE DEVICE WITH FOOT RESPONSIVE CLUTCH DRIVE

Filed Nov. 23, 1964

2 Sheets-Sheet 1

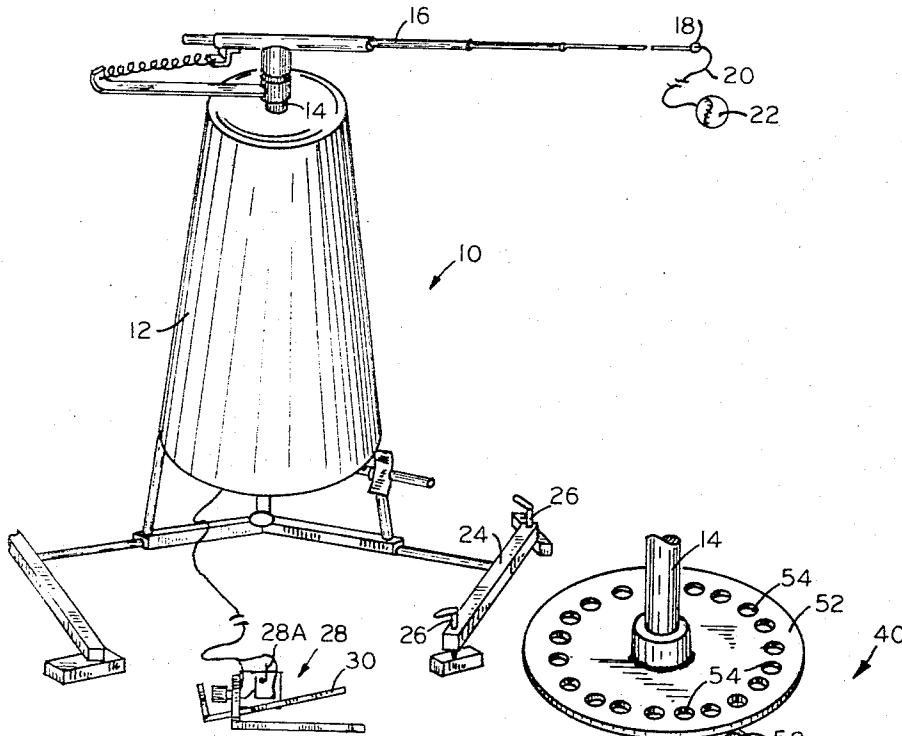


FIG. 1

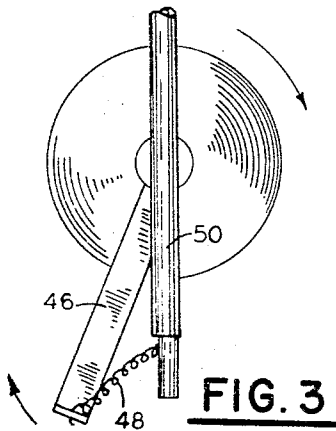


FIG. 3

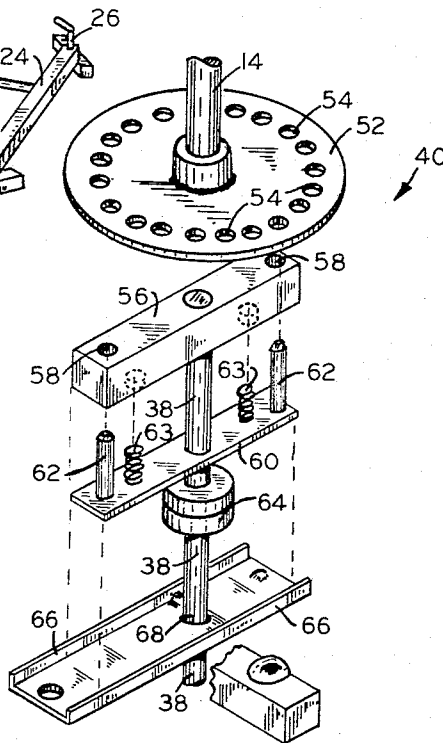


FIG. 6

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2 Sheets-Sheet 2

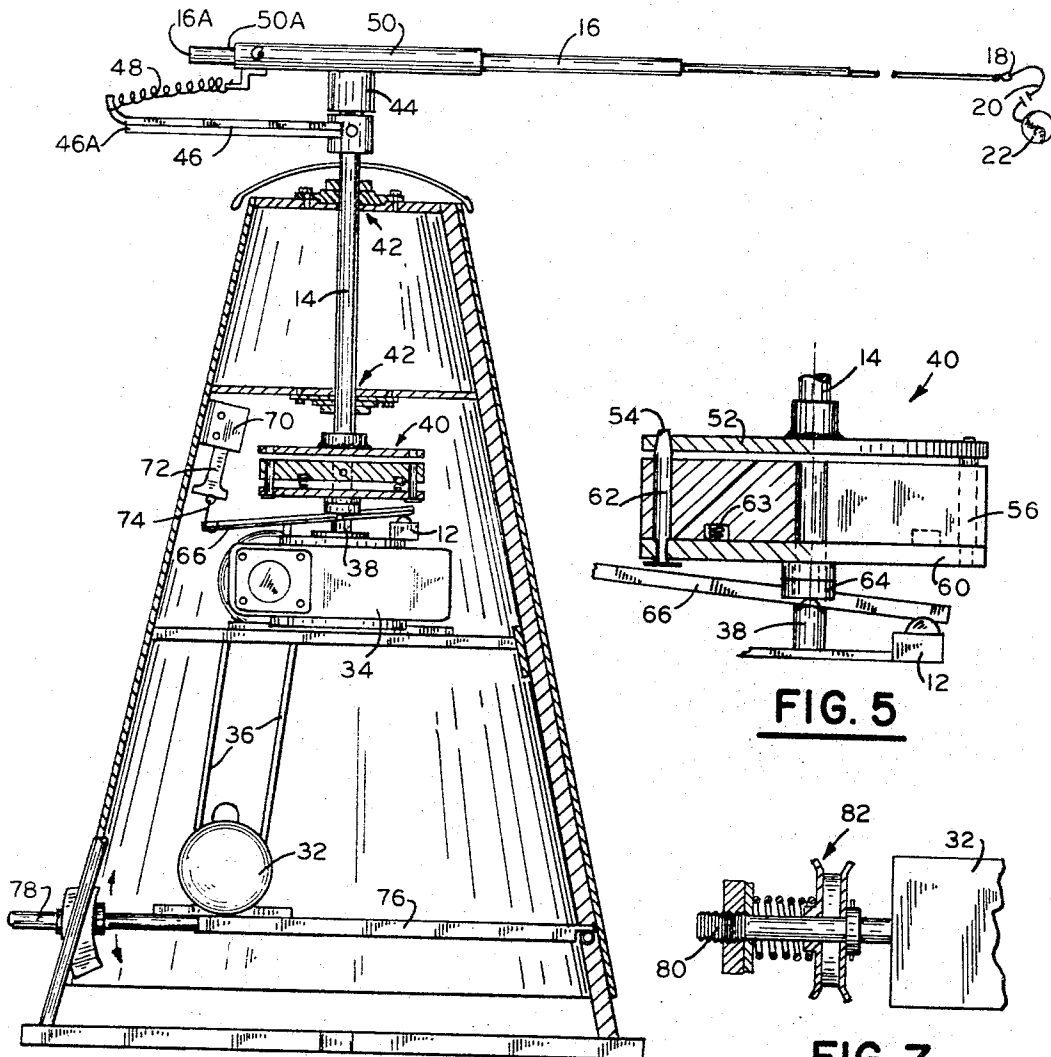


FIG. 2

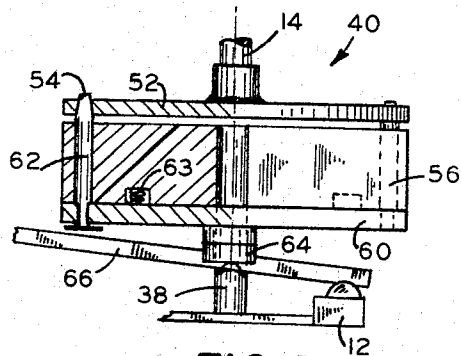


FIG. 5

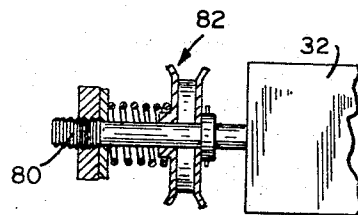


FIG. 7

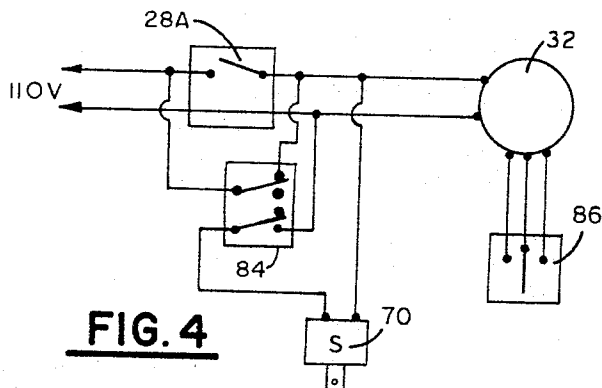


FIG. 4

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BATTING PRACTICE DEVICE WITH FOOT RESPONSIVE CLUTCH DRIVE

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6 Claims. (Cl. 273-26)

This invention relates to a baseball batting practice device.

In order for a player to become proficient in batting baseballs, he must continually practice the skill. The accurate placement of the arc of the baseball bat as it is swung plus the exact timing required for a solid blow against a ball require a great deal of perfection which can only be attained through many hours of practice.

Pitching devices have been perfected utilizing a movable arm which throws a ball with a pivoted arm. Such devices work satisfactorily but are relatively expensive and require the use of a large number of balls as well as a large field or a net. The balls, after being batted, have to be gathered from the batting field for reuse in the machine.

This invention includes improvements to the concept of a batting practice device wherein a ball is swung in an arc past the batter. The basic concept of a batting practice device utilizing a ball rotating around a center point is shown in the following United States Patents: 1,862,044, 2,017,820, 2,058,277, 2,633,320, and 2,818,255.

While the basic concept of the batting practice device shown in these patents is satisfactory, certain deficiencies exist which have precluded the use of this type of batting practice device. This invention overcomes the limitations and deficiencies in existing batting practice devices of the type having a tethered ball swung around a center point.

It is therefore an object of this invention to provide an improved batting practice device.

A more specific object of this invention is to provide an improved batting practice device wherein the ball is rotated in a large diameter circle past the batter in such a manner that as the batter strikes at the ball, the ball is caused to be substantially in free flight and, wherein upon striking the ball a sound blow, the ball will freely reverse direction.

Another object of this invention is to provide a batting practice device which helps to teach the proper foot action of the batter as he strikes at a ball.

Another object of this invention is to provide a batting practice device which swings the ball to be batted in a large arc in such a way that the ball travels irregularly to simulate the action of a ball pitched by an expert pitcher.

Another object of this invention is to provide a batting practice device having means whereby the device can be adjusted to pass the ball near the batter in either a substantially horizontal plane or in a downward or upward plane at the option of the user.

Another object of this invention is to provide a batting practice device having means wherein it can be easily adjusted for either a left or right handed batter.

Another object of this invention is to provide a batting practice device having means wherein the velocity of the ball may be easily adjusted.

These and other objects and a better understanding of the invention may be had by referring to the following description and claims taken in conjunction with the attached drawings in which:

FIGURE 1 is an external plan view of the batting practice device of this invention.

FIGURE 2 is a cross-sectional view of the batting practice device.

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FIGURE 3 is a top fragmentary view of the horizontally extending boom member showing how it is rotated.

FIGURE 4 is a rudimentary wiring diagram of the device of this invention.

FIGURE 5 is an enlarged cross-sectional view of the clutch portion of the invention.

FIGURE 6 is an enlarged exploded view of the clutch portion of this invention.

FIGURE 7 is a fragmentary view of an adjustable sheave means whereby the speed of rotation of the machine is varied.

This invention may be described as an improved baseball batting practice device. More particularly, but not by way of limitation, the invention may be described as a baseball batting device comprising an upright base structure, a freely rotatable vertical shaft extending upwardly from the base, a horizontally extending boom member affixed at one end thereof the upper end of said vertical shaft whereby said boom member is rotated in substantially a horizontal plane by said shaft, a cord affixed at one end to the outer end of said boom, a ball attached to the other end of said cord, a rotary power means supported by the base structure, a remotely actuatable clutch means selectively coupling said vertical shaft to said rotary power means whereby, as said clutch means is actuated, said power means rotates said vertical shaft and thereby said boom member, and a foot operated remotely positioned clutch actuating means whereby when foot pressure is applied to the clutch actuating means the clutch couples said shaft to said power means to rotate said arm and when foot pressure is released said clutch is de-energized whereby said shaft and arm member are freely rotatable.

Referring now to the drawings and first to FIGURE 1, the batting practice device of this invention is indicated generally by the numeral 10. The device consists of an upright base structure 12 having a freely rotatable vertical shaft 14 extending upwardly therefrom. Attached to the shaft 14 is a horizontally extending boom member 16. Affixed to the outer end 18 of boom member 16 is a cord 20 and attached to the outer end of the cord is a baseball 22.

The base structure 12 is supported by legs 24 (preferably three of such legs, only two of which are seen in FIGURE 1), the legs 24 being provided with means of adjusting the base structure 12 so that the degree of deviation of shaft 14 from the vertical may be varied. Such means of adjusting the structure 12 may include hand threaded screws 26. The purpose of the adjustable legs 24 will be described subsequently.

An important element of the invention is the provision of a foot actuated switch, generally indicated by the numeral 28. When foot pressure is applied to lever 30, switch contacts 28A close a circuit for purposes to be described subsequently.

Referring to FIGURE 2, the details of construction of the baseball batting practice device are better shown. Supported within the base structure 12 is an electric motor 32 which drives a gear box 34 by means of belt 36. Extending from the gear box 34 is an output shaft which extends vertically and coaxially with the vertical drive shaft 14. It can be seen that the output shaft 38 is in fact a shaft representing the rotational output of motor 32.

An important portion of this invention is the clutch means which couples the rotation of output shaft 38 to vertical drive shaft 14, the clutch means being generally indicated by the numeral 40. Vertical drive shaft 14 is supported by bearings 42 and is normally freely rotatable relative to the base structure.

In its simplest embodiment, the boom member 16 may be affixed at its inward end directly to shaft 14 so that upon rotation of shaft 14 the boom member 16 is rotated to rotate ball 22 in a large diameter circle. In the pre-

ferred embodiment, however, the boom member 16 is freely pivotally supported to the upper end of vertical drive shaft 14 by means of a collar 44, the boom member 16 being supported near the inward end 16A of the boom member 16 but spaced from the end 16A. Affixed to the vertical drive shaft 14 just below the collar member 44 and extending in a horizontal plane parallel to the boom member 16 is a horizontal drive arm 46 which is affixed to and rotate by vertical drive shaft 14. Connected between the outer end 46A of the drive arm and the outer end 16A of the boom member is a spring 48. As a construction detail, the collar 44 may have fixed horizontally to it at its upper end a tubular member 50 which slidably receives the boom member 16 and in which case the spring 48 is affixed (as shown) to the inward end 50A of the tubular member 50, in which case the boom member 16 is connected in tubular member 50 by means of spring pin 51.

In the arrangement shown in FIGURES 2 and 3 whereby the boom member 16 is freely rotatable relative to the vertical drive shaft 14, torque to rotate the boom member is applied from drive arm 46 through spring member 48. The provision of this flexible coupling between the drive shaft 14 and boom member 16 produces an important effect. When the device of this invention is being utilized, and especially under conditions where there is any wind velocity at all, the varying air frictional drag of the ball 22, cord 20 and boom 16 as it is rotated causes the spring 48 to be stretched to varying degrees. This causes an uneven movement in ball 22 as it is swung in a large circle which increases the difficulty of a batter accurately hitting the ball. This simulates the uneven flight of a ball pitched by an expert pitcher and teaches the user of the device of this invention to more intently concentrate on the path of the ball as it approaches him.

Referring to FIGURES 5 and 6, the clutch portion of the invention is shown in detail. Affixed to the lower end of vertical drive shaft 14 in a perpendicular plane is a plate member 52 having a multiplicity of holes 54 therein spaced from each other and equidistant from the shaft 14. Affixed to the upper end of output shaft 38 is a drive block member 56. The drive block member 56 has two openings 58 therein which align with openings 54 in the plate member 52. The drive block member 56 is positioned adjacent to and in a plane parallel the plate member 52. Slidably supported on the output shaft 38 adjacent to and below the drive block 56 is a locking plate 60 having two locking pins 62 which extend into opening 58 in drive block member 56. When slid into the most advanced upward position, the drive pins 62 extend past drive block 56 and into openings 54 in the plate member 52 thereby coupling the rotation of output shaft 38 to vertical drive shaft 14.

Extending downwardly from the locking plate 60 is a collar member 64. A pivot member 66 is pivotally supported to the base structure and is provided with an opening 68 which loosely receives the output shaft 58. In its downward position the pivot member 66 permits springs 63 to urge the locking plate 60 downwardly to disengage pins 62 from plate member 52. The bevel on the top end of pins 62 and similarly countersunk holes 54 in plate 52 also assist in urging locking plate 60 downward to disengage pins 62. Another purpose of springs 63 is to align the locking plate 60 when it is in its downward position parallel with drive block member 56 so that one locking pin 62 will not be higher than the other thereby preventing the pins from dragging in openings 54. Supported to the base structure, as best shown in FIGURE 2, is a solenoid 70 having a plunger 72 extending therefrom. A wire link 74 attaches the plunger 72 to pivot member 66 so that solenoid 70, when actuated to withdraw plunger 72, raises pivot plate 66 to engage locking pins 62 with plate member 52 and thereby couple rotation of the output shaft 38 to vertical drive shaft 14.

As shown in FIGURE 2, motor 32 is supported on a

pivotable motor structure 76 whereby the machine speed is controlled by the handle portion 78. As shown in FIGURE 7, the output shaft 80 of motor 32 is provided with an expandable sheave, generally indicated by the numeral 82. As tension on the belt 36 (FIGURE 2) increases, the sheave 82 expands to place the arc of the belt as it passes over the sheave in closer proximity to the center line of the shaft and thereby vary the ratio between sheave 82 and the gear box sheave (not shown) to vary the speed of rotation of the vertical shaft 14, the boom member 16 and thereby the ball 22.

FIGURE 4 is a rudimentary wiring diagram of the device. A two pole double throw switch 84 is provided between motor 32 and a power source. With the switch 84 pushed down, motor 32 rotates continuously to thereby rotate sheave 82 making it easier to move handle 78 up or down for the ultimate purpose of changing the speed of ball 22. Locking pins 62 do not extend to engage the plate member 52 and therefore vertical drive shaft 14 is not rotated because power which normally goes through switch 84 to solenoid 70 is broken when switch 84 is pushed down for the purpose of running the motor only. When switch 28A is closed, by applying foot pressure on foot switch 28, solenoid 70 is actuated to engage the clutch 40 and cause rotation of vertical shaft 14. An additional improvement is the provision of a reversing switch 86 whereby the direction of rotation of motor 32 and the rotation of boom member 16 and ball 22 may be reversed to accommodate either a left or right handed batter.

Operation

This device may be utilized by a single individual to practice batting without the assistance of others. When the device is to be used, it is set up in an area suitable to accommodate the diameter of swing of ball 22. While this may be varied considerably, the larger the diameter of the swing of the ball 22, the more realistically the ball flight simulates that of a pitched ball. It has been found that the diameter of swing should be at least approximately forty feet. With the direction reversing switch 86 set to move the ball in the arc required by the batter according to whether he is a left or right handed batter, the user first puts his forward foot (left foot for a right handed batter, right foot for a left handed batter) on lever portion 30 of the foot switch 28, as shown in FIGURE 1. This causes the clutch 40 to engage and start the rotation of arm 16 and thereby ball 22. As long as the user keeps his forward foot on lever member 30, the clutch continues to be engaged and the ball 22 will continue to be rotated in a large diameter arc. When the batter strikes at the ball, as he does so, if he is batting according to the properly accepted form, he lifts his forward foot and moves it in a direction to meet the ball. As he does this the batter moves his foot off of foot switch 28 to thereby disengage clutch 40. This means that as he strides into the ball as he strikes, clutch 40 has been disengaged and the boom member 16 and vertical shaft 14 is freely rotating and not connecting in any way to the other components of the device. When the batter strikes at the ball, the ball, boom, and vertical shaft 14 are free to reverse direction of rotation easily and, if a sound blow on the ball is struck, the boom member 16 will be caused to rotate in the opposite direction by the force of the blow. This provision whereby the ball is in substantially free flight is contrasted with the other known batting practice devices of the rotating type. Unless the ball is in free flight at the time of the strike, the batter when striking the ball experiences a tremendous and unnatural shock which is highly detrimental to successful practice. This invention has overcome this problem with existing batting practice devices and has provided a batting practice device which is extremely successful in teaching the coordination, timing and concentration required for a good baseball batter.

As previously indicated, the legs 24 of the device may

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be adjusted, such as by means of hand threaded screws 26, to vary the deviation from the vertical of shaft 14. In this way the user of the invention may adjust the machine so that as the ball passes him it does so in a horizontal plane, in an upward plane, or a downward plane. This permits the user to practice hitting different pitches. By adjusting handle 78 (FIGURE 2) to vary the pitch of sheave 82, the speed of rotation of the ball can be varied. This permits the user to practice hitting balls traveling at different speeds.

Although this invention has been described with a certain degree of particularity, it is manifest that many changes may be made in the details of construction and the arrangement of components without departing from the spirit and scope of this disclosure.

What is claimed:

1. A baseball batting practice device comprising:

- an upright base structure;
- a freely rotatable vertical shaft extending upwardly from said base structure;
- a horizontally extending boom member affixed at one end thereof to the upper end of said vertical shaft whereby said boom member is rotated in substantially a horizontal plane by said shaft;
- a cord affixed at one end to the other end of said boom member;
- a ball attached to the other end of said cord;
- a rotary power means supported by said base structure;
- a remotely actuatable clutch means selectably coupling said vertical shaft to said rotary power means whereby as said clutch means is actuated, said power means rotates said vertical shaft and thereby said boom member; and
- a foot operated remotely positionable clutch actuating means whereby, when foot pressure is applied to said clutch actuating means, the clutch actuates to couple said shaft to said power means to rotate said boom member and when foot pressure is released said clutch is de-energized whereby said shaft and boom member are freely rotatable.

2. A baseball batting practice device comprising:

- an upright base structure;
- a freely rotatable vertical drive shaft extending upwardly from said base;
- a horizontally extending boom member affixed at the inner end to the upper end of said vertical shaft whereby said boom member is rotated substantially horizontally by said shaft;
- a cord affixed at one end to the outer end of said boom member;
- a baseball attached to the outer end of said cord;
- an electric motor supported by the base structure, the motor having an output shaft;
- a clutch means coupling said output shaft to said vertical shaft;
- a solenoid means to controllably engage and disengage said clutch means; and
- a foot operated switch means connected to said solenoid, whereby said clutch is engaged when foot pressure is applied to said switch to cause said shaft and boom member to be rotated and whereby when foot

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pressure is removed from said switch means said shaft and boom are freely rotatable.

3. A baseball batting practice device according to claim 2 wherein said clutch includes:

- a plate member perpendicularly affixed to said vertical drive shaft having a multiplicity of holes therein spaced from each other and equidistant from said shaft;
- a vertical motor shaft coupled to said motor and rotated by the motor, the motor shaft coaxially positioned in juxtaposed end relationship relative to said vertical drive shaft;
- a drive block member affixed to said motor shaft adjacent and parallel to said plate member, the drive block having at least one opening therein alignable with said openings in said plate member;
- a locking plate slidably supported on said motor shaft adjacent said drive block and having at least one locking pin affixed thereto and extending through said opening in said drive plate such that when the locking plate is in the upward position the locking pin extends through said opening in said plate member to rotatably lock the motor shaft to the vertical drive shaft;
- spring means biasing said locking plate slidably downward whereby said locking pins are normally out of engagement with said plate member; and
- means controlled by said solenoid means to slidably position said locking plate upwardly when foot pressure is applied to said foot operated switch.

4. A batting practice device according to claim 2 including direction of rotation reversing switch means connected to said motor whereby the direction of rotation of the motor and thereby the boom member may be reversed to accommodate both left and right handed batters.

5. A batting practice device according to claim 2 including means on said base structure adjustably varying the deviation from the vertical of said drive shaft.

6. A batting practice device according to claim 2 where-

- in:
- said horizontally extending boom member is freely rotatably supported on the upper end of said vertical drive shaft, said boom member being supported on said shaft at a point spaced from the inner end of the boom member;
- a horizontally extending drive arm affixed at the inner end to said vertical drive shaft adjacent said boom member; and
- a spring affixed to the outer end of said drive arm and the inner end of said boom member.

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