A portable, manually operated collapsible softball pitching machine having a spring actuated underhand pitching arm movable to operative position with a cocking lever. The ball pitching machine has a cocking lever that engages the spring biased pitching arm and moves it to a half cocked position where the pitching arm is latched. The cocking lever then engages a booster arm and moves the pitching arm to a fully cocked position. Provided also is a pivotally mounted platform that is manually operated to tension a separate spring to add an additional force to the pitching arm.

3 Claims, 7 Drawing Figures
SPRING TYPE BALL THROWING BOOSTER

BACKGROUND OF THE INVENTION

Baseball teams have long needed baseball pitching machines to provide practice for batters without using human pitchers, many of whom are too inconsistent in control, accuracy and speed to provide for a worthwhile batting practice. The requirements and shortcomings of baseball pitching machines are more fully discussed in applicant's U.S. Pat. No. 3,552,371 issuing Jan. 5, 1971 for a Baseball Pitching Machine.

As part of applicant's continuing development program, the softball pitching machine and fast ball kit of the present invention meets the needs of beginner and advanced players, and the wide range of abilities of players in Park, School, Church and Recreational Leagues. No softball pitching machine hereafter has met the requirements of simplicity, accuracy, realistic pitching simulation, stability, dependability and portability.

SUMMARY OF THE INVENTION

The softball pitching machine of the present invention uses the basic rugged design with a tripod fold-out frame of applicant's baseball machine for the "underhand" throwing of softballs typically having a 12 inch diameter. A ball feed tube automatically feeds stored balls into a ball holder when the ball in the holder has been ejected by the triggered rotating pitching arm. The release point of the ball is similar to the typical underhand delivery of softballers. The ejector automatically imparts a reverse spin to the ball to simulate a "drop" pitch. Simple adjustment of the ball-holder regulates the trajectory, accommodating various attitudes of machine placement as well as adjusting the strike zone for different batters.

Cocking of the machine is accomplished by rotating a cocking lever forward to quarter turn, two times for each pitch. This keeps the cocking strength and energy requirements of the operator well below that of the average adult male or female.

The softball pitching machine of the present invention is easy to set up, is handy and readily available for use. Its accuracy makes every pitch count. The machine throws the ball in a realistic simulation of a pitched ball in its speed and trajectory. It is simple to operate and maintain, pocking a season's worth of hitting into a single batting practice session.

The fast ball kit adapts the basic machine for higher speeds, substantially extending its use through the beginner stage to use by advanced and experienced players. This kit attaches to the machine with simple clamps with no holes to drill and represents a unique feature in that it provides the difficult to achieve goal of accuracy at fast speed as well as slow.

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a side elevational view of the softball machine with the pitching arm in uncocked position;

FIG. 2 is a side elevational view of the softball machine with the pitching arm in the half cocked position;

FIG. 3 is a side elevational view of the softball machine with the pitching arm in fully cocked position;

FIG. 4 is a fragmentary view of the softball machine latching structure;

FIG. 5 is a fragmentary front view of the catch between the cocking lever and pitching arm;

FIG. 6 is a side elevational view of the softball machine with the pitching arm in fully cocked position and the speed ball kit attachment in place; and

FIG. 7 is a side elevational view of my previously patented baseball pitching machine with the speed ball kit attached to it.

DESCRIPTION OF ILLUSTRATIVE EMBODIMENT

Reference is made to FIG. 1 wherein is shown a portable, collapsible support frame 10. This support frame includes a front U-shaped leg 12 having its loop 14 with ground contact pad 16 at the bottom and the open ends 18 at the top. Another U-shaped support frame 20 has its loop 22 at the rear with the open ends 24 extending forwardly and integrally welded to open ends 18 of the leg 12. Extending downwardly from loop 22 is a rear support leg 26 terminating in a ground contact pad 28.

A pair of transverse braces 30 connect the rear end of frame 20 with the lower end of leg 12 to provide rigidity. Rear brace 32 extends from the lower end of leg 26 to one of the welded intersections between ends 18 and 24 for the same reason.

The third leg of the tripod support frame is formed by an upper rear strut 34 and lower rear strut 36 pivotally attached to rear support leg 26 at pivot points 38, 40, and an upper forward strut 42 and lower forward strut 44 pivotally attached to leg 12 at pivot points 46, 48. These four struts 34, 36, 42, 44 terminate at a third ground contact pad 46 where they are all fixedly held by a single bolt, not shown. Removal of this bolt permits the third leg to be collapsed for transportation of the machine to and from its place of use and storage.

Rotatably mounted on support frame 10 at pivot 49 is the pitching arm 50 and energy booster arm 52 which are held together and at right angles by a brace 54. At the free end of pitching arm 50 is a rubber hammer head 56 which is adapted to eject a softball 58 positioned on a ball holder 60 fastened on leg 12. The ball holder 60 is a V-shaped tray made to tilt up or down with a thumbscrew to adjust the ball's trajectory. The hammer head 56 is of such shape and its angle of contact with ball 58 is such that the ball is ejected with a forward spin. A ball storage tube 62 is mounted on leg 12 to store several softballs each of which automatically drops onto ball holder 60 and into the path of hammer head 56.

A spring 64 is used to rotate throwing arm 50 in a counterclockwise direction in FIG. 1 shown by arrow 65. This spring is attached at one end 66 by bracket 68 to loop 22 of the trigger support frame 20 and at the other end 70 to end 72 of cable 74. This cable 74 loops over pulley 76 which rotates on bracket 78 on the bottom of front leg 12. The cable then extends upwardly and has its other end 80 secured at cable attachment point 82 on pitching arm 50 between hammer head 56 and pivot point 49. The spring 64 and cable 74 tends to keep the pitching arm 50 in the position shown in FIG. 1, with hammer head 56 in contact with ball 58 resting on ball holder 60. A screen guard 84 on both sides of the plane of rotation of pitching arm 50 is for safety purposes to prevent injury by the operator accidentally having his arm in the path of rotation.

A cocking lever 86 used in cocking the pitching arm 50, a first stage cocking latch and safety 88, and release trigger 90 complete the assembly shown in FIG. 1 but their structure, function, and operation can best be described with reference to FIGS. 2, 3, 4 and 5. In FIG.
2 the pitching arm 50 has been rotated clockwise, shown by arrow 92, one quarter turn to its half-cocked position, which is substantially parallel to the ground. This is accomplished by moving cocking lever 86 clockwise as shown by arrow 94 from the dashed line position 96 to its substantially vertical position shown by solid lines 98. Hammer head 56 on pitching arm 50 rests on the first stage cocking latch and safety 88 which prevents the tension of spring 64 from returning the pitching arm to its original position shown in FIG. 1.

To fully cock the pitching arm 50 to the raised position in which it is shown in FIG. 3 the cocking lever 86 is returned from its position 98 in FIG. 2 to its position 96 and is raised up once more. This permits the energy booster arm 52 to engage and be retained by trigger mechanism 90. The final position shown in FIG. 3 removes the first stage cocking latch and safety 88 from the path of the hammer head 56 when the pitching arm is released. Details of the latching and trigger structure are shown in FIG. 4 and details of the catch between the cocking lever and pitching arm are shown in FIG. 5.

Referring now to FIG. 4 there is shown the parallel legs of trigger support frame 20 which are integral with the front legs 12. Gussets 100 welded thereto support pivot points 49 which are the ends of a rotatable shaft 102 upon which energy booster arm 52 and pitching arm 50 are axed for rotation. The trigger assembly 90 is substantially the same as that shown in my earlier patent. It has a mounting bracket 104 fastened to frame 20. An adjusting screw 106 with crank 108, as used on the baseball machine of my earlier patent, has a trigger 110 mounted thereon. Handle 112 is used to move the trigger 110 into and out of the path of energy booster arm 52 for retention and release purposes. A hand shield 114 on frame 20 provides a place for the operator to grip frame 20 while shielding the hand from the path of rotation of the booster arm and pitching arm.

The first stage and cocking latch 88 is a U-shaped member 116 pivotally mounted on brackets 118 on the legs of frame 20. An offset weight 120 tends to keep the U-shaped member 116 in an upright position so it will support and retain the hammer head 56 in the half cocked position shown in FIG. 1. The U-shaped member 116 has an offset end crank 22 which is pushed downwardly by the cocking lever arm 86 when the arm is restored to horizontal position after fully cocking the pitching arm 50 to its upright position. This rotates the U-shaped member out of the path of the pitching arm 50 and its hammer head 56 so that it will not interfere when trigger mechanism 90 releases the pitching arm. As noted in FIGS. 3 and 4, cable 74 passes over a standoff 122 on booster arm 52 to provide a moment arm for the cable about pivot point 49 to give a strong initial rotative force on the pitching arm 50.

Referring now to FIG. 5, the actuation of the cocking lever 86 for cocking the pitching arm 50 will now be explained. As seen from the front, the pitching arm 50 extends down and the booster arm 52 extends to the left. They are shown connected by brace 54 and pivotally mounted on shaft 102 rotationally mounted between gussets 100 at the upper front portion of the machine. The cocking lever 86 has a bearing 124 on shaft 102 for pivotal movement and to serve as a fulcrum. Lever 86 has an arm 126 extending beyond the bearing 124. A latch 128 is positioned in the end of arm 126. An arcuate slot 130 is cut in the tubular wall of arm 126 and a pin 132 is positioned in the slot and connected to the latch 128. As pin 132 moves in slot 130 it rotates latch 128 into and out of engagement with a fixed dog 134 on pitching arm 50 and a spring loaded dog 136 which extends transversely on the energy booster arm 52.

The movement of pin 132 in slot 130 is done as cocking lever 86 is rotated. This is accomplished by means of a cam groove 138 in a bracket 140 which is affixed to frame 20. When cocking lever 86 is first moved from horizontal to vertical position, latch 128 is rotated into the path of fixed dog 134 on the pitching arm 50 to move the pitching arm 50 to its half cocked position in which the hammer head is retained by the cocking latch as earlier explained. As the cocking lever 86 is returned to horizontal position the latch 128 brushes past the spring loaded dog 136 and engages it for further rotation when the cocking lever 86 is raised the second time to fully cock the pitching arm 50. Trigger ear 142 on energy booster arm 52 engages trigger 110 (shown in FIG. 4) when the pitching arm 50 is fully cocked. When the cocking lever 86 is lowered a second time, latch 128 is rotated out of position of both dogs 134 and 136 so that when the pitching arm 50 is released, it is free to rotate without interference from the lever 86.

A sectional view of the fast ball kit attachment to the softball pitching machine is shown in FIG. 6. Here the machine is shown in fully cocked position with cable 74 extending over standoff 122 on energy booster arm 52. The fast ball kit includes another cable 144 connected to cable attachment point 82 on the pitching arm 50. A stabilizing pulley 146 is mounted on a bracket 148 attached across the legs of the brace 130. An operator platform consisting of a fulcrum 150, pedal 152, pulley 154 and spring 156 completes the kit. Cable 144 is looped over pulley 154 and is attached to the spring 156. In operation, when the machine has been cocked, end 158 of pedal 152 assumed a raised position just below pulley 146. Fulcrum 150 is on the ground. Before triggering the pitching arm, the operator steps on pedal 152 and depresses it to the ground, placing a tension on spring 156. Thus when pitching arm 50 is released, the tension from spring 156 is added to that of spring 64 and the velocity of rotation of the pitching arm 50 is increased.

In FIG. 7 the fast ball kit attachment is applied in a similar manner to the baseball pitching machine which throws a ball overhand as set forth in my earlier patent. Here pitching arm 160 is in cocked position and when released will pivot clockwise about pivot point 162 as shown by arrow 164. Cable 166 extends from spring 168 to the end 170 of arm 160 after passing over pulley 172 on the upper rear part of the frame. Cable 166 also passes over the end of booster arm 174 which provides an added lever arm for additional initial force when the pitching arm 160 is released. The second cable 176, which is part of the fast ball kit, is also attached to end 170 of the pitching arm 160. Stabilizing pulley 178 is mounted on transverse braces 180 of the frame. End 182 of pedal 184 is below the pulley 178 and raised above the ground when the machine is cocked and fulcrum 186 is positioned on the ground. Before release the operator steps onto pedal 184 to depress end 182 to the ground and to place spring 188 in tension. When pitching arm 160 is released, the force from spring 188 is added to that of spring 186 to increase the velocity.
of rotation of the pitching arm 160, and hence the velocity of the ball in flight.

A significant advantage in this fast ball attachment is that the weight of the operator helps to stabilize the machine during the pitching cycle and keep the machine aligned for the next pitch. No additional weights are necessary to compensate for the higher reaction forces.

Having disclosed illustrative embodiments of this invention, other modifications will become apparent to those skilled in the art and it is to be understood that these variations are to be considered as part of this invention as set forth in the appended claims.

What I claim is:

1. A softball pitching machine comprising:
   a trigger support frame having a front end and a rear end, said frame being mounted on front and rear ground contacting legs;
   a transverse shaft;
   a pitching arm having an end pivotally mounted on the transverse shaft on said front end of said frame and having a plane of rotation passing through said front and rear ends, said pitching arm having a hammer head for contacting a ball to be pitched thereby;
   a ball holder mounted on said frame below said shaft and adapted to support a ball thereon in the path of rotation of said hammer head;
   cocking means for rotating said hammer head above said shaft to a cocked position;
   retaining means for releasably retaining said hammer head in said cocked position; and
   power means for rotating said hammer head into said ball on said ball holder to thereby project a ball therefrom;
   said cocking means including a cocking lever engageable with said pitching arm for rotation thereof one-quarter turn to a half cocked position;
   a first stage cocking latch and safety pivotally movable into the path of rotation of said hammer head for retaining said pitching arm in said half cocked position;
   an energy booster;
   said cocking lever being engageable with said energy booster arm rotatable with said pitching arm to rotate said pitching arm a second quarter turn to said cocked position;
   said cocking lever being operable to remove said first stage cocking latch and safety from said hammer head rotation path.

2. A combination including a frame of a ball pitching machine having a rotatable pitching arm, a platform having a ground contacting end and a depressable raisable end, a spring fastened to said platform at said ground contacting end, a first pulley positioned on said platform at said raisable end, a second pulley, means including a cable attached at one end thereof to said spring and at its other end to said frame for transferring a second and independent force built up in the spring during the depressing of the raisable end of the platform when the pitching arm is in a cocked position, while being tensioned by a primary spring and the cable being reeved over the pulleys.

3. A softball pitching machine comprising:
   a trigger support frame having a front end and a rear end, said frame being mounted on front and rear ground contacting legs;
   a transverse shaft;
   a pitching arm having an end pivotally mounted on said transverse shaft on said front end of said frame and having a plane of rotation passing through said front and rear ends, said pitching arm having a hammer head for contacting a ball to be pitched thereby;
   a ball holder mounted on said frame below said shaft and adapted to support a ball thereon in the path of rotation of said hammer head;
   cocking means for rotating said hammer head above said shaft to a cocked position;
   retaining means for releasably retaining said hammer head in said cocked position; and
   power means for rotating said hammer head into said ball on said ball holder to thereby project said ball therefrom;
   said power means including a spring and cable for applying tension to said cable attached to said pitching arm between said hammer head and said pivotally mounted end, said spring being placed in tension when said hammer head is rotated to said cocked position;
   said power means also including a second cable attached to said pitching arm;
   a tiltable platform having a spring mounted therein; said second cable being attached to said spring and to the pitching arm for applying tension thereto upon depression of said platform whereby both said springs and said cables are placed in tension when said hammer head is in cocked position and said platform is depressed.

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