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(54) **DEVICE FOR DETECTING AND RECORDING CHARACTERISTICS OF A PROJECTILE**

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(57) **ABSTRACT**

A baseball pitching training device constructed to detect the position and speed of a pitched baseball thrown proximate to a homeplate. A frame is connect to a base with multiple sensors positioned within the frame and base. The sensors are arranged proximate to a homeplate, such that when a baseball passes within a predetermine distance of the homeplate, the sensors detect the baseball and a control unit, in response to the sensors detecting the baseball, determines the position and speed of the baseball. When select sensors detect the baseball, a strike is indicated by the control unit. Among other things, the training device can be programmed to vary the strike zone.

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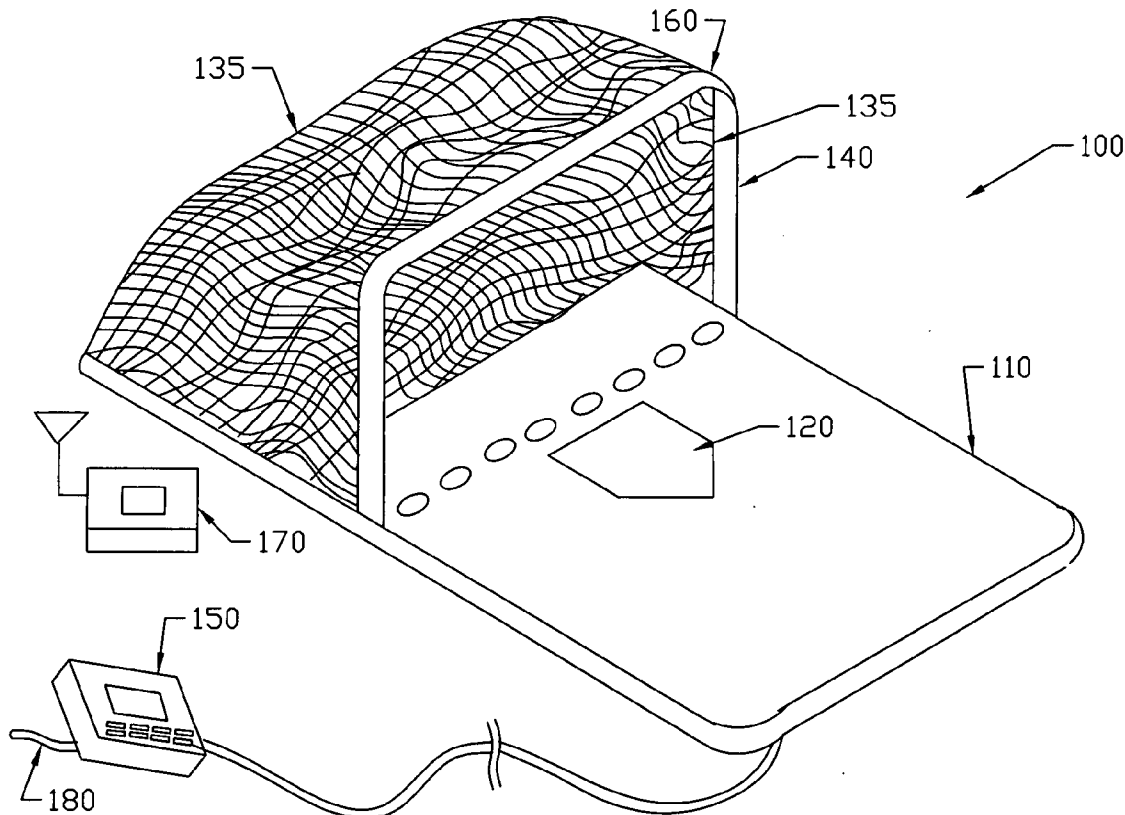
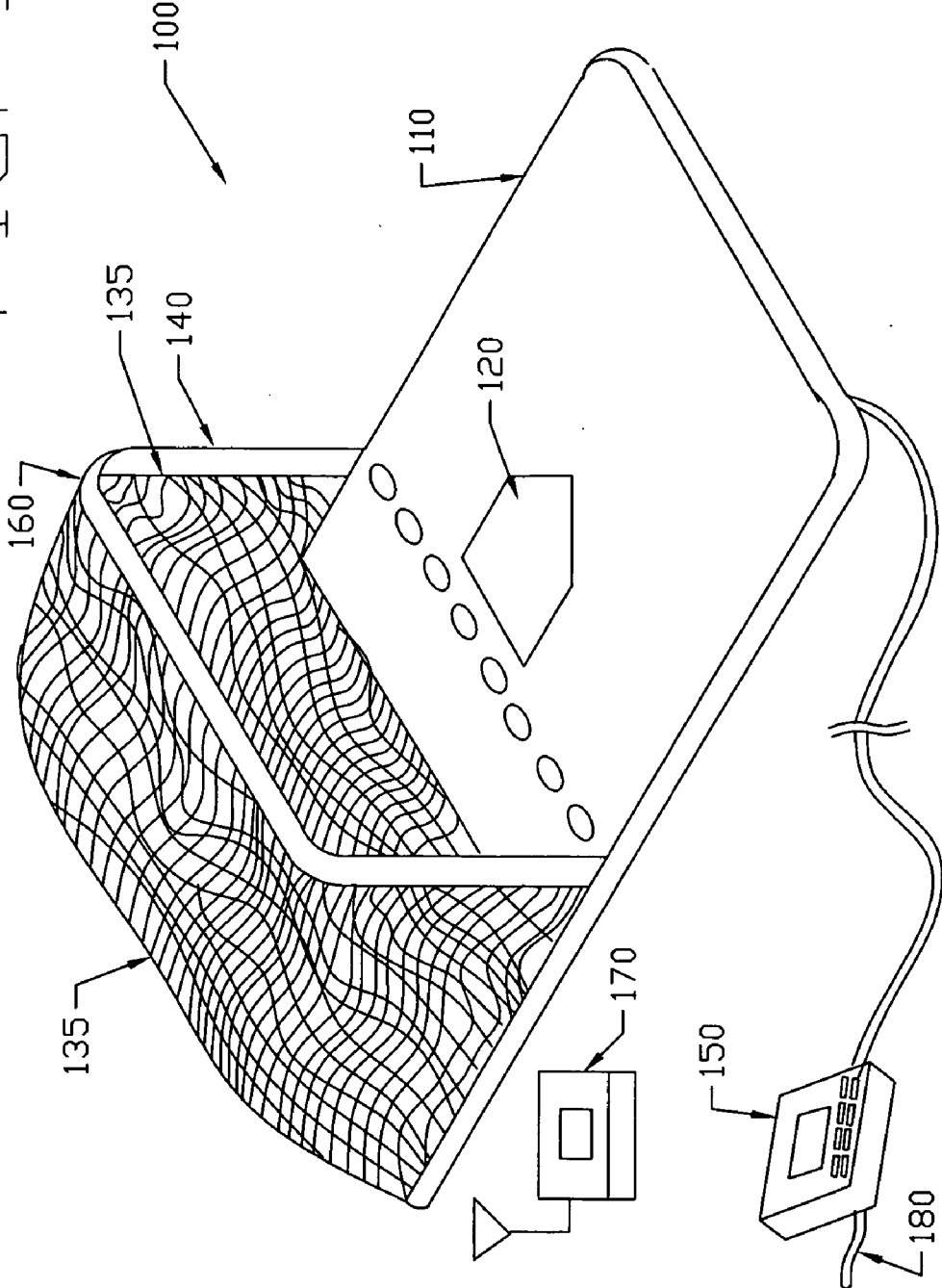


FIG. 1



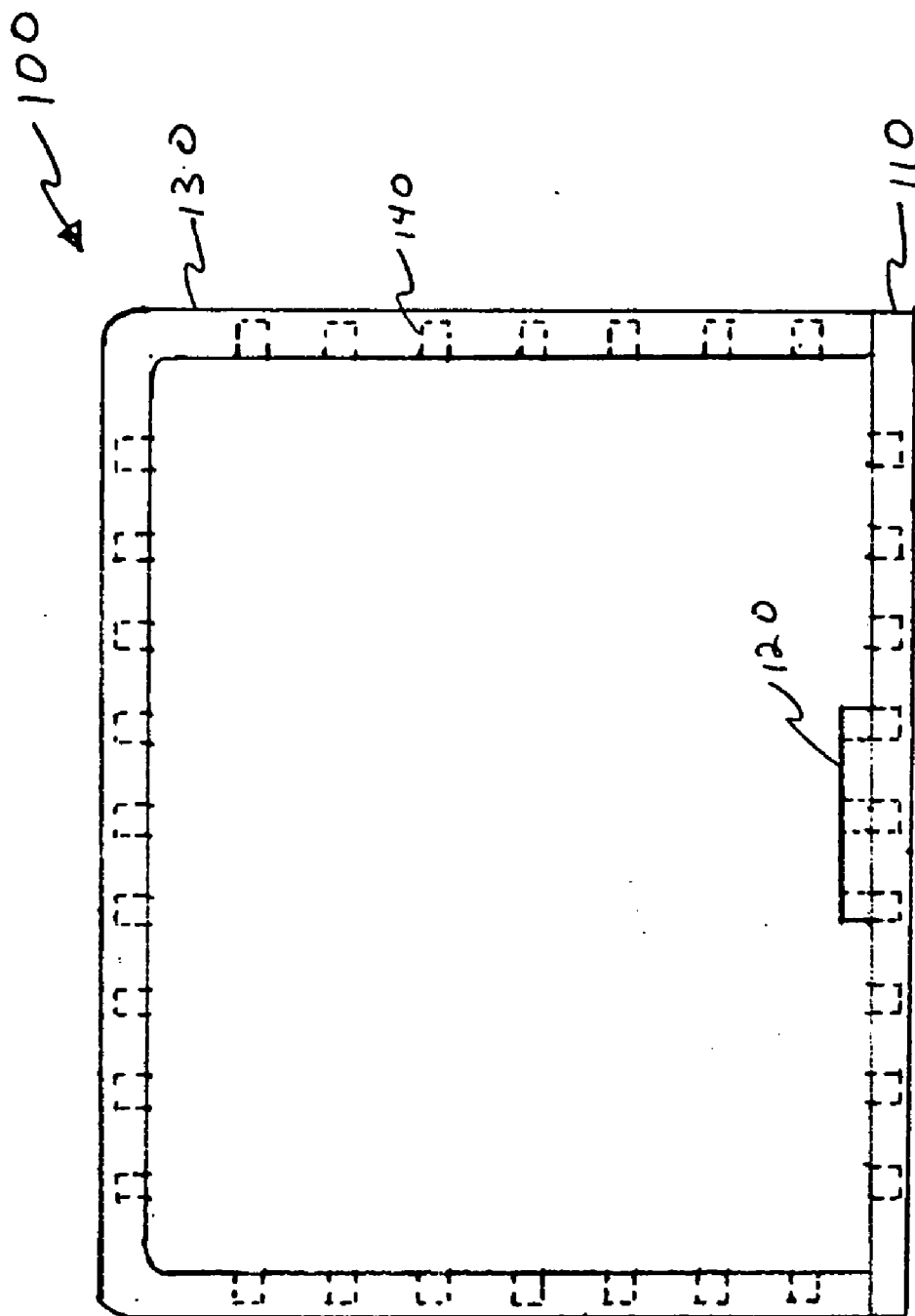


FIG 2

**DEVICE FOR DETECTING AND RECORDING CHARACTERISTICS OF A PROJECTILE**

DETAILED DESCRIPTION

FIELD OF THE INVENTION

[0001] The present invention relates to systems and devices for detecting and recording characteristics of a projectile, and more particularly, but not by way of limitation, to a programmable device that can calculate the speed of a thrown object such as a ball, as well as determine the placement or position of the throw, such as whether the thrown ball was a ball or strike, and further provide corresponding information to a user.

BACKGROUND

[0002] Recreational sports and hobbies are popular all around the world. It is when a person is in the pursuit of some degree of proficiency in these types of activities that a diversion from the routine patters of life can be experienced. Many times, people may excel in a particular side interest or pastime to such a degree that they may be competitive with others who have the same interests. A person may enjoy bowling, for example, and find that competing in a league against other bowlers provides a great measure of enjoyment.

[0003] Those who participate in sports as a recreational activity and who desire to have some measure of success in so doing must develop and maintain a certain level of proficiency in the sport's skills. For golfers, the ability to swing the club in a harmonious manner with the movement of the player's body is critical to successful contact with the golf ball. Tennis players must also have the swinging motion coordinated with body movement and eye contact in order to play the game with success. Others who play sports such as racquetball, table tennis, and badminton have similar physical attributes that must be developed.

[0004] Baseball players are among those who practice a great deal in order to prepare themselves to play with any degree of competence. They must be able to catch, throw, run bases, and hit a pitched baseball in a number of different situations. Often, hours and hours are spent in developing these skills in preparation for games. Batting skills, the offensive weapon of a baseball team, are generally substantial portions of a player's training. As such, there are many training devices, both simple and high tech, for batters to develop and improve their batting skills. In contrast, there aren't as many types of devices to aid a player, such as a pitcher, in training and developing their skills in throwing. It would be advantageous therefore, to develop a device or apparatus that can be readily used to improve a player's throwing and pitching.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] A more complete understanding of the present invention may be had by reference to the following Detailed Description and appended claims when taken in conjunction with the accompanying Drawings wherein:

[0006] FIG. 1 is a front perspective view of the present invention; and

[0007] FIG. 2 is a front view illustrating the frame and the base of the present invention as similarly shown in FIG. 1.

[0008] Referring now to the drawings wherein like or similar elements are designated with identical reference numerals throughout the views and figures, and wherein the various elements depicted are not necessarily drawn to scale, and in particular, to FIG. 1, there is shown a training device 100 for facilitating the detection of a the characteristics of a thrown object, such as a baseball, and providing feedback to a user. As illustrated training device 100 includes a base 110, horizontal target zone, i.e. a homeplate 120, a frame 130, a backstop 135, multiple sensors 140 and control unit 150.

[0009] The number and position of sensors 140 are strategically positioned in base 110 and frame 130 to be able to accurately detect the characteristics of the object to be projected into training device 100. For example, a training device 100 built primarily for the detection of baseballs may require more sensors 140, with the sensors positioned closer together, than for a training device 100 built primarily for the detection of larger softballs.

[0010] Control unit 150 is used to control the operation of training device 100, which will be described in more detail herein below. It is contemplated that control unit 150 can be connected to sensors 140 via a cable or via a wireless connection 160. It is further contemplated that the control unit 150, as well as the other elements of training device 100 can be either powered via a hardwire power connection 180, or an alternative power supply such as batteries. Training device 100 could also utilize a separate computer 170 to store and analyze data from control unit 150.

[0011] Still referring to FIG. 1, backstop 135 is utilized to catch or stop the object that is thrown into training device 100. Good results have been achieved utilizing netting for backstop 135, although it is contemplated to be within the scope of this invention to utilize other materials therefore, such as a tarp or the like. Additionally backstop 135 is removable to facilitate either a different style of backstop or a person, such as a catcher, to stop the object.

[0012] Good results have been achieved by utilizing PVC pipe to construct frame 130, although it is contemplated to be within the scope of this invention that any sturdy material could be utilized, including but not limited to metal pipes.

[0013] Referring now to FIG. 2, there is illustrated a front view of the training device 100 with the back stop 135 being removed therefrom. As illustrated, sensors 140 in the vertical portions of the frame 130 are in alignment, as are the sensors 140 in the horizontal portion of frame 130 with the sensors 140 of base 110, all creating a detection area therebetween. As illustrated, sensors 140 can be recessed within frame 130 to provide protection for the sensors 140 from being struck by the thrown object. As can be appreciated by one ordinarily skilled in the art, various types of sensors 140 could be utilized in the present invention to detect characteristics of a thrown object. For example electronic light sensors could be utilized to detect the position and speed of the object when a ball crosses the detection area and breaks a path or paths of light between the sensors. Similarly a Doppler device could be utilized to measure the speed.

[0014] Referring to FIGS. 1 and 2, an example of the operation of the training device 100 will now be described with respect to a baseball pitcher. In operation, a user would

use control unit 150 to program the desired strike zone. For example the sensors 140 aligned with homeplate 120 on base 110 as well as the sensors 140 corresponding thereto on horizontal portion of frame 130, as well as select sensors 140 on the vertical portions of frame 130 would be designated as a strike zone. When a baseball is thrown into training device 100, as the baseball passes through the detection area of sensors 140, the velocity of the baseball as well as the horizontal and vertical positions of the baseball as it crossed homeplate 120 would be detected. This information would be sent to controller 150, whereby based upon the previously programmed strike zone, the position of the pitch as well as if it were a ball or strike would be displayed.

[0015] As can be appreciated, training device 100 could be programmed in a number of ways. Not only can a user program the strike zone, but a virtual batter could also be programmed, such that when either 4 balls or 3 strikes are detected, the number of strikes and balls resets to zero, and a new batter is faced. A cumulative total of balls and strikes and positions of pitch could also be maintained for a particular player, as well as fastest pitch, slowest pitch, average speed, and each pitches speed, not only for a particular practice sessions but for any given time period.

[0016] In the preceding detailed description, reference has been made to the accompanying drawings that form a part hereof, and in which are shown by way of illustration specific embodiments in which the invention may be practiced. These embodiments, and certain variants thereof, have been described in sufficient detail to enable those skilled in the art to practice the invention. It is to be understood that other suitable embodiments may be utilized and that logical changes may be made without departing from the spirit or scope of the invention. The description may omit certain information known to those skilled in the art. The preceding detailed description is, therefore, not intended to be limited to the specific forms set forth herein, but on the contrary, it is intended to cover such alternatives, modifications, and equivalents, as can be reasonably included within the spirit and scope of the appended claims.

What is claimed is:

- 1. A device for determining at least one of the velocity and position of a thrown object, said device comprising:
  - a frame;
  - a base connected to the frame; and
  - a plurality of sensors disposed within each of said frame and said base, said plurality of sensors arranged such that when the thrown object passes within a predetermined area proximate said plurality of sensors, at least one of said plurality of sensors detects the object and determines the at least one of the velocity and position of the thrown object.
- 2. The device as recited in claim 1, and further comprising a control unit connected to said plurality of sensors.
- 3. The device as recited in claim 2, wherein said control unit for programming said device.
- 4. The device as recited in claim 3, wherein said control unit operable to select certain of said plurality of sensors, such that if any of said certain of said plurality of sensors detects the object, the position of the thrown object is determined to be a strike.

5. The device as recited in claim 4, and further comprising a removable backstop for receiving the thrown object subsequent to passing proximate said plurality of sensors.

6. The device as recited in claim 4, wherein said control unit further for cumulating the at least one of the velocity and position of multiple thrown objects.

7. A device for determining at least one of the velocity and position of a thrown ball, said device comprising:

- a generally rectangular shaped frame;
- a base connected to the generally rectangular shaped frame;
- a plurality of sensors disposed within each of the generally rectangular shaped frame and the base, the plurality of sensors arranged such that when the ball passes within a predetermined area proximate said plurality of sensors, at least one of said plurality of sensors detects the ball and determines the at least one of the velocity and position of the thrown object.

8. The device as recited in claim 7, wherein said generally rectangular shaped frame is constructed at least in part from PVC.

9. The device as recited in claim 8, and further comprising a control unit connected to said plurality of sensors.

10. The device as recited in claim 9, wherein said control unit is connected to said plurality of sensors via a wireless connection.

11. The device as recited in claim 9, wherein said control unit for programming said device.

12. The device as recited in claim 11, wherein said control unit is operable to select certain of said plurality of sensors, such that if any of said certain of said plurality of sensors detects the ball, the position of the thrown object is determined to be a strike.

13. The device as recited in claim 12, and further comprising a removable backstop for receiving the ball subsequent to passing proximate said plurality of sensors.

14. The device as recited in claim 13, wherein said control unit further for cumulating the at least one of the velocity and position of multiple thrown balls.

- 15. A baseball pitching training device comprising:
  - a frame;
  - a base connected to the frame;
  - a plurality of sensors disposed within each of said frame and said base;
  - a control unit connected to said plurality of sensors; and
  - said plurality of sensors being arranged such that when a baseball is thrown within a predetermined area proximate said plurality of sensors, at least one of the plurality of sensors detects the baseball and communicates the detection of the baseball to the control unit.

16. The baseball pitching training device as recited in claim 15, and further comprising a homeplate positioned on said base proximate to a select of said plurality of sensors.

17. The baseball pitching training device as recited in claim 16, wherein said controller indicating the position of the thrown baseball in response to the communication from the at least one of the plurality of sensors.

18. The baseball pitching training device as recited in claim 17, wherein said control unit for programming the baseball pitching training device.

19. The baseball pitching training device as recited in claim 18, wherein said control unit operable to select certain of said plurality of sensors, such that if any of said certain of said plurality of sensors detects the baseball, the position of the baseball is determined to be a strike.

20. The baseball pitching training device as recited in claim 19, and further comprising a removable backstop for receiving the baseball subsequent to passing proximate said plurality of sensors.

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