US007815525B2

(12) **United States Patent**
Small

(10) **Patent No.: US 7,815,525 B2**
(45) **Date of Patent: Oct. 19, 2010**

(54) **TRACEABLE PLAYING BALL AND TRACKING SYSTEM FOR THE SAME**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 373 days.

(21) Appl. No.: **11/946,402**

(22) Filed: **Nov. 28, 2007**

(65) **Prior Publication Data**

US 2009/0137340 A1 May 28, 2009

(51) **Int. Cl.**
A63B 37/00 (2006.01)
A63B 43/00 (2006.01)
A63B 43/06 (2006.01)

(52) **U.S. Cl.** **473/351**; 463/30; 463/39; 463/40; 473/353

(58) **Field of Classification Search** 423/349; 463/30, 39, 40; 473/349, 351, 353
See application file for complete search history.

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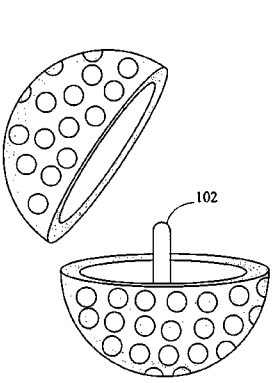
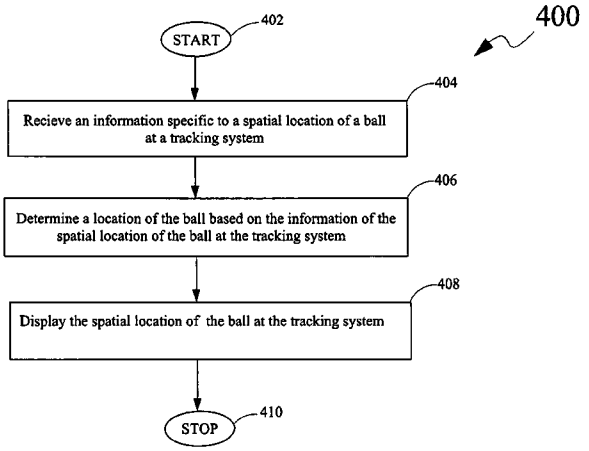
(57) **ABSTRACT**

Disclosed are a ball for use in a sporting activity, and a tracking system for tracking the ball. The ball comprises a microchip embedded in the ball. The microchip is adapted to transmit an information specific to a location of the ball to the tracking system. The tracking system is configured to locate the ball based on the information specific to the spatial location of the ball.

12 Claims, 5 Drawing Sheets





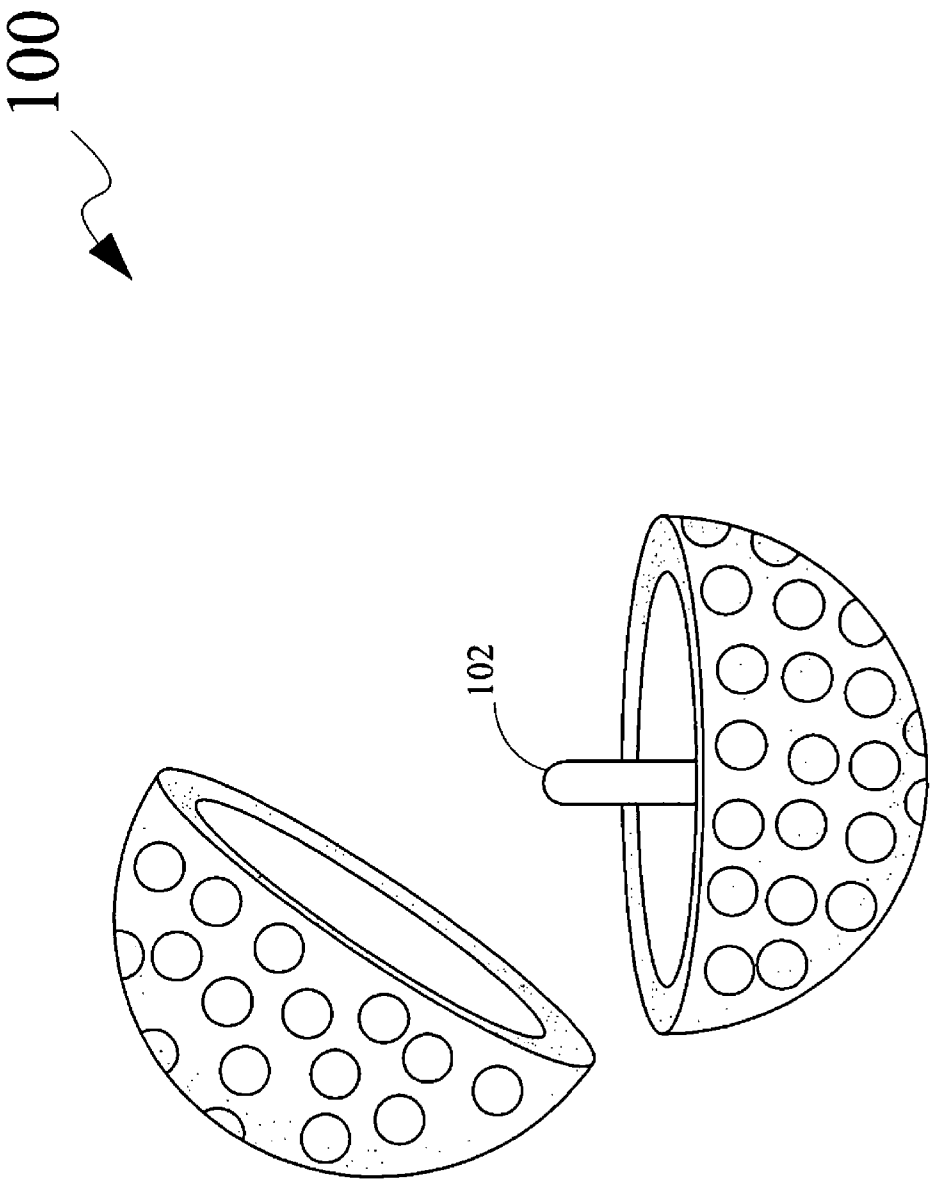


FIG. 1

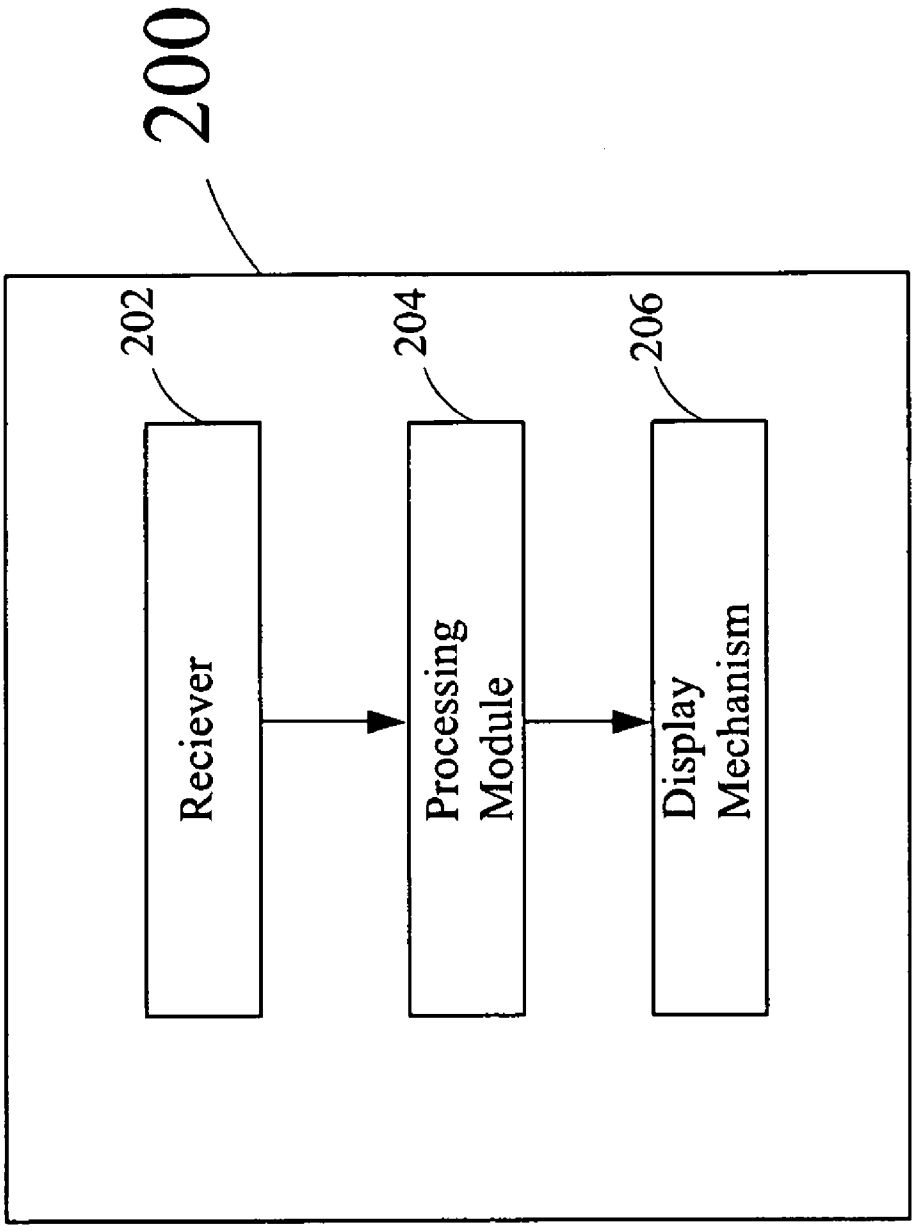

200
202
Reciever
204
Processing Module
206
Display Mechanism

FIG. 2

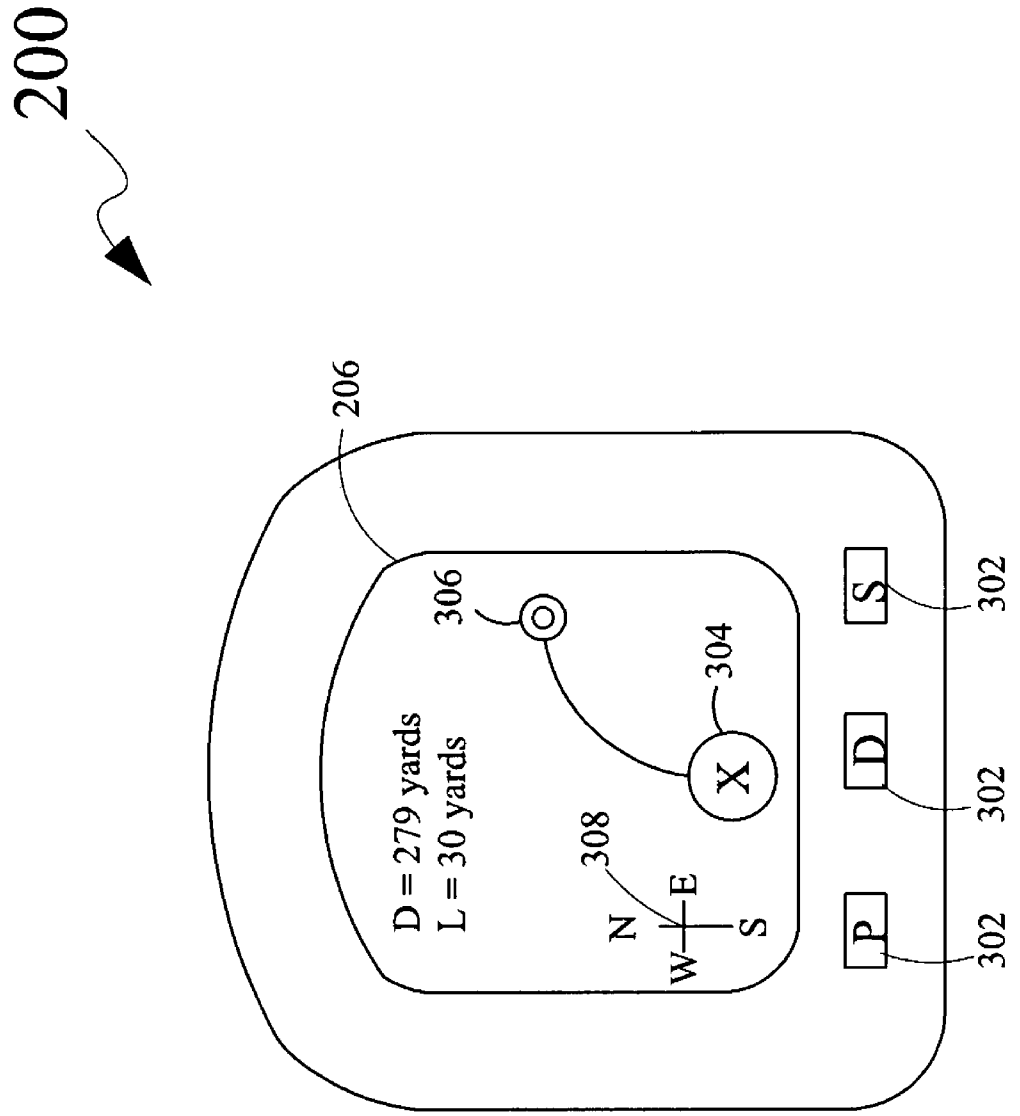


FIG. 3A

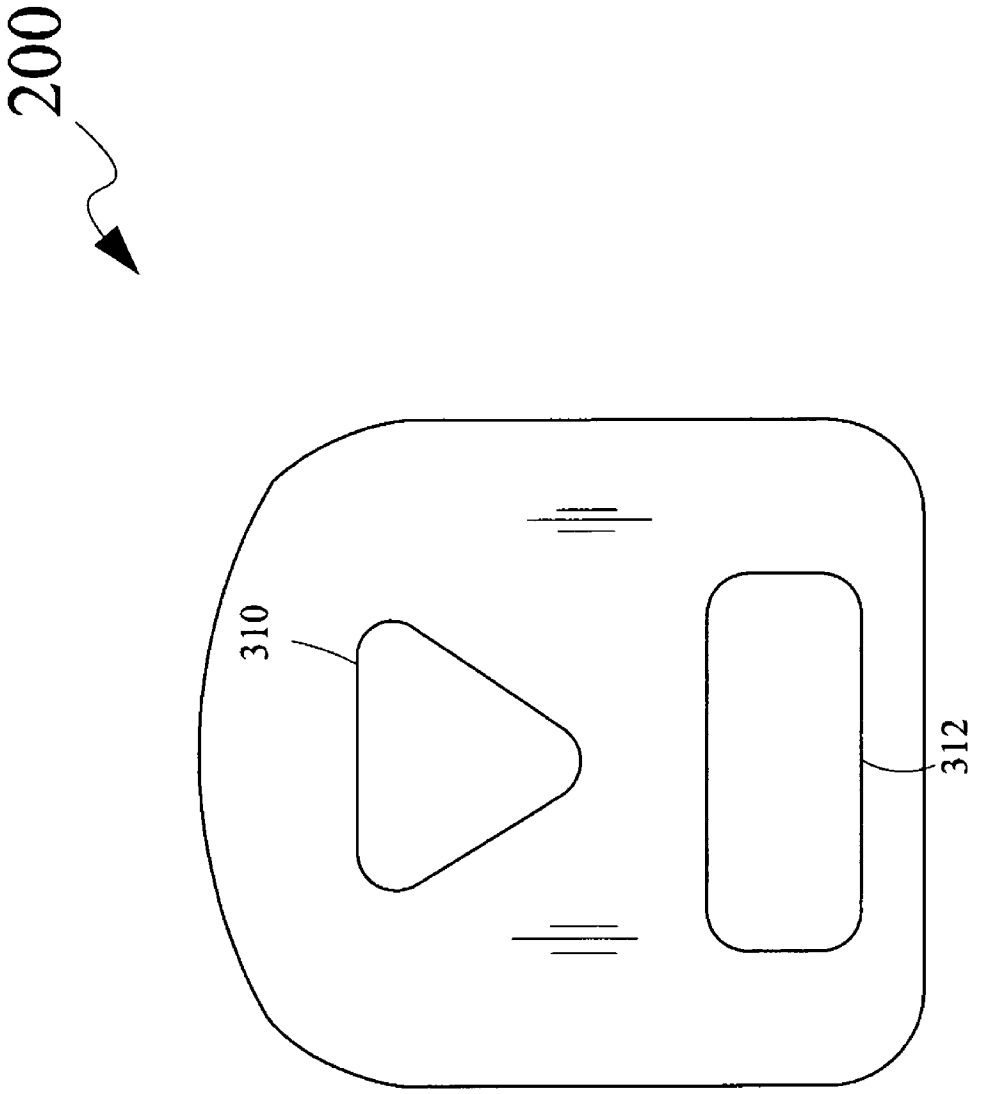


FIG. 3B

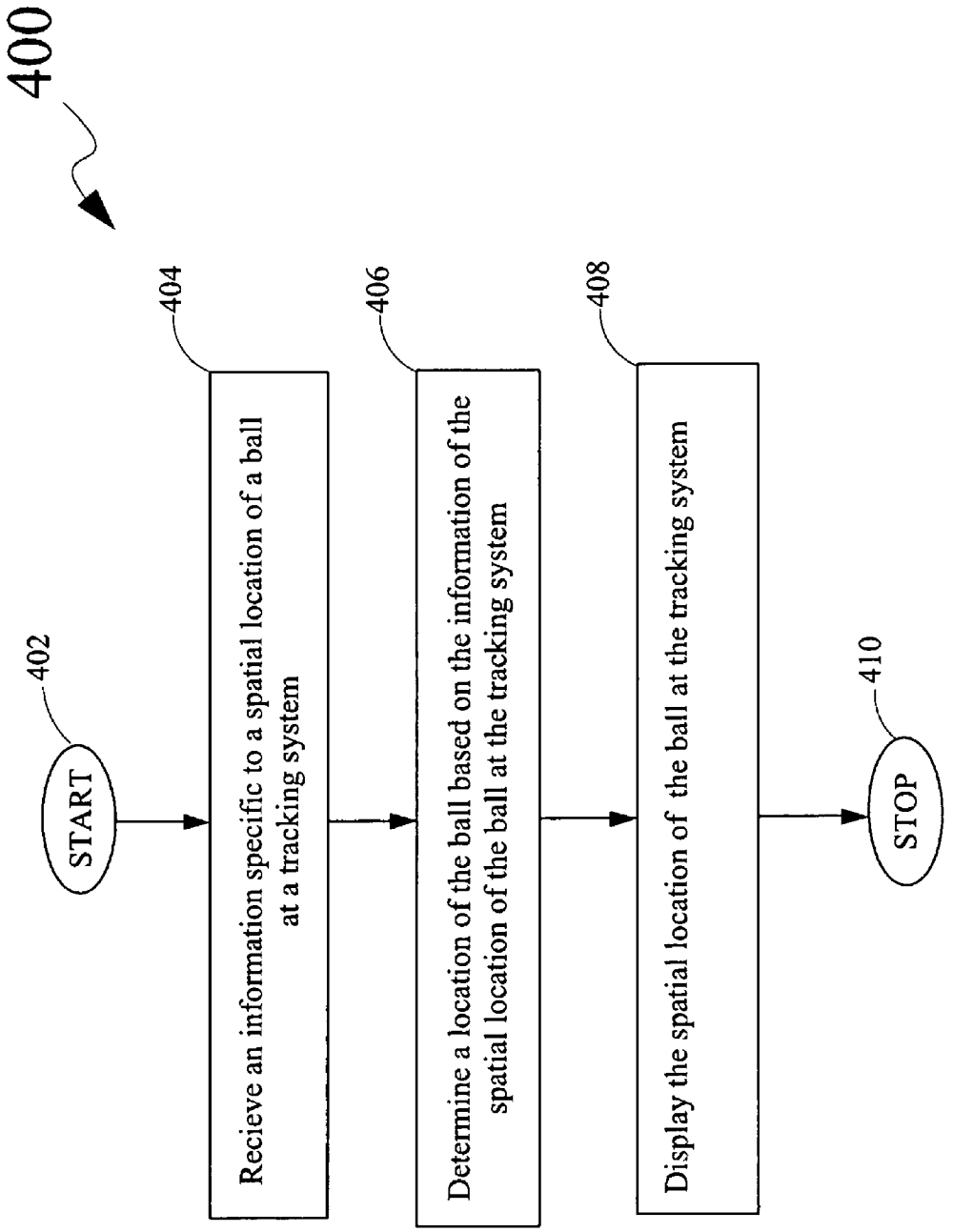

400
402
START
404
Recieve an information specific to a spatial location of a ball at a tracking system
406
Determine a location of the ball based on the information of the spatial location of the ball at the tracking system
408
Display the spatial location of the ball at the tracking system
410
STOP

FIG. 4

TRACEABLE PLAYING BALL AND TRACKING SYSTEM FOR THE SAME

FIELD OF THE INVENTION

The present invention relates generally to tracing objects, and more particularly, to tracing balls used in sport activities.

BACKGROUND OF THE INVENTION

At almost every place, for recreation or professional purposes, people are generally involved in many outdoor sporting activities including games such as golf, football, and baseball. Such typical activities generally involve playing with a ball and other equipment. During these activities, balls generally traverse from one place to another through the entire playground. Often, especially in the game of golf, the ball can get lost, causing players to spend a lot of time in searching for the ball after it has been hit by the club during play of the game.

There are existing tracking systems that keep a track of the balls during the sporting activity. A majority of these existing tracking systems use a variety of cameras to capture the movement of the ball during a game. Using cameras to consistently capture the movement of the ball during the game may be a costly affair. Further, the ball may land in an area that is not be in a capturing zone of the cameras. Again, a camera based tracking system is not an effective solution in unfavorable weather conditions such as fog, rain and the like.

Therefore, based on the foregoing, there is a need for a tracking system that is capable of tracking the ball used in a sport activity in a reliable manner in all weather conditions. Further, the tracking system should also be cost effective.

SUMMARY OF THE INVENTION

In view of the foregoing disadvantages inherent in the prior art, the general purpose of the present invention is to provide a traceable playing ball and a tracking system for locating the playing ball and configured to include all the advantages of the prior art, and to overcome the drawbacks inherent therein.

Therefore, an object of the present invention is to provide a ball that is capable of providing information specific to a spatial location of the ball to a tracking system.

It is another object of the present invention to provide a tracking system for locating a ball that is used in a sport activity.

In light of the above objects, in one aspect, the present invention provides a ball to be used in a sport activity. The ball comprises a microchip that is embedded in the ball. The microchip is adapted to transmit an information specific to a spatial location of the ball to a tracking system. The tracking system is configured to locate the ball based on the information specific to spatial location of the ball.

In another aspect, the present invention provides a tracking system for locating a ball to be used in a sport activity. The tracking system comprises a receiver configured to receive an information specific to a spatial location of the ball. The ball is configured to transmit the information specific to the spatial location of the ball. Further the tracking system comprises a processing module communicably coupled to the receiver for determining the location of the ball based on the information specific to the spatial location of the ball. Furthermore, the tracking system comprises a display mechanism for displaying the location of the ball determined by the processing module.

In yet another aspect, the present invention provides a method of tracking a ball during a sport activity. The method comprises receiving an information specific to a spatial location of the ball by a tracking system. The method further comprises determining a location of the ball based on the information of the spatial location of the ball at a receiver of the tracking system.

These together with other aspects of the present invention, along with the various features of novelty that characterize the present invention, are pointed out with particularity in the claims annexed hereto and form a part of the present invention. For a better understanding of the present invention, its operating advantages, and the specific objects attained by its uses, reference should be made to the accompanying drawings and descriptive matter in which there are illustrated exemplary embodiments of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

The advantages and features of the present invention will become better understood with reference to the following detailed description and claims taken in conjunction with the accompanying drawings, wherein like elements are identified with like symbols, and in which:

FIG. **1** is an exploded perspective view of a ball used in a sport activity, according to an exemplary embodiment of the present invention;

FIG. **2** is a block diagram of a tracking system, according to an exemplary embodiment of the present invention;

FIG. **3**A is a front view of the tracking system, according to an exemplary embodiment of the present invention;

FIG. **3**B is a rear view of the tracking system, according to an exemplary embodiment of the present invention; and

FIG. **4** is a flow diagram illustrating a method of locating a ball during a sport activity, according to an exemplary embodiment of the present invention.

Like reference numerals refer to like parts throughout the description of several views of the drawings.

DETAILED DESCRIPTION OF THE INVENTION

The exemplary embodiments described herein detail for illustrative purposes are subject to many variations in structure and design. It should be emphasized, however, that the present invention is not limited to a particular traceable ball and a tracking system, as shown and described. It is understood that various omissions and substitutions of equivalents are contemplated as circumstances may suggest or render expedient, but these are intended to cover the application or implementation without departing from the spirit or scope of the claims of the present invention.

The terms "a" and "an" herein do not denote a limitation of quantity, but rather denote the presence of at least one of the referenced item.

Referring to FIG. **1**, an exploded perspective view of a ball **100** is shown, in accordance with an embodiment of the present invention. The ball **100** may be used in a sport activity. Herein, the sport activity preferably includes golf, but may also include games such as football, baseball, and the like. The ball **100** is represented in two halves, which is cut across the diameter of the ball **100**. The ball **100** includes a microchip **102**. As shown in FIG. **1**, the microchip **102** is embedded inside the ball **100**. In an embodiment of the present invention, the microchip **102** is embedded in the center of the ball **100** while manufacturing the ball **100** in order to make the microchip **102** shock resistant during the sport activity. However, the microchip **102** must not necessarily be embedded in

the center of the ball **100**, but the microchip **102** may also be embedded in other areas within the ball **100**.

The microchip **102** is adapted to transmit an information specific to a spatial location of the ball **100** to a tracking system **200** (not shown in FIG. **1**). The tracking system **200** is configured to locate the ball **100** based on the information specific to the spatial location of the ball **100**. The tracking system **200** is described in detail in conjunction with FIGS. **2**, **3**A and **3**B. The information specific to the spatial location of the ball **100** comprises at least one of a location of the ball **100** from the tracking system **200**, distance from a reference point (for example, longest drive of the ball **100** from the reference point, a location of the ball **100** with respect to a particular hole in case of golf), elevation and slope of the ball **100**, and other data that may assist in locating the ball **100**.

Referring now to FIG. **2**, a block diagram illustrating various components of the tracking system **200** is shown, according to an exemplary embodiment of the present invention. The tracking system **200** may be a pocket size portable device, which may be attached with a belt of a player, placed in his/her pocket or may be placed in a sport kit. The tracking system **200** comprises a receiver **202**, a processing module **204** and a display mechanism **206**. The receiver **202** is configured to receive an information specific to the spatial location of the ball **100**. As already explained in conjunction with FIG. **1**, the ball **100** is configured to transmit the information specific to the spatial location of the ball **100**.

The processing module **204** is communicably coupled to the receiver **202**. The processing module **204** determines the location of the ball **100** based on the information specific to the spatial location of the ball **100**. The display mechanism **206** displays the location of the ball **100** determined by the processing module **204**. The location of the ball **100** may include, but is not limited to, a graphical display of the reference point, a landing position of the ball **100**, textual display of the distance between the ball **100** and the reference point, and textual distance of the ball **100** from a person carrying the tracking system **200** during searching of the ball **100**. The location of the ball **100** may further include slope and elevation of a landing position of the ball **100**.

Referring now to FIGS. **3**A and **3**B, the tracking system **200** is shown, according to an exemplary embodiment of the present invention. FIG. **3**A represents a front view of the tracking system **200**. The tracking system **200** further comprises at least one button, such as buttons **302**, as shown in FIG. **3**A. The buttons **302** facilitate a person in operation of the tracking system **200**. More specifically, the buttons **302** are used to guide a display pattern at the display mechanism **206**. An exemplary display pattern representing the location of the ball **100** is shown in FIG. **3**A.

The button **302**, represented by a letter 'P' thereon, represents power. By depressing the button **302** with alphabet 'P', the tracking system **200** may be powered 'ON' or 'OFF'. Further, the button **302**, represented by a letter 'S', upon depressing, displays a distance between the ball **100** and the person carrying the tracking system **200** during the searching of the ball **100**. Again, the button **302** represented by a letter 'D', when pressed displays the distance of the ball **100** from a reference point on the display mechanism **206**. It will be apparent to a person skilled in the art that only three buttons **302** are shown for exemplary purposes and it should not be considered limiting.

As shown in FIG. **3**A, the exemplary display pattern at the display mechanism **206** includes a reference position **304** (shown by a cross sign (X)), which represents a reference point, against which the distance and the direction of the ball **100** is determined. Further, the display pattern includes a landing position **306** (shown by a circle sign (O)), which represents a position, where the ball **100** has landed, on or off of a course or field of play. The display pattern also includes a compass **308** that represents directions north (N), south (S), east (E) and west (W). The direction of the ball **100** represented by the compass **308**, and the distance of the ball **100** from the reference position **304** may assist a person in searching the ball **100**.

In an embodiment of the present invention, the display mechanism **206** also represents a textual display of the distance D of the ball **100** from the reference position **304**. The distance D represents a distance between the reference position **304** and the landing position **306**. Further, the display pattern also includes a display of a current location L of the ball **100** from the tracking system **200**, when the person is searching for the ball **100**. For example, as shown in FIG. **3**A, the distance D of the ball **100** from the reference position **304** is 279 yards. Further, the location L of the ball **100** represents the current distance of the ball **100** from the person carrying the tracking system **200**, which is shown as 30 yards. The current location L of the ball **100** keeps changing, when the person is heading towards or away from the ball **100**.

Referring now to FIG. **3**B, a rear view of the tracking system **200** is shown, according to an exemplary embodiment of the present invention. The tracking system **200** optionally includes a clip **310**, which is capable of being engaged with objects such as a belt of a player, pocket or clothes of the player. The tracking system **200** further includes a slot **312** capable of receiving at least one removable battery including, but not limited to, an AA battery for providing power to the tracking system **200**.

Referring now to FIG. **4**, a flow diagram **400** illustrating a method of locating a ball such as the ball **100** is shown, according to an exemplary embodiment of the present invention. The method is initiated at **402**. At **404**, an information specific to a spatial location of the ball **100** is received by a tracking system such as the tracking system **200**. The information specific to the spatial location of the ball **100** comprises at least one of a location of the ball **100** from the tracking system **200**, distance of the ball **100** from a reference point (for example, longest drive of the ball **100** from the reference point, a location of the ball **100** with respect to a particular hole in case of golf), elevation and slope of the ball **100**, and other data that may assist in locating the ball **100**.

Thereafter, at **406**, the method includes determining a location of the ball **100** based on the information of the spatial location of the ball **100** at the tracking system **200**. Furthermore, at **408**, the method comprises displaying the spatial location of the ball **100** on a display mechanism such as the display mechanism **206** of the tracking system **200**. Thereafter, the method of locating the ball **100** is terminated at **410**.

Various embodiments of the present invention offer following advantages. The present invention provides a low cost tracking system, such as the tracking system **200** for locating a ball, such as the ball **100**, which is used in a sport activity. Further, the working of the tracking system **200** does not depend upon factors such as weather conditions. Furthermore, the present disclosure provides an option of transmitting a variety of information specific to spatial location of the ball **100** to the tracking system **200** that may be used to locate the ball **100**.

The foregoing descriptions of specific embodiments of the present invention have been presented for purposes of illustration and description. They are not intended to be exhaustive or to limit the present invention to the precise forms disclosed, and obviously many modifications and variations are possible in light of the above teaching. The embodiments

were chosen and described in order to best explain the principles of the present invention and its practical application, and to thereby enable others skilled in the art to best utilize the present invention and various embodiments with various modifications as are suited to the particular use contemplated. It is understood that various omissions and substitutions of equivalents are contemplated as circumstances may suggest or render expedient, but these are intended to cover the application or implementation without departing from the spirit or scope of the claims of the present invention.

What is claimed is:

1. A ball for use in a sport activity, comprising:

a microchip embedded in the ball, the microchip adapted to transmit an information specific to a spatial location of the ball to a tracking system, wherein the tracking system is configured to locate the ball based on the information specific to the spatial location of the ball, and wherein the information specific to the spatial location of the ball includes slope of the ground on which the ball is located.

2. The ball of claim **1**, wherein the information specific to the spatial location of the ball includes at least one of a location of the ball from the tracking system, distance from a reference point of the ball, and an elevation of the ball.

3. A tracking system for locating a ball used in a sport activity, the tracking system comprising:

a receiver configured to receive an information specific to a spatial location of the ball, wherein the ball is configured to transmit the information specific to the spatial location of the ball, wherein the information specific to the spatial location of the ball includes slope of the ground on which the ball is located;

a processing module communicably coupled to the receiver for determining the location of the ball based on the information specific to the spatial location of the ball; and

a display mechanism for displaying the location of the ball determined by the processing module.

4. The tracking system of claim **3**, further comprising:

at least one button for guiding a display pattern at the display mechanism; and

a slot configured to receive a removable battery for charging the tracking system.

5. The tracking system of claim **3**, wherein the information specific to the spatial location of the ball comprises at least one of a location of the ball from the tracking system, distance of the ball from a reference point, and an elevation of the ball.

6. A method of locating a ball during a sport activity, the method comprising:

receiving an information specific to a spatial location of the ball by a tracking system form the ball; and determining a location of the ball based on the information specific to the spatial location of the ball by the tracking system, wherein the information specific to the spatial location of the ball includes slope of the ground on which the ball is located.

7. The method of claim **6**, further comprising displaying the location of the ball by the tracking system.

8. The method of claim **6**, wherein the information specific to the spatial location of the ball comprises at least one of location of the ball from the tracking system, distance from a reference point, and elevation of the ball.

9. The method of claim **8**, further comprising displaying the slope.

10. The method of claim **9**, wherein the ball is a golf ball.

11. The method of claim **10**, wherein the information specific to the spatial location of the ball includes distance from the ball to a particular hole on a golf course.

12. The system of claim **4**, wherein the ball is a golf ball and the displaying system selectively displays the slope of the ground on which the ball is located and distance from the ball to a particular hole on a golf course.

* * * * *