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(54) **GOLF BALL AND CLUB HANDLE**

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(57) **ABSTRACT**

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A golf ball with an imbedded chip and a golf club grip that is capable of communication with the golf ball in order to provide certain information to the golfer, such as the height of the ball, how hard the ball was hit, the distance traveled, the spin and trajectory, and the angle it was hit at, along with other factors

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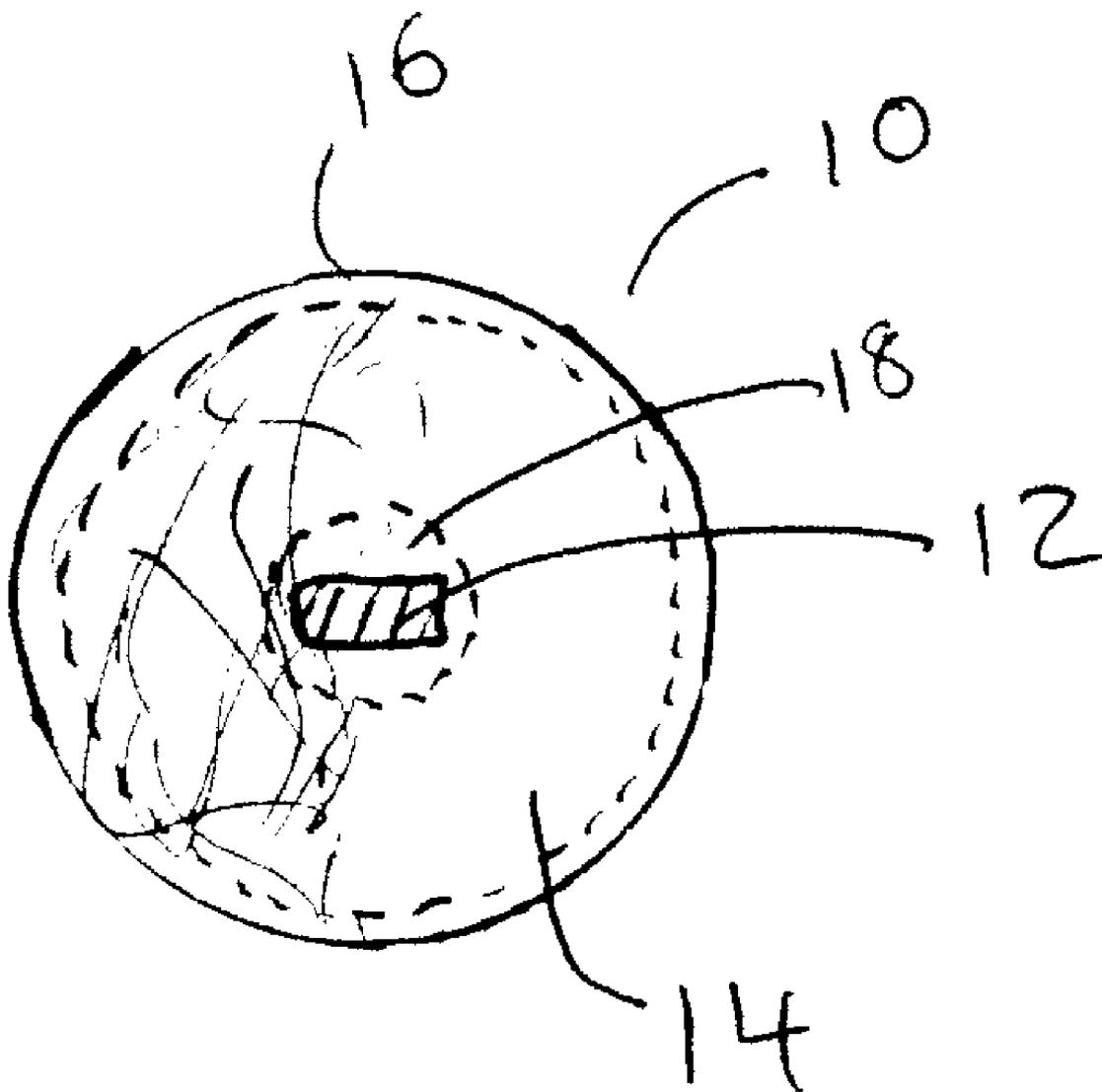


FIG. 1

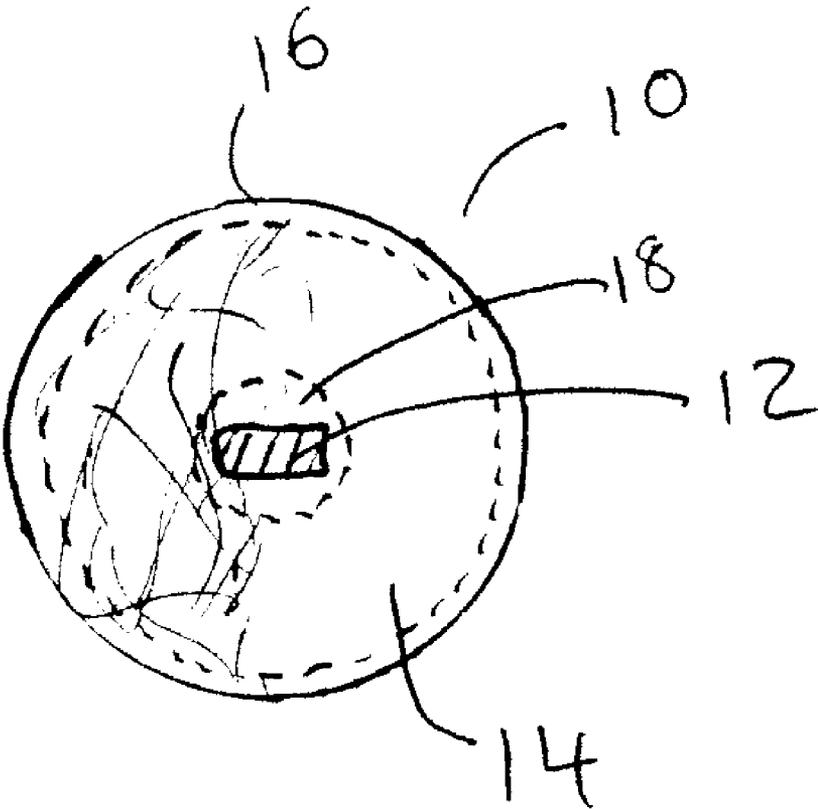
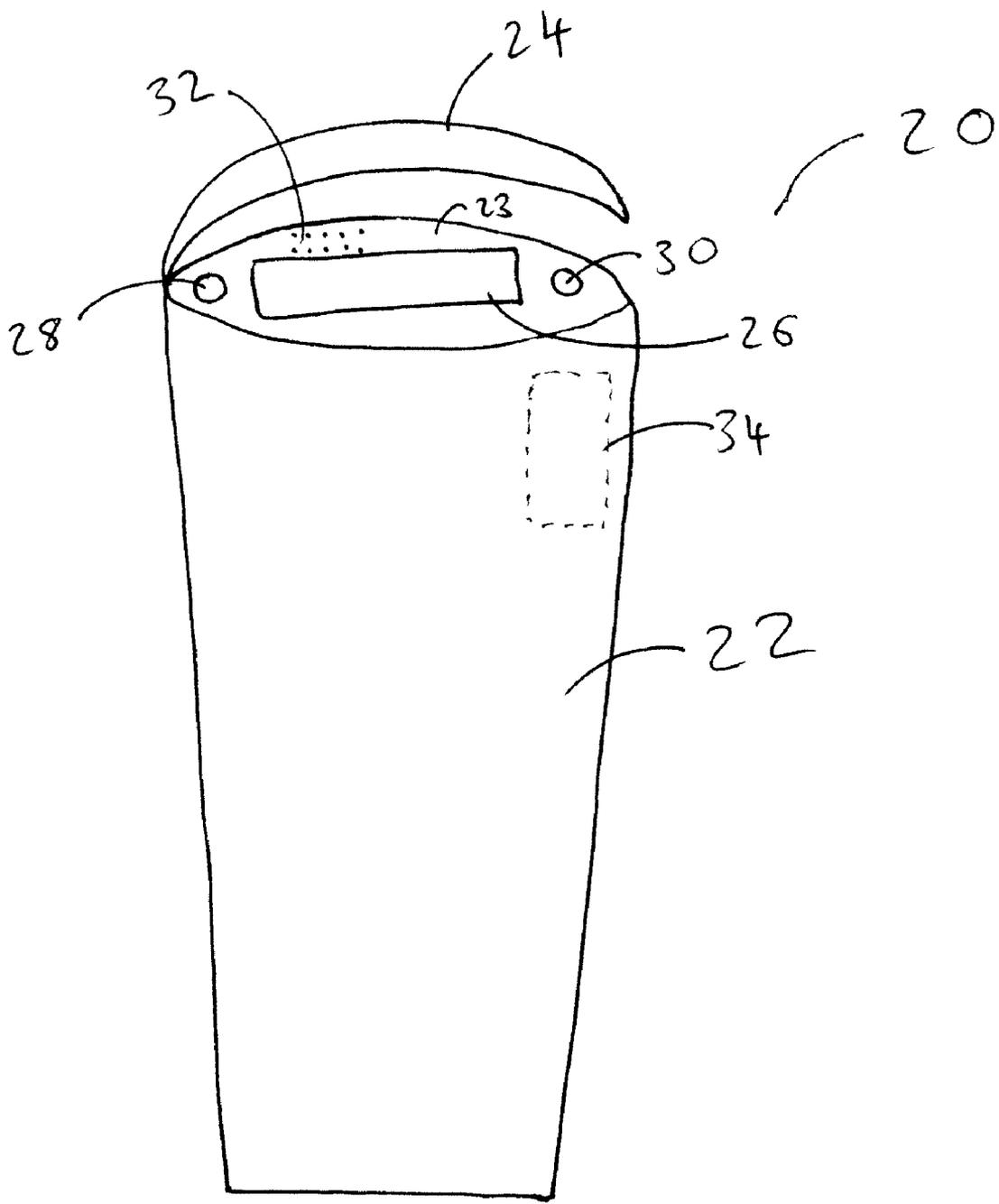


FIG. 2



GOLF BALL AND CLUB HANDLE

CROSS REFERENCE TO RELATED APPLICATION

[0001] This application claims benefit to provisional application 60/893,164, filed Mar. 6, 2007.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention is related to a golf ball and a golf club handle, and more specifically, a golf ball with an imbedded chip capable of communication with the golf club handle.

[0004] 2. Prior Art

[0005] Golf is a very popular sport which requires an extraordinary amount of training, skill, and precise timing gained through substantial experience. To learn golf, a prospective golf player typically takes a series of lessons from a professional who can properly instruct the player on the correct swing. Generally, the instructors teach golfers the proper form of a golf swing and correct their subtle errors in an attempt to perfect their swing. These lessons help the player fine tune their ability to accurately drive the golf ball desired distances using drivers, irons or woods.

[0006] The game of golf involves striking a one inch diameter ball with a golf club to direct the ball towards a hole in the golf course. Despite the singular goal, there are many variables. Golf clubs come in a variety of shapes and sizes to produce different results, imparting to the ball differing degrees of spin, trajectory, loft, and distance, depending upon the force with which the golfer swings the club. Each golf club consists of a grip, a shaft, and a golf club head. The head of each golf club varies in shape, face angle, and weight from other clubs, all of which affect the flight of the ball after it is struck with the club. Likewise, the way in which a player swings the club also affects the ball's distance and flight path.

[0007] For any given shot, a golfer may use a "full" or a "partial" swing. The golfer will hit the golf ball with the greatest force if he takes a full swing. The greater force applied during the swing, the further the ball will travel after it is struck.

[0008] A partial swing is generally reserved for shorter shots in order to advance the ball a shorter distance or by greater loft. For very short shots, a golfer may perform a "chip" or a "pitch" shot. The chip occurs when the golfer partially swings a golf club having a low club face angle. The chip produces a low trajectory flight of the ball. Likewise, the pitch occurs when the golfer partially swings a golf club having a high club face angle. The pitch produces a high trajectory flight of the ball.

[0009] In addition to the above, the final effort on each hole is putting. It is especially important for golfers to practice their putting techniques in order to lower their overall score. However, all shots are important, and the best golfers practice all types of shots in order to develop a balanced game. Thus, a universal golf swing training device should facilitate golfers in properly executing both full and partial swings, as well as puffing, in order to develop a better overall game.

[0010] As golf instructors understand, adjusting the amount of force necessary to propel a golf ball a desired distance and fine-tuning the relative arm-motions may be practiced repeatedly so as to build a subconscious memory of the particular combinations of each factor when putting/chip-

ping. In golf instruction, teaching a golfer the correct golf swing may assist a golfer in obtaining the proper distance and speed to reach the hole. However, after completing the swing, the golfer might not have a really good idea of how high, how hard or how well he hit the golf ball unless the instructor tells him.

[0011] One of the most difficult aspects of putting and chipping is the skill of adjusting the golf swing speed and angle to account for the slope of a green. More specifically, a golfer must visually identify a target line which the golfer actually hits the ball along, the breaking point where the ball deviates from the target line due to the slope of the green, the line on which the golf ball will actually travel, and the golf ball's point of entry into the hole. It is through an understanding of each of these that a golfer may successfully putt/chip a ball into a golf hole. In doing so, the golfer must essentially approximate the slope angle, the distance, and the speed which is necessary to hit the ball into the hole. Extensively practicing a golf swing might improve speed and distance control, but aiming and accommodating speed and distance control based on the slope angle requires more visual perception and experience than swing technique.

[0012] Therefore, if the golfer were able to know after each hit how hard he hit the golf ball, how high he hit the golf ball, and what angle or "slice" he hit the ball, along with other factors, the golfer will be able to learn a lot more after each swing, and be able to adjust his golf swing speed and angle to account for different "greens".

SUMMARY OF THE INVENTION

[0013] The present invention satisfies the above-mentioned need by providing a golf ball with an imbedded chip and a golf club grip that is capable of communication with the golf ball in order to provide certain information to the golfer, such as the height of the ball, how hard the ball was hit, the distance traveled, the spin and trajectory, and the angle it was hit at, along with other factors. The invention provides a better way for golfers of all ages in public and private driving ranges to improve their swing by measuring the characteristics of the golf ball once struck, and providing this information to the golfers.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] These and other features, aspects, and advantages of the apparatus and methods of the present invention will become better understood with regard to the following description and accompanying drawings where:

[0015] FIG. 1 illustrates a golf ball in accordance with an embodiment of the present invention; and

[0016] FIG. 2 illustrates a grip for the golf club in accordance with an embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0017] As shown in FIG. 1, the present invention provides a golf ball 10 with an integrated circuit (IC) chip 12 imbedded in its core 14. The IC chip 12 can input, output and/or store data relating to the golf ball's flight properties such as distance, height, spin, trajectory, angle the ball is struck and shot history. The IC chip 12 can also store information about the corresponding golf club, as will be further explained below.

[0018] The golf ball 10 can be manufactured similar to the golf ball described in U.S. Patent Application No. 2005/0164808. The golf ball 10 can comprise a solid core 14, a

cover **16**, and the IC chip **12** can be encapsulated with a protective layer **18** in the center of the ball.

[0019] The material of which the solid core **14** is made can be a rubber base composition which is obtained by an ordinary process including compounding in a selected proportion and vulcanizing under controlled conditions. The core-forming composition generally comprises a base rubber, a crosslinking agent, a co-crosslinking agent, an inert filler and the like. The base rubber used may be natural rubber and/or synthetic rubber which is used in the manufacture of conventional solid golf balls. Use may be made of 1,4-polybutadiene containing at least 40% cis-configuration, for example. If desired, the polybutadiene may be compounded with an appropriate amount of natural rubber, polyisoprene rubber, styrene-butadiene rubber or the like. Exemplary crosslinking agents used herein are organic peroxides such as dicumyl peroxide and di-t-butyl peroxide. The co-crosslinking agent may be selected from, for example, metal salts of unsaturated fatty acids, especially zinc and magnesium salts of unsaturated fatty acids having 3 to 8 carbon atoms (e.g., acrylic acid, methacrylic acid), but is not limited thereto. Exemplary inert fillers include zinc oxide, barium sulfate, silica, calcium carbonate, zinc carbonate, etc. For the solid core material, thermoplastic resins and elastomers such as ionomer resins and polyester elastomers may also be used in lieu of the rubber composition.

[0020] While the material of which the cover **16** is made is not particularly limited, it is preferably selected from thermoplastic resins and elastomers which are well known in the art. Examples include thermoplastic urethane elastomers, ionomer resins, polyester elastomers, polyamide elastomers, propylene-butadiene copolymers, 1,2-polybutadiene, and styrene-butadiene copolymers, alone or in admixture of any. For example, one or more ionomer resins may be used as the base to form the cover. Titanium dioxide, barium sulfate, magnesium stearate or the like may be added to the ionomer resin(s) for adjusting specific gravity and hardness. If necessary, UV absorbers, antioxidants, dispersing aids (e.g., metal soaps) and the like may be further added. The method of enclosing the solid core **14** with the cover **16** is not particularly limited. Typically employed are a method of molding a pair of hemispherical cover preforms, encasing the core **14** in the cover preforms, and heat compression molding and a method of injection molding a cover-forming composition around the core **14**.

[0021] The IC chip **12** can be encapsulated with a protective layer **18**, which can be a generally spherical component prepared by enclosing an IC chip **12** with a protective layer **18** of a special rubber member such as silicone rubber or butyl rubber. The IC chip **12** can be a tiny thin piece of about 0.4 mm square. The IC chip **12** is protected by encapsulating it with a special rubber which does not interfere with the internal function of the IC chip. The special rubber used herein is not particularly limited as long as it has elastic and vibration-damping functions. For example, silicone rubber and butyl rubber can be used.

[0022] The IC chip **12** encapsulated with the protective layer **18** can be incorporated in the golf ball **10**, typically by embedding the encapsulated IC chip **12** at the center of the solid core **14** during its manufacture prior to rubber vulcanization, then vulcanizing the rubber so that the encapsulated IC chip **12** becomes integral with the solid core **14**. More specifically, the encapsulated IC chip **12** is forcedly inserted into an unvulcanized rod-shaped rubber composition, known

as "slug" in the art, at the center, followed by vulcanization. In this way, the vulcanized rubber and IC chip **12** are integrally combined.

[0023] The IC chip **12** is designed to input, output and/or store data properties of the golf ball **10**, including but not limited to the force the golf ball is hit with, the spin and trajectory, the angle at which it is struck, the number of times it is struck, and information about the height, distance traveled, velocity (initial, peak, etc.) and time.

[0024] The IC chip **12** has a data storage means capable of writing and reading the information about the above items. The data storage element can comprise a storage section, a processor section, and a transmitter section, wherein information bits relating to the properties of the golf ball **10** are written in the storage section.

[0025] Next, a golf club grip or handle **20** capable of communication with the golf ball **10** will be explained with reference to FIG. 2. The handle **20** can comprise a base **22** and a cap or cover **24**. When the cover **24** is opened, a surface **23** can be seen on the top of the base **22**. The surface can include an LCD monitor **26** for reading out information about the golf ball, such as the properties described above. These properties (distance, time, height, etc.) can be shown together, or individually using button **30**. The LCD monitor can provide other information, such as time, battery indicator, etc., and can have a background light. An on/off switch **28** can be provided, as well as a number pad **32** for entering a program code (to read data or to access the data). A battery housing **34** can be provided to provide a battery for the grip **20**. The golf handle also has an imbedded IC chip (not shown) in it to input, output and/or store data. The IC chip **12** of the golf ball **10** is capable of communication with the IC chip of the golf handle **20**.

[0026] The golf handle **20** can be removable or permanently fixed to a golf club. The handle **20** can have threads such as to screw on/off to a handle, or some other means such as a clip or other locking feature to cause the handle to be removable from the golf club.

[0027] In operation, when the golf handle **20** is used on a club to strike the golf ball **10**, a radio wave is transmitted from an internal unit of the IC chip **12** of the golf ball **10** and received by a receiving unit in the IC chip of the golf handle **20**. The golf ball **10** is activated once the club face strikes the ball. A sensor imbedded in the IC chip **12** activates the system. The properties described above are then transmitted by the golf ball **10** and received by the golf handle **20**. These properties can then be read out in the LCD display **26** of the golf handle **20**, and shown to the user. The user can view the properties immediately after the swing, or can take a number of swings at a range, and then view all of them after as the IC chips are capable of storing the information based on the code of each ball, as will be described below.

[0028] A code can be input into each IC chip **12** of each golf ball **10** when manufactured, and printed on the packaging. Once the code is entered into the keypad **32** of the golf handle **20**, that golf ball **10** is ready to be used with that handle **20**. The handle **20** can store information about any number of golf balls **20**, and separate data on each golf ball **10** separately according to the code.

[0029] The system of the present invention also allows for easy retrieval of the golf balls. Because the code is stored into the handle, if a GPS type system is used, a golf ball can be easily identified and found within the driving range. It will then be known how many balls were used, and the system will be imbedded within the IC chips so that easy retrieval is

possible of the golf balls. In another embodiment, the golf ball **10** can have an illuminated cover for night practice.

[0030] The present invention helps golfers to make adjustments to their swing for correcting slicing and the force used. The users can see the actual distance and height the ball traveled, along with other properties, according to each swing, to remove uncertainty, guessing and yardage markers from the game. The users can use this information to improve their swings.

[0031] The IC chip in the golf ball is shown to communicate with the golf club handle, but it is also capable of communication with computer systems, P.C.'s, mp3 players, cellular telephones, handheld devices, PDA's, pagers, etc., and is not limited to the above.

[0032] While there has been shown and described what is considered to be preferred embodiments of the invention, it

will, of course, be understood that various modifications and changes in form or detail could readily be made without departing from the spirit of the invention. It is therefore intended that the invention be not limited to the exact forms described and illustrated, but should be constructed to cover all modifications that may fall within the scope of the invention.

What is claimed:

1. A golfing information system comprising:
a golf ball with a transmitting integrated circuit;
a golf club with a receiving circuit that receives a signal from the golf ball and a display for displaying the signal from the golf ball.

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