A device and method for viewing and analyzing the surface of a putting green. The device includes an image capturing device and a display device attached to opposite ends of a shaft. The shaft may include telescoping sections which permit the shaft to be collapsed for storage, extended for use, and adjusted to suit the height of the golfer. A golfer places the image capturing device on or close to the ground to obtain an image of the surface of the green. The golfer adjusts the length of the shaft using the telescoping sections so the display is positioned at a convenient height. The image is transmitted via cable or wirelessly to the display. The golfer views the image of the putting surface on the display and visually determines the breaks and imperfections of the putting surface between the ball and the cup.
GOLF GREEN READER DEVICE AND METHOD

FIELD OF THE INVENTION

[0001] The invention relates generally to a device and method for use by a player of the game of golf, and more particularly to a device and method that are used to assist a golfer with observing and identifying the slopes, breaks and other surface conditions of a putting green from a standing position without having to kneel, crouch or stoop down.

BACKGROUND OF THE INVENTION

[0002] In the sport of golf, when a golfer reaches the putting green (the “green”) he is only allowed to use a putter club, which does not impart any loft to the ball. This means that the ball must roll on the surface of the green to its destination, the cup or hole. To help ensure a good putt, it is necessary to identify any deviations, imperfections or irregularities that may prevent a perfectly straight roll. To do this, the golfer typically must kneel, crouch or stoop to as close to ground level as possible to get a better view of the surface of the green. Some players go so far as to nearly lie down on the ground to get the best view. Kneeling, crouching or stooping in this manner may result in wet or dirty hands and clothing if the ground is wet or muddy from rain or sprinklers. It can also cause the golfer discomfort or back pain. Such maneuvers require a good deal of balance and coordination to remain steady, and may also cause the player to appear less dignified.

[0003] A golfer gains an advantage when he can view the surface of the green as close to ground level as possible. This permits him to assess the possible line to take when hitting the ball, as he can better see the slopes, breaks and irregularities of the putting surface. The problem is that the only way to get this ideal view is to kneel, crouch, stoop or even lie down in an inconvenient, uncomfortable and undignified way. It would be highly advantageous to have a device that would allow the golfer to view the green surface at ground level from a standing position without having to kneel, crouch or stoop down.

BRIEF SUMMARY OF THE INVENTION

[0004] A preferred embodiment of the invention is a green reader device comprising an image capturing device and a display device including a viewing screen. The image capturing device is positioned at the lower end of an elongated shaft, and the display device is positioned at the upper end of the shaft. Preferably, the shaft consists of two or more telescoping sections which permit the shaft to be collapsed for storage, extended for use, and adjusted to suit the height of the golfer.

[0005] In a method of use of the device of the invention, a golfer places the device with the bottom of the lower end of the shaft on or close to the ground, so that the image capture device obtains an image of the surface of the putting green. The golfer adjusts the length of the shaft using the telescoping sections so that the viewing screen is positioned at a convenient height. The image of the putting surface is transmitted via cable or wirelessly to the viewing screen. The golfer then views the image of the putting surface on the screen and visually determines the breaks and imperfections of the putting surface between the ball and the cup.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] FIG. 1 is an illustration of a golfer using one embodiment of the green reader device of the invention on a putting green.

[0007] FIG. 2 is an illustration of a golfer storing the green reader device of the invention in a standard golf bag.

[0008] FIG. 3a is a side view of the green reader device of the invention with the telescoping sections extended, and partially cut away to show an internal cable.

[0009] FIG. 3b is a side view of the device of FIG. 3a with the telescoping sections collapsed.

[0010] FIG. 4a is a perspective view of the device of FIG. 3a with the telescoping sections extended.

[0011] FIG. 4b is a partial perspective view of the device of FIG. 4a showing the viewing screen rotated to a horizontal position.

[0012] FIG. 4c is a partial perspective view of the device of FIG. 4b showing the viewing screen pivoted and extended.

[0013] FIG. 5 is an illustration of a golfer using an alternate embodiment of the invention, in which the image capturing device is attached to the golfer's shoe and the viewing screen is a handheld device.

[0014] FIG. 6 is an illustration of a golfer using an alternate embodiment of the invention, in which the image capturing device is attached to the golfer's putter and the viewing screen is a handheld device.

DETAILED DESCRIPTION OF THE INVENTION

[0015] With reference to the figures, the present invention provides for a green reader apparatus and methods of use of the apparatus. Green reader device 10 includes an image capturing device 12 and a display or viewing screen 14. Image capturing device 12 is positioned at the lower end of an elongated hollow shaft 16, and display 14 is positioned at the upper end of shaft 16. Preferably, shaft 16 consists of three telescoping sections 16A-C. A connecting cable 18 located inside shaft 16 transmits an image from image capturing device 12 to display 14 where it may be conveniently viewed by a golfer. Alternatively, the image may be transmitted wirelessly from image capturing device 12 to display 14 using any appropriate wireless technologies known in the art.

[0016] As shown in FIG. 1, to use green reader device 10, a golfer places the bottom of the lower end of shaft 16 on or close to the ground, so that image capture device 12 obtains an image of the surface of the putting green. Device 10 may be oriented to capture a view that includes a line L along the green surface toward the target, namely cup (hole) 20 which may be marked by pin (flag) 22. The golfer adjusts shaft 16 by sliding telescoping sections 16A-C so that screen 14 is located at a convenient height for viewing without stooping, crouching or even bending. Once adjusted, sections 16A-C may be secured frictionally by tightening a knurled ring, or by any other appropriate retention means known in the art. The golfer then views the image of the putting surface on display 14 and visually determines the breaks and imperfections of the putting surface along line L between his golf ball and cup 20.

[0017] When it is not in use, device 10 may be conveniently stored in a standard golf bag as shown in FIG. 2. As shown in FIG. 3, the illustrated embodiment includes three telescoping sections 16A-C which permit shaft 16 to be collapsed to a short length for convenient handling and storage when not in use, and extended to a height to accommodate golfers of
varying heights when in use. Of course, it will be understood that two, three or more telescoping sections could be provided, or the shaft could be hinged to fold in segments. Alternately, shaft 16 may be of a fixed, non-adjustable length. [0018] Shaft 16 has been illustrated as having a circular cross-section with a diameter similar to that of the shaft of a golf club, but it could instead be rectangular or any other desired shape. Likewise, the term shaft will be understood to encompass any suitable elongated housing which can accommodate the image capturing device and the display. [0019] Image capturing device 12 is preferably a small video camera, such as a CCD camera, but may be a still camera or any other suitable type device. Display 14 is preferably a color video display, such as an LCD unit, but could be any suitable type of display. Alternately, instead of or in addition to transmitting the image to display 14, the image may be transmitted from image capture device 12 to a golfer’s and/or caddy’s handheld device such as a tablet computer or smartphone, and/or to a display screen located in a golf cart, using known wireless communications protocols such as Bluetooth® technology. If a device such as a tablet computer is used as the display device, image analysis software may be provided on the computer to analyze the image of the surface of the green and provide additional information to the golfer about the slopes and breaks of the putting surface, for example by showing contour lines superimposed on the image of the putting surface, or even showing a projected and/or suggested putting line. [0020] As shown in Fig. 4, display 14 is preferably adjustable mounted on shaft 16 so that it may be rotated and/or tilted to provide the best viewing angle. For example, display 14 may be connected to shaft 16 by a pivot arm 24 that permits display 14 to be extended and/or rotated. A screen housing or hood (not shown) may also be provided to shade the viewing screen of display 14 and make it easier to view in bright sunlight. [0021] Image capturing device 12 and display 14 are powered by a battery pack, preferably of the rechargeable type, which may be located within shaft 16 in a manner that is conveniently accessible for recharging or replacement as needed. [0022] Additional features may be provided. For example, a small spirit (bubble-type) level may be mounted on shaft 16, which the golfer can use to assist in determining the slope of the green. Alternately, an electronic level with data displayed on display 14 may be provided. [0023] An alternative embodiment of the invention is shown in Fig. 5. In this embodiment, image capturing device 26 is attached to one of the golfer’s shoes, by a fastener 28, such as a clip, hook-and-loop fastener, or other suitable fastening means. Display 30 is preferably a handheld device, which may be a dedicated device or a general purpose device such as a tablet computer or smartphone. The desired image is obtained by the golfer position his putter so that image capturing device 32 is oriented toward the cup. The image is transmitted wirelessly from image capturing device 32 to display 36. [0025] Preferably, in each embodiment, the entire device is waterproof, or at least substantially water resistant, to protect the electronics from exposure to rain. [0026] While the invention has been described with respect to certain preferred embodiments, as will be appreciated by those skilled in the art, it is to be understood that the invention is capable of numerous changes, modifications and rearrangements and such changes, modifications and rearrangements are intended to be covered by the following claims.

1. A golf green reader device comprising: an image capturing device for obtaining an image of the surface of a putting green; a display device operably connected to the image capturing device for displaying the image; and a shaft having a lower end and an upper end, wherein the image capturing device is attached to the shaft proximate to the lower end of the shaft and the display device is attached to the shaft proximate to the upper end of the shaft.

2. The device of claim 1, wherein the shaft comprises a plurality of telescoping sections to allow the length of the shaft to be adjusted.

3. The device of claim 1, wherein the display device is pivotally mounted on the shaft so that the viewing angle of the display device may be adjusted.

4. The device of claim 1 wherein the shaft is hollow, and the display device is operably connected to the image capturing device by a cable located within the shaft.

5. The device of claim 1 wherein the display device is operably connected to the image capturing device by wireless transmission means.

6. A golf green reader device comprising: a remote image capturing device for obtaining an image of the surface of a putting green; a hand-held viewing device comprising a display; and transmission means for wirelessly transmitting an image signal from the image capturing device to the viewing device.

7. The device of claim 6 wherein the remote image capturing device is adapted to be attached to a user’s shoe.

8. The device of claim 6 wherein the remote image capturing device comprises a clip for removably attaching the remote image capturing device to the shaft of a golf club.

9. The device of claim 6 wherein the viewing device is a computer comprising software programmed to analyze the image and to display information about the surface of the putting green.

10. A method for viewing the surface of a putting green, comprising: providing an apparatus comprising an image capturing device operably connected to a display device; placing the image capturing device proximate to the surface of the putting green; orienting the image capturing device to obtain an image of the putting surface in a desired direction; and viewing the image of the putting surface displayed on the display device.

11. The method of claim 10 wherein the device comprises a shaft, the image capturing device being attached proximate to a first end of the shaft and the display device being attached.
proximate to the second end of the shaft, and wherein the step of placing the image capturing device proximate to the surface of the putting green is performed by placing the first end of the shaft on or adjacent to the surface.

12. The method of claim 11 wherein the length of the shaft is adjustable, further comprising the step of adjusting the length of the shaft so that the display device is located at a desired height above the surface.

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