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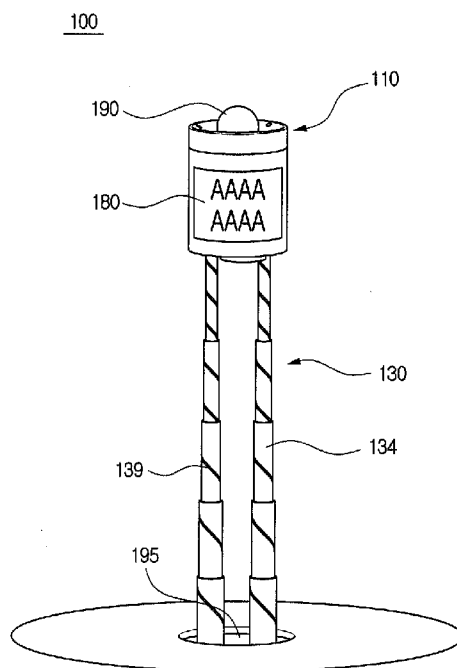
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(54) Title: APPARATUS FOR LIFTING A GOLF BALL IN A HOLECUP



(57) Abstract: A golf ball-lifting apparatus includes: a golf ball carriage for holding the golf ball; a power supply device assembled with the golf ball carriage; and a carrier part for moving up the golf ball carriage and the power supply device to a predetermined height from a ground, wherein the power supply device supplies power to the carrier part, and the apparatus can be put in the hole cup. The apparatus does not require a cumbersome job of digging a hole into the ground in order to install the apparatus. By the apparatus, the golfers need not bow to pick up the golf ball from the hole cup.

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Description

APPARATUS FOR LIFTING A GOLF BALL IN A HOLECUP

Technical Field

- [1] The present invention relates to an apparatus for lifting a golf ball in a hole cup, and more particularly to an apparatus which can automatically move a golf ball up and down so that golfers can retrieve the golf ball in a more convenient manner.

Background Art

- [2] In general, golfers have to bow or bend their bodies in order to retrieve a golf ball from a hole cup when the golf ball has been put into the hole cup during a golf game. In order to eliminate such inconvenience, various golf ball-lifting devices have been and are being developed, which can automatically lift a hole cup when a golf ball is put into the hole cup, so that a golfer can retrieve the golf ball from the hole cup without bending his/her body.
- [3] FIG. 1 is a sectional view of a conventional golf ball-lifting device which is disclosed in Korean Utility Model Registration No. 20-0248150.
- [4] Referring to FIG. 1, the conventional golf ball-lifting device includes a support drum 1' disposed below a hole cup 1. The support drum 1' has a porous lid 2 disposed at the upper end of the support drum 1'. A porous plate 4 is placed on the porous lid 2, and a sensing plate 5 is placed on the porous plate 4. A switch 6 is located under the porous plate 4. The switch 6 has an elastic lever 7 in contact with the sensing plate 5. An upper end of a support column 11 is fixed to a lower surface of the porous plate 4. The support column 11 extends through a slide hole 2 and has a lower end connected to a cross bar 13. A vertical rod 14 is fixed to a middle portion of the cross bar 13 and has a rack 15 formed on the vertical rod 14. The rack 15 is engaged with a pinion 17 rotated by a motor 16. Therefore, as the pinion 17 is rotated by the motor 16, the rack 15 is moved up or down, so as to move the hole cup up or down.
- [5] However, in the conventional golf ball-lifting device, the support drum 1' is located under the hole cup 1, which is installed leveled with or beneath the ground surface. Therefore, in order to install the conventional golf ball-lifting device, it is necessary to dig a hole into the ground and then embed the support drum 1' in the hole, which is a cumbersome job. Further, the maximum height to which the conventional golf ball-lifting device can raise the hole cup 1 is limited by the length of the rack 15.

Disclosure of Invention

Technical Solution

- [6] Therefore, the present invention has been made in order to overcome the problems of the conventional golf ball-lifting apparatus, and it is an object of the present

invention to provide a golf ball-lifting apparatus for moving a golf ball in a hole cup up and down, which has a golf ball carriage easily moved up and down with nearly no limit to the maximum height to which the golf ball carriage can be lifted up.

[7] It is another object of the present invention to provide a golf ball-lifting apparatus for moving a golf ball in a hole cup up and down, which does not require a cumbersome job of digging a hole into the ground in order to install the apparatus.

[8] It is another object of the present invention to provide a golf ball-lifting apparatus for moving a golf ball in a hole cup up and down, which can automatically raise a golf ball when the golf ball is placed in a hole cup, so that the golfers need not bow to pick up the golf ball from the hole cup.

[9] It is another object of the present invention to provide a golf ball-lifting apparatus for moving a golf ball in a hole cup up and down, which can be controlled either automatically or manually by a remote control.

[10] It is another object of the present invention to provide a golf ball-lifting apparatus for moving a golf ball in a hole cup up and down, which can be inserted in an existing hole cup without any additional installation work.

[11] It is another object of the present invention to provide a golf ball-lifting apparatus for moving a golf ball in a hole cup up and down, which can be easily installed, taken out, and moved by using a grip.

[12] According to an aspect of the present invention, there is provided an apparatus for lifting a golf ball in a hole cup, the apparatus comprising: a golf ball carriage for holding the golf ball; a power supply device assembled with the golf ball carriage; and a carrier part for moving up the golf ball carriage and the power supply device to a predetermined height from a ground, wherein the power supply device supplies power to the carrier part, and the apparatus can be put in the hole cup.

[13] The golf ball carriage has a concave upper surface for seating the golf ball therein, ball-retaining grooves for guiding the golf ball to the central portion of the concave surface and preventing the golf ball from rolling around after the golf ball is seated in the central portion of the concave surface, and a central hole formed through a central portion of the golf ball carriage so that a flagpole can be inserted through the central hole.

[14] The carrier part comprises: a driving shaft rotated by power supplied from the power supply device, the driving shaft having a guide groove formed on an outer surface of the driving shaft; a plurality of hollow tubes sequentially surrounding the driving shaft one by one, each of the hollow tubes having a guide groove formed on an outer surface thereof; and a plurality of ball bearings, which are assembled one by one with upper ends of the hollow tube, wherein each ball bearing of a hollow tube is inserted in and guided along the guide groove formed on the outer surface of an inner

hollow tube just inside of the hollow tube.

- [15] Each of the guide grooves of the driving shaft and the hollow tubes has a spiral shape. The upper ends of the hollow tubes have heights which decrease from an innermost hollow tube to an outermost hollow tube. The apparatus further comprises an advertisement member provided on an outer surface of the golf ball carriage, so that the advertisement member is rotated together with the golf ball carriage and is exposed together with the golf ball carriage when the golf ball carriage moves up out of the ground, thereby enhancing the advertisement effect.
- [16] The power from the power supply device is transferred to the driving shaft through a belt connecting a main pulley provided at the power supply device with an auxiliary pulley provided at the driving shaft. The apparatus further comprises a C-ring for clamping the ball bearing so as to prevent the ball bearing from being separated from the guide groove, wherein the ball bearing is inserted in a bearing hole formed at the upper end of each of the hollow tubes.
- [17] Also, the apparatus further comprises a golf ball detector located adjacent to the golf ball carriage, wherein the golf ball detector applies an electric signal to the power supply device according to if a golf ball is placed on the golf ball carriage or not. The apparatus further comprises a sound generator or a light emitter located adjacent to the golf ball carriage, thereby providing a more vivid game for not only the golfers but also the gallery.
- [18] The guide groove has a stopper jaw formed at a lower end of the guide groove, so as to stop the ball bearing guided along the guide groove. When the ball bearing is located at the lower end of the guide groove, the ball bearing is engaged with the stopper jaw. Then, when the driving shaft goes on rotating, the ball bearing engaged with the stopper jaw causes the hollow tube to rotate and move upward along with the driving shaft. Then, the ball bearing of the hollow tube just outside of the rotating hollow tube is guided along the guide groove of the rotating hollow tube. In this way, the hollow tubes are sequentially rotated and moved upward one by one.

Brief Description of the Drawings

- [19] The foregoing and other objects, features and advantages of the present invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings in which:
- [20] FIG. 1 is a sectional view of a conventional golf ball-lifting device;
- [21] FIG. 2 is a perspective view of an apparatus 100 for lifting a golf ball in a hole cup according an embodiment of the present invention in a state where the apparatus 100 has been raised;
- [22] FIG. 3 is a perspective view of an apparatus for lifting a golf ball in a hole cup

according an embodiment of the present invention;

[23] FIG. 4 is a sectional view of the golf-ball-lifting apparatus shown in FIG. 3, in order to illustrate the upward and downward movement of the golf ball carriage and the power supply device by the carrier part;

[24] FIG. 5 is an exploded perspective view of the driving shaft and the hollow tubes for illustrating the engagement between them; and

[25] FIG. 6 is a perspective view of a packaged golf-ball lifting apparatus equipped with a grip according to an embodiment of the present invention.

Best Mode for Carrying Out the Invention

[26] Reference will now be made in detail to the preferred embodiments of the present invention. However, the present invention is not limited to or by the embodiments described below.

[27] FIG. 2 is a perspective view of an apparatus 100 for lifting a golf ball in a hole cup according an embodiment of the present invention in a state where the apparatus 100 has been raised.

[28] Referring to FIG. 2, the apparatus 100 is manually placed in or taken out from a constructed hole cup 195 in a simple manner. In other words, it is unnecessary to embed the golf ball-lifting apparatus 100 in the ground and it is thus unnecessary to dig a separate hole in order to install the golf ball-lifting apparatus 100 according to the present invention. The golf ball-lifting apparatus 100 for lifting a golf ball in a hole cup according to the present invention includes a golf ball carriage 110 formed at an upper portion of the golf ball-lifting apparatus 100 and a carrier part 130 for lifting a golf ball to a position at which a golfer can easily retrieve the golf ball from the golf ball carriage 110. The carrier part 130 is disposed adjacent to the golf ball carriage 110 and receives power from a power supply device 120 which rises together with the golf ball carriage 110 up to the above-mentioned position.

[29] The golf ball carriage 110 for receiving a golf ball 190 has a concave upper surface for seating the golf ball 190 therein, ball-retaining grooves 111 for guiding the golf ball 190 to the central portion of the concave surface and preventing the golf ball 190 from rolling around after the golf ball 190 is seated in the central portion of the concave surface, and a central hole formed through a central portion of the golf ball carriage 110 so that a flagpole can be inserted through the central hole.

[30] The hollow tubes 134 determine the maximum height to which the golf ball carriage 110 can be raised. Each of the hollow tubes 134 has the shape of a hollow cylinder. The hollow tubes 134 overlap each other, that is, each of the hollow tubes 134 is surrounded by an outer hollow tube sequentially from the innermost hollow tube to the outermost hollow tube. Therefore, the hollow tubes 134 have diameters sequentially

increasing from the innermost hollow tube to the outermost hollow tube. Further, the hollow tubes 134 have similar lengths sequentially decreasing from the innermost hollow tube to the outermost hollow tube. As a result, it is possible to easily control or determine the maximum height to which the golf ball carriage 110 can be raised, only by controlling the entire thickness of the hollow tubes 134, that is, the number of the hollow tubes 134.

- [31] A guide groove 139a is formed in a spiral shape on a corresponding outer cylindrical surface of a driving shaft 132 or the hollow tubes 134. Therefore, when a ball bearing 135 is guided along the guide groove 139a, each of the driving shaft 132 and the hollow tubes 134 is rotated while being moved upward and the golf ball carriage 110 supported by the driving shaft 132 is also rotated while being moved upward.
- [32] The golf ball-lifting apparatus 100 may further include an advertisement member 180 provided on an outer surface of the golf ball carriage 110 as shown in FIG. 2. The advertisement member 180 is rotated together with the golf ball carriage 110 and is exposed together with the golf ball carriage 110 when the golf ball carriage 110 moves up out of the ground. The rotating and emerging advertisement member can provide advertisement in a smoother manner and can enhance the advertisement effect.
- [33] FIG. 3 is a perspective view of an apparatus for lifting a golf ball in a hole cup according an embodiment of the present invention.
- [34] Referring to FIG. 3, in the apparatus 100 for lifting a golf ball in a hole cup according to an embodiment of the present invention, the golf ball carriage 110 is formed at an upper portion of the golf ball-lifting apparatus 100. The carrier part 130 is disposed adjacent to the golf ball carriage 110 and receives power from a power supply device 120 which rises together with the golf ball carriage 110 up to the above-mentioned position. According to the present embodiment, the power supply device 120 includes a Direct Current (DC) motor to which a battery 125 disposed adjacent to the DC motor supplies power. However, not only the DC power such as the battery 125 but also an Alternating Current (AC) power can be used as the power supply device 120. Therefore, the present invention is not limited to the DC motor.
- [35] Further, the golf ball carriage 110 for receiving the golf ball 190 has a concave upper surface for seating the golf ball 190 therein, ball-retaining grooves 111 for guiding the golf ball 190 to the central portion of the concave surface and preventing the golf ball 190 from rolling around after the golf ball 190 is seated in the central portion of the concave surface, and a central hole formed through a central portion of the golf ball carriage 110 so that a flagpole can be inserted through the central hole.
- [36] The carrier part 130, which is assembled with the golf ball carriage 110 and can move the golf ball carriage 110 up and down, has the driving shaft 132 which is rotated

by power supplied from a power supply device 120. The driving shaft 132 is sequentially surrounded by a plurality of the hollow tubes 134 in close to each other. Each of the driving shaft 132 and the hollow tubes 134 has the guide groove 139a formed on an outer cylindrical surface thereof. Each of the hollow tubes 134 has a ball bearing 135 provided at an upper end thereof. When the driving shaft 132 is rotated by the power supply device 120, the ball bearing of each of the hollow tubes 134 is guided along the guide groove 139a, so that the hollow tubes 134 sequentially move up while rotating one by one from the innermost hollow tube.

[37] The power from the power supply device 120 is transferred to the driving shaft 132 through a belt 138 connecting a main pulley 131 provided at the power supply device 120 with an auxiliary pulley 136 provided at the driving shaft 132. In order to reduce the friction between the driving shaft 132 and the hollow tubes 134, the ball bearing 135 is inserted through a bearing hole formed at the upper end of each of the hollow tubes 134.

[38] In addition, a sound generator 160 and a light emitter 170 are located adjacent to the golf ball carriage 110, so as to provide a more vivid game for not only the golfers but also the gallery. According to the present embodiment, a speaker is used as the sound generator 160 and a lamp is used as the light emitter 170.

[39] Further, a golf ball detector 150 is located adjacent to the golf ball carriage 110 and determines if a golf ball 190 is placed on the golf ball carriage 110. The golf ball detector 150 includes a relay 141 which can control time for supplying power to the power supply device 120 based on the determination if a golf ball 190 is placed on the golf ball carriage 110.

[40] The golf ball-lifting apparatus 100 according to the present embodiment further includes a signal receiver 200 for receiving a signal from a remote control. When the signal receiver 200 receives a signal from a remote control, the golf ball-lifting apparatus 100 moves the golf ball carriage 110 up or down. Especially, when the signal receiver 200 receives a signal from a remote control after the golf ball 190 is placed on the golf ball carriage 110, the golf ball-lifting apparatus 100 may raise the golf ball carriage 110 carrying the the golf ball 190 while performing various functions, including sound generation, light emission, etc., which are controlled by the remote control.

[41] FIG. 4 is a sectional view of the golf-ball-lifting apparatus shown in FIG. 3, in order to illustrate the upward and downward movement of the golf ball carriage and the power supply device by the carrier part.

[42] Referring to FIG. 4, in the apparatus 100 for lifting a golf ball in a hole cup according to the present invention, the golf ball carriage 110 has a concave upper surface for seating the golf ball 190 therein, ball-retaining grooves 111 for guiding the

golf ball 190 to the central portion of the concave surface and preventing the golf ball 190 from rolling around after the golf ball 190 is seated in the central portion of the concave surface, and a central hole formed through a central portion of the golf ball carriage 110 so that a flagpole can be inserted through the central hole.

[43] The carrier part 130 is assembled with the golf ball carriage 110 and has the driving shaft 132 rotated by power supplied from a power supply device 120. The driving shaft 132 is sequentially surrounded by a plurality of the hollow tubes 134 in close to each other. Each of the driving shaft 132 and the hollow tubes 134 has the guide groove 139a formed on an outer cylindrical surface thereof. Each of the hollow tubes 134 has a ball bearing 135 provided at an upper end thereof. When the driving shaft 132 is rotated by the power supply device 120, the ball bearing 135 of each of the hollow tubes 134 is guided along the guide groove 139a, so that the hollow tubes 134 sequentially move up while rotating one by one from the innermost hollow tube.

[44] The guide groove 139a is formed in a spiral shape on a corresponding outer cylindrical surface of the driving shaft 132 or the hollow tubes 134. Therefore, when the ball bearing 135 is guided along the guide groove 139a, each of the driving shaft 132 and the hollow tubes 134 is rotated while being moved upward and the golf ball carriage 110 supported by the driving shaft 132 is also rotated while being moved upward.

[45] The power from the power supply device 120 is transferred to the driving shaft 132 through the belt 138 connecting the main pulley 131 provided at the power supply device 120 with the auxiliary pulley 136 provided at the driving shaft 132. In order to reduce the friction between the driving shaft 132 and the hollow tubes 134, the ball bearing 135 is inserted through a bearing hole formed at the upper end of each of the hollow tubes 134. Further, the golf ball-lifting apparatus 100 further includes a C-ring 137, which tightly clamps the ball bearing 135 so as to prevent the ball bearing 135 from being separated from the guide groove 139a. Due to the C-ring 137, the more inside the hollow tube 134 is located, the higher the upper end of the hollow tube 134 is. That is, the height of the hollow tube 134 decreases from the innermost hollow tube to the outermost hollow tube. As a result, from among the hollow tubes 134, the innermost hollow tube has the tallest height and the outermost hollow tube has the shortest height.

[46] FIG. 5 is an exploded perspective view of the driving shaft and the hollow tubes for illustrating the engagement between them.

[47] Referring to FIG. 5, the guide groove 139a is formed on the outer surface of the driving shaft 132 and the ball bearing 135 provided at the upper end of the hollow tube 134 is slidably inserted in the guide groove 139a. The guide groove 139a has a stopper jaw 139b formed at a lower end of the guide groove 139a, so as to stop the ball bearing

135 guided along the guide groove 139a. When the ball bearing 135 is located at the lower end of the guide groove 139a, the ball bearing 135 is engaged with the stopper jaw 139b. Then, when the driving shaft 132 goes on rotating, the ball bearing 135 engaged with the stopper jaw 139b causes the hollow tube 134 to rotate and move upward along with the driving shaft 132. Then, the ball bearing 135 of the hollow tube 134 just outside of the rotating hollow tube 134 is guided along the guide groove 139a of the rotating hollow tube 134. In this way, the hollow tubes 134 are sequentially rotated and moved upward one by one.

[48] According to the sequential upward or downward movement of the hollow tubes 134, the golf ball carriage 110 fixed to and supported by the driving shaft 132 is moved upward or downward.

[49] FIG. 6 is a perspective view of a packaged golf-ball lifting apparatus equipped with a grip according to an embodiment of the present invention.

[50] Referring to FIG. 6, the golf ball-lifting apparatus 100 according to the present invention further includes a grip 210 which crosses over the golf ball-lifting apparatus 100 and is connected to both sides of the upper end of the golf ball-lifting apparatus 100 through hinge pins 105. The grip 210 can be pivoted about an axis extending through the hinge pins 105. Therefore, a golfer can easily carry the golf ball-lifting apparatus 100 by holding the grip 210, and it is thus very easy to install the golf ball-lifting apparatus 100 in a hole cup, take out the golf ball-lifting apparatus 100 from a hole cup, and move from the golf ball-lifting apparatus 100 from one hole cup to another hole cup. When the golf ball-lifting apparatus 100 is installed into one hole cup, the grip 210 is moved down and disposed in contact with the outer surface of the golf ball-lifting apparatus 100.

Industrial Applicability

[51] As can be seen from the foregoing, the golf ball lifting-apparatus according to the present invention includes hollow tubes for moving the golf ball carriage up or down. Therefore, it is possible to easily move a golf ball up or down with nearly no limit in the height.

[52] Further, according to the present invention, a golf ball can be automatically raised when the golf ball is placed in a hole cup, so that the golfers need not bow to retrieve the golf ball from the hole cup.

[53] Further, according to the present invention, the golf ball lifting-apparatus can be controlled not only automatically but also manually by a remote control.

[54] Moreover, a golf ball-lifting apparatus for moving a golf ball in a hole cup up and down according to the present invention does not require a cumbersome job of digging a hole into the ground in order to install the apparatus.

- [55] Further, according to the present invention, a sound generator and a light emitter are located adjacent to the golf ball carriage and can provide a more vivid game for not only the golfers but also the gallery.
- [56] Further, according to the present invention, an advertisement member provided on an outer surface of the golf ball carriage is rotated together with the golf ball carriage and is exposed together with the golf ball carriage when the golf ball carriage moves up out of the ground. The rotating and emerging advertisement member can provide advertisement in a smoother manner to not only golfers but also the gallery.
- [57] Further, according to the present invention, the rotating and emerging advertisement member can maximize the advertisement effect.
- [58] Moreover, the golf ball-lifting apparatus for moving a golf ball in a hole cup up and down according to the present invention can be inserted in an existing hole cup without any additional installation work.
- [59] In addition, the golf ball-lifting apparatus for moving a golf ball in a hole cup up and down according to the present invention can be easily installed, taken out, and moved by using a grip.
- [60] While this invention has been described in connection with what is presently considered to be the most practical and preferred embodiment, it is to be understood that the invention is not limited to the disclosed embodiment and the drawings, but, on the contrary, it is intended to cover various modifications and variations within the spirit and scope of the appended claims.

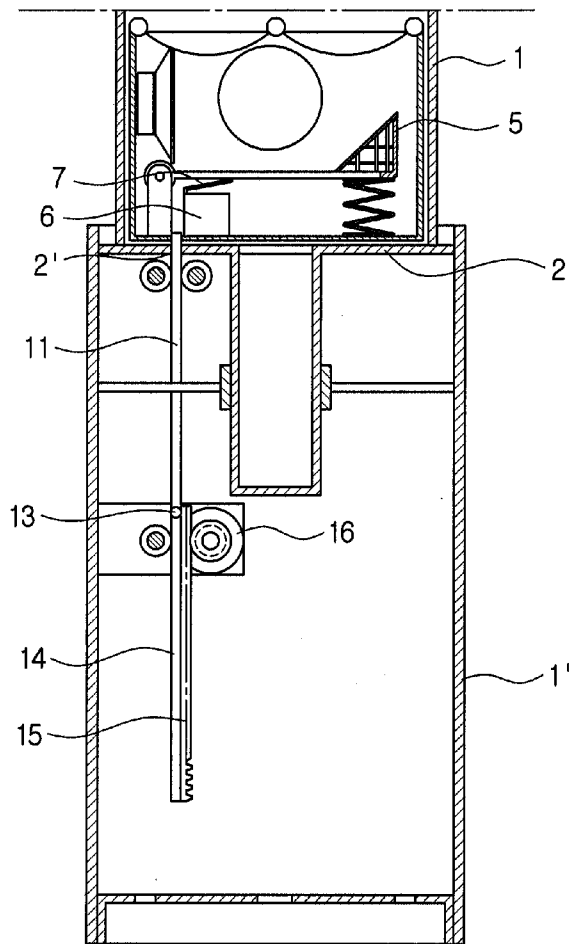
Claims

- [1] An apparatus for lifting a golf ball in a hole cup, the apparatus comprising:
a golf ball carriage for holding the golf ball;
a power supply device assembled with the golf ball carriage; and
a carrier part for moving up the golf ball carriage and the power supply device to a predetermined height from a ground,
wherein the power supply device supplies power to the carrier part, and the apparatus can be put in the hole cup.
- [2] The apparatus as claimed in claim 1, wherein the golf ball carriage has a concave upper surface for seating the golf ball therein, ball-retaining grooves for guiding the golf ball to the central portion of the concave surface and preventing the golf ball from rolling around after the golf ball is seated in the central portion of the concave surface, and a central hole formed through a central portion of the golf ball carriage so that a flagpole can be inserted through the central hole.
- [3] The apparatus as claimed in claim 1, wherein the carrier part comprises:
a driving shaft rotated by power supplied from the power supply device, the driving shaft having a guide groove formed on an outer surface of the driving shaft;
a plurality of hollow tubes sequentially surrounding the driving shaft one by one, each of the hollow tubes having a guide groove formed on an outer surface thereof; and
a plurality of ball bearings, which are assembled one by one with upper ends of the hollow tube, wherein each ball bearing of a hollow tube is inserted in and guided along the guide groove formed on the outer surface of an inner hollow tube just inside of the hollow tube.
- [4] The apparatus as claimed in claim 3, wherein each of the guide grooves of the driving shaft and the hollow tubes has a spiral shape.
- [5] The apparatus as claimed in claim 3, wherein the power from the power supply device is transferred to the driving shaft through a belt connecting a main pulley provided at the power supply device with an auxiliary pulley provided at the driving shaft.
- [6] The apparatus as claimed in claim 3, further comprising a C-ring for clamping the ball bearing so as to prevent the ball bearing from being separated from the guide groove, wherein the ball bearing is inserted in a bearing hole formed at the upper end of each of the hollow tubes.
- [7] The apparatus as claimed in claim 3, wherein the upper ends of the hollow tubes have heights which decrease from an innermost hollow tube to an outermost

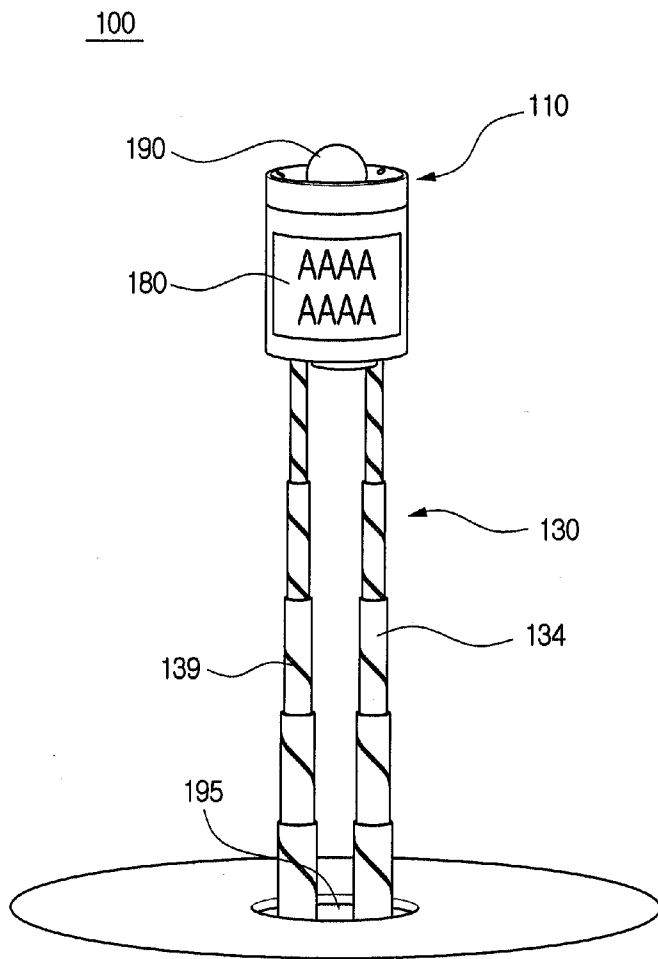
hollow tube.

- [8] The apparatus as claimed in claim 1, further comprising a golf ball detector located adjacent to the golf ball carriage, wherein the golf ball detector applies an electric signal to the power supply device according to if a golf ball is placed on the golf ball carriage or not.
- [9] The apparatus as claimed in claim 1, further comprising a sound generator located adjacent to the golf ball carriage, so as to generate sound.
- [10] The apparatus as claimed in claim 1, further comprising a light emitter located adjacent to the golf ball carriage, so as to emit light.
- [11] The apparatus as claimed in claim 1, further comprising an advertisement means provided on an outer surface of the golf ball carriage, so that the advertisement means is rotated together with the golf ball carriage and is exposed together with the golf ball carriage when the golf ball carriage moves up out of the ground.
- [12] The apparatus as claimed in claim 1, further comprising a relay adjacent to the golf ball carriage, wherein the relay can control time for supplying power to the power supply device based on if a golf ball is placed on the golf ball carriage.
- [13] The apparatus as claimed in claim 1, further comprising a signal receiver for receiving a signal from a remote control, wherein the signal receiver is located adjacent to the golf ball carriage,
- [14] The apparatus as claimed in claim 1, further comprising a grip which crosses over the apparatus and is connected to both sides of an upper end of the apparatus through hinge pins.

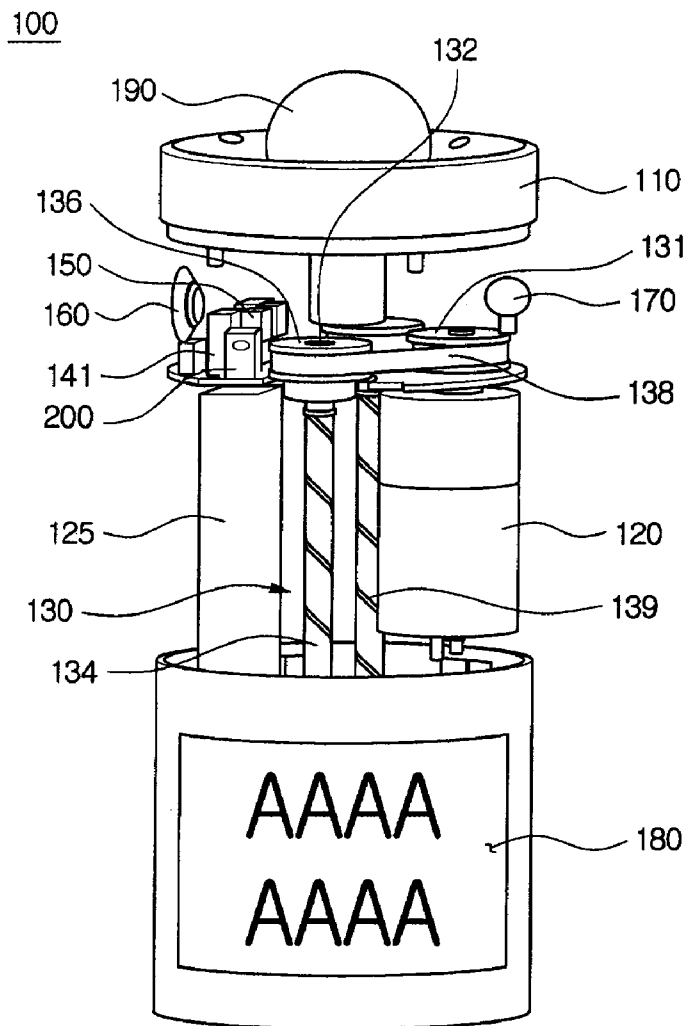
[Fig. 1]



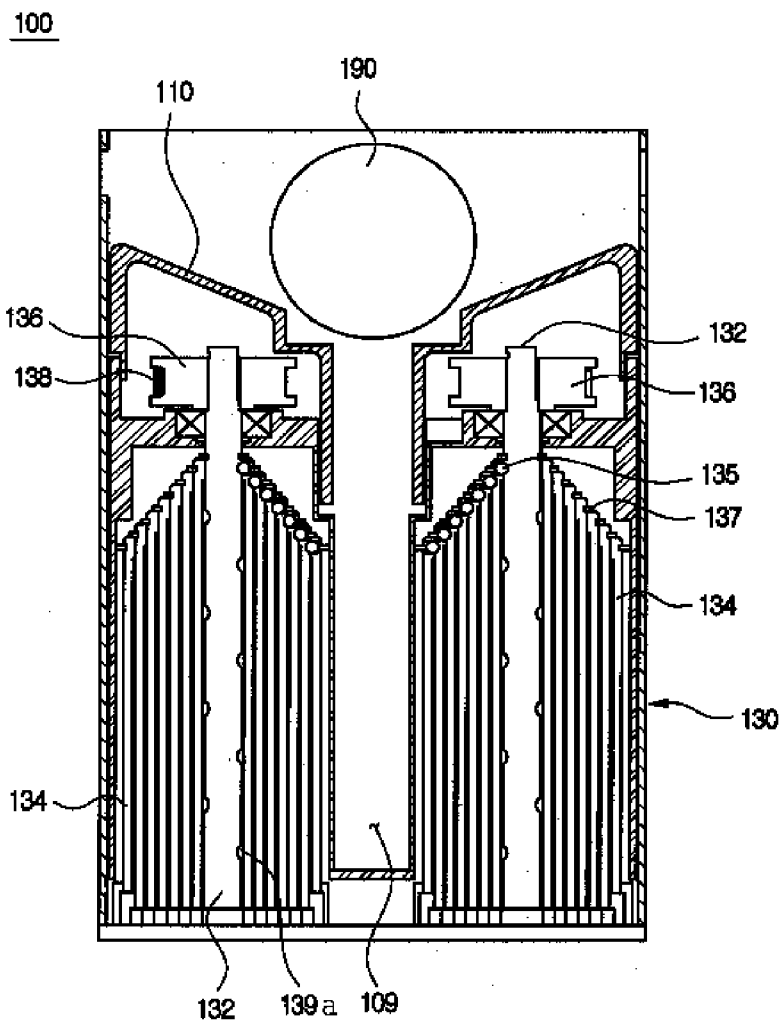
[Fig. 2]



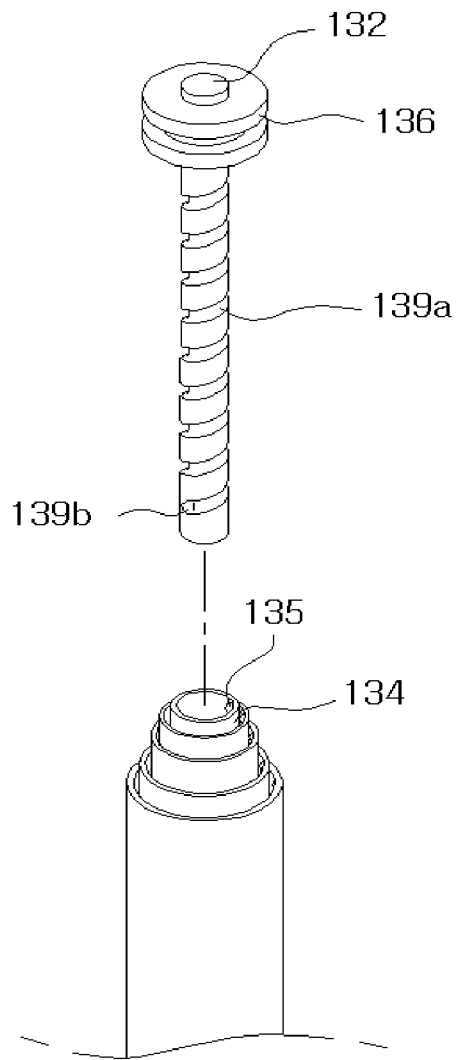
[Fig. 3]



[Fig. 4]

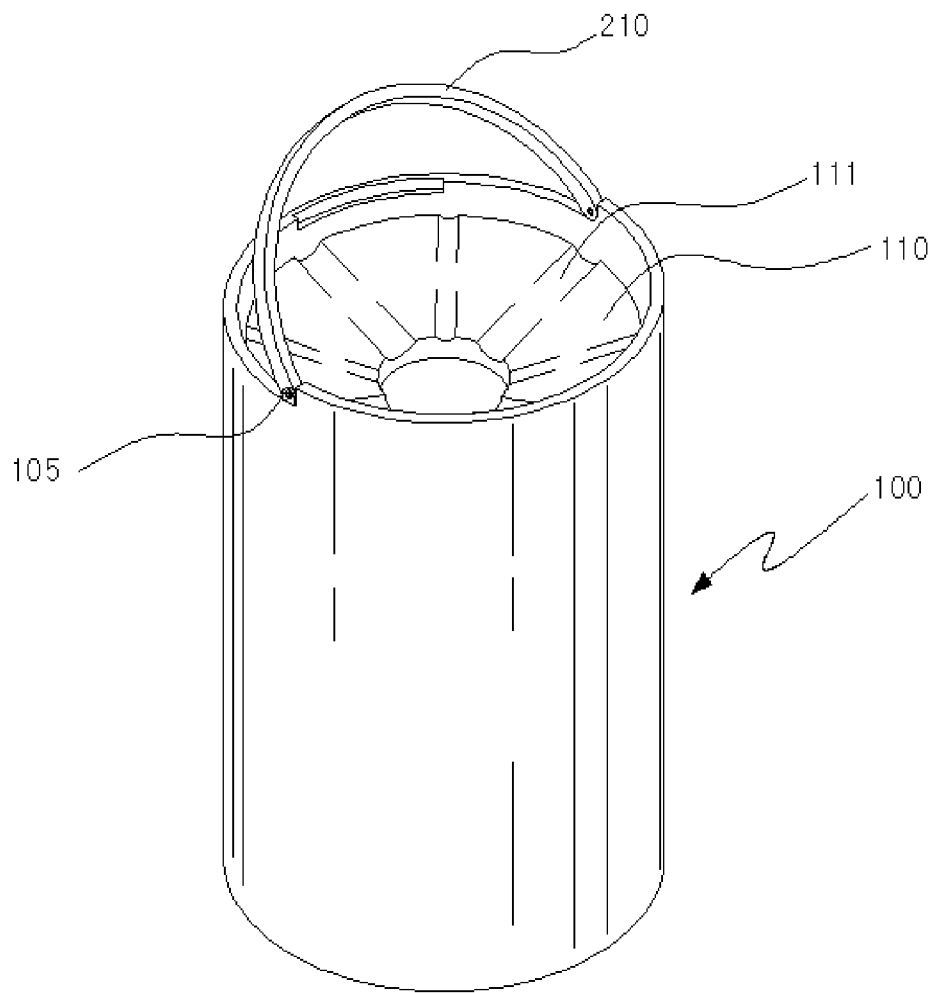


[Fig. 5]



6/6

[Fig. 6]



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2006/002828**A. CLASSIFICATION OF SUBJECT MATTER***A63B 57/00(2006.01)i*

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC8 A63B 57/00, 69/36

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Patents and applications for inventions since 1975

Korean Utility models and applications for Utility models since 1975

Japanese Utility models and application for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKIPASS(KIPO INTERNAL) "hole cup", "golf", "ball"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 1992-5120063 A (Birchler; Terry M. et al) 09 June 1992 See claims 1-15 ; figures 1 and 3	1
A	JP 2002-263227 A (TAKEZAWA, SHIGEYUKI) 17 September 2002 See Claims 1-4 ; figures 1 and 4	1
A	JP 05-317472 A (TANAKA SEIMITSU KOGYO KK) 03 December 1993 See Claim 1 ; figures 1 and 7	1
A	KR 20-0190284 Y1 (KIM, JAE YUNG) 15 July 2000 See Claims 1-4 ; figures 4 and 6	1



Further documents are listed in the continuation of Box C.



See patent family annex.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

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