Title: AN ARRANGEMENT AT A DRIVE OF POINT

Abstract: The present invention relates to an arrangement at a drive off point or driving bay for golf balls or similar balls, comprising a raisable and lowerable ball support, a so-called peg, on which a ball (30) may be placed for driving thereof after lifting of the ball support with the ball (30) to the desired level above the level of the drive off point, the ball support (29) being disposed on the end of an arm (14) which is switchable from a low position (Fig. 1) below the level of the drive off point for loading of the ball support (29) with a ball (30), to a higher position (Fig. 2 and 4) on said desired ball driving level above the level of the drive off point, and the ball support (29) is switchable in a shaft (2) in which a ball feeder tube (3) discharges at said low loading position.
AN ARRANGEMENT AT A DRIVE OF POINT

The present invention relates to an arrangement according to the preamble to appended Claim 1.

Most drive off points, or as they are also known driving bays, at driving ranges and similar practice facilities lack ball supports which afford the possibility of optional level setting and preferably also automatic ball teeing. These shortcomings are particularly manifest in facilities which are in intensive use where it is desirable that the time for occupying each drive off point is to be as short as possible. For many people, it is further desirable to be able to avoid changing position between driving off several golf balls in succession and easily being able to select and alter the level of the golf ball which is to be driven off. It has further proved desirable to be able to arrange a so-called pegging device so that this is completely concealed beneath the drive off point so that ball discharge and pegging devices do not affect the drive off point, but the drive off point may have substantially the same appearance as any tee whatever on a golf course.

The task forming the basis of the present invention is to satisfy the above-outlined wishes and, to as high a degree as possible, obviate the drawbacks inherent in prior art arrangements.

This task is solved according to the present invention in the arrangement disclosed by way of introduction in that it has been given the characterising features in appended Claim 1 and possibly one or more of the appended subclaims.

Through the present invention, it is possible, using the arrangement intimated by way of introduction, to optionally select the desired level of the ball support and also to realise an automatic pegging the golf ball on the support in that the ball support, after a ball is driven off, is lowered to a starting position for pegging a golf ball and is thereafter raised to the desired golf ball level. As a result of this switching of the support, extremely simple fully automatic pegging of the golf ball is made possible
thereon in that, for example, a ball feeder tube leads to the ball support in its low, lowered level. As a result of the present invention, it is moreover possible to position the entire arrangement completely secured beneath the drive off point of driving bay whereby this may be given substantially the same appearance as any other golf tee on a golf course whatever. Moreover, the arrangement according to the present invention will not be exposed to the elements whereby it will have considerably better operational reliability than prior art arrangements.

The present invention will now be described in greater detail hereinbelow, with reference to the accompanying Drawings. Fig. 1 shows a photographic image of an arrangement according to one embodiment of the present invention with the parts in the starting or collecting position. Fig. 2 shows a similar image to that of Fig. 1 from the opposite side of the arrangement. Fig. 3 is an end elevation, partly in section, of the arrangement according to Fig. 1. Fig. 4 shows a view similar to that of Fig. 3 of the arrangement of Fig. 1. Fig. 5 is a top plan view, partly in section, of the left-hand end of the apparatus illustrated in Fig. 1, with a golf ball in position for feeding to a ball support. Fig. 6 shows a view similar to that of Fig. 5 with the ball in position during feeding to the ball support. Fig. 7 shows a view of parts of the starting or collecting position according to Fig. 1. Fig. 8 shows a view similar to that of Fig. 7, but with the parts in position for raising to the drive off position according to Fig. 4. Fig. 9 shows a view of another embodiment of the arrangement according to the present invention. Fig. 10 is a top plan view of the embodiment illustrated in Fig. 9.

It should be emphasised that the arrangement shown on the Drawings is a prototype which has proved to function extremely well and satisfy all needs.

The prototype shown on the Drawings is constructed from a plate 1, at whose one end a tube shaft 2 is fixedly welded, the shaft being substantially vertical. A ball feeder tube 3 is connected to the tube shaft 2. On the plate 1, there is further provided a column 4 and two vertical rods 5 and 6 which, at the upper ends, support a circuit plate 7 and a step motor 8 whose shaft extends through or past the circuit plate 7 and supports a sprocket wheel 9. At its upper end, the column 4 supports a sprocket
wheel 10 and at its lower end, a sprocket wheel 11. A chain 12 extends over the sprocket wheels and is connected, at 13, to an arm 14. The arm 14 has two ball sleeves 15 and 16 which run each on their rod 17 and 18. The rods 17 and 18 extend substantially vertically from the frame plate 1 to an upper connecting member 19 which is connected to the upper end of the tube 2 by means of a stay 19A.

In addition to the sprocket wheel 10, the column 4 supports, at its upper end, a line wheel 20 which has a line groove 21 for a line 22 whose one end is secured to the arm 14 and whose other end is secured in a weight 23 which assists in lifting the arm 14 from the lower position illustrated in Fig. 1 to the upper position illustrated in Fig. 2.

The arm 14 is U-shaped and has an inner part 24 which is journalled on a shaft 25 in order to be able to be pivotal inside the arm 14. The arm 14 further supports an inductive transducer 26 which is intended to cooperate with a metal flag on the pivotal part 24 of the arm 14. The transducer 26 need not, naturally, be of the inductive type but may be a photocell type or any other suitable type. The arm 14 further supports a grub screw 27 which is disposed to cooperate with a spring 28 which urges the opposite end of the inner part 24 of the arm 13 in relation to the spring end in a direction towards the arm 14 proper as illustrated in Fig. 1. The opposite end of the inner part 24 in relation to the spring end is narrower than the remainder of the inner part 24 and extends into the tube 2 through a longitudinal recess or slot 2A and carries a ball support 29. A bushing 29A of rubber or similar material may be disposed between the end of the inner part of the arm 14 and the ball support 29. It is appropriate to provide a long arm 14 with inner part 24 therein so that the movement of the ball support 29 with the golf ball 30 will be as rectilinear as possible.

The inner part 24 of the arm 14 is urged against the top or upper region of the arm 14 in the position of the spring 28 illustrated in Fig. 1 as long as there is no golf ball 30 on the ball support 29. As soon as a golf ball 30 is placed on the ball support 29, the weight of the golf ball 30 is sufficient to compress the spring 28 and place the metal
flag in register with the inductive transducer 26 so that there is obtained an indication that there is a golf ball 30 on the golf ball support 29. This puts the arrangement in a state of preparedness for lifting the golf ball 30 from the position illustrated in Fig. 1 and 2.

Figs. 5 and 6 show in greater detail the connection between the ball feeder tube 3 and the shaft tube 2. At the connection, there is provided a so-called ball valve 31 which is in the form of a stirrup which surrounds a part of the ball feeder tube 3, with a separator plate 32 and a closure plate 33. The plates 32 and 33 are designed, on the one hand, to separate a golf ball 30 in the tube 3 from the others and, on the other hand, to displace a separated golf ball 30 into the tube 2 and up on the ball support 29 so that it arrives at the position illustrated in Fig. 5. This is attained in that the plates 32 and 33 are displaced into the tube 3 in the different positions of the stirrup 31 through slots in the tube 3, given that the distance between the plates 32 and 33 is less than the diameter of a golf ball 30 and given that the plate 32 contacts the golf ball as soon as the plate 33 opens to the shaft tube 2. The plate 32 will displace the ball into the shaft tube 2 and if the ball does not preferably enter the shaft tube 2, the plate 33 will displace the golf ball into the correct position on the ball support 29. In order to facilitate advancement of the golf balls in the tube 3, the tube is disposed with a given inclination towards the shaft tube 2 of a number per cent, for example 4%. The stirrup 31 is secured on the end of a solenoid piston 34 which extends into a coil 35 which is controlled by suitable electronics. The coil 35 is mounted on a rod 36 which extends out from the tube 2. The ball feeder tube 3 may be connected to a suitable tube system for continuous supply of golf balls 30.

As was mentioned previously, the entire arrangement according to the present invention is placed on a drive off point or driving bay so that only the ball support 29 with the golf ball 30 projects up above the so-called floor level of the drive off point. The step motor 8 may be controlled in such a manner that the golf ball 30 is placed at the desire of level above the floor level of the drive off point, and this ball level may be adjustable for satisfying the individual needs of every golfer. After setting of a level, the step motor can lift the ball to exactly the same level as long as this is
desirable. The work of the step motor 8 for lifting the golf ball 30 to the level illustrated in Fig. 2 is greatly facilitated by the weight 23 which helps to lift up the arm 14 from the position illustrated in Fig. 1 to the position illustrated in Fig. 2. On access to a more powerful step motor, it may be possible to dispense with the weight 23 and the associated components such as the line wheel 20, the line groove 21, the line 22 and their anchorages.

Figs. 9 and 10 show another embodiment of the arrangement according to the present invention, the same reference numerals having been applied to substantially the same components as in the embodiment described in the foregoing.

The column 4 and the two rods 5 and 6 have, in this embodiment, been replaced by a plate 38 upstanding from the plate 1 and provided with anchorages 39 and 40 for the sprocket wheels 10 and 11. The plate 38 further carries the step motor 8 and possibly electronic cards. In addition, it has been possible to dispense with the weight 23 and the associated components, such as the line wheel 20, the line groove 21, the line 22 and their anchorages, which implies a major simplification. A further major difference resides in the arrangement for separating and feeding a golf ball 30 in the shaft 2 and, in this embodiment, consists of a fork disk 41 with two shanks 42 and 43, the disk being rotatably secured on a lug 44 fixed on the underside of the infeed tube 3. At least the shanks 42 and 43 are capable of extending into the tube 3 by suitable recesses therein. The fork disk 41 has an arm 45 whose end is pivotally connected to a linkage arm 46 which is adjustable as regards its length for possible adjustment of the movement and whose opposite end is pivotally connected to a linkage arm 47 which is pivotal in a sleeve 48 secured on the shaft 2 by the intermediary of a U-shaped bent rod 49 in that the linkage arm 47 is secured on the rod 49 whose one end extends into the sleeve 48 and whose other end extends in under the end of the arm 14 located at the shaft 2, as shown in Fig. 9. In this position, the fork disk 41 is rotated to the position illustrated in Fig. 9. During rotation, the shank 43 is pivoted into the tube 3 and separates and displaces a golf ball 30 into the shaft 2 in that the second shank 42 leaves the tube 3 free for passage of the golf ball 30. At the same time, the shank 43 prevents passage of the immediately following
golf ball until the golf ball 30 on the support 29 has been raised up to the drive off position in Fig. 4 when the other end of the rod 49 has accompanied the arm 14 upwards and entailed rotation of the fork disk 41 to the position illustrated by ghosted lines in Fig. 9. On the plate, there is further disposed a photocell 50 which indicates the lower position of the arm 14. The arm 14 further supports a plate 51 which restricts the movement of the inner part 24.

Many modifications are naturally conceivable without departing from the scope of the inventive concept as defined in the appended Claims.
CLAIMS

1. An arrangement in a drive off point or driving bay for golf balls or similar balls, comprising a raisable and lowerable ball support, a so-called peg, on which a ball (30) may be placed for driving thereof after lifting the ball support with the ball (30) to the desired level above the level of the drive off point, the ball support (29) being disposed on the end of an arm (14) which is switchable from a low position (Fig. 1) below the level of the drive off point for loading the ball support (29) with a ball (30), to a higher position (Figs. 2 and 4) on said desired ball driving level above the level of the drive off point, and the ball support (29) being adjustable in a shaft (2) in which a ball feeder tube (3) discharges at said low loading position, characterised in that the arm (14) extends substantially at right angles to the ball support (29) and consists of a first part and a second part (24) of substantially the same extent as the first part, that the second part (24) supports the ball support (29) at its one end and is pivotal in relation to the first part, and that the first part is journalled for said linear movement.

2. The arrangement as claimed in Claim 1, characterised in that the opposite end of the second part (24) of the arm (14) in relation to the ball support (29) is spring-biased (28) for bringing together the opposite ends towards one another.

3. The arrangement as claimed in Claim 2, characterised in that said opposing ends are located in spaced apart relationship from one another against the action of the spring (28) as long as a ball (30) is located on the ball support (29).

4. The arrangement as claimed in Claim 1, characterised in that a ball separator (32, 33) is disposed at the transition between the shaft (2) and the ball feeder tube (3) or in the end of the ball feeder tube (3).

5. The arrangement as claimed in Claim 4, characterised in that the ball separator (32, 33) is disposed to displace in a separate ball (30) into the shaft (2) for placing on the ball support (29).
6. The arrangement as claimed in Claim 1, characterised in that the arm (14) is journaled for the linear movement on a number of rods (17, 18) and is connected to a lifting device (8, 12, 23).

7. The arrangement as claimed in Claim 6, characterised in that the lifting device includes a chain (12) driven by a step motor (8) and connected to the arm (14).

8. The arrangement as claimed in Claim 7, characterised in that the lifting device includes a weight (23), which, by the intermediary of a line (22) is connected to the arm (14) so as to facilitate the lifting of the arm (14) with the ball support (29) and the ball (30) in the shaft (2) from the low position to the desired higher position, while the ball (30) is on the desired level above the drive off point.

9. The arrangement as claimed in Claim 5, characterised in that the ball separator is a fork disk (41) which is rotary by means of linkage arms (46, 47, 49), of which one is actuable by means of the arm (14) at its lower position for separation and insertion of a ball (30) in the shaft (2) for placing on the ball support (29).

10. The arrangement as claimed in Claim 9, characterised in that the shanks (42, 43) of the fork disk (41) are disposed to extend into the ball feeder tube (3), the one shank permitting passage of a ball (30) while the other shank prevents passage of a ball (30) into the shaft (2).
INTERNATIONAL SEARCH REPORT

INTERNATIONAL APPLICATION No. PCT/SE 03/01331

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: A63B 47/00, A63B 69/36
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)

IPC7: A63B

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

SE, DK, FI, NO classes as above

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Further documents are listed in the continuation of Box C. See patent family annex.

Date of the actual completion of the international search: 4 November 2003

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