Title: TRAINING DEVICE FOR GOLF STROKES

Abstract: The present invention relates to a training device for golf strokes which enables a user to practise his/her golf strokes, or warm up before a round on the golf course within a restricted area with simple means. In an embodiment of the invention, moreover, the invention can provide an indication of how far the ball would have travelled as a function of the force of the stroke and the ball's angle of departure.
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Training device for golf strokes

The present invention relates to a training device for golf strokes which enables a user to practise his/her golf strokes, or warm up before a round on the golf course within a restricted area with simple means. In an embodiment of the invention, moreover, the invention can provide an indication of how far the stroke would have travelled as a function of the force of the stroke and the ball's angle of departure. The training device may further be employed with all types of clubs, preferably with the exception of putters.

When playing golf, it is a known fact that there are often periods of inactivity during play on the course, while there also may often be a waiting period prior to the actual play because the course is busy etc., and for this reason it may be desirable to use a training device to practise strokes, particularly strokes with the "driver", with a view to polishing up one's swing and loosening up one's musculature before moving on to the course, or also during the course of the game. A training device of this kind, however, must be easy and light to carry while at the same time being of such a nature that it does not bother other people in the vicinity, and should be easy to move. Furthermore this should be combined with a very solid foundation for the training device, since after all substantial forces are involved when the ball is struck. The training device must therefore be easily "secured" to the ground and easily released from the ground when moving. Furthermore, it is desirable that such a training device should provide a natural stroke and the ball must therefore be able to move freely from the point of departure from, for example, a "tee" and must be able to move unchecked for a short distance in such a manner that the counter force on the club and the ball's departure motion are as natural as possible.

Moreover, it is naturally desirable to obtain an evaluation of how good the stroke is, for example by means of an indication of how far the ball would have travelled under normal circumstances, thus enabling the individual strokes to be evaluated against one another for subsequent polishing of one's stroke technique and swing, thereby improving one's proficiency at the game. Such an indication may be provided as a function of inter alia angle of departure, strike point and striking power.

With this in mind, it is desirable to provide a training device for golf strokes which to a great extent provides a natural stroke within a restricted area, and where the training device is so designed that it is light to carry and easy to fix
in the ground as well as being easy to move when the user wishes to move. Such a training device is provided according to the present invention and it is an object of the training device that it will also appear in at least one embodiment where an indication is given of the force of the stroke, and possibly an indication of how far the ball would have travelled under natural conditions.

From previously known solutions we refer inter alia to US patent 5,121,923 which describes a golf training device which is designed to meet a number of the objectives stated above in connection with the present invention. The device consists of a golf ball which via a rope or the like is connected to a bearing which rotates about a horizontally located shaft which in turn is connected to a stand or a frame. In its normal position the ball will be suspended at a desired distance above the base with the string or rope in a substantially vertical position from the bearing, and when the ball is struck by a golf club the ball rotates with the rope about the horizontal axis. The training device further comprises a device which can read and present the rotational velocity of the bearing connecting the ball and the rope with the horizontal shaft. This in turn offers the possibility of reading the force and angle of the stroke and it is also possible to present information concerning the direction of the ball as a result of the player's failure to strike the ball correctly, thereby producing a "slice" or "hook". In order to restrict the ball's rotation about the horizontal axis, on each side of the rope connecting the ball with the bearing there are provided brake discs which together form a groove where the rope rotates when the ball is struck by the player's club.

Moreover, in US patent 5,366,225 a training stand is described where a golf ball is suspended in a rope or the like from a horizontally located shaft, and is preferably connected with the shaft via a simple bearing device or the like. It is further stated that the horizontal shaft is a part of a stand which is arranged on a base plate which in turn can be placed in the ground with a "spike" or the like which is driven into the ground and keeps the base plate with the training stand in a suitable arrangement at a specific distance above the ground.

Moreover, in US patent 5,338,026 a training device for golf balls is described which can be used in connection with, for example, a basketball hoop. The training device is arranged on the top of the basketball hoop's upper ring and from this device there is freely downwardly suspended a device with a rope and a golf ball. The distance between the device which is placed above the
basketball hoop and the ground may be adjusted so that the golf ball assumes the desired position at a specific distance above the ground.

The prior art solutions which are described in the above-mentioned US patents 5,121,923 and US 5,366,225 relate to training devices where the golf ball rotates about a horizontal axis via a rope or the like. In many cases this may have obvious drawbacks with regard to the attachment of the training device to the ground where a torque is created about the attachment point in the ground as a result of the horizontal distance between the torque for the rope and the vertical axis over the attachment point(s). This torque may cause the training device to become unstable in its attachment in the ground, which in turn will result in a variation of the ball's distance above the ground from stroke to stroke, while at the same time leading to a direct risk of injury if the training stand works loose from the ground during or immediately following a stroke. Furthermore, any readings of the ball's angle and velocity will depend on whether the fulcrum about the horizontal axis extends about a correct, stable horizontal axis and if the training apparatus assumes an oblique position relative to the desired horizontal axis, the angular reading of the direction of the stroke will be wrong while the ball's velocity (rotation velocity) is affected by the oblique attachment. In addition, even while it is being struck, the ball will be restricted by the suspension device, thus restricting the "genuine" feeling of hitting the ball.

In order to overcome the above-mentioned disadvantages of previously known technical solutions, in addition to providing a training device for golf which meets the above-mentioned objects, according to the present invention a training device is provided according to the introduction to the following independent claim 1, with characterising features as indicated in the characterising part of the following claim 1. Further embodiments are indicated in claims 2 to 6 and in claim 7 a particularly suitable embodiment is indicated with characterising features as indicated in the characterising part of claim 7. Alternative embodiments associated with claim 7 are indicated in claims 8 to 12.

Thus a training device for golf is described, which device consists of an elongate body with an upper and a lower part, which device is mounted substantially vertically and where the lower part of the training device forms a base for keeping the training device in a correct position during use. This base may, for example, be composed of a lower part in the form of an earth spike or
other conical, elongate body which is inserted into the ground when the device is in use. Alternatively, the base may be composed of a plate or the like with substantial weight in order that the training device should remain stationary even when the ball is struck. According to the present invention, in one embodiment the upper part of the training device is provided with a seat for holding the golf ball and on the lower edge of the ball's seat there is attached a flexible body connecting the golf ball with the training device, the flexible body also being attached to the golf ball. This flexible body may be a rope or a wire, and the length may be varied according to requirements in such a manner that the ball does not strike surrounding objects or people, while at the same time the flexible body is sufficiently long to enable the ball to receive a natural direction of departure when struck. The ball's seat may be designed in such a manner that it surrounds parts of the ball's lower sphere in order to facilitate the transport of the training device. Furthermore, in a preferred embodiment there is provided in the ball's seat a groove in which the flexible body may be located during transport. In the preferred embodiment, moreover, the attachment point for the flexible body in the training device is rotatable about the training device's longitudinal axis.

The rotatable attachment for the flexible body may be composed of a bearing device such as a ring or the like which rotates about the training device's vertical body and longitudinal axis. When the user strikes the ball with the golf club, after moving some distance in free flight, the ball will thereby be restrained by the flexible body, and the ball then rotates about the training device's longitudinal axis. The ball is placed at a distance from the training device, for example on an ordinary "tee", and when the user strikes the ball in a stroke, the ball will immediately (after having stretched the flexible body) rotate around the training device's longitudinal axis. In a further embodiment the upper part of the training device is designed in such a manner that the bearing device, which is rotatable about the training device's longitudinal axis and upper part, can move freely along the training device in its longitudinal direction. This may be implemented, for example, by the training device being slightly conically tapering towards the upper end. In this connection in the preferred embodiment there may be provided a lower limiting device where the bearing device has its departure position, for example by resting on a plate or the like mounted round the training device's elongate body. The motion of the bearing device in the training device's longitudinal direction may further be implemented along a scale which indicates how far the ball would have
travelled under normal, free conditions. The bearing device's motion in the
training device's longitudinal direction will thus be a function of the stroke's
angle of departure and force (the ball's outgoing velocity) which will assist in
pulling the bearing device up along the training device's upper part. If, for
example, an iron with a high number or the like (pitch) is used, the angle will
be greater, but the force (departure velocity) will be lower and the stroke will
not necessarily be long even though the angle of departure is greater. In this
regard the scale is adapted in relation to the weight of the bearing device
which provides the rotatable connection about the training device, the length of
the flexible connection, etc.

In the attached figures there are further exemplified embodiments of the
present invention, in which:

fig. 1 is a sectional view from the side of the training device with an upper seat
for the ball;

fig. 2 is a plan view from the side of an embodiment where the flexible body is
rotatably mounted about the training device's upper part, and can move in the
device's longitudinal direction.

In fig. 1 the training device's elongate body is illustrated with an upper part 3
and a lower part 4 where a golf ball 6 is placed at the upper part. The golf ball
is connected to an attachment device 1 via a flexible body 7. In the preferred
embodiment the attachment device 1 is rotatably mounted about the upper part
3 of the elongate body. The ball 6 can be transported in a seat 5 where there is
provided a groove 8 where the flexible body 7 is located. Furthermore, the
lower part 4 of the training device is in the form of an earth spike or the like,
thus permitting the training device to be embedded in the ground.

Alternatively, the training device may be mounted on a relatively heavy plate
or other plate-shaped body which can be attached to a base by means of
suction cups or the like.

Furthermore, in fig. 2 an embodiment of the training device is illustrated where
the attachment 1 for the flexible body 7 connecting the golf ball 6 with the
training device is rotatably mounted about the upper part 3 of the training
device. Moreover, the upper part 3 is marked with a scale, for example from 0
to 300 metres (or yards), where there is also provided a lower limiting device 2
for the rotatable body 1, thus enabling the body 1 to rotate about the upper part
3 of the training device above the limiting device 2, while at the same time the
body 1 can move along the training device's longitudinal axis as a function of
the ball's angle of departure and velocity as the result of a stroke. In this
embodiment too the lower part of the training device 4 is in the form of an
earth spike or the like which is inserted into the ground, securing the training
devices for use. Alternatively, the training device in this embodiment can also
be mounted on a relatively heavy plate or other plate-shaped body which can
be attached to a base by means of suction cups or the like.

The figures and the description presented herein indicate only embodiments of
the invention and the inventive concept is set forth in the following patent
claims.
PATENT CLAIMS

1. A training device for golf, which device consists of an elongate device with an upper and a lower part (3, 4), which device is mounted substantially vertically, and where the lower part (4) of the training device forms a base for holding the training device in the correct position during use, characterized in that on an attachment device (1) on the upper part (3) there is attached a flexible body (7) connecting a golf ball (6) with the training device, where the flexible body (7) is also attached to the golf ball.

2. A training device according to claim 1, characterized in that the lower part (4) is in the form of an earth spike or other conical/elongate body which is inserted into the ground to the desired depth when the device is in use.

3. A training device according to claim 1, characterized in that the lower part (4) is in the form of a plate-shaped body.

4. A training device according to claims 1-3, characterized in that at the upper part (3) there is provided a seat (5) for holding the ball (6) and that the ball's (6) seat (5) is designed in such a manner that it surrounds parts of the ball's lower sphere.

5. A training device according to claims 1-4, characterized in that in the ball's (6) seat (5) there is provided a groove (8) for the flexible body (7) connecting the ball (6) with the training device.

6. A training device according to claims 1-5, characterized in that the attachment device (1) for the flexible body (7) in the training device is rotatable about the training device's longitudinal axis.

7. A training device for golf, which device consists of an elongate device with an upper and a lower part (3, 4), which device is mounted substantially vertically, and where the lower part (4) of the training device forms a base for holding the training device in the correct position during use, characterized in that on an attachment device (1) on the upper part (3) there is attached a flexible body (7) connecting a golf ball (6) with the training device, where the flexible body (7) is also attached to the golf ball (6), where the attachment device (1) for the flexible body (7) is rotatably mounted about the training device's upper part (3).
8. A training device according to claim 7, characterized in that the flexible body (7) connecting the training device and the ball (6) is attached to a bearing device (1) which is rotatable about the training device's longitudinal axis at the training device's upper part (3).

9. A training device according to claim 8, characterized in that the bearing device (1) which rotatably connects the ball (6) with the training device's upper part (3) via the flexible body (7) can move freely in the training device's longitudinal direction over a lower limiting device (2).

10. A training device according to claim 9, characterized in that the upper part (3) of the training device, above the lower limiting device (2) for the bearing device's (1) substantially vertical movement along the training device is slightly conically shaped with tapering diameter towards the upper end of the upper part (3) in order to assist the bearing device's (1) movement in the vertical direction.

11. A training device according to claims 7-10, characterized in that the lower part (4) is in the form of an earth spike or other conical/elongate body which is inserted into the ground to the desired depth when the device is in use.

12. A training device according to claims 7-10, characterized in that the lower part (4) is in the form of plate-shaped body.
A. CLASSIFICATION OF SUBJECT MATTER

IPC7: 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)

WPI, EDOC, JAPIO

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<td>GB 2035185 A (R.D.P. GOSSCURTH), 18 June 1980 (18.06.80), figure 1</td>
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<td>Y</td>
<td>US 3412897 A (C.R. SLATER), 26 November 1968 (26.11.68), figure 1, detail 39, 40</td>
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Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:
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