

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets

(11)

Publication number:

0 134 066
A1

(12)

EUROPEAN PATENT APPLICATION

(21)

Application number: **84302704.6**

(51)

Int. Cl.: **A 63 B 69/36**

(22)

Date of filing: **19.04.84**

(30)

Priority: **09.08.83 GB 8321410**

(71)

Applicant: **GOLFING WAY LIMITED, 142/4 Church Street, Bocking Braintree Essex CM7 5LA (GB)**

(43)

Date of publication of application: **13.03.85**
Bulletin 85/11

(72)

Inventor: **Way, Denys Roland, 142/4 Church Street, Bocking Braintree Essex, CM7 5LA (GB)**

(84)

Designated Contracting States: **AT BE CH DE FR GB IT LI LU NL SE**

(74)

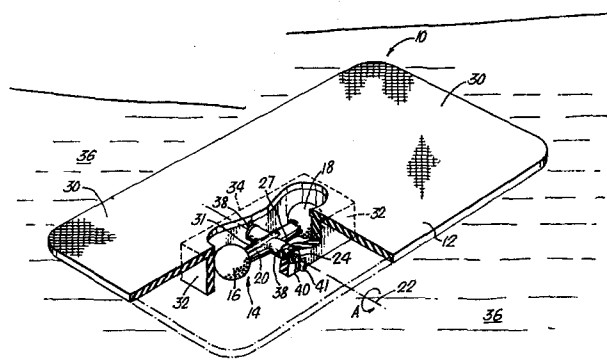
Representative: **Allen, Oliver John Richard et al, Lloyd Wise, Tregear & Co. Norman House 105-109 Strand, London, WC2R 0AE (GB)**

(54)

Improvements in and relating to golf practising devices.

(57)

A golf practising device (10) comprising a wholly integral spindle (14) pivotally mounted to a base structure (12) about a horizontal axis (22) so as to allow substantially free rotation thereabout and in such a way that on being hit by a golf club/wood it substantially simulates the feel of a conventional golf ball while at the same time remaining in the immediate vicinity of the base structure (12). The spindle (14) is pivotally mounted to the base structure (12) via either an axle (24) or a ball and socket joint (52, 54).



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IMPROVEMENTS IN AND RELATING TO
GOLF PRACTISING DEVICES

This invention relates to a golf practising device and in particular to the practise
5 driving/hitting of a golf ball.

It is usual for golfers when wishing to practise tee or fairway shots to take a number of golf balls and hit them on the practice range of a golf course. Such an arrangement is often inconvenient, for
10 example, the time and cost to travel to the nearest golf course, the possibility of losing some golf balls on the range and the possibility of the practice range being already in use by other golfers.

In order to overcome some of these problems,
15 and allow a golfer to practise at home, devices are known which support a golf ball at the end of a spindle whereby on hitting it may rotate about a vertical axis. Such arrangements have the disadvantages firstly in that the part of the device supporting the spindle
20 may be struck and damaged by a 'wild' shot and secondly in that the spindle can be supported on only one side thereof whereby the arrangement is inherently unstable.

Other devices are known which support a golf ball at the end of a biased spindle whereby free
25 rotation is prevented. The disadvantage of this

arrangement is that it does not give, when the ball is struck, the 'feel' of a conventional golf ball to a golfer.

It is an object to overcome or mitigate one of
5 more of the above problems.

A golf practising device in accordance with one aspect of the invention comprises a golf ball member integral with a mounting member which is pivotally mounted about a horizontal axis to a base structure so
10 as to allow substantially free rotation of the ball in a vertical plane while retaining the ball in the immediate vicinity of the base structure.

Such a device is simple in design, easy to use
and relatively inexpensive to manufacture.

15 The overall arrangement and construction of the device is such that it may be used many times without breakage yet provide the golfer when he hits the ball member with the feel of a conventional golf ball.

It has been found in particular that the
20 provision of an integral golf ball and mounting member helps to give the necessary inherent strength to the arrangement to absorb the "hitting" energy on the ball, while the provision of the ball and mounting member to pivot about a horizontal axis means that the other
25 parts of the device apart from the ball member itself

do not extend above the hitting surface and thus are not liable to damage or whatever, and finally the provision of a freely rotatable ball helps to give the correct feel of a conventional golf ball.

5 Preferably the simulated golf ball and integral mounting members are pivotally mounted to the base structure via an axle member, preferably a steel rod, which extends along a horizontal axis relative to the ground. The arrangement is preferably such that
10 both ends of the axle member are supported in order to cope with the stress that occurs when the golfer hits the ball member.

 Alternatively, the golf ball member is mounted by means, preferably a ball and socket-joint, to the
15 structure which allows for transverse and spinning movement of the golf ball member when hit, thus relieving stress on the device as a whole.

 The base structure may be provided with adjustable means in order to alter the height of the
20 ball member above the base structure so as to simulate upwardly or downwardly sloping ground and/or simulate a tee or ground shot. Means may be provided to locate the simulated golf ball at rest just above the upper surface of the base structure ready for hitting.

25 The simulated golf ball may be suitably

provided with means on said ball to indicate actual point of contact of the ball with the club/wood, such that the golfer knows whether he has correctly hit the ball or not.

5 Means may also be provided on the base structure to measure and indicate how hard the ball has been hit and/or the distance that the ball would have travelled if it had not been mounted.

Such a golf practising device may be assayed
10 substantially to simulate the feel of a conventional golf ball by providing the correct weight, elasticity and rotatability of the components to achieve such a result, and retains the ball on hitting in the immediate vicinity of the device so that the ball may
15 be re-hit immediately.

Clearly such an arrangement is versatile and may be used nearly anywhere including at home or at the office, negating the need to use a practice range at a golf course and the possibility of losing balls thereon.

20 In accordance with another aspect of the invention a golf practising device comprises a base structure, the upper surface of which in use is flush with ground level, and a golf ball member pivotally mounted to the base structure in such a way that on
25 being hit by a golf club/wood the golf ball member is

free to rotate freely in a vertical plane and substantially below ground level.

The invention will now be described, by way of example, with reference to the accompanying drawings,

5 in which:-

Figure 1 is a perspective view of one embodiment of the device in accordance with the invention,

Figure 2 shows in greater detail a front view
10 of a portion of the device of Figure 1,

Figure 3 shows the side view of the portion of the device as shown in Figure 2, and

Figure 4 is a side cross-sectional view of another embodiment of the device in accordance with the
15 invention.

The golf practising device 10 shown in Figure 1 comprises a base structure 12 and a spindle 14 mounted thereto. The spindle 14 has two simulated golf ball members 16 and 18, one at each end of a stem mounting
20 member 20 so as to counterweight and balance each other, the members 16, 18 and 20 being wholly integral so as to provide the necessary rigidity against the force and stress/strain caused by a golf club/wood hitting the ball member.

25 The spindle 14 is pivotally mounted to the base

structure 12 about a horizontal axis 22, and specially on a steel rod 24 which extends along that axis. The rod 24 passes through a bore 26 provided in a central elongated portion 28 of the mounting member 20, such
5 that the spindle 14 may rotate substantially free about the axis 22 and in the vertical plane 23. Preferably the bore 26 of the spindle 14 is lined by a steel insert 29 in order to prevent wear and tear of the spindle 14 on the steel rod 24.

10 The base structure 12 comprises two main portions, an upper portion 30 which defines a 'playing' surface on which the golfer swings his golf club/wood and a lower portion 32 which is hollow and in which the
15 ~~rod 24~~ extends there across such that both ends of the rod are securely supported to the portion 32 to provide rigidity to the device 10.

Preferably the upper portion 30 is of rubber with a linen insert in order to prevent quick wear and tear, while the lower portion 32 is also made of
20 rubber. The use of rubber is of advantage due to the fact that it 'absorbs' the various stresses and strains on the device caused by the ball member being hit, and further in that there is no problem with regard to rust/corrosion.

25 The lower portion 32 has a rectangularly shaped

outer edge (see 34), the 'squareness' of the leading or front end being such as to provide rigidity and stability to the device 10 when the ball member is struck. The side walls of the portion 32 meanwhile are
5 provided with inserts of plates of metal in order firstly to give a better hitting feel to the ball when struck and secondly to provide extra rigidity and stability to the device.

In use, a hole must be dug or formed in the
10 ground 36 corresponding in width and length to the lower portion 32 such that when the device 10 is placed therein, the device 10 is firmly secured in the ground and whereby the upper portion 30 is substantially level
with the upper surface of the ground 36. A golfer
15 wishing to practice a golf shot can then simply hit one of the ball members 16 or 18 which extends above the upper portion 30, after which the ball rotates (see arrow A) within the lower portion 32 and about the axis 22 thereby remaining in the immediate vicinity of
20 the base structure 12. The rod 24 is rigidly attached to slots 38 in the lower portion by securing means (e.g. split pin and washer) 40 at each end of the rod. The rod 24 and securing means 40 are adjustable between various alternative positions in the slots 38 in order
25 to alter the height of the ball member 16 or 18 above

the upper portion 30 so as to simulate upward or downward sloping ground and/or simulate a tee or ground shot.

Lugs 41 are provided on the outer side wall of the lower portion 32, against which the securing means 40 engage thereby preventing any further rotation of the rod 24.

The spindle 14 shown in Figures 2 and 3 is formed from a single mould of hard plastic material preferably of hardness in the range of 30 to 52°D (as measured by Durometer D - Method 150 54868). Even more preferably the plastic material is polyurethane and specifically polyurethane 4492 AC, 192 or 150.

Polyurethane 4492 AC which has been found to be the ideal spindle material has a hardness of 42, and a tensile strength of 42.4 MPa (Method 150 S3777(E)) and a Tear Strength (Angle) of 127 KN (Method DIN 53515).

The weight of the spindle 14 is preferably in the range of 3.8 to 4.2 oz and even more preferably 4 to 20 oz in order to provide the necessary 'feel' of a conventional golf ball when hit, and the use of Polyurathane 4492AC due to its elasticity and density was found to be ideal in this respect.

The spindle 14 is also provided with integral reinforcing ribs 27 which extend from the central

portion 28 of the stem member 20 to the ball members 16 and 18 in order to provide extra rigidity to the spindle 14. These ribs 27 extend substantially at right angles to the horizontal axis 22, and further are
5 positioned in a vertical plane containing that axis 22 whereby they are not damaged when a golf club/wood strikes a ball member.

Further but smaller reinforcing ribs 31 integral with the spindle 14 are also provided which
10 extend in a vertical plane at right angles to the axis 22, so as to provide a certain extra resistance against the effects of the force exerted when the ball member is struck.

The golf practising device 44 of Figure 4 is
15 shown placed within a hole in the ground 45, and comprises a base structure 46 and a spindle having a ball member 50 simulating a conventional golf ball at each end of a stem mounting member 48. The member 48 includes an integral ball portion 52 which moves and
20 engages in a half-socket 54 provided on each side of the structure 46 to form a ball and socket joint. The member 48 and balls 50 rotate laterally (see arrow C) in the structure 46 about a horizontal axis 56, while transverse and spinning movement also occurs due to the
25 ball and socket joint to relieve stress in the device

as a whole. The integral member 48 and balls 50 are of strong moulded plastic (e.g., polyurethane).

In order to counteract the considerable lateral strain exerted on the ball and socket joint (52, 54) 5 when the ball 50 is hit and which tends to move the two sockets 54 away from each other, an axle 64 (shown dotted) such as a steel rod may also be provided extending along the horizontal axis 56 which together with securing means 66 (shown dotted) would hold the 10 two half sockets 54 relative to each other. In this particular arrangement, the ball member 52 would be provided with a bore 68 (shown dotted) with a larger diameter than the axle 64 whereby only part transverse and spinning would be allowed.

15 These 'spinning balls' can be provided with means such as a bold line fixed around a circumference of the ball to indicate on hitting whether the ball has been sliced, hooked or hit correctly, and further to indicate the rate and amount that the ball is 20 spinning. The ball could also be covered in chalk or other substance which on being hit would indicate the actual point of contact with the club/wood head and provide information to the golfer as to whether the ball was sliced, hooked, topped etc.

25 The member 48 is also provided with ribs 58

which engage on every revolution a lug 60 mounted to the structure 46. The ribs 58 and lug may also act as a measuring device, each time the rib acting on the lug measuring half a revolution.

5 Alternatively the ribs 58 are in the form of rings movable on the shaft of the member 48, such that only one ring may be arranged to contact the lug 60 thereby positioning specifically one of the balls 50 and measuring instead a whole revolution.

10 Instead of ribs 58 and lug 60, the device 10 may be provided with a strain gauge, a photo-electric cell beam or magnetised strips in order to measure the number of revolutions.

 This information would then be computed to give
15 either an indication of yards travelled, revolutions per minute, velocity or the total number of revolutions..

 Means in the form of stoppers (not shown) may also be provided on the base structure to locate the simulated golf ball at rest just above the upper
20 surface of the base structure ready for hitting. In this regard, it has been found however that due to the counterweighting and arrangement of the spindle that there is a certain inherent capability of the spindle to stop at the correct position ready for re-hitting in
25 any case.

The upper surface 62 of the device 44, which is flush with the upper surface of the ground 45, is in the form of a plate may be adjusted (see arrow D) to simulate upwardly or downwardly sloping ground and/or
5 simulate a tee or rough lie shot.

In the devices shown in Figures 1 and 4, aging rotating spindles can be replaced with a new spindle after wear and tear.

Any one of the foregoing golf practise devices
10 may form part of a platform adjustably sloped to ground level and on which a golfer stands. The upper surfaces of the device would be flush with the platform level such that the golfer on the platform hitting the simulated golf ball can practise upward or downward
15 sloping lies.

CLAIMS:

1. A golf practising device comprising a golf ball member integral with a mounting member which is pivotally mounted about a horizontal axis to a base structure so as to allow substantially free rotation of the ball member in a vertical plane while retaining the ball in the immediate vicinity of the base structure.
2. A device as claimed in Claim 1 wherein the integral golf ball and mounting members are mounted to the base structure by means which also allow transverse and/or spinning movement of the golf ball member.
3. A device as claimed in Claim 2 wherein said means is a ball and socket joint.
4. A device as claimed in Claim 1 wherein the integral golf ball and mounting members are pivotally mounted to the base structure via an axle which extends along said horizontal axis.
5. A device as claimed in any preceding Claim including means to locate the golf ball member after hitting to a position just above the base structure ready for rehit.
6. A device as claimed in any preceding Claim wherein means on the golf ball member are provided to indicate the actual point of contact of said member with the golf club/wood.

7. A device as claimed in any preceding Claim including means to measure and then indicate either how hard the ball member was hit and/or the distance the ball would have travelled if not mounted.

5 8. A device as claimed in any preceding Claim wherein adjustable means are provided on the base structure in order to alter the height of the golf ball member above the base structure so as to simulate upward or downward sloping ground and/or simulate a tee
10 or rough lie shot.

9. A device as claimed in any preceding Claim wherein the integral golf ball and mounting members are provided with reinforcing means which extend substantially at right angles to said horizontal axis.

15 10. A device as claimed in any preceding Claim wherein there is a golf ball member integral with the mounting member at each end thereof so to counterweight each other.

11. A golf practising device comprising a base
20 structure, the upper surface of which in use is flush with ground level, and a golf ball member pivotally mounted to the base structure in such a way that on being hit by a golf club/wood the golf ball member is free to rotate freely in a vertical plane and
25 substantially below ground level.



Fig. 2.

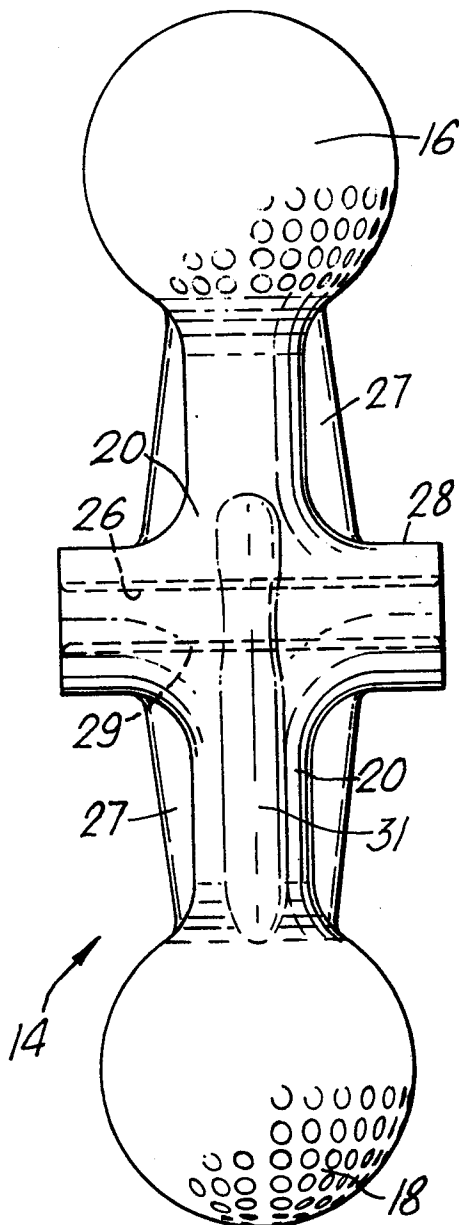
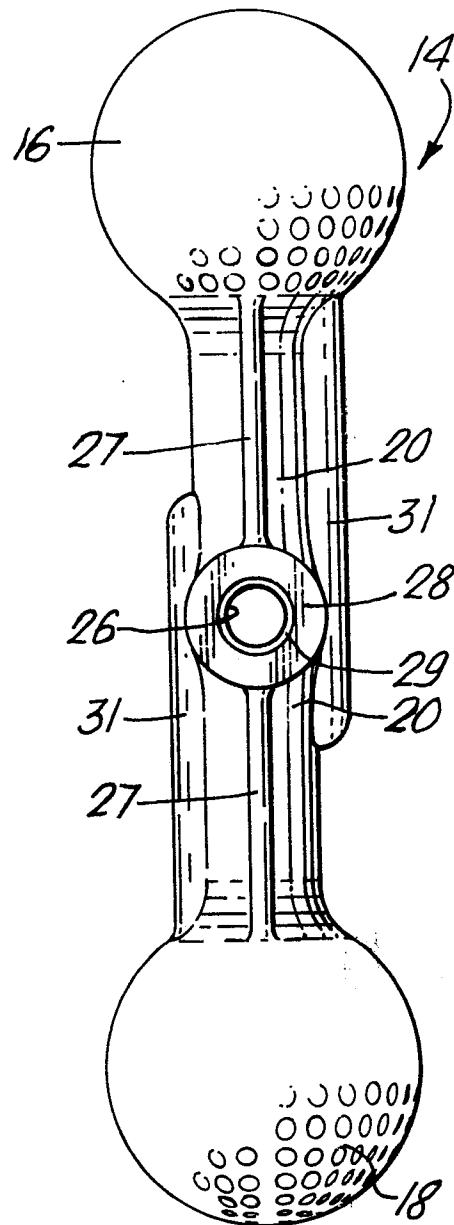


Fig. 3.





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EUROPEAN SEARCH REPORT

0134066

Application number

DOCUMENTS CONSIDERED TO BE RELEVANT			EP 84302704.6
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X	<u>GB - A - 193 321 (STOKOE)</u> * Claims; page 3, left column, lines 3-7, 16-24; fig. 1,4 * --	1,2,4,7,10,11	A 63 B 69/36
X	<u>GB - A - 1 076 573 (CAMERON)</u> * Claim 1; page 1, left column, lines 9-19; fig. 3 * --	1,2,4,10,11	
X	<u>US - A - 3 743 296 (BRANZ)</u> * Abstract; fig. 4; column 3, lines 29-42 * --	1,4,5,7,9,11	
X	<u>US - A - 3 535 936 (HOWELL)</u> * Abstract; fig. 2,4 * --	1,4,5,7,11	
X	<u>GB - A - 1 122 531 (CLARK)</u> * Claims; fig. 2-4 * --	1,5,11	TECHNICAL FIELDS SEARCHED (Int. Cl.4) A 63 B 69/00
X	<u>US - A - 1 932 049 (RYAN)</u> * Claims; fig. 4-7 * --	1,4,10,11	
X	<u>US - A - 1 213 679 (MURPHY)</u> * Totality * --	1,4,10,11	
X	<u>US - A - 3 647 219 (RAVATT)</u> * Abstract; fig. 1,2 * ----	1,4,10,11	
The present search report has been drawn up for all claims			
Place of search VIENNA		Date of completion of the search 10-10-1984	Examiner SCHÖNWÄLDER
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			