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54 **Improvements to magnetic ball and target.**

57 A magnetic ball (1) comprises a hollow sphere (2) of magnetic material and a resilient covering (3).

A target substituting for a golf hole has two parts, a thin plate (4) of permeable magnetic material, and a cylindrical permanent magnetic (5) of significant thickness mounted upon the plate.

The plate size is approximately equal to that of a golf hole. The magnet (5) physically obstructs the passage of a ball over the plate, the thickness of the

magnet being chosen to give the desired degree of obstruction. The magnet is strong enough positively to locate a ball on the plate.

The degree of physical obstruction reduces with increasing distance between the line of travel of the ball and the centre of the disc.

In other embodiments physical obstruction to the passage of the ball is provided by a ring 6 or vanes 9.

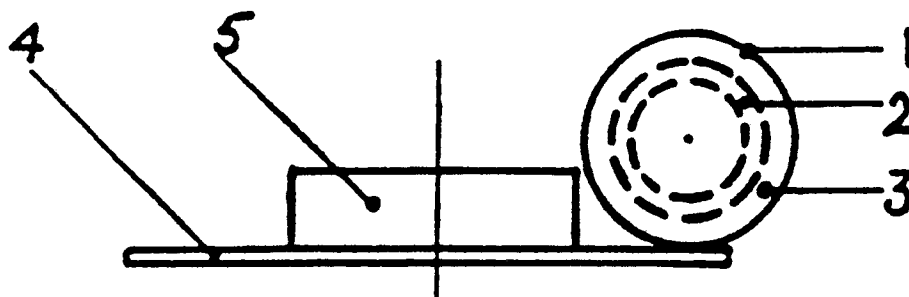


FIG 1.

IMPROVEMENTS TO MAGNETIC BALL AND TARGET

This invention is concerned with the improvement of equipment for the playing of golf or like "hole and ball" games without the need for holes.

Attempts have been made in the past to produce equipment for the playing of golf putting or like games eliminating the need for an hole. Two good examples of these attempts are :-

(a) A mechanical means where a circular disc considerably larger than a golf hole has several small rocking plates arranged around the periphery of the disc which allow a ball to roll in but not out. This is not a very good simulation of normal golf putting conditions.

(b) A ball containing magnetic material and a magnetically permeable disc the same diameter as that of a golf hole with a permanent magnet mounted upon it. This construction requires a strong magnet and is relatively costly.

The present invention seeks to solve the problem of providing a better and more economic solution by emulating normal hole and ball conditions more faithfully than with the use of a ball and disc.

There are several requirements which should preferably be met for a game where a disc or plate replaces the hole to be an acceptable substitute for the real thing which are as follows :-

(i) The ball must have the same weight, size and physical characteristics as a standard golf ball.

(ii) A ball rolling towards the plate must not be attracted towards or on to it until the ball well overlaps the edge of the plate.

(iii) A ball rolling slowly over the edge of the hole will fall into it. Therefore a ball rolling slowly over the edge of a substituted plate must be attracted and held positively onto the plate.

(iv) A ball travelling more quickly will firstly carry over the front edge of the hole, lose height in a falling trajectory, and then strike the far edge of the hole. Up to a certain critical velocity the ball's kinetic energy will be destroyed and it will fall back into the hole. Above this critical velocity the ball will strike the far edge of the hole faster and higher, and will carry on beyond the hole. This critical velocity is lower as the line of travel of the ball is offset from the line running through the centre of the hole.

With the magnetic construction referred to in (b) above, a ball rolling over the disc has to be stopped by magnetic forces. The mechanism being that when an electrical conductor passes through a magnetic field, it suffers resistance to its movement. To achieve an adequate arresting force a relatively strong magnetic field is required with resultant higher costs and field strength control problems at the end of the disc.

The present invention provides a golf putting or other "hole and ball" game, in which the gravitational field and hole edge system which control the fall of the ball into the hole are simulated by a plate and ball, each containing or comprising magnetic material, which material of either or both is magnetised, characterised in that the game includes means to cause significant physical obstruction to the passage of the ball over the plate.

The target may comprise a thin plate with one or more protuberances from its upper surface to cause significant obstruction to the passage of the ball over the plate.

The target may comprise a thin plate with one or more permanent magnets of substantial thickness mounted upon it in order to cause significant obstruction to the passage of the ball.

The target may comprise a thin permanently magnetised plate with obstructive protuberances on its upper surface.

The target may comprise a thin plate with one or more permanent magnets and one or more separate protuberances mounted upon it.

The target may comprise a thin plate with three or more substantially radial vanes mounted upon it.

The target may comprise a permanently magnetised plate of significant thickness.

The height of obstructing protuberances above the upper surface of the plate is preferably in the range of 15% to 40% of the diameter of the ball.

The ball may comprise a core of magnetic material with a resilient covering.

The ball may contain magnetic particulate material mixed with rubber or like resilient material.

The ball may contain one or more permanent magnets.

The target may comprise a block mounted upon one or more plates to create sectors for achieving different scores.

By way of example, specific embodiments of the invention will now be described, with reference to the accompanying drawings, in which :-

Figure 1 is an elevation showing a first embodiment of the invention, comprising a disc, magnet and ball;

Figure 2 is a plan view of the embodiment shown in Figure 1;

Figure 3 is an elevation showing a second embodiment of game according to the invention, comprising a disc, magnet and ring;

Figure 4 is a plan view of the embodiment shown in Figure 3;

Figure 5 is an elevation showing a third embodiment comprising a disc, magnet and vanes; and

Figure 6 is a plan view of the embodiment shown in Figure 5.

The first embodiment which is illustrated in Figures 1 and 2 consists of a ball 1 which has a hollow spherical core of magnetically susceptible material 2 and with a resilient covering 3. There is also a target disc consisting of a base 4 made of magnetically susceptible material and a cylindrical permanent magnet 5 of relatively moderate strength and cost. A ball 1 travelling along line A at low speed will roll up to the edge of the plate 4 and be drawn positively onto the disc by the magnetic field. A faster ball travelling along line A will collide with the top edge of magnet 5, will be stopped and then held positively upon the plate assembly by the magnetic field. An even faster ball will bounce over obstruction 5 and roll on beyond the disc.

A ball travelling along line B in Figure 2 will strike block 5 obliquely and will not be retarded as effectively. The critical speed will therefore be lower. Similarly a ball travelling along line C will not strike block 5 and will not be retarded by the magnetic forces with a resultant very low critical velocity.

The simulation of normal putting conditions is therefore very good, and requires a much lower level of magnetic energy than a system with little or no mechanical obstruction provision.

In order to offer a suitable degree of physical obstruction the height or thickness of block 5 can conveniently be in the range of 15% to 40% of the diameter of the ball. At lower thicknesses than 15% little effect obstruction is given, at thicknesses greater than 40% of the ball diameter, the ball bounces back from the edge of the obstruction.

A further advantage of this construction is that a ball rolled up to the target accurately and at optimal speed will be attracted to come to rest on top of block 5. A ball rolling on a less accurate line or at a speed greater or lesser than optimal will come to rest on the plate periphery. This allows a more interesting game to be played with different scoring levels as opposed to the "hit or miss" of normal golf putting. The block and plate can be mounted on a third plate to give a third level of scoring.

An alternative embodiment is shown in Figures 3 and 4 where a ring of non-magnetic material 6 and compact permanent magnet 7 of relatively high strength are mounted upon disc 8 which is magnetically permeable.

In the third embodiment shown in Figures 5 and 6 there are radial, obstructing vanes 9 and a strong magnet 10 mounted upon a permeable plate 11. The required radial variation in degree of obstruction can be achieved by the inclination of the top edge of the vanes.

The reader's attention is directed to all papers

and documents which are filed concurrently with or previous to this specification and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

Each feature disclosed in this specification (including any accompanying claims, abstract and drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

Claims

1. A golf putting or other "hole and ball" game, in which the gravitational field and hole edge systems which control the fall of the ball into the hole are simulated by a plate (4,8,11) and ball (1) each containing or comprising magnetic material, which material of either or both is magnetised characterised in that the game includes means (5,6,9) to cause significant physical obstruction to the passage of the ball (1) over the plate (4,8,11).

2. A game as claimed in Claim 1, in which the target comprises a thin plate (4,8,11) with one or more protuberances (5,6,9) from its upper surface to cause significant obstruction to the passage of the ball over the plate.

3. A game as claimed in Claim 1, in which the target comprises a thin plate (4) with one or more permanent magnets (5) of substantial thickness mounted upon it in order to cause significant obstruction to the passage of the ball.

4. A game as claimed in Claim 1, in which the target comprises a thin permanently magnetised plate (8,11) with obstructive protuberances (6,9) on its upper surface.

5. A game as claimed in Claim 1, in which the target comprises a thin plate (8,11) with one or more permanent magnets (7,10) and one or more

separate protuberances (6,9) mounted upon it.

6. A game as claimed in claim 1, in which the target comprises a thin plate (11) with three or more substantially radial vanes (9) mounted upon it.

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7. A game as claimed in Claim 12, in which the target comprises a permanently magnetised plate of significant thickness.

8. A game as claimed in any one of Claims 2 to 6, in which the height of obstructing protuberances above the upper surface of the plate (4,8,11) is in the range of 15% to 40% of the diameter of the ball (1).

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9. A game as claimed in any one of the preceding Claims, in which the ball comprises a core of magnetic material (2) with a resilient covering (3).

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10. A game as claimed in any one of Claims 1 to 8, in which the ball contains magnetic particulate material mixed with rubber or like resilient material.

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11. A game as claimed in any one of Claims 1 to 8, in which the ball contains one or more permanent magnets.

12. A game as claimed in Claim 1, in which the target comprises a block mounted upon one or more plates to create sectors for achieving different scores.

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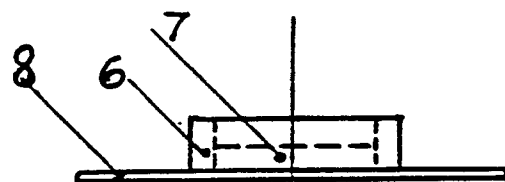
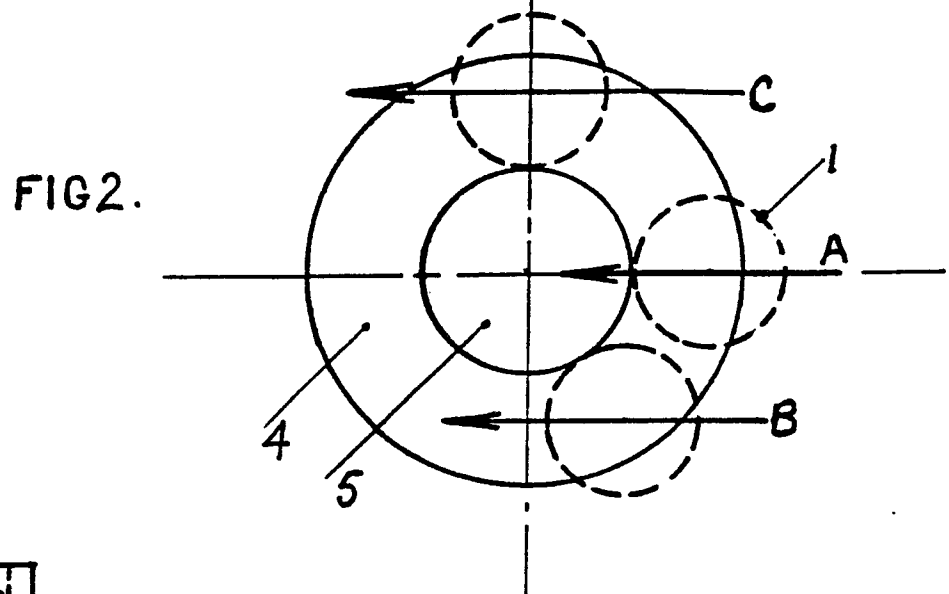
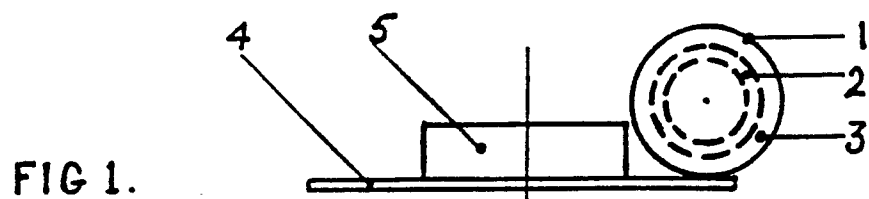


FIG 3.

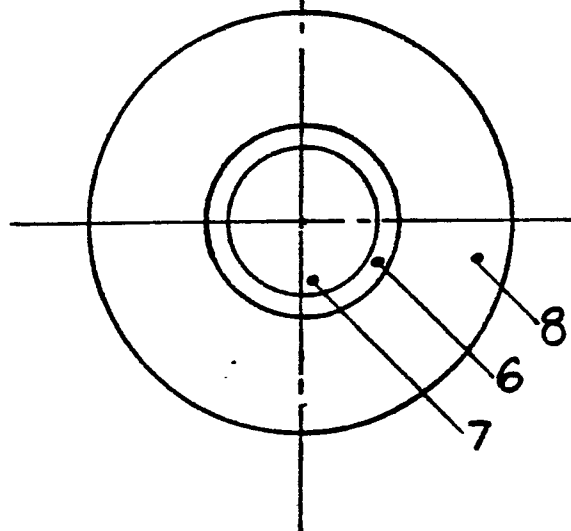


FIG 4

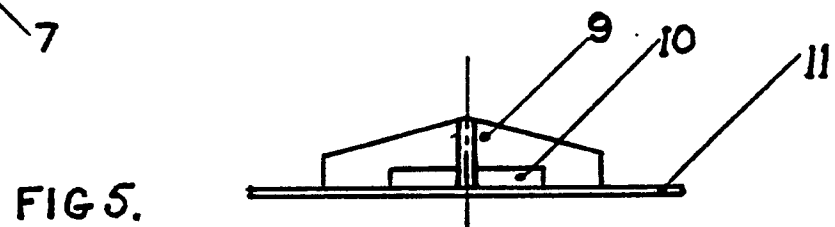


FIG 5.

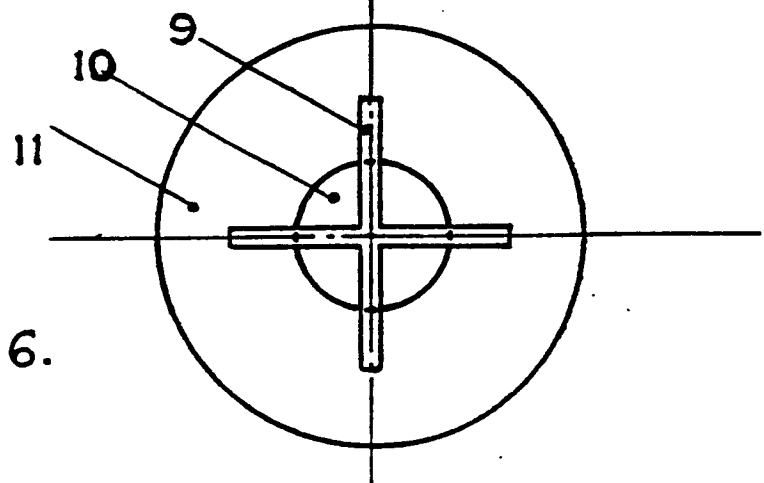


FIG 6.

DOCUMENTS CONSIDERED TO BE RELEVANT			EP 90303400.7
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ⁵)
A	<u>GB - A - 2 201 100</u> (WALSH) * Totality * --	1,3,7, 9,11	A 63 B 57/00
A	<u>GB - A - 1 350 842</u> (GOLBY) * Fig. 1-5; page 2, lines 38-65 * --	1,2	
A	<u>US - A - 4 007 938</u> (GUENTHER) * Fig. 1-3; column 2, lines 37-41 * --	1	
A	<u>GB - A - 184 409</u> (DEAN) * Fig. 1-5; page 2, lines 97-105 * --	1	
A	<u>US - A - 3 752 482</u> (CASSEL) * Fig. 1-5 * --	1	
A	<u>GB - A - 1 194 485</u> (HAWLEY) * Fig. 1-3, page 1, lines 60-74 * --	1	
A	<u>US - A - 1 338 963</u> (ROLFE) * Fig. 1-3; page 1, line 78 - page 2, line 4 * ----	1,12	
The present search report has been drawn up for all claims			
Place of search VIENNA		Date of completion of the search 19-06-1990	Examiner BRÄUER
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	