GOLF PRACTICE APPARATUS

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ABSTRACT

Apparatus is provided for enabling a golfer to practice putting, and which is also useful for practicing chipping, pitching, and full golf swings. The apparatus includes a base which defines a putting surface, and it comprises two spring-biased sensor arms which extend upwardly from the putting surface, and which are spaced apart on either side of the path along which the ball is to be putted. In the operation of the apparatus, the ball is placed between the sensor arms and the golfer lines up his putter behind the sensor arms. Then, when the golfer strokes the ball, the putter blade strikes the sensor arms and causes them to be turned down towards the plane of the putting surface against their spring bias. If both sensor arms are struck simultaneously by the putter blade, a central indicating light is energized. If both sensor arms are struck simultaneously by the putter blade, a central indicating light is energized. On the other hand, if one or the other of the sensor arms is struck first by the putter blade, indicating an error to the left, or to the right, either one of two further indicating lights is energized to indicate a "left" or a "right" putting error.

8 Claims, 5 Drawing Figures
This application is a continuation-in-part of copending application Ser. No. 381,708 which was filed July 23, 1973 in the name of the present inventor and is now abandoned.

BACKGROUND OF THE INVENTION

As every golfer knows, putting is a most important part of his game, and his putter is used more than any other single club. Therefore, it is most important for a golfer to perfect his putting skill. There are two familiar difficulties encountered in putting. The first is the ability to move the putter in a perfectly straight line towards the hole, and the second is the ability at the same time to hold the putter blade exactly perpendicular to the path along which the ball is to travel, as the putter is stroked through the ball.

Directional putting errors are caused by the golfer causing the putter to strike the ball at a point other than the center of the putter blade which produces skewing of the putter blade as the ball is being struck, by causing the putter blade to be angularly displaced with respect to the desired direction, or by striking the ball with the blade moving across the desired path of ball movement instead of along the path. Any one of these errors in the putting stroke can cause the ball to miss the cup.

The apparatus of the invention is especially constructed to enable the golfer to correct the putting errors referred to in the preceding paragraph, and to acquire the capability of moving the ball along the desired path to the hole with the putter blade exactly perpendicular to the path. The apparatus of the invention provides an indication as to whether the golfer has fulfilled the aforesaid criteria, before, during and immediately after impact of the putter blade with the golf ball.

The apparatus of the invention operates in a manner to provide the golfer with an instantaneous indication as to whether he has putted the golf ball properly. Thus, he can immediately detect any putting error, as he is making it, and this detection occurs at the exact time the error arose. In the use of the apparatus of the invention, the golfer does not have to wait until the ball has stopped rolling to determine whether or not the ball missed the hole, and he can immediately start analyzing the errors, if any, that he may have committed.

In the apparatus of the invention, and as explained briefly above, unless the putter blade is exactly perpendicular to the path along which the golf ball should travel at the moment of impact with the ball, the resulting angular error of the putter blade will cause an unequal angular displacement between the two spring-biased upright sensor arms. This angular displacement between the sensor arms actuates a switch of pre-set sensitivity in such a direction as to enable a corresponding indicating light to be activated at the instant one or both sets of arms are struck by the putter, to indicate whether the putter blade is perpendicular to the path, or whether a "right" or "left" angular putting error has occurred.

Furthermore, by positioning the sensor arms so that they are separated by a distance which is a function of the length of the putter blade, a small axial displacement between the center of impact of the putter blade and the desired ball path will result in only one sensor arm being struck, thus creating an error which is immediately detected by the apparatus of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective representation of the apparatus of the present invention in one of its embodiments;

FIG. 2 is an elevational view of the embodiment of FIG. 1, and is also a diagram of the electric circuitry associated with the embodiment;

FIG. 3 is a top plan view of a presently preferred embodiment of the invention;

FIG. 4 is a side elevation of the embodiment of FIG. 3; and

FIG. 5 is a schematic representation of the operating components of the embodiment of FIG. 3, and of its associated electric elements and circuitry.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENTS

In the embodiment of FIG. 1, for example, the apparatus of the invention is contained in a rectangular housing 10, the top of which forms a putting surface. A ball 12 is placed on a tee 26 on the putting surface between a pair of upright spring-biased sensor arms 14 and 16. The sensor arms 14 and 16 extend up through slots 15 and 17 in the housing 10, and these arms are turned down towards the putting surface as the blade 18 of a putter is stroked along the path on which the ball is to be putted and past the sensor arms after impacting the ball.

For a perfect putt, both of the spring-biased sensor arms 14 and 16 must be turned down at the same time. In the embodiment of FIG. 1, an indicator light 20 is energized when the arm 14 is struck before the arm 16, thus indicating an angular error to the right. A further indicator light 22 is provided which is energized when the arm 16 is struck before the arm 14 to indicate an angular error to the left, and a third indicator lamp 24 is provided which is energized when both sensor arms are struck simultaneously by the putter blade to constitute a positive indication of a correct putt.

In the embodiment of FIG. 2, an elongated yoke 50 is pivotally mounted on a screw 52 for horizontal angular movement about the vertical axis of the screw 52 directly under the putting surface formed by the top of the housing 10. The head of the screw 52 may constitute the tee 26 for the golf ball 12. In the embodiment of FIG. 2, a first elongated horizontal arm 54 is clamped to one end of the yoke 50 by an appropriate clamp 56, the arm 54 extending parallel to the axis of the yoke 50 beyond one end of the yoke. Likewise, a second elongated horizontal arm 58 is clamped to the other end of the yoke 50 by an appropriate clamp 60, the arm 58 extending beyond the other end of the yoke parallel to its axis, and in axial alignment with the arm 54. A pair of springs 62 and 64 attached to the respective arms 54 and 58 bias the yoke 50 to a centered angular position perpendicular to the path of the golf ball 12 when it is properly putted.

The sensor arm 14 is pivotally mounted on the arm 54, and it is spring-biased to an upright position in its corresponding slot 15 (FIG. 1) against a restraining bar 68 by means of a spring 66. Likewise, the sensor arm 16 is pivotally mounted on the arm 58, and a spring 70 holds the latter arm upright in its slot 17 (FIG. 1) against a restraining bar 72.
When the golf ball 12 is hit properly by the putter blade 18 in FIG. 1, both of the sensor arms 14 and 16 are struck at the same time, and both are turned down together about the common axis of the horizontal arms 54 and 58 against the biasing pressure of the springs 66 and 70, and the yoke 50 remains in its angularly centered position. So long as the yoke 50 remains angularly centered, a contact 80 on the end of the arm 58 remains centered between two fixed contacts 82 and 84.

However, if the sensor arm 16 is struck before the sensor arm 14, the yoke 50 and the horizontal arms 54 and 58 turn about the vertical axis of screw 52, so that the contact 80 moves into engagement with the fixed contact 82. On the other hand, if the sensor arm 14 is struck prior to the sensor arm 16, the yoke 50 and horizontal arms 54, 58 turn about the vertical axis to bring the contact 80 into engagement with the fixed contact 84. The indicator lights 20 and 22 are connected respectively to the fixed contacts 82 and 84, and to the negative terminal of a battery 90. The positive terminal of the battery is connected to the arm 58 which provides a conductive path to the contact 80.

As shown in FIG. 2, the contact 80 is spring-biased on the end of the arm 58 by means of a spring 81 into engagement with a third fixed contact 83. The contact 83 is connected through a further indicator light 24 to the negative terminal of the battery 90. Therefore, so long as the yoke 50 and the arms 54, 58 remain angularly centered about the vertical axis, a circuit is completed to the light 24, so that the light 24 is energized. As will be described, an appropriate switch is interposed in the circuit of the indicator lights, so that the light 24 is energized only when the contacts 80 and 83 are closed, and only after the sensor arms 14 and 16 have been turned down by the putter blade through a predetermined angular distance. In this way, the light 24 will glow to indicate a perfectly putted ball.

The indicator lights 20, 22, and 24 are shunted by respective capacitors 92, 94 and 96 which serve to prolong the intervals in which the lights are energized upon contact being established between the contact 80, and the fixed contacts 82, 83 and 84. It will be appreciated, therefore, that a putting error to the right causes the indicator light 20 to be energized, a putting error to the left causes the indicator light 22 to be energized, and a perfect putt causes the indicator light 24 to be energized.

Thus, in the embodiment of FIG. 2, the spring-biased upright sensor arms 14 and 16 are pivotally attached to the respective horizontal arms 54 and 58 at the respective end of the yoke 50. The sensor arms turn in a plane perpendicular to the plane of angular movement of the yoke as they are struck by the blade of the putter, to be turned down towards the putting surface. The yoke is attached to the underside of the top of the housing 10 by the screw 52 which forms the pivotal axis, and which allows the yoke and arms to turn in a plane parallel to the putting surface. Both the yoke and sensor arms are restrained by, and returned to their normal undisturbed positions by means of the springs 62, 64 and 66, 70 respectively. The pivot arm 58 also serves as the center pole of the switch formed by the contacts 80, 82, 83 and 84. The contact 80, in an embodiment to be described, is adjustable relative to the contacts 82 and 84, so that the sensitivity of the apparatus may be set to any desired degree, thus simulating accuracies required for different distances from the hole.

As described above, should either sensor arm 14 or 16 be angularly displaced relative to the other due to a putting error, electrical contact is established between the movable contact 80 and one of the two fixed contacts 82 and 84, so that the indicator light 20, or the indicator light 22, is energized. On the other hand, if the ball is struck properly, the contact 80 remains in contact with the contact 83, and the indicator light 24 is energized.

In the embodiment of FIGS. 3-5, the requirement for the centering springs 62 and 64 is obviated since there is no need for the yoke in the second embodiment to be held in an angularly centered position. The embodiment of FIGS. 3-5 may be reduced considerably in size as compared with the embodiment of FIG. 1, and it is constructed so that the sensor arms may be turned down into the plane of the putting surface when the apparatus is not in use, and held in that plane, so as to provide a compact and easily stored unit.

The second embodiment, as shown in FIG. 3, includes a T-shaped base 10A, so that its forward portion has a decreased width, as compared with its rear portion. The sensor arms 14 and 16 are supported on aligned threaded rods 101, 103 extending from the ends of a transverse yoke 100 and protruding beyond the side edges of the forward part of the base as shown. The rods 101 and 103 turn in the yoke 100, as shown in FIG. 5, and, against the biasing of the springs 105 and 107. The springs normally function to hold the sensor arms 14 and 16 upright with respect to the putting surface.

The sensor arms 14 and 16, instead of turning in slots in the base, as was the case in the embodiment of FIG. 1, are positioned out from the side edges of the forward portion of the base 10A, as shown in FIG. 3. The sensor arms 14, 16 may be threadably adjusted along the rods 101, 103 to provide any desired spacing between the sensor arms. In this way, the spacing between the sensor arms 14, 16 may be adjusted to correspond to the length of the putter blade, in order that any slight misalignment of the putter blade with the ball 12 will cause only one of the sensor arms to turn, indicating an error. The adjustable spacing between the sensor arms is achieved by providing bushings 102, 104 attached to the sensor arms and threaded to the rods 101, 103; and which are set to desired positions on the rods. The bushings are held in place on the rods by appropriate set screws 106, 108.

A pair of tabs 95 and 97 are provided which slide in and out from the side edges of the forward portion of the base 10A, and which serve to hold the sensor arms 14 and 16 in their down position when the apparatus is not in use.

As shown in FIG. 5, sector switch arms 110, 111 are attached to rods 101 and 103, and located at each end of yoke 100. Each switch has a fixed arcuate contact 120, 121 mounted on the base 10A. The biasing springs 105 and 107 are attached to the sector switch arms 110 and 111. The sector switch arms 110, 111 are closed to fixed arcuate contacts 120 and 121 as the sensor arms 14 and 16 are turned down from their upright position, and remain closed until the arms are turned down to the position shown in FIG. 3. These switches provide that the electrical circuitry associated with the apparatus normally is de-energized, and remains de-energized.
until one or the other of the sensor arms 14, 16 is moved slightly by the putter. Therefore, there is no need for the yoke 100 to remain centered when the putter is not in use, because the indicating lights are not energized until the ball is actually stroked. Also, the switches 110 and 111 assure that the electrical circuitry will be de-energized when the arms are in the position of Fig. 3, and when the apparatus is not in use.

As shown in Fig. 5, for example, an elongated threaded rod 116 extends out from the yoke 100 at its point, and turns with the yoke about the vertical axis of the screw 52. A contact 118 is threaded to the rod 116 to be adjustable along the rod, and this contact selectively contacts a pair of elongated fixed contacts 82A and 84A as the yoke 100 and rod 116 turn about the vertical axis of the screw 52. Fixed contacts 82A, 83A and 84A are attached to the sensing contact assembly, which is in turn mounted on base 10A. The contact 118 may be adjusted along the rod 116 to provide any desired sensitivity to the apparatus. The fixed contact 83A engages the adjustable contact 118, and it establishes contact with adjustable contact 118 so long as it remains in its center position, as shown in Fig. 5.

The circuitry shown in Fig. 5 is similar to that previously illustrated in Fig. 1. It will be appreciated that when the sensor arms 14 and 16 are in their upright position, as released by the tabs 95 and 97, of Fig. 3, both sector switches 110 and 111 are open, so that the connection to the positive terminal of the battery 90 is broken. In lining up his putt, the golfer lines up the blade of his putter with the upright sensor arms 14 and 16, and turns the blade of the putter and the arms to a centered position, if his alignment is accurate. In that position, adjustable contact 118 is closed to contact 83A. Then, if the golfer puts the ball properly, both the sensor arms 14 and 16, will be turned down together to close the sector switch arms 110 and 111, and to complete a circuit through the contacts 118 and 83A to the central indicator light 24, which is energized to indicate a proper putt.

On the other hand, should one or the other of the sensor arms 14 or 16 be struck by the putter blade before the other, the yoke 100 will turn about the vertical axis of screw 52, to cause the adjustable contact 118 to break with the contact 83A, and to cause the adjustable contact 118 to contact with one or the other of the fixed contacts 82A, 84A. Then, when one or the other of the sector switch arms 110 or 111 establishes the electric circuit, the indicator light 20 or the indicator light 22 will be illuminated. It will be appreciated that there are additional means for achieving the off-on-off operation of the sector switches 111 and 120, and 110 and 121.

The apparatus described here may be completely self-contained within its own housing, and may have its own power supply, to be readily portable to suit the convenience of the golfer. The apparatus of the invention is advantageous in that by placing the indicator lights adjacent the ball, they train the golfer to keep his head stationary. Specifically, when putting, the golfer concentrates on assuring that the center light 24 will be energized, rather than the lights 22 or 20, and instead of jerking his head towards the hole to see whether or not the ball is going to drop, he will keep his head stationary and concentrate on the light 24. The apparatus of the invention also makes it possible, in restricted areas, for an accurate putting stroke, and other golf strokes, to be developed without actually using a ball.

It will be appreciated that although particular embodiments of the invention have been shown and described, modifications may be made. It is intended in the following claims to cover the embodiments which come within the spirit and scope of the invention.

What is claimed is:

1. Golf training apparatus comprising: a housing having a top defining a putting surface along which a golf ball is to be moved by the face of a golf club along a predetermined path; first and second spring-biased elongated sensor arms normally extending upwardly from the aforesaid surface on each side of said predetermined path in position to be engaged by the face of the club as the club is moved along the path to impact the golf ball, and to be turned down thereby toward the plane of the putting surface, said sensor arms being positioned to be engaged simultaneously by the face of the golf club as it is moved along the predetermined path only if the face of the club has a particular angular relationship with the path and is properly centered with respect to the path; an elongated yoke pivotally mounted to the underside of the top of the housing for angular movement about a vertical axis in a plane parallel to and displaced down from the plane of the putting surface; spring-biased means mounting said sensor arms to the respective ends of said yoke for independent angular movement of said sensor arms about a horizontal axis; first and second electrically energized indicator lights; electric contact means mechanically coupled to said yoke; and electric circuitry connecting said indicator lights to said contact means to cause said indicator lights to be selectively energized upon angular movement of the yoke about said vertical axis in one direction or the other.

2. The golf training apparatus defined in claim 1, in which said mounting means for said sensor arms comprises first and second axially aligned rods.

3. The golf training apparatus defined in claim 2, in which the sensor arms are adjustable to pre-set positions along said rods.

4. The golf training apparatus defined in claim 2, in which said rods extend beyond the sides of the housing to support the sensor arms in positions displaced out from the sides of the housing.

5. The golf training apparatus defined in claim 4 and which includes side tabs for releasably holding the sensor arms down adjacent the sides of the housing.

6. The golf training apparatus defined in claim 1, and which includes a further rod affixed to said yoke at the pivotal point thereof and extending out from the axis of said yoke below the top of the housing; and in which said electric contact means includes a first contact movable along said further rod, and second and third elongated contacts spaced from the first contact on either side of said further rod and a fourth elongated contact centrally positioned with respect to the first contact.

7. The golf training apparatus defined in claim 1, and in which said electric contact means includes first and second switches coupled to said sensor arms to be closed during a predetermined portion of the arcuate travel of said arms.

8. The golf training apparatus defined in claim 7, and which includes a third electrically energized indicator light, and further electric circuitry connecting said electric contact means and said first and second switches to said third indicator light to cause the third indicator light to be energized upon angular movement of said sensor arms without corresponding angular movement of the yoke.