

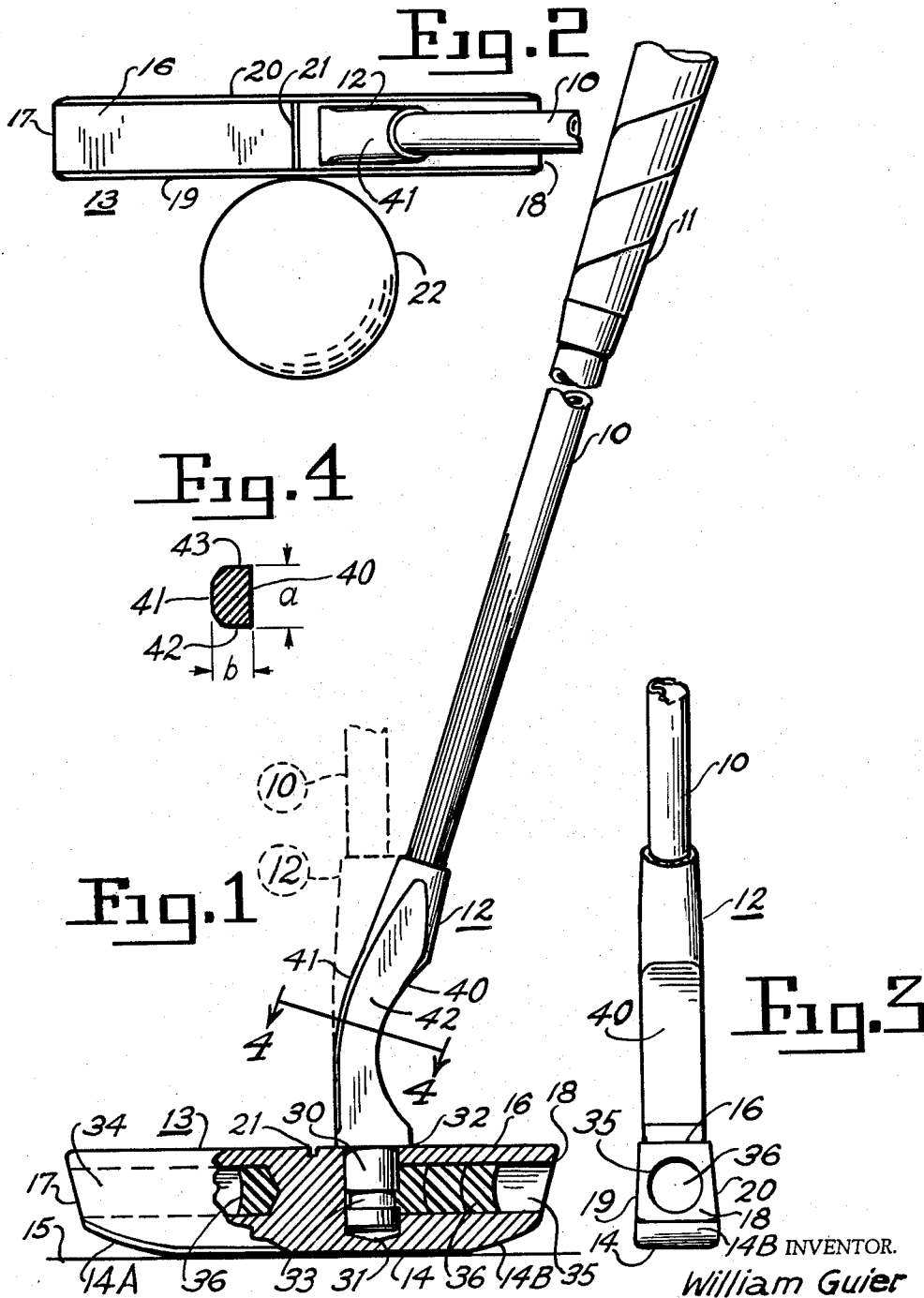
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GOLF CLUB INCLUDING SOFT METAL TO LOCK GROOVED SHAFT END TO HEAD

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1

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**GOLF CLUB INCLUDING SOFT METAL TO LOCK
GROOVED SHAFT END TO HEAD**
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The present invention relates to an integrated construction for the golf club used in the shorter strokes of what is commonly referred to as putting. More particularly, the present invention seeks to balance the putter both visually and by weight to provide the maximum opportunity for the ability of the golfer in his game.

Over the years the market has been saturated by putter designs of almost unbelievable variation. Rather than seek the common denominator of putter design which reinforces mental, optical and muscular concentration on that single straight line from ball to cup, the designers appear to have merely worked around one or two desirable features at most. Even more often, the features which are most highly publicised part company with reality. No one, to this day, has produced a putter whose design is the fruit of systematic perspective.

Today, the golfer seeking a putter, the most important one club in his bag, is faced with a bewildering variety of putter-head configurations, finishes and weights. The advertisements for these putters assault him with extravagant claims for their features which prove to be no more than selling gimmicks. Worse, the artful language woven around these putters actually obscures basic defects in their designs.

The problems met in designing a putter include both the appearance of the club as well as the distribution of weight throughout the component parts of the club. In appearance the requirement is fundamental that the vital mental concentration of the golfer must not be disrupted. The weight must be distributed in the club so as to not unbalance the muscular coordination of the golfer as he executes his stroke. Finally, the point on the club with which the ball is struck must be established so as to transmit force to the ball along that single straight line from the ball to cup.

A principal object of the invention is to provide balance in both appearance and physical weight of a putter.

Another object is to provide a configuration for the club head which gives an impression of uniformity to the eye.

Another object is to provide shapes and finishes for all surfaces under observation during the stroke which will not distract the eye and therefore disturb mental concentration.

Another object is to provide the club head with an adjustable sole, or lie, in order to match the subjective requirements of a particular golfer and give a "right" feel to his club.

Another object is to provide a balance of the weight between the point on the club which strikes the ball and the portion of the club grasped by the golfer's hands which will give force to the ball along that straight line from the ball to the cup.

The invention contemplates a putter head formed with a substantially square configuration. All lines of the shape of the head align with the straight line from the ball to the cup or they are formed at right angles to such line. Moreover, the striking and trailing faces are parallel. All lines under observation are so arranged in this square configuration so as to render an impression of uniformity, balance and prevent distraction of the eye.

The invention further contemplates that those surfaces of the putter under the direct observation of the golfer will be consistently plain and dull. The many sources of light which strike these surfaces at many angles will not

2

be reflected into the eyes of the golfer when he is over the ball, preparing for the stroke.

The invention further contemplates a neck between the shaft of the club and the blade which can be bent quickly and safely. The neck is of ductile material which is shaped to give a predetermined section in which the bending takes place so as to not throw the blade and shaft out of their alignment in a common plane.

It is further contemplated that recesses be provided in the toe and heel of the blade of the club to receive lead slugs. The insertion, or removal, of these lead slugs provide the means with which the entire weight of the blade can be increased, or distributed in the blade, to give that balance of weight across the striking point on the blade which will direct the force of the stroke along that straight line from the ball to the cup.

Other objects and advantages of the present invention will become readily apparent from the following detailed description of the invention with specific references to the accompanying drawing in which:

FIG. 1 is a partially sectioned elevation of substantially a complete golf club embodying my invention;

FIG. 2 is a plan view of the blade of the club of FIG. 1 as a ball is struck;

FIG. 3 is an end view of the blade of the club; and

FIG. 4 is a section through the bendable neck of the club of FIG. 1 in the direction of 4-4.

The basic silhouette

FIG. 1 is the nearest to a complete illustration of a golf club in which my invention is embodied. Shaft 10 may be made of a wide range of materials and given any of a number of forms. In FIG. 1 shaft 10 is indicated as tubular in form. At present, it is quite common to use stainless steel tubing for this purpose.

Shaft 10 is shown but partially in FIG. 1. Specifically, only parts of the handle are shown. The illustration is thus selectively abbreviated to give a clear depiction to the club head, or blade, within the limitations of the area available for the drawing.

Shaft 10 is provided with handle 11 on one end. Neck 12 is mounted on the opposite end of shaft 10. Head, or blade, 13 is mounted on neck 12. The shape of neck 12, its material, and its mounting within blade 13, are very important features of the invention. These features of neck 12 will be taken up as separate matters infra.

Initial consideration is to be given the overall, basic silhouette which provides the balanced appearance of the putter. FIG. 1 is to be taken with both FIGS. 2 and 3 to give a full disclosure to this feature of the invention. All golfers are impressed with this basic silhouette upon first seeing the putter of the invention. The simple lines immediately bear witness to the concept of balance carried throughout the design.

FIG. 1 shows lower surface 14 properly soled on ground surface 15. Upper surface 16 is directly observed by the golfer when addressing the ball. These surfaces are parallel to each other as well as to ground surface 15. The ends of surface 14 are swept up into surfaces 14A and surface 14B. Should the swing carry the surface 14 slightly off the preferred sole shown, the ends 14A and 14B will not catch, or snag, on the ground. The parallel surfaces 14 and 16 contribute to the solid sense of balance in this side elevation of the blade 13.

The end surface 17 of the blade toe and the end surface 18 of the blade heel are substantially at right angles to upper and lower surfaces 14 and 16. True, each of these end surfaces are given a slight inward taper from surface 16, but this does not militate against their basic contribution to the balance and solidarity of the blade silhouette disclosed in FIG. 1.

FIG. 2 shows the club blade as it is observed from above.

by the golfer addressing his ball. In this view the basic squareness, or solidarity, of the blade silhouette is again pronounced. The horizontal lines of striking face 19 and trailing face 20 are parallel to each other. These lines of the faces are also at right angles to the horizontal lines of both end surface 17 and end surface 18.

A single line marker 21 is formed in, or upon, upper surface 16 as a "T-square" aiming guide aid with which to strike ball 22 with the so-called "sweet spot" on surface 19. The silhouette under direct observation by the golfer supplements the simple visual guidance provided by line marker 21 in striking the ball with the proper portion of the blade by imparting a visual impression of balance to the blade.

FIG. 3 shows that the striking surface 19 and trailing surface 20 actually slant slightly outward from their upper boundary lines. However, here again the silhouette retains a basic squareness to its lines. From this view, as indeed in all the views, the putter looks as if it is designed to be brought, simply and directly, against ball 22 to force the ball into the cup.

Blade balance

The silhouette of the club head stimulates in the golfer a visual sense of balance. However, this feeling generated in the owner of the club is reinforced by an actual weight balance as the club is held in the hands. This actual balance is brought about by the distribution of mass within the head of the club.

First, the club head is attached to shaft 10, with neck 12. For this consideration, neck 12 is a simple extension of shaft 10. The specific shape, material and other functions of neck 12 will be taken up infra. For this immediate consideration of weight distribution within head 13, neck 12 is a generally elongated extension of shaft 10, fixed at one end to head 13 beside the aiming mark 21 so this mark 21, in surface 16, can be directly observed by the golfer while addressing ball 22.

The end of neck 12 which is fixed to head 13 is firmly anchored within the body of head 13. Specifically, the anchored end 30 of neck 12 is journaled in hole 31. End 30 is turned and given a cylindrical form, leaving a shoulder 32 to come down flush against upper surface 16 of the head 13. A circumferential groove 33 is formed in cylindrical end 30.

Holes are drilled into body 13, axially aligned with each other. Hole 34 is formed in the toe of the blade, from surface 17 and parallel with upper and lower surfaces 16 and 14. A similar hole 35 is formed in the heel of the blade, from surface 17 and axially aligned with hole 34. This latter hole is extended into body 13 until it connects with vertical hole 31, going through the wall of this hole.

Both hole 34 and hole 35 are sized to receive weights. These weights are preferably of lead, but they may be of any material which is adequately heavy to distribute the combined weight of the blade and weights in holes 34 and 35 on each side of the attached neck 12. Formed in the shape of wafers 36, the lead slugs can be driven into holes 34 and 35 in the numbers desired to give the golfer the feeling of balance across the sweet spot on the striking surface 19 below marker 21.

If the golfer changes his mind about the weight distribution in the blade 13 he can add additional wafers 36 to either hole 34 or hole 35. Should the golfer decide the total weight of the blade and wafers is too great, wafers can be removed from the holes by drilling. Thus the arrangement of lead wafers 36 in holes 34, 35 provides great flexibility to the choice in arriving at the balance and feel suitable to the individual judgment of the golfer in deriving the results sought by the golfer.

The holes and lead wafers 36 also provide a means for anchoring end 30 of neck 12 in blade 13. Hole 35, in the heel of blade 13, extends from surface 18 to hole 31. When cylindrical end 30 is positioned in hole 31, groove 33 is in communication with hole 35. A lead slug 36,

forced down hole 35 will come against neck end 30 and some of the material of the slug will extrude into groove 33. In this manner, a key is formed of the slug material in the keyway of the groove 33. End 30 is thereafter prevented from being withdrawn from hole 31, is anchored therein. A more complete key can be formed by melting lead and pouring it into hole 35. The molten metal will flow into the groove 33 and hole 35 and form a positive anchor for neck 12 to blade 13.

Although I have referred to wafers, or bodies, 36 as made of lead, I certainly do not wish to be limited to this material for forming a union between neck 12 and blade 13. For example, there are glues which can be poured into groove 33 from hole 35. Then slugs 36 can be forced into position within holes 34, 35 for the weight balancing. Also a plastic body, say of epoxy resin, can be forced down hole 35 and forced into groove 33 by a following slug 36 of harder material. My inventive combination should not be limited to the materials to which I specifically refer above.

Lie adjustment

Every golfer has his individual manner of addressing his ball. In general, each golfer using the club illustrated in the drawing would desire to sole surface 14 evenly on the ground adjacent ball 22 as shown in FIG. 2. He will stand a distance from ball 22 which is compatible with the angle shaft 10 makes with the plane of the ground. Stated in reverse order, the golfer selects a lie (angle of shaft 10 to the ground plane) compatible with the distance he selects from his ball and the manner in which he chooses to grasp end 11 of shaft 10. Each golfer will find the club disclosed to be readily adjusted to provide the lie desired. Further, the invention provides the adjustment without misalignment of the plane of striking surface 19 with the plane containing the shaft 10 and neck 12.

The anchoring of neck 12, by one end, to blade 13 has been disclosed. The attachment of neck 12, by the other end, to shaft 10, is evident from the drawing. The shape and function of the neck 12, between these ends, provides the adjustment of the lie covered by the invention.

In FIG. 1, neck 12 is indicated as capable of being bent, or distorted, into a range of positions. Each position within this range establishes a separate lie. The owner of the club illustrated can bend neck 12 to any of the positions desired within the range by hand, or with a simple jig, without danger of changing the relationship of the plane of surface 19 and the plane in which shaft 10 moves as neck 12 is bent. A particular shape for neck 12 enables this action to be taken. This cross-section is shown at FIG. 4, as taken at lines 4—4 through neck 12 in FIG. 1.

A unique provision for this cross-section of neck 12 is its dimension transverse the length of blade 13 which is greater than its dimension aligned with the blade. More specifically, the dimension is a finite amount less than dimension *b*. With the difference in these dimensions great enough, bending in neck 12 will always occur in alignment with the axis of blade 13.

This cross-section is not provided anywhere along the length of neck 12 other than at a relatively short section at the midpoint. Bending of neck 12 is then controlled, regulated to this section and governed by its dimensions and material.

In this medial, bendable portion of neck 12, back surface 40 is in the form of an arc as viewed from the side in FIG. 1. Front surface 41 roughly parallels back surface 40. Obviously, two sturdy posts of a simple jig can be brought to bear on these two surfaces and the desired bend put in neck 12.

The relative dimensions of the neck cross-section insure the neck bending at the correct portion of the neck. The material of the neck is selected to give the desired compromise between the strength needed to stand up under the force of strokes with the club and the need for

changing the degree of bend with the simple jig and manual manipulation. This material can be soft brass, malleable iron, or even some alloy with strength enough to hold the blade straight and true while capable of being bent as desired.

Finally, with respect to neck 12, there are the side panels 42 and 43. These side panels are no more than flat areas ground directly from the neck material. These areas are quite useful to bear inscriptions, names or decorations. Should it be desirable to give the putter as a gift, these panels are the perfect place to put something distinctive and suitable to the occasion. Therefore, the form and material of neck 12 not only provides means for adjusting the lie of the club but advances the aesthetics of the device.

Surface finish

The basic silhouette of the club head gives the visual impression of balance. The distribution of the mass of the club head gives a feeling of balance in the hands when the club is picked up and swung to strike a golf ball. Should the feel not be satisfactory the distribution of mass can be adjusted to suit the individual demands of each golfer. The angle of the shaft with the longitudinal axis of the club head can be readily changed without disturbing the relation between the plane of the striking surface of the club head and the plane of the shaft and the neck portion between the shaft and club head. All of these features supplement the combination of concentration and movement of the golfer as he addresses and strokes his ball. All of these factors provide him with the maximum opportunity for employing his ability as a golfer. Still another factor is the visual impact imparted by the surface of the club structure under observation during the employment of the club.

An obvious requirement for the surface of the club is that it not distract the attention of the golfer. There are countless changes in the light patterns to which the club surface is exposed under normal conditions of use. All of the variables of light in the open pick at the concentration of the golfer. If the light in those patterns is reflected from the surface of his equipment with continual variations, the ordinary golfer is placed under a distracting pressure which will militate against his effectiveness. His concentration is destroyed to some degree. His game must suffer.

It is an object of the present invention to systematically eliminate, or at least greatly reduce, the roving halations, or changes in reflected light patterns, on the surface of the club. Basically, the approach is to deliberately dull the finish of those surfaces of the club under direct observation by the golfer as he addresses his ball.

I recognize that sporadic attempts have been made to dull the finish of some portions of the surface of golf clubs. Further, many golfers have welcomed the dulling which results on the club surface from normal use. But no plenary, systematic, pre-use attempt has been made, to my knowledge, to provide all the surface viewed by the golfer with an essentially non-reflecting finish. Certainly there has been no combination of such a surface with the simple, non-distracting, lines of the silhouette provided for my club.

My concept does not limit itself to any particular way of providing the dull, non-reflecting, surface. A layer of some suitable material may be found that is satisfactory. The surface may be roughened to a satisfactory degree. In all events, the concept is to provide this finish to every portion of the surfaces of the head, neck and shaft of the club. Then the finish becomes an integral part of the combination including the simple, basic, silhouette which aids in producing a club which looks right, feels right and putts right.

From the foregoing it will be seen that this invention is one well adapted to attain all of the ends and objects hereinabove set forth, together with other advantages

which are obvious and which are inherent to the apparatus.

It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of the claims.

As many possible embodiments may be made of the invention without departing from the scope thereof, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

The invention having been described, what is claimed is:

1. A golf putter in which,
 - the blade is an elongated body having a simple silhouette made up of straight lines,
 - a first hole is formed vertically in the body at a location adjacent the sweet spot in the striking face of the blade,
 - a second hole is formed in the heel of the blade and extends axially within the blade until it intersects the first hole,
 - a neck has a cylindrical end extended into the first hole and the cylindrical end has a groove extending circumferentially about a medial location of the end,
 - a soft metal body positioned in the second hole and against the cylindrical end of the neck with at least a portion of the soft metal of the body projecting into the groove as a key which anchors the neck in the blade body,
 - and a shaft is attached to the neck with a predetermined lie with the blade.
2. A golf putter in which,
 - the blade is an elongated body having a simple silhouette made up of straight lines,
 - a first hole is formed vertically in the body at a location adjacent the sweet spot in the striking face of the blade,
 - a second hole is formed in the heel of the blade and extends axially within the blade until it intersects the first hole,
 - a third hole is formed in the toe of the blade and extends axially aligned with the second hole,
 - a neck has a cylindrical end extended into the first hole and the cylindrical end has a groove extending circumferentially about a medial location of the end,
 - a series of soft metal bodies are distributed within the second and third holes as necessary to adjust the total weight of the blade and bodies across the sweet spot in the striking face of the blade to the satisfaction of the golfer, a portion of one of the bodies in the second hole projecting into the groove of the neck,
 - and a shaft is attached to the neck with a predetermined lie with the blade.
3. A golf club construction, including;
 - an elongated blade of unitary structure having,
 - a first hole extending vertically down into the body blade at a point intermediate its ends,
 - and a second hole in the blade extending transverse the first hole and connecting with the first hole;
 - a shaft having an elongated neck portion attached to one end of the shaft with the free end of the neck portion sized to extend down into the first hole of the blade;
 - a groove in the neck end extending down into the first hole;
 - and a body of metal which is soft relative to the metal of the neck portion and which is positioned in the second hole with a portion of the soft metal forced into the groove of the neck in order to anchor the neck portion of the shaft to the blade.
4. A golf club particularly adapted to the putting strokes of a golf game, including;
 - a blade having,

7

an elongated body having a basic silhouette dominated by a combination of straight and simple lines which give a visual stimulation of balance and solidarity, striking and trailing faces with their horizontal lines parallel to each other,
 a flat and level upper face in which a single straight line in the direction of the stroke is placed over the sweet spot in the striking face,
 a vertical hole in the body through the upper face, and a horizontal hole in the body which communicates with the vertical hole;
 a neck with one end shaped and sized to fit down into the vertical hole in the body, there being formed about the end and in alignment with the horizontal hole a circumferential groove;
 a metallic body in the horizontal hole forced against the neck end in order that a portion of the body is forced into the groove to anchor the neck in the blade;
 and a shaft attached to the neck to complete the club.

5

10

15

8

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