ABSTRACT

A head for a golf club includes a wood body with a cut-out in the lower surface thereof for receiving a sole plate, having a longitudinal keel with concave sides, to lower the center of gravity, to provide minimum ground contact, to stabilize the line of travel and to set up a favorable air flow along the bottom of the head for separating the grass as the club is swung. The sole plate may be provided with three upwardly opening cavities above the keel into which plugs may be inserted during manufacture to selectively vary the weight of the completed head.

1 Claim, 5 Drawing Figures
GOLF CLUB HEAD WITH SOLE PLATE-KEEL ATTACHMENT

This invention relates to golf clubs and more particularly to a head for such clubs.

Golf clubs known as woods are used for hitting the ball off the tee, from the fairway and possibly from the rough. The number 1 wood or driver has a straight or substantially vertical face and is used primarily at the tee for straight ahead distance. The number 2 wood or brassie has a face slightly inclined from the vertical and is used for hitting the ball from the fairway for distance with a very little loft to only slightly raise the ball off the ground. The number 3 wood or spoon has a face with a more incline and is used for hitting the ball from the fairway for less distance but with more loft to raise the ball possibly over an obstruction or trap. The number 4 wood or cleek and the number 5 wood or baffle continue this trend towards more loft and less distance as do the number 6-10 woods which give so much loft as to be of little use on the fairway and are therefore reserved for use in the rough where the loft is needed to pick the ball out of the tall grass.

Normally, the woods with the exception of a driver or the ball from its location on the ground in the fairway or the rough. With conventional woods, the lower surface is flat to engage the ground over its entire surface and thereby flattens the grass while hitting the ball. It is well understood that to get the most distance for a given effort in a golf shot, the golf club head must have its maximum momentum just as the face of the golf club head and the ball engage. However, the engagement of the ground and the flattening of the grass by a conventional head slows the speed of the head and lowers the momentum just at this critical time. Of course this problem is greatest when the ball is lying in the "rough" where high grass absorbs more of the momentum of the head than is desirable.

Therefore it is an object of this invention to provide a novel golf club head with a lower keel which gives a minimum of surface area to engage the ground, and to hold the line of travel as the head contacts the turf and which has concave sides to set up a favorable air flow pattern over the lower surface to separate the blades of grass.

Other and additional objects of this invention are to provide a golf club head having a wooden body with a cutout for a sole plate having such a keel, to provide such a head with such a sole plate having a series of upwardly opening cavities over the keel to lighten the head, and to provide such a head with a sole plate having plugs in the upwardly opening cavities to selectively vary the weight of the head.

SUMMARY OF THE INVENTION

The improved golf club head according to this invention for attachment to a conventional shaft and grip to form an improved golf club includes a body having a longitudinal keel downwardly extending to provide a comparatively small lowermost surface area for a minimum ground contact. The sides of the keel may be concave to give a favorable air flow over the lower surface to separate the grass. The body may have a cutout receiving a sole plate with the keel and having upwardly opening cavities which may be filled with plugs to vary the weight of the head.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front elevational view of a golfer swinging a golf club having a golf club head according to this invention, mounted thereon with the club being shown just prior to hitting a ball lying in the rough.

FIG. 2 is a front elevational view on an enlarged scale of the golf club head.

FIG. 3 is a bottom view taken along the plane III—III of FIG. 2.

FIG. 4 is a sectional view taken along the plane IV—IV of FIG. 2.

FIG. 5 is an exploded perspective view of the sole plate and the plugs therefor.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT:

Referring now to the drawings and particularly to FIG. 1, a golf club head embodying the present invention is generally indicated at 10 and is shown secured to a shaft 11 having for example a number 4 wood shaft length for maximum swing arc and having a conventional grip 12 to form an improved golf club 13. The club 13 is shown in hands of an expert golfer 14, just as the head 10 is about to engage the ball.

As best seen in FIG. 3, the golf club head 10 generally includes an upwardly extending shaft receiving neck 15, a body 16, a sole plate 25.

The improved golf club head 10 is shown in the preferred embodiment as being a "wood" and includes a wooden body 16 with a front face 17. The front face 17 may be of any incline to the vertical with an exemplary incline being shown which would approximate that of a number 7 wood. The front face 17 has a centrally located cutout 18 for a trapezoidal panel. The body 16 is bulged at 19 behind the front face 17 as is conventional for a wood. The body 16 has a lower surface 20 having a cutout 21 for receiving a sole plate 25. The cutout 21 follows the shape of the sole plate 25 to be fitted therein, and has centrally located opposed peninsulas 22 to locate the sole plate 25 with respect to the body 16.

As best seen in FIG. 3, the sole plate 25 is shaped to mate with cutout 21 in the lower surface 20 of the body 16. The sole plate 25 has a front face 26 which when the sole plate 25 is located in the cutout 21, provides an extension of the front face 17 of the body 16. The front face 26 is relatively wide and the sole plate 25 extends rearwardly therefrom to narrow into a waist 27 before spreading again at the rear end 28. The waist 27 mates with the centrally located opposed peninsulas 22 to locate the sole plate 25 with respect to the body 16. The sole plate 25 is secured within the cutout 21 in the lower surface 20 of the body 16 by epoxy to bond the sole plate 25 and the body 16 together.

As seen in FIG. 1, the sole plate 25 has a major portion 29 of the lower surface from which a longitudinal keel 30 protrudes downwardly. In FIG. 3, the longitudinal keel 30 extends from generally centrally from the front face 26 rearwardly along a line that will be the path of swing of the front face of the golf club head 10 on the golf club 13. The bottom of the keel 30, being lowermost, contacts the ground before the ball is struck to space the major portion 29 of the lower surface of the plate 25 and lower surface 20 of the body 16. Thus
the area of contact with the ground is only the bottom of the keel 30.

The preferred embodiment has a keel 30 with concave sides 31. (See FIG. 2.) The concave sides 31 blend smoothly with the keel 30 and the major portion 29 of the lower surface 30 plate 25. The purpose of providing the concave sides 31 to the longitudinal keel 30 is to set up a favorable air flow over the lower surfaces 29 and 30 of the club head 10 as the club 13 is swung through the air. As the head 10 passes through the air, the keel 30 splits the air ahead of the club head 10 and the concave sides 31 direct the air outwardly as it passes over the lower surfaces 29 and 20. This pattern of air flow tends to separate and bend the grass as the head 10 approaches the ball (See FIG. 1) rather than crush the grass as the conventional flat bottomed head does.

As seen in FIG. 3, the sole plate 25 is also provided with a recess 32 in the lower surface 29 in which can be inserted the golfer's initials or a manufactured trademark.

The golf club head 10 is completed by the insertion of a trapezoidal panel 35 in the cutout 18 on the front face 17 of the body 16. The panel 35 is made of a plastic material which can engage a ball repeatedly without becoming dented or worn as the wood of the body 16 will become if such a panel 35 were not provided.

As seen in FIG. 5, if a variation in the weight of the golf club head 10 is desired, a series of cavities 33 may be drilled in the upper surface 34 of the sole plate 25. Preferably the cavities 33 will be located along the axis of the keel 30 to permit greater depth without opening to the major portion 29 of the lower surface which for reasons of appearance should be smooth. In the preferred embodiment shown, three such cavities 33 are provided.

Plugs 37 are provided for the cavities 33 in the upper surface 34 of the sole plate 25. These plugs 37 may be made of the same material as the sole plate 25 and mate with the cavities 33 to enable the manufacture of golf club head 10 with different weights. If a light golf club head is desired, the plugs 37 are omitted entirely, and if a heavy golf club head is desired all the plugs 37 are inserted in the cavities 33 with variations therebetween having different numbers of plugs 37 in respective cavities 33.

As an example of the advantages to be gained by using the golf club 13 with the improved head 10 over a golf club with a conventional flat bottomed head, consider the situation of a ball lie in the "rough" having thick grass several inches high such as shown in FIG. 1. The ball is not resting on the ground but is supported by the grass. Directly behind the ball, the grass stands generally straight to obstruct the planned path of the head 10 to the ball. As the golf club 13 is swung, the head 10 passing through the air sets up the favorable air flow across the lower surface, as explained earlier, to sweep the blades of grass toward the outside. If the approach of the head 10 is not exact, the head 10 may engage the growing prior to striking the ball. If the head 10 does engage the ground, the keel 30 will act to space the major portion 29 of the lower surface from the ground with the only engagement being between the bottom of the keel 30 and the ground. The engagement of the keel with the ground or the turf may help the golfer hold the line of travel of the head. With the separation of the grass and the minimum ground engagement, a minimum of head speed will be lost thereby at the critical time prior to front face 35 of the head 10 striking the ball to deliver a greater momentum to the ball at impact, for both distance and lift.

While the improved golf club head 10 in the preferred embodiment is shown as being a "wood" the invention as disclosed is equally applicable to other types of heads to give the described advantages. Thus, the improved golf club head according to this invention provides a downwardly extending longitudinal keel with concave sides for a minimum ground contact, for holding the line of travel through the turf and for a favorable air flow over the lower surface to reduce the loss of momentum of the head. The reduction in the loss of momentum just prior to the ball being struck gives greater distance and loft to the golf shot.

I claim:

1. In combination with a golf club head comprising a non-metallic body having a heel portion, a toe portion, a ball striking forward face and a substantially flat underside containing a recess sunk upwardly therein to extend laterally forwardly and intersect said forward face, said face being longitudinally elongated between the heel and toe portions of the club, the improvement comprising

a. a metallic insert received and fitted in the recess in interlocking relation with the body,

b. the insert also having a ball striking forward face which extends in co-planar relation with the body forward face to define therewith a combination forward face which is upwardly and rearwardly inclined, the insert increasing in longitudinal width dimension toward forward wingtip portions of the insert closest the toe and heel portions of the head, the insert front face having a lower apex portion which is downwardly convexly rounded, said combination forward face having lower edges which extend upwardly and longitudinally oppositely in generally diverging relation from said lower apex portion and respectively toward the toe and heel portions of the head,

c. the insert having a downwardly facing keel extending from said apex portion as a laterally rearwardly elongated extension thereof whereby the keel is also downwardly convexly rounded along its length, and

d. the insert having underside faces at longitudinally opposite sides of the keel, each said underside face having downward concavity which remains substantially the same throughout the lateral length of said underside face and longitudinally blends with said substantially flat underside of said body at said toe and heel portions, said underside faces also extending forwardly toward the insert front face and presenting forwardly rounding edge portions merging with the upwardly diverging lower edges of the insert front face.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 3,761,095
DATED : September 25, 1973
INVENTOR(S) : Stanley C. Thompson

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Summary page, at [63]: "Continuation of Ser. No. 6,443, Dec. 28, 1970, abandoned." should read --Continuation of Ser. No. 6,443, Jan. 28, 1970, abandoned.--

Signed and Sealed this Twenty-third Day of May 1978

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

LUTRELL E. PARKER
Acting Commissioner of Patents and Trademarks