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(54) Abstract Title
Golf club head with lower surface projection

(57) A metalwood golf club head (2) including upper and lower surfaces (6,8), a front ball striking face (10), and a curved rear surface (12) is characterized by a concave projection (16) in the lower surface extending from the face toward the rear surface. The lower surface may have a pair of recesses (18) which may be stepped (20). The rear surface may have a horizontal depression (24). The degree of concavity of the projection may increase with an increase in the loft of the striking face (10). The projection may also have a forward portion (16a, fig 3) which is parallel to the ground. The concave projection enables the club head to strike a golf ball on the ground, and particularly in a poor lie such as in a bunker or deep rough, without the head becoming buried in the ground.

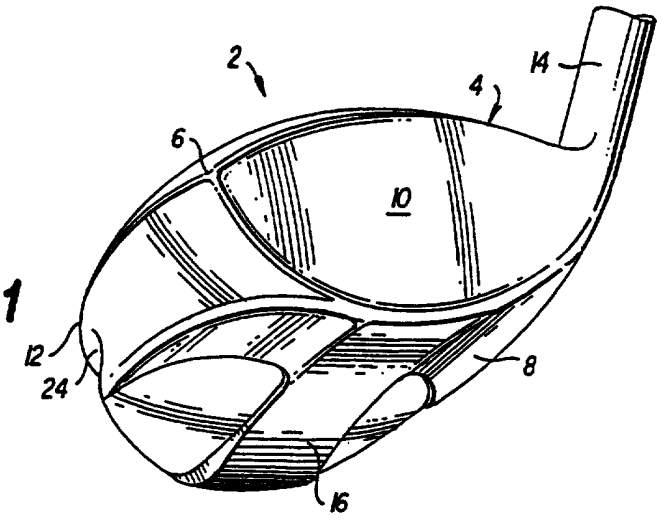

FIG. 1

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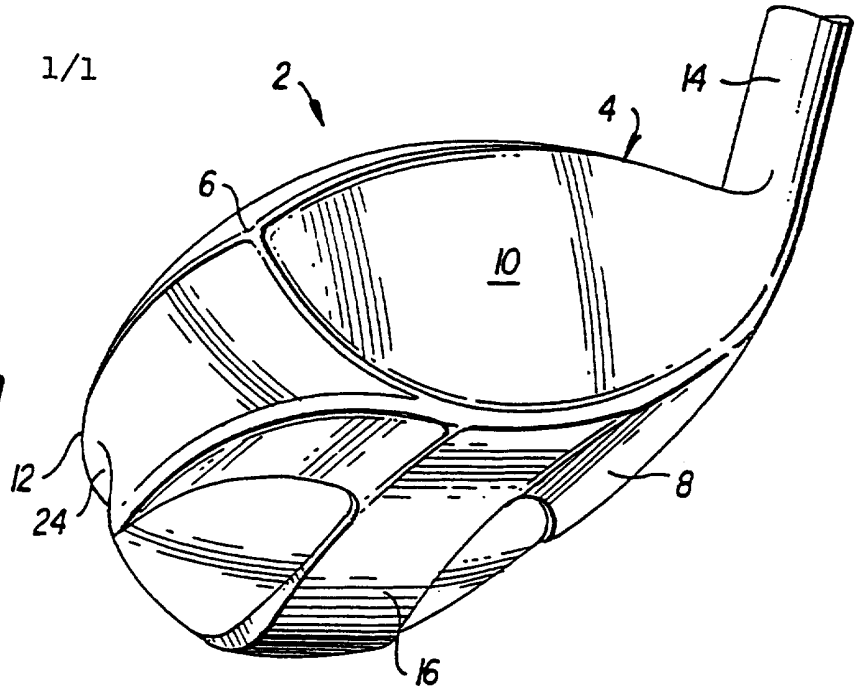

FIG. 1

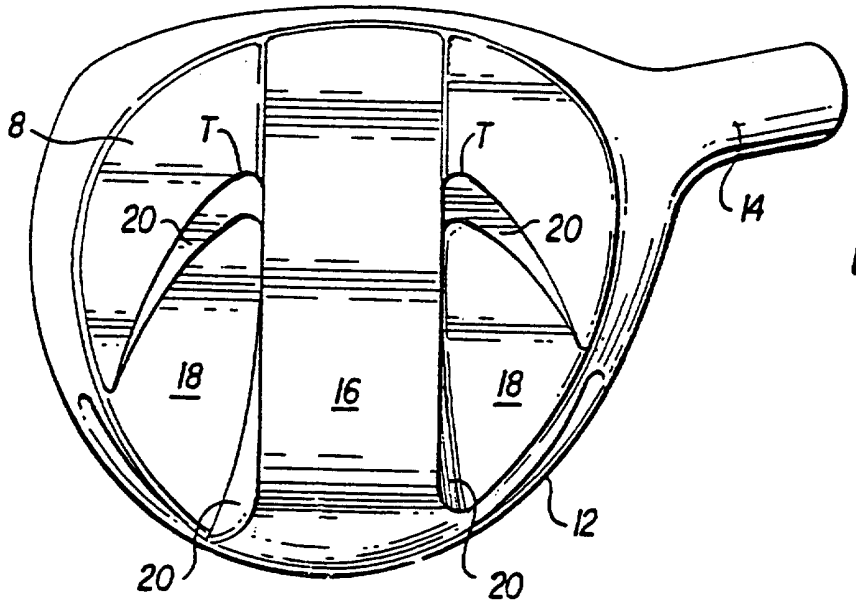

FIG. 2

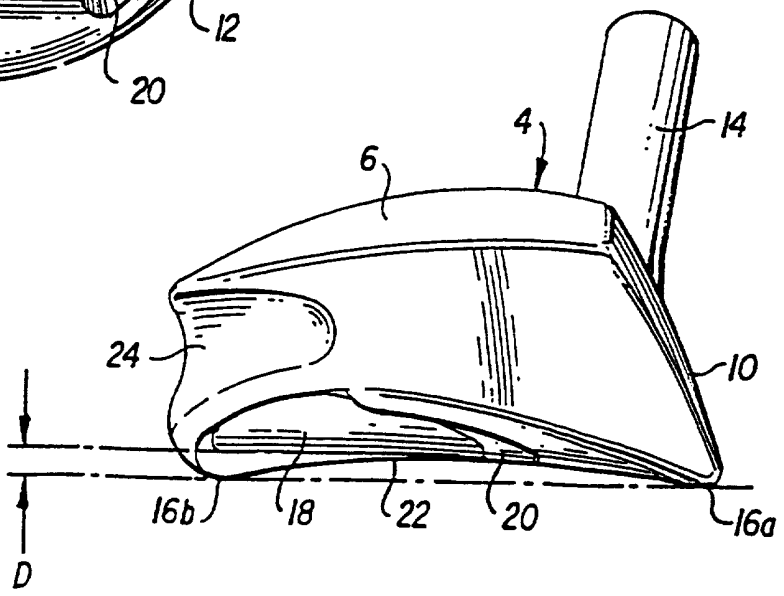

FIG. 3

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GOLF CLUB HEAD

In the game of golf, various club types are used to play different golf shots. These club types include woods, irons, and a putter. Increasingly, woods are being used to play golf shots where the ball is resting on the ground rather than on a tee. Because a wood has an enlarged rearwardly rounded head as compared to an iron, conventional woods are not suitable for use in playing a shot from thick rough or from a bunker since the woods have a tendency to hang up or become buried in such environments.

The present invention relates to an improved golf club wood head designed for shot making from difficult lies in thick rough and fairway bunkers. The head has a unique sole design to provide the wood with sufficient bounce similar to that of a sand wedge to prevent the head from becoming buried while striking a golf ball.

Numerous golf club heads, and particularly wood heads, have been developed for use in striking a golf ball off the ground rather than from a tee. One such head is a brassie or fairway wood. The Dunn U.S. patent No. 1,541,126 for example, discloses a brassie having a concave sole extending from the head to the toe of the club head. The concave sole effectively raises the center of gravity of the head so that it is aligned with the center of gravity of the golf ball being struck.

A more recent development is the BUSHWACKER lofted wood manufactured by Crown Golf, Inc. in the 1970's, which has a heavy brass sole plate including a downward bulge to assist in lifting the ball from difficult lies.

Also known in the art are golf club wood heads having a median rib in relief with respect to the sole of the club and perpendicular to the club face as shown in the Dumontier et al U.S. patent No. 5,547,188.

Although the prior devices operate satisfactorily, there still exists the need for a wood type golf club head which has versatility for playing long shots from difficult lies such as in heavy rough and fairway bunkers as well as from easier fairway lies. The present invention relates to such a club head.

According to a first aspect of the present invention, there is provided a golf club head, comprising:

a metal body having an upper surface, a lower surface, a front ball striking face, and a curved rear surface, said lower surface comprising a projection extending between said

face and said rear surface, said projection having a concave configuration, whereby said club head is prevented from becoming buried in the ground when striking a golf ball.

A second aspect of the present invention provides a golf club, comprising a golf club head of said first aspect of the present invention.

The present invention may be embodied in any suitable manner. Said lower surface may comprise a pair of recesses (stepped recesses) on opposite sides of said projection respectively, said recesses extending from said rear surface and terminating at a location short of said face. Said golf club may comprise a step between said lower surface and each of said recesses. Said rear surface may comprise a generally horizontal depression. The depth of the concavity within said projection may increase as the loft of said striking face increases. Said projection may have a forward portion for being parallel to the ground.

In the accompanying drawings which are by way of example of the present invention:

Fig. 1 is a perspective view of one example of a golf club head according to the present invention.

Fig. 2 is a bottom plan view of the club head of Fig. 1.

Fig. 3 is an end plan view of the club head of Fig. 1.

As shown in the drawings, the present invention relates to a golf club head 2 and more particularly to a wood style golf club head including a metal body 4 having an upper surface 6, a lower surface 8, a front ball striking face 10, and a curved rear surface 12. At the heel end of the body is a hosel 14 for connection with a shaft to form the complete golf club.

As shown in Figs. 1 and 2, the lower surface 8 of the head body has a unique T-shaped configuration defined by a lateral projection 16 extending between the face and the rear surface and by a pair of recesses 18 on opposite sides of the projection. The projection preferably extends along the lateral median of the head as best shown in Fig. 2. Moreover, the recesses on each side of the projection preferably include a step 20 and extend from the rear surface of the head to a terminating location T short of the face.

Referring now to Fig. 3, the projection 16 has a concave configuration, with the concavity 22 extending along the length of the projection. Preferably, the projection has

a forward portion 16a adjacent to the lower edge of the face 10 which is parallel to the ground. This forward portion of the club sole prevents the club from digging into the ground while a golf swing is executed to strike a golf ball resting on the ground. The projection also has a rearward portion 16b at the opposite end of the concavity 22 from the forward portion 16a which is generally co-planar with the forward portion. The rearward portion of the projection provides a certain degree of bounce to the club head as the head passes along the ground while striking the ball to further prevent the club head from digging into or becoming buried in the ground, a bunker, or thick rough. In this regard, the concave projection on the lower surface of the club provides a feel and performance similar to a sand wedge when playing the ball from a difficult lie.

The face 10 of the club head can be provided with a desired degree of loft, and different heads incorporating different lofts are possible according to the invention. Generally, the greater the degree loft of the striking face (i.e. the angle between a line perpendicular to the ground at the lower edge thereof), the greater the depth D of the concavity. Thus, a three-wood having a loft of 16° may have a shallower concavity 22 within the projection than a nine-wood having a loft of 29°.

The rear surface 12 of the club head 4 contains a generally horizontal lateral depression 24. The depression improves the aerodynamics of the head and also reduces the weight thereof.

As noted above, the head is preferably formed of metal. It can be cast as a unitary body or may have separate components securely connected together. For example, the striking face 10 may be inserted into a recess provided in the front of the head, allowing the face to be formed of a material different from that of the head body.

It will be apparent to those of ordinary skill in the art that various changes and modifications may be made without deviating from the inventive concepts set forth above. The disclosures of the present invention include all of the above description, the accompanying claims, and the accompanying drawings. The disclosures of the claims, abstract, and drawings are to be read as being incorporated into the above description. For example, the depth of the concavity in said projection may be covered by the loft of the club face.

CLAIMS:

1. A golf club head comprising:
a metal body having an upper surface, a lower surface, a front ball striking face, and a curved rear surface, said lower surface comprising a projection extending between said face and said rear surface, said projection having a concave configuration, whereby said club head is prevented from becoming buried in the ground when striking a golf ball.

2. A golf club head as claimed in claim 1, wherein said lower surface comprises a pair of recesses on opposite sides of said projection respectively, said recesses extending from said rear surface and terminating at a location short of said face.

3. A golf club head as claimed in claim 2, comprising a step between said lower surface and each of said recesses.

4. A golf club head as claimed in any one of claims 1 to 3, wherein said rear surface comprises a generally horizontal depression.

5. A golf club head as claimed in any one of claims 1 to 4, wherein the depth of the concavity within said projection increases as the loft of said striking face increases.

6. A golf club head as claimed in any one of claims 1 to 5, wherein said projection has a forward portion for being parallel to the ground.

7. A golf club head, substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

8. A golf club, comprising a golf club head as claimed in any one of claims 1 to 7.

The Patent Office

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Application No: GB 9811801.1
Claims searched: 1-8

Examiner: Paul Jenkins
Date of search: 7 September 1998

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.P): A6D (D23B)

Int Cl (Ed.6): A63B 53/00, 53/04

Other: Online: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
A	GB 2308984 A	(CALLAWAY) Figures 2 & 9 and page 9 second complete paragraph	
A	EP 662328 A1	(CALLAWAY) All figures	

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.