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(54) **LOW RESISTANCE GOLF CLUB**

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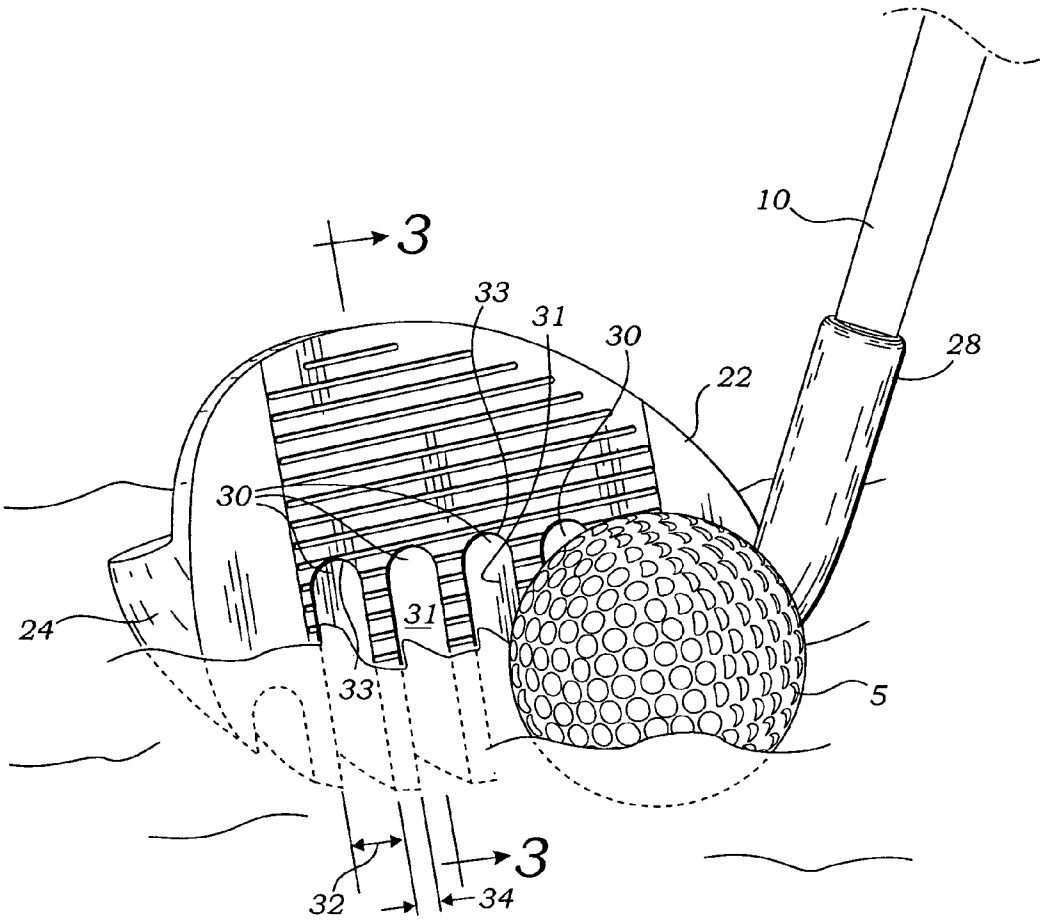
(57) **ABSTRACT**

A golf club head provides a face, a toe, a sole and a neck. A plurality of slots are spaced apart with each of the slots extending from the sole upwardly medially within the head. The slots are in generally parallel correspondence and are uniformly spaced and are uniform in width, where the uniform slot width exceeds the uniform slot spacing. The slots have flat side walls, terminate upwardly with a circular surface, and diverge in width from the face to the back of the club, so that they present the least resistance when the club moves through sand.



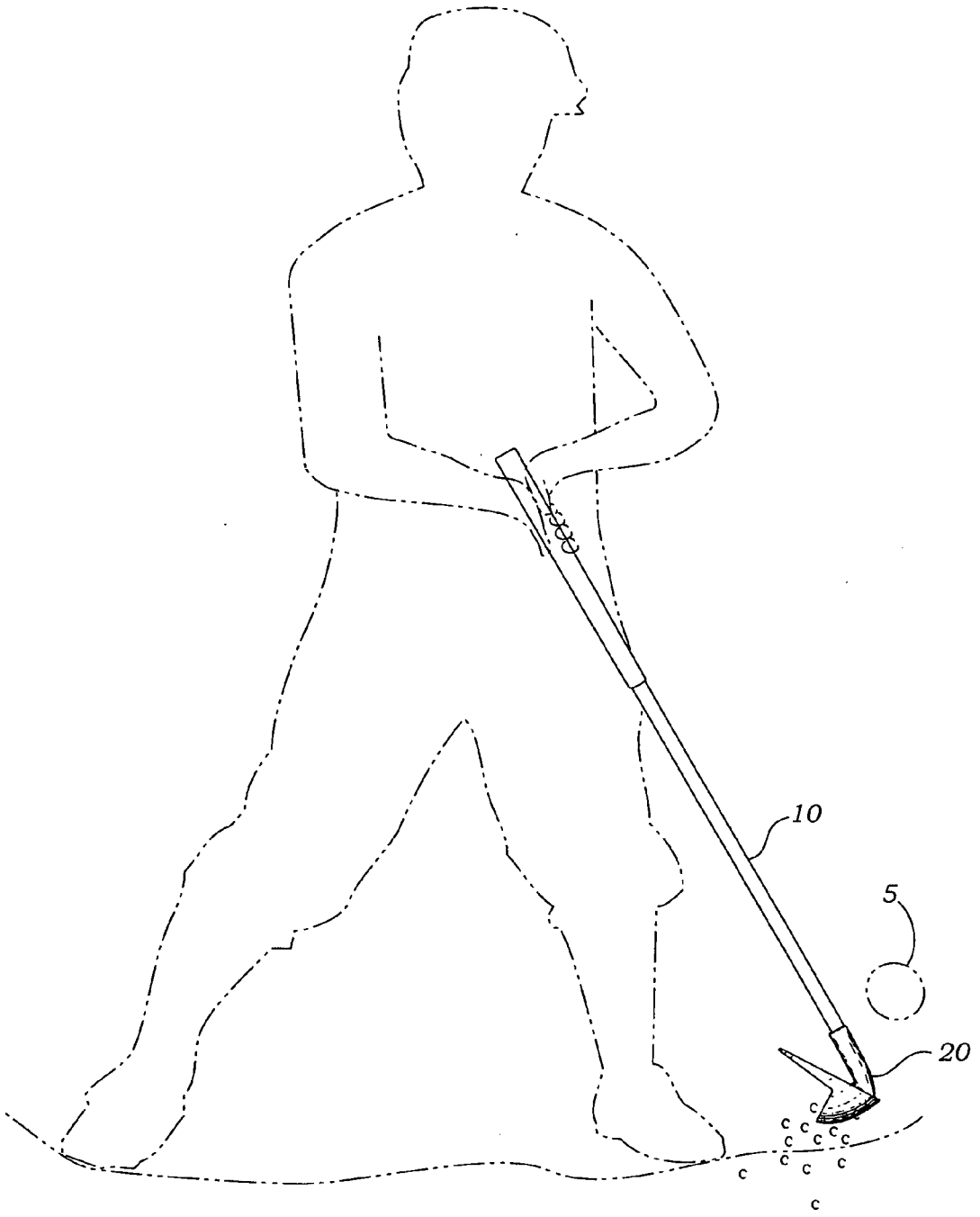


Fig. 1

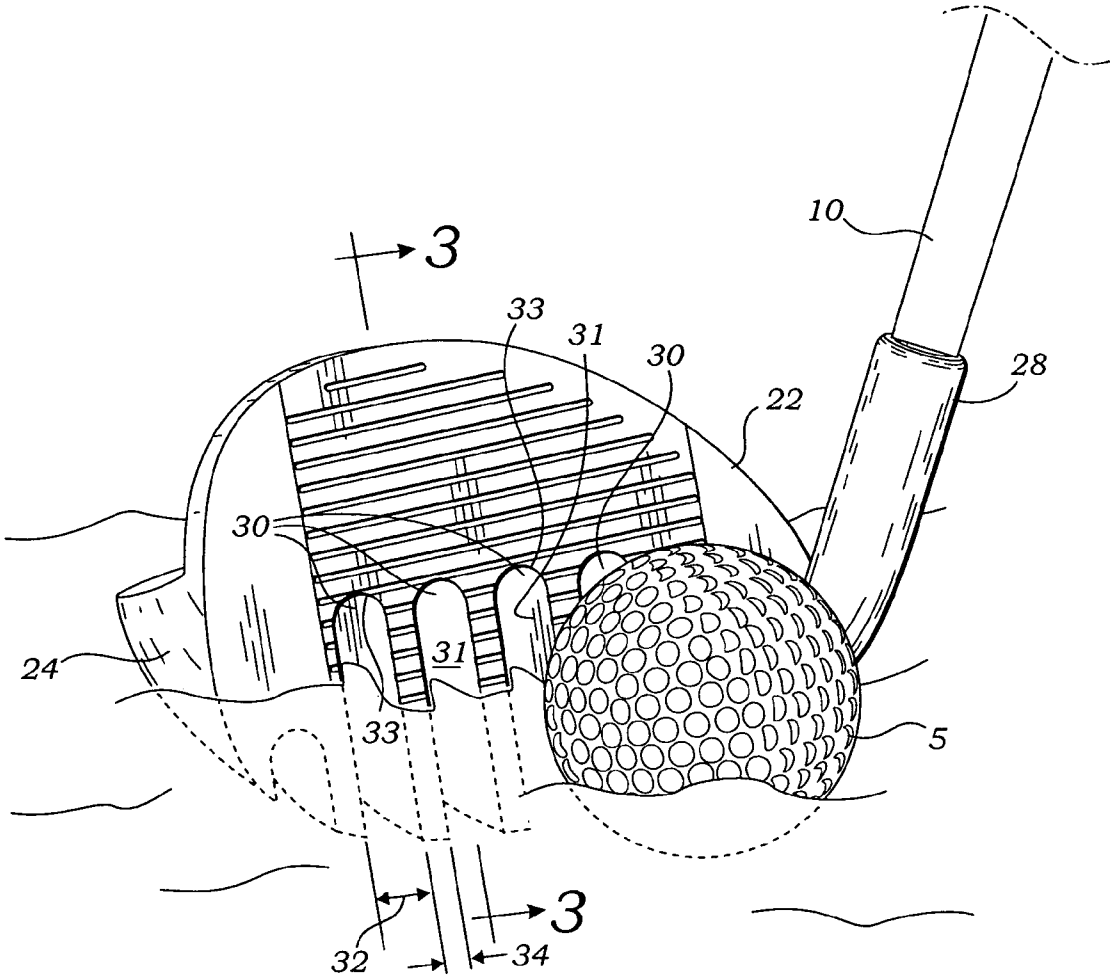


Fig. 2

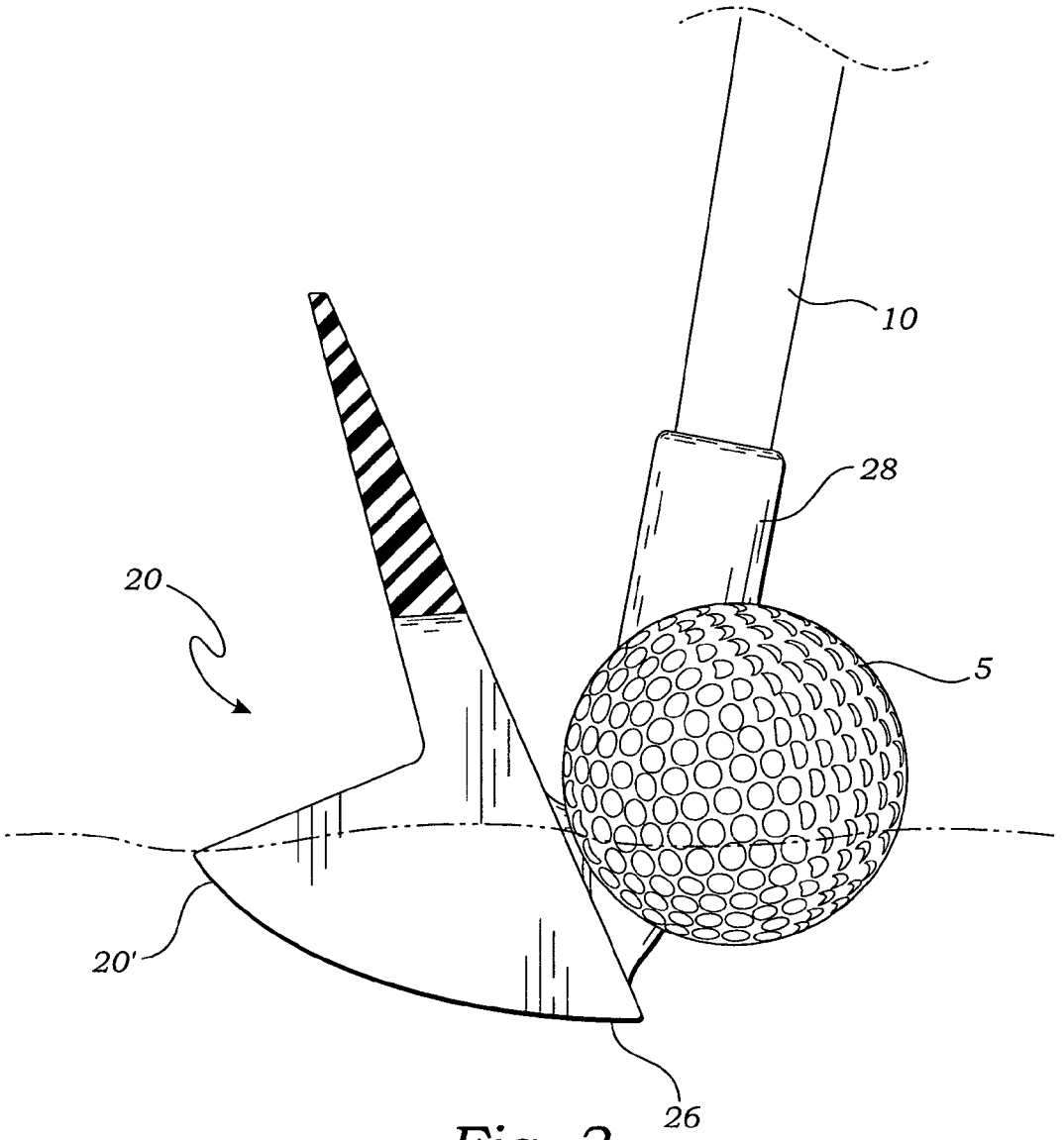


Fig. 3

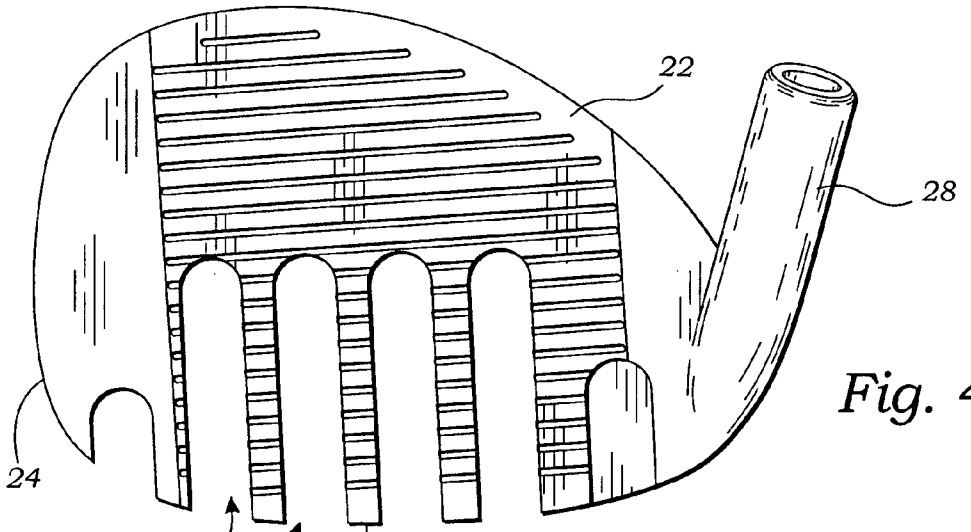


Fig. 4

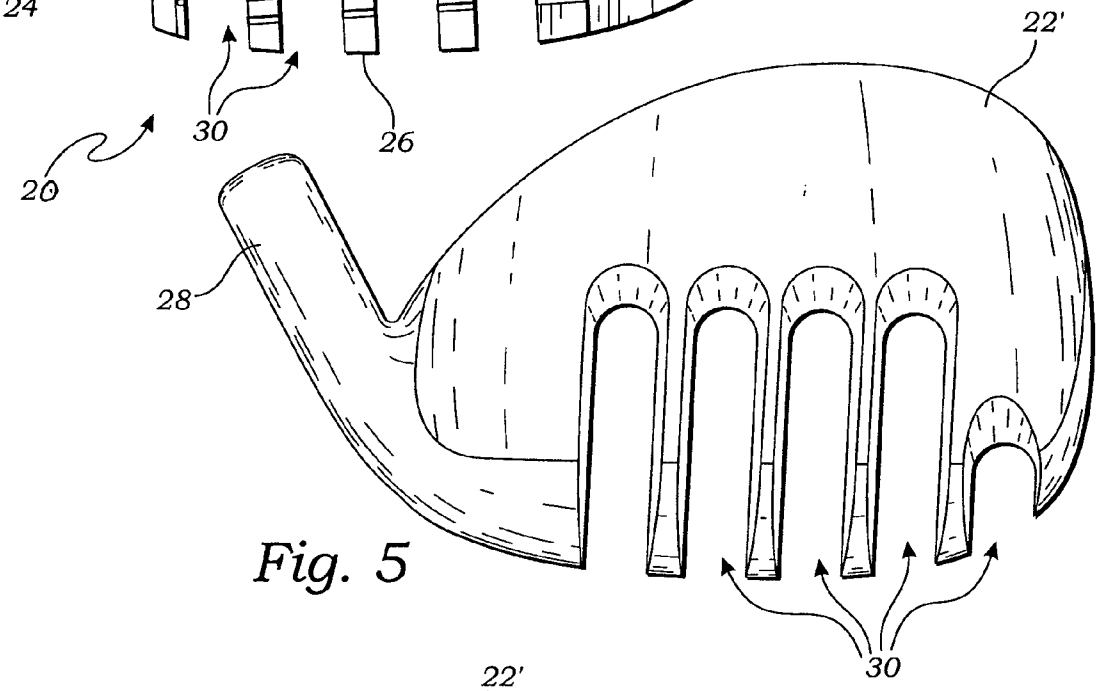


Fig. 5

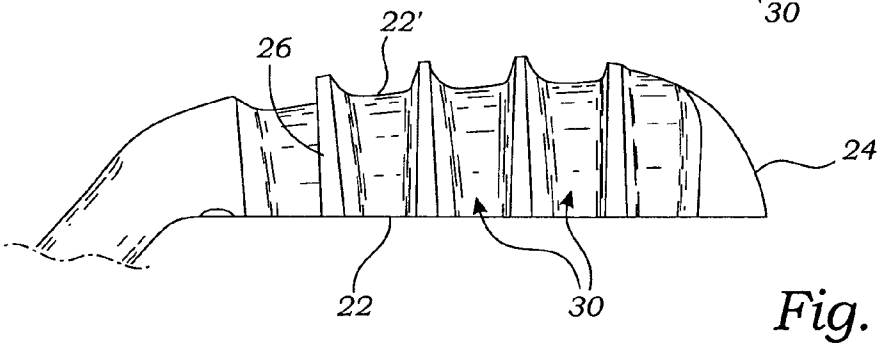


Fig. 6

LOW RESISTANCE GOLF CLUB

RELATED APPLICATIONS

[0001] This is a continuation-in-part application of a prior filed and currently pending RPA application having Ser. No. 10/402,617 and file date of Mar. 27, 3003.

INCORPORATION BY REFERENCE

[0002] Applicant(s) hereby incorporate herein by reference, any and all U. S. patents, U.S. patent applications, and other documents and printed matter cited or referred to in this application at the time of filing.

BACKGROUND OF THE INVENTION

[0003] Field of the Invention

[0004] This invention relates generally to golf clubs and more particularly to a sand wedge club with open slots so as to present less resistance to the sand during a stroke.

[0005] Description of Related Art

[0006] The following art defines the present state of this field:

[0007] Pritchett, U.S. Des. 419,213 describes golf club head with slot design.

[0008] Wood, U.S. Pat. No. 5,547,426 describes an improved golf club head and set of clubs using progressively sized heads. The club head, of the sort generally referred to as "irons" has the usual striking and opposed back faces, an upper edge, a sole, a heel adjacent to the hosel and a toe opposite the heel. A slot of selected depth is provided across the back, extending diagonally from the upper heel area to the lower toe portion, so as to provide a thin central region and two thicker regions at the intersection of toe and upper edge and at the intersection of heel and sole. The resulting head has a diagonal balance along a line extending along the major axis of the normal elliptical pattern of ball impacts against the striking face, which results in a larger and more desirably oriented "sweet spot". The clubs in a set of irons may have progressive top edge thicknesses so that all top edges appear to have the same width in use, progressively increasing sole width from long to short irons to provide optimum ground friction characteristics and progressively increasing heel to toe lengths going from short to long irons. The hosel typically has an airfoil shaped cross section with the sharp trailing edge extending perpendicular to the intended direction of ball flight.

[0009] Gallagher, U.S. Pat. No. 6,042,486 describes an innovative golf club head that beneficially dampens the transmission of shock and vibration from the front hitting face to the hosel and associated shaft, and is more tolerant of inadvertent mis-hits of the golf ball. The golf club head includes a front hitting face is isolated to some degree from the hosel by a heel-side face aperture located in the front hitting face near the heel between the front hitting face and the hosel. The heel-side face aperture preferably extends through the golf head from the front hitting face to the back face. The invention may reside in blade-type club or in a cavity-back club having a cavity in its back face that defines a perimeter weighted golf club head. In the latter case, the heel-side face aperture may be provided as a slot which connects the front hitting face to the central cavity in the back face. The innovative golf club head may also have a toe slot which connects a toe of the golf club head to the central cavity and "floats" the front hitting face relative to the heel and toe of the club. If desired, the front hitting face may be floated relative to the top rail and sole, as well, such that it forms an "island." In all of the above embodiments, a vibration-dampening material is preferably placed within a fill void consisting of the heel-side face aperture, the central cavity, and the toe slot (as present).

[0010] Chen, U.S. Pat. No. 6,458,042 describes a wooden golf club head having an air flow guiding slot structure which comprises an upper guiding port, a lower guiding port, and a continuous wall connecting the upper guiding port and the lower guiding port. The continuous wall is provided with an opening. The upper guiding port is located in a top curved surface of an arcuate side of the head and is provided with a notch. The lower guiding port is located in a bottom inclined surface of the arcuate side of the head. The upper guiding port, the lower guiding port, the opening, and the continuous wall form together an air flow channel for balancing the air flow pressures of the top curved surface and the bottom inclined surface of the head.

[0011] The prior art teaches wood and metal golf clubs of a great variety of sizes and shapes, but does not teach a slotted golf head with vertical slots that are open to the sole of the club, and that widen in the direction from front face to back surface of the club. Such a slot conformation is now known by the inventor to provide for improved movement of the club through heavy grass and especially through sand. For instance Brown, U.S. Pat. No. 212,293 shows, in his **FIG. 3**, slots that are uniform in width from front to back faces of the club. Brown, U.S. Pat. No. 780,776 teaches that the slots should converge toward the rear of the club, which is the opposite conformation of the instant invention and has been found to produce more, not less, resistance as the club moves through moist sand. Likewise, the several Taylor references and Gordos all teach uniform slot width. The present invention provides significant advantage over the prior art as described in the following summary.

SUMMARY OF THE INVENTION

[0012] The present invention teaches certain benefits in construction and use which give rise to the objectives described below.

[0013] A golf club head provides a face, a toe, a sole and a neck. A plurality of slots are spaced apart with each of the slots extending from the sole upwardly and terminating medially within the head; and, further, the slots extend from the face rearwardly to clear the back of the head. The slots are in generally parallel correspondence and are uniformly spaced and are uniform in width as well, where the uniform slot width exceeds the uniform slot spacing. The slot width uniformly expands as one moves from the front fact to the back.

[0014] A primary objective of the present invention is to provide an apparatus and method of use of such apparatus that provides advantages not taught by the prior art.

[0015] Another objective is to provide such an invention capable of being used as a sand wedge or with grass and presenting less interference with the ground during a stroke.

[0016] A further objective is to provide such an invention capable of hitting a golf ball straight and true.

[0017] A still further objective is to provide such an invention capable of providing greater club speed due to less air resistance.

[0018] Other features and advantages of the present invention will become apparent from the following more detailed description, taken in conjunction with the accompanying drawings, which illustrate, by way of example, the principles of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The accompanying drawings illustrate the present invention. In such drawings:

[0020] **FIG. 1** is a side elevational view of the preferred embodiment of the invention as used in the sport of Golf;

[0021] **FIG. 2** is a perspective view thereof, showing how the golf club head might lie at the instant of impact with a golf ball wherein the golf ball is in a sand trap;

[0022] **FIG. 3** is a sectional view thereof taken along line **3-3** in **FIG. 2** and showing the slot clearance of the club head;

[0023] **FIG. 4** is a front elevational view of the club head showing slot conformations in the face of the club;

[0024] **FIG. 5** is a rear elevational view of the club head showing slot conformations in the rear surface of the club; and

[0025] **FIG. 6** is a bottom plan view of the club head showing the slot conformations and especially illustrating how the slots widen in the direction moving from the face to the back of the club.

DETAILED DESCRIPTION OF THE INVENTION

[0026] The above described drawing figures illustrate the present invention in at least one of its preferred, best mode embodiments, which is further defined in detail in the following description. Those having ordinary skill in the art may be able to make alterations and modifications in the present invention without departing from its spirit and scope. Therefore, it must be understood that the illustrated embodiments have been set forth only for the purposes of example and that they should not be taken as limiting the invention as defined in the following.

[0027] The present invention is a golf club apparatus comprising a shaft **10** and a head **20**. The head **20** is fixed to one end of the shaft **10** as is well known in the construction of golf clubs. Likewise, the head provides, a face **22**, a toe **24**, a sole **26** and a neck **28**, in a manner that is also well known in the construction and conformation of golf clubs. The present head **20** differs from the standard wood or iron golf club head in that it provides a plurality of slots **30** that are in spaced-apart correspondence, wherein each of the slots **30** extends from the sole upwardly within the head **30**. Preferably, the slots **30** are in generally parallel correspondence and extend medially into the head **20** as shown, and further, extend in straight fashion from the club face **22** to the back **22'** of the head **20**. Preferably, also, the slots **30** are uniformly spaced and are uniform in width, with the width shown by numeral **32** in **FIG. 2**. Preferably, the uniform slot width **32** exceeds the uniform slot spacing defined by numeral **34** shown in **FIG. 2**. The shaft **10** may, or may not, be considered as a part of the invention, although the head **20** cannot be used without a shaft **10**, as shown in **FIG. 1**. Of critical importance, the slots **30** are wider at the back **22'** relative to their width **32** at the face **22**. This is shown clearly in **FIGS. 5 and 6**. It has been found, that because of this slot conformation, and especially because of the combination of slots open to the sole **26** and divergent in width from face **22** to back **22'** of the club, that a significant reduction in resistance to the club is found when the club moves through sand and heavy grass. This improvement is most dramatic in moist or wet sand.

[0028] The present invention is most useful when attempting to drive a golf ball **5** out of a sand trap as illustrated in **FIGS. 1-3**. As the head **20** moves through the sand, the sand presents less resistance to the motion of the head because some of the involved sand moves through the slots **30** causing less resistance to the motion of the head and, likewise, the head **20** is deflected less than if the slots **30** were not present. In tests, it is found that when the slots **30** are terminated medially in the head, as best seen in **FIG. 2**, the slots **30** have little or no influence on the direction or course of the golf ball that is struck by the head **20**. Preferably, the slots **30** have flat side walls **31** and terminate with a circular surface **33**, as this embodiment has been shown to present the least resistance to the ground surface and are the easiest to clean of captured debris. The divergent side walls **31** are particularly relevant in producing low drag.

[0029] The enablements described in detail above are considered novel over the prior art of record and are considered critical to the operation of at least one aspect of one best mode embodiment of the instant invention and to the achievement of the above described objectives. The words used in this specification to describe the instant embodiments are to be understood not only in the sense of their commonly defined meanings, but to include by special definition in this specification: structure, material or acts beyond the scope of the commonly defined meanings. Thus if an element can be understood in the context of this specification as including more than one meaning, then its use must be understood as being generic to all possible meanings supported by the specification and by the word or words describing the element.

[0030] The definitions of the words or elements of the embodiments of the herein described invention and its related embodiments not described are, therefore, defined in this specification to include not only the combination of elements which are literally set forth, but all equivalent structure, material or acts for performing substantially the same function in substantially the same way to obtain substantially the same result. In this sense it is therefore contemplated that an equivalent substitution of two or more elements may be made for any one of the elements in the invention and its various embodiments or that a single element may be substituted for two or more elements in a claim.

[0031] Changes from the claimed subject matter as viewed by a person with ordinary skill in the art, now known or later devised, are expressly contemplated as being equivalents within the scope of the invention and its various embodiments. Therefore, obvious substitutions now or later known to one with ordinary skill in the art are defined to be within

the scope of the defined elements. The invention and its various embodiments are thus to be understood to include what is specifically illustrated and described above, what is conceptually equivalent, what can be obviously substituted, and also what essentially incorporates the essential idea of the invention.

[**0032**] While the invention has been described with reference to at least one preferred embodiment, it is to be clearly understood by those skilled in the art that the invention is not limited thereto. Rather, the scope of the invention is to be interpreted only in conjunction with the appended claims and it is made clear, here, that the inventor(s) believe that the claimed subject matter is the invention.

What is claimed is:

1. A golf club apparatus comprising: a shaft and a head, the head fixed to one end of the shaft; the head providing a face, a toe, a sole and a neck; a plurality of vertical slots in spaced apart correspondence; each of the slots extending divergently from the face rearwardly within the head to the back of the club, said slots being open to the face, sole and the back of the club.

2. The apparatus of claim 1 wherein the slots are in generally parallel correspondence.

3. The apparatus of claim 1 wherein the slots extend from the sole medially into the head.

4. The apparatus of claim 1 wherein the slots are uniformly spaced with uniform width.

5. The apparatus of claim 4 wherein the uniform slot width exceeds the slot spacing.

6. The apparatus of claim 3 wherein the slots have flat side walls.

7. The apparatus of claim 6 wherein the slots each terminate with a circular surface.

* * * * *