UNITED STATES DISTRICT COURT
DISTRICT OF NEW JERSEY

IRREVOCABLE TRUST of ANTHONY J. ANTONIOUS, **Plaintiff,** **v.** **NIKE, INC.,** **Defendant.**	Civil Action No. 11-cv-06327 (KM) **OPINION** **(*Markman* Patent Construction)**

MCNULTY, District Judge

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Introduction

This Opinion contains the Court's construction of key patent terms following a *Markman* hearing. This patent infringement case arises from a dispute over the proprietary design of golf club heads. The plaintiff is a trust representing the interests of Anthony Antonious, now deceased, who was "a prolific inventor of golf equipment." Plaintiff (the "Trust")[1] owns U.S. Patent No. 5,735,754 for an Aerodynamic Wood Golf Club Head (the " '754 patent"). (A copy of the '754 patent, with Reexamination Certificate, is annexed to this opinion.) *See* Plaintiff's Opening Markman Brief under Loc. Pat. R. 4.5(a), November 5, 2012, ECF No. 37 ("Pl. Opening Br.") at 1.

The Trust alleges that the defendant, Nike, Inc., has infringed the '754 patent by "making, using, importing, advertising, offering for sale, and selling products infringing Plaintiff's '754 patent including, without limitation, various drivers, hybrids and fairways woods sold under the name SQ DYMO, and other Defendant's golf clubs, principally during the 2008 to 2011 period." Complaint, filed October 27, 2011, ECF No. 1 ("Compl.") ¶ 13. Nike responds that the claims of the '754 patent are not nearly as broad as the Trust seems to think. Nike further submits that, during a reexamination of the '754 patent, the Trust disclaimed critical elements upon which it now bases its claims of infringement. *See* Defendant Nike Inc.'s Opening Claim Construction Brief for Claims 1 and 9 of U.S. Patent No. 5,735,754, November 7, 2012, ECF No. 39 ("Def. Opening Br.") at 1.

Patent construction must of course precede any analysis of patent infringement. Therefore, on April 29, 2013, I convened a *Markman* hearing to determine the meaning of various claims contained in the '754 patent. *See Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976–79 (Fed. Cir. 1995) (en banc), *aff'd,* 517 U.S. 370, 116 S. Ct. 1384, 134 L. Ed. 2d 577 (1996). I have carefully considered all of the parties' written submissions and arguments. In this Opinion I set forth my construction of the patent claims in dispute.

I. Factual Background and Procedural History

The Trust claims that Mr. Antonious's invention "relates to improvements in the aerodynamic configuration of the base or bottom surface of a club head, which allow greater speed and accuracy of golf swings, for a given application of force by a golfer, by minimizing undesirable effects of air resistance." Pl. Opening Br. at 1.

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[1] The inventor listed on the patent at issue was Mr. Antonious. For simplicity, this opinion may use "the Trust" to refer to the plaintiff/inventor.

> The present invention represents an improvement over known prior art wood type golf club heads by providing an aerodynamic surface on the bottom surface adjacent the rear edge of the club head, which produces greater club head speed when the club is swung. This aerodynamic surface reduces undesirable air turbulence which causes aerodynamic drag and creates a smoother, laminar type airflow around the club head. A golf club using this improvement permits a golfer to hit longer and straighter golf shots for a given applied swing force. The aerodynamic structure also creates increased aerodynamic stability club head resulting in increased control of the club head position during the swing, particularly on impact, thereby producing more consistent golf shots.

'754 patent at Column 1, "Summary of the Invention."

The '754 patent was issued in April 1998. It was reexamined[2] by the PTO starting in September 2008. *See* Pl. Opening Br. at 1. According to Nike, the PTO opened the reexamination at the request of Adams Golf, "a competitor in the golf industry that the Trust sued for alleged infringement of the '754 patent. The reexamination challenged the validity of the '754 patent in view of prior art golf club heads the PTO had not previously considered." Def. Opening Br. at 4–5. During reexamination, the Trust amended the '754 Patent by adding certain limitations to the original specification and claims, and by

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[2] If . . . the Director finds that a substantial new question of patentability affecting any claim of a patent is raised, the determination will include an order for reexamination of the patent for resolution of the question. The patent owner will be given a reasonable period, not less than two months from the date a copy of the determination is given or mailed to him, within which he may file a statement on such question, including any amendment to his patent and new claim or claims he may wish to propose, for consideration in the reexamination.

35 U.S.C. § 304.

. . .

> In any reexamination proceeding under this chapter, the patent owner will be permitted to propose any amendment to his patent and a new claim or claims thereto, in order to distinguish the invention as claimed from the prior art cited under the provisions of section 301, or in response to a decision adverse to the patentability of a claim of a patent. No proposed amended or new claim enlarging the scope of a claim of the patent will be permitted in a reexamination proceeding under this chapter.

35 U.S.C. § 305.

adding a new claim, "Claim 9." *Id.* at 5-6. Thus amended, the Patent received a Reexamination Certificate on January 5, 2010. *See* Pl. Opening Br. at 1 and "Ex Parte Reexamination Certificate," Exhibit B to Complaint. (A copy of the Reexamination Certificate is attached to this opinion, after the patent.)

In October 2011, the Trust filed the Complaint in this action, alleging that Nike's "various drivers, hybrids and fairways woods sold under the name SQ DYMO, and other of Defendant's golf clubs," sold principally during the 2008 to 2011 period, infringed the reexamined '754 patent. Compl. ¶¶ 11-31; *see* 35 U.S.C. § 271.[3]

Pursuant to the Local Patent Rules of the United States District Court for the District of New Jersey ("Local Patent Rules") 4.3,[4] the Parties submitted a

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[3]

> **(a)** Except as otherwise provided in this title, whoever without authority makes, uses, offers to sell, or sells any patented invention, within the United States or imports into the United States any patented invention during the term of the patent therefor, infringes the patent.
> **(b)** Whoever actively induces infringement of a patent shall be liable as an infringer.
> **(c)** Whoever offers to sell or sells within the United States or imports into the United States a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer.

35 U.S.C. § 271.

[4]

> **4.3. Joint Claim Construction and Prehearing Statement.** Not later than 30 days after the exchange of "Preliminary Claim Constructions" under L. Pat. R. 4.2(a), the parties shall complete and file a Joint Claim Construction and Prehearing Statement, which shall contain the following information:
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> (a) The construction of those terms on which the parties agree;
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> (b) Each party's proposed construction of each disputed term, together with an identification of all references from the intrinsic evidence that support that construction, and an identification of any extrinsic evidence known to the party on which it intends to rely either to support its proposed construction or to oppose any other party's proposed construction, including, but not limited to, as permitted by law, dictionary definitions, citations to learned treatises and prior art, and testimony of all witnesses including experts;
>
> (c) An identification of the terms whose construction will be most significant to the resolution of the case. The parties shall also identify any term whose construction will be case or claim dispositive or

"Joint Claim Construction and Prehearing Statement" on September 20, 2012. *See* ECF No. 35 ("Joint Statement"). The Joint Statement identifies the claim terms in dispute, the construction of which will dispose of, or be most significant to the resolution of, the case. *See id.* at 2–3 and L. Pat. R. § 4.3(c). The Joint Statement says that the Parties agree that the most critical terms to be construed are:

1. Substantially parallel with
2. C-shaped slot
3. Skid surface
4. Wall separating said skid surface from said bottom surface
5. Offset from

See Joint Statement Ex. B.

The two claims at issue, which contain those five critical terms, are Claim 1 and Claim 9. Claim 1 was amended and Claim 9 was added as a new claim in the reexamination. *See* Reexamination Certificate; Joint Statement Ex. B.

A *Markman* hearing was held on April 29, 2013, during which the parties presented their claim construction arguments and exhibits over the course of approximately five hours. I reserved decision at the close of the hearing.

II. Applicable Standards and Identification of Claims In Dispute

A. Patent Claim Construction

"Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement

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substantially conducive to promoting settlement, and the reasons therefor;

(d) The anticipated length of time necessary for the Claim Construction Hearing; and

(e) Whether any party proposes to call one or more witnesses at the Claim Construction Hearing, the identity of each such witness, and for each witness, a summary of his or her testimony including, for any expert, each opinion to be offered related to claim construction.

(f) Any evidence that is not identified under L. Pat. R. 4.2(a) through 4.2(c) inclusive shall not be included in the Joint Claim Construction and Prehearing Statement.

(g) This rule does not apply to design patents.

L. Civ. R. 9.3(4.3) (D.N.J.).

thereof, may obtain a patent therefor, subject to the conditions and requirements of this title." 35 U.S.C. § 101. In order to obtain a patent, the inventor must submit a written application providing (1) "a specification as prescribed by 35 U.S.C. § 112"; (2) "a drawing as prescribed by § 113"; and (3) "an oath or declaration as prescribed by § 115." *See* 35 U.S.C. § 111.

> The patent's specification must contain
>
> a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

Id. § 112.

The patent's "claims" round out the specification by "particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention." *Id.* § 112.

> The function of claims is (a) to point out what the invention *is* in such a way as to distinguish it from what was previously known, i.e., from the prior art; and (b) to define the *scope of protection* afforded by the patent. In both of those aspects, claims are not technical descriptions of the disclosed inventions but are legal documents like the descriptions of lands by metes and bounds in a deed ....

In re Vamco Mach. & Tool, Inc., 752 F.2d 1564, 1577 n.5 (Fed. Cir. 1985) (emphasis in original).

Patent infringement analysis requires two steps: (1) determining the meaning and scope of the patent claims asserted to be infringed (i.e. "claim construction"); (2) comparing the properly construed claims to the device accused of infringing. *See Markman*, 52 F.3d at 976; *MBO Laboratories, Inc. v. Becton, Dickinson & Co.*, 474 F.3d 1323, 1329 (Fed. Cir. 2007) ("A determination of patent infringement requires a two-step analysis: first, the meaning of the claim language is construed, then the facts are applied to determine if the accused device falls within the scope of the claims as interpreted."). Here, we are concerned only with step one, which involves "a matter of law exclusively for the court." *Markman*, 52 F.3d at 977.

> A fundamental principle of claim construction is that patent claims must have the same meaning to all persons at all times, and that

> the meanings of the claims are determined and fixed at the time the [PTO] issued the patent. The purpose of a *Markman* hearing is for the court and the parties to settle conclusively on the interpretation of disputed claims. Indeed, the need for uniformity of claim construction and concerns about fairness to competitors inform the policy of reserving the claim construction function to the trial judge.

Novartis Corp. v. Teva Pharmaceuticals USA, Inc., 565 F. Supp. 2d 595, 603 (D.N.J. 2008) (internal citations omitted). "When a court construes the claims of the patent, it is as if the construction fixed by the court had been incorporated in the specification, and in this way the court is defining the federal legal rights created by the patent document." *Markman*, 52 F.3d at 978 (internal quotations and citation omitted).

When construing claims, a district court should give the claim terms their "ordinary and customary meaning." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). "Ordinary and customary meaning" however, is not limited to the understanding of the average person. Rather, it must be assessed from the standpoint of a hypothetical "person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application."[5] *Id.* at 1313. (That hypothetical person is sometimes abbreviated as a "PHOSITA".)

> [The] objective baseline from which to begin claim interpretation . . . is based on the well-settled understanding that inventors are typically persons skilled in the field of the invention and that patents are addressed to and intended to be read by others of skill in the pertinent art. . . . Importantly, the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.

Id. (internal citations omitted); *see also Novartis Corp.*, 565 F. Supp. 2d at 604 ("Although an invention is defined by a patent's claims, they do not stand alone. Instead, claims are part of a fully integrated written instrument consisting principally of a written description of the invention, often referred to

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[5] Defendant submits that, in this case, a person having ordinary skill in the art ("PHOSITA") has either a specialized schooling background (e.g. undergraduate engineering degree) and at least two years of experience designing golf clubs, or a person having at least four years of experience researching, designing, and developing golf clubs and having some formal training in physics. *See* Def. Opening Br. at 7-8. Plaintiff has little to say on the definition of a PHOSITA.

as the specification, and concluding with the claims. For that reason, claims must be read in view of the specification, of which they are a part.") (internal quotations and citations omitted).

In some cases, the meaning of claim terms as understood by a PHOSITA may be readily apparent, "even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words." *Phillips*, 415 F.3d at 1314. In other cases, however, the meaning is not so easily ascertained, and the court must look to the "sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean." *MBO Labs*, 474 F.3d at 1329 (quoting Phillips, 415 F.3d at 1314). "Those sources include the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art." *Phillips*, 415 F.3d at 1314 (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1116 (Fed. Cir. 2004)).

Those sources are not necessarily weighted equally; there is a hierarchy of relevance. Generally, the patent's "intrinsic evidence"—"the patent itself, including the claims, the specification and, if in evidence, the prosecution history . . . ."—"is the most significant source of the legally operative meaning of disputed claim language." *Novartis*, 565 F. Supp. 2d at 603-04 (quoting *Vitronics Corp.*, 90 F.3d at 1582).

The patent's specification, "the single best guide to the meaning of a disputed term," should be consulted first. *Phillips*, 415 F.3d at 1317 (citing *Vitronics*, 90 F.3d at 1582). The specification may reveal "whether the inventor has used any terms in a manner inconsistent with their ordinary meaning. The specification acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication." *Novartis*, 565 F. Supp. 2d at 604 (quoting *Vitronics*, 90 F.3d at 1582). After consulting the specification, the court should review the patent's prosecution history, which also is "part of the 'intrinsic evidence' that directly reflects how the patentee has characterized the invention." *MBO Labs, Inc.*, 474 F.3d at 1329 (quoting *Vitronics*, 90 F.3d at 1317). The prosecution history includes statements made by the patentee during reexamination. *See Krippelz v. Ford Motor Co.*, 667 F.3d 1261, 1266 (Fed. Cir. 2012) ("A patentee's statements during reexamination can be considered during claim construction, in keeping with the doctrine of prosecution disclaimer") (citation omitted). Finally, if the specification and the patent's intrinsic evidence do not clarify the claim terms, the court may consult "extrinsic evidence"—testimony, dictionaries, learned treatises or other materials not part of the public record. *See Phillips*, 415 F.3d at 1317.

B. Parts of the Golf Club Head

Before identifying the disputed claims, it may be helpful to identify the parts of the golf club head. For purposes of visualization (and not by way of limiting or defining the claims), I here reprint Figures from the '754 patent. I have added labels of certain parts.

ILLUSTRATION

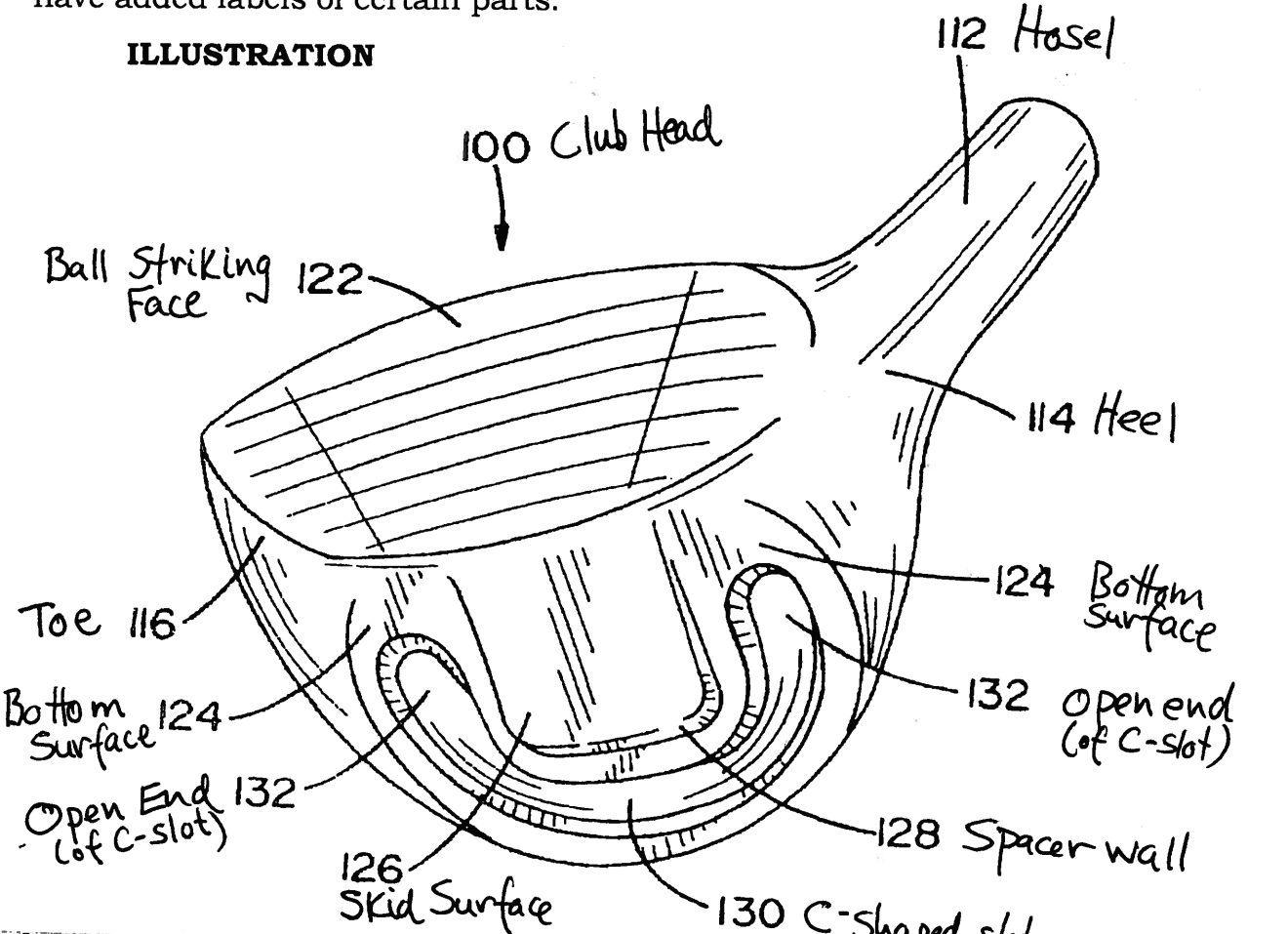
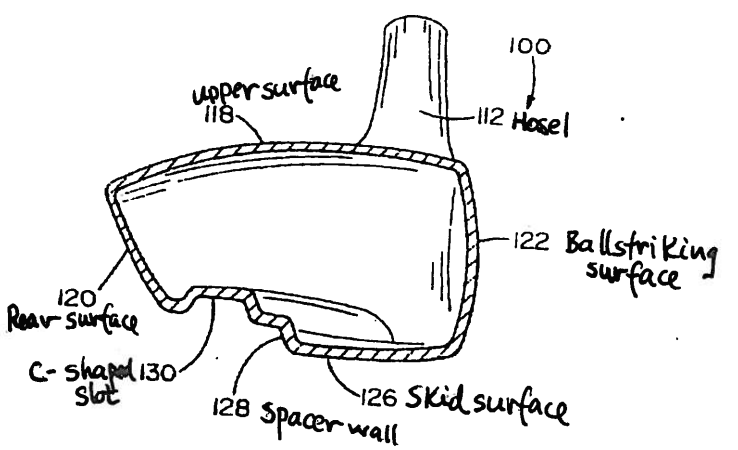


FIG. 5



C. The Specification and the Disputed Claims of the '754 Patent

There are two claims at issue: Claim 1 (amended) and Claim 9 (a new claim), as reflected in the Reexamination Certificate issued in January 2010. Claims 1 and 9 (like all of the patent's claims) relate to the following specification:

> An aerodynamic golf club head including a club head body having a heel, toe, rear surface, ball striking face, upper surface and bottom surface.

Claim 1, as amended at the time of reexamination, describes the following "improvement":

> An aerodynamic configuration on, *and* ***substantially parallel with***, said bottom surface adjacent said rear surface in the form of a **c-shaped slot** having an open end facing forwardly toward said ball striking face; said aerodynamic configuration further including a **skid surface** formed on and raised from said bottom surface; said **skid surface** having **a wall separating said skid surface from said bottom surface**, *said* ***c-shaped slot*** *transecting a virtual centerline passing through said ball striking surface and said rear surface of said club head.*

Reexamination Certificate, p. 2, lines 16–30. (Disputed terms are in **bold.** Amendments at the time of reexamination are in *italics*. Note that some phrases are ***both.***)

Claim 9, added as a new claim in the reexamination, describes the following "improvement":

> An aerodynamic configuration within, and **substantially parallel to**, said bottom surface adjacent said rear surface, in the form of a **c-shaped slot** having an open end facing forwardly toward said ball striking face, **said slot offset from**, and a portion thereof passing through, a virtual centerline passing transversely through a heel-to-toe axis of said club head.

Id., lines 41-51. (Disputed terms are in **bold.** All of Claim 9 was added in the reexamination.)

The Parties have jointly summarized their positions as to each of the disputed terms as follows:

Term	Plaintiff's Construction	Defendant's Construction
1. **Substantially parallel with**	Relationship between the c-shaped slot formed on a curved surface and the curved bottom surface, adjacent to the rear surface, of the golf club head	The flat plane of the c-shaped slot and the flat plane of the bottom surface/sole of the club head are essentially parallel to each other, and the c-shaped slot therefore does not extend into the side walls or skirt.
2. C-shaped slot	Any generally C-shaped channel.	An aerodynamic slot characterized by a flat bottom surface and a c-shaped profile, in the sole/bottom surface, not the sidewalls, of the golf club head.
3. Skid surface:	A surface of the golf club head formed on and raised from the bottom surface so as to extend outwardly from the bottom surface/sole, and as designed to skim across the ground when the club head is swung.	A surface of the golf club head formed on and raised from the bottom surface so as to extend outwardly from the bottom surface/sole, separated from the bottom surface by the spacer wall, and designed to skim across the ground when the club head is swung.
4. Wall separating said skid surface from said bottom surface	The only term in this phrase not otherwise construed or discussed herein is 'wall.' Wall means any non-horizontal surface that separates the skid surface from the bottom surface.	A spacer wall separating the bottom surface from the skid surface, where the spacer wall is separate and distinct from the perimeter walls of the c-shaped slot.
5. Offset from:	Existing or disposed at a displacement from the virtual centerline of the club head.	Substantially, rotationally offset relative to the virtual centerline.

See Joint Statement Ex. B.

III. Construction of Disputed Claims

The Trust's approach to claim construction can be described easily. It "seeks to interpret the claim language according to its 'ordinary and customary meaning.'" Pl. Opening Br. at 7. The Trust therefore relies primarily on the

meanings of the words in the claim, as it defines them. The Trust asserts that there is a "heavy presumption" in favor of such a definitional construction. *See id.*

Nike's approach requires more explanation. Nike acknowledges the importance of plain meaning. It also relies, however, on the history of the reexamination of the '754 patent: particularly, the Trust's representations and citations of prior art to the PTO. According to Nike, in the reexamination the Trust narrowed its claims to distinguish its claimed invention from prior art, particularly the Air Bear and Hogan H40. *See* Def. Opening Br. at 4–5.

Nike maintains that a hypothetical PHOSITA considering this patent, particularly during reexamination, would have been aware of the Air Bear and Hogan H40 prior art, and would have "understood that the purported purpose of the c-shaped slot of these [prior art] clubs was to improve aerodynamic performance and to provide the same alleged advantages as the '754 patent." *Id.* at 8. The PHOSITA, moreover, would have known of "other prior art clubs with c-shaped slots in their bottom surfaces that the PTO never considered during examination or reexamination of the '754 patent," such as the Bio-Mech II and the Fairway Devil, both of which have a c-shaped slot and skid surface intended to create "an aerodynamic dual tunnel bottom surface." *Id.* at 9. This is all relevant, Nike submits, because "the PHOSITA's knowledge of the prior art frames the context within which the '754 patent claims must be construed." The Trust's claim constructions are overbroad, says Nike, "because they ignore not only the Trust's prosecution disclaimers, but also the crowded field within which the patent was issued." *Id.* at 10.

Nike submits two "Illustrations" of the possible orientation of the "aerodynamic configuration" claimed by the '754 patent. They are taken, says Nike, from the Figures in the '754 patent itself. The first, *see* Def. Opening Br. at 6 ("Illustration 3"), reproduces Patent Figures 1-5, which "teach about the 'aerodynamic configuration' relative to other parts of the club head. . . ." *Id.* These Figures depict the "c-shaped slot" as being "formed on and substantially parallel with the bottom surface," with the open ends of the c-slot facing forward "toward the ball striking face." *Id.* The second, *see* Def. Opening Br. at 7 ("Illustration 4"), reproduces '754 Patent Figures 9 and 10, which "teach an alternative orientation for the claimed aerodynamic configuration," wherein the c-slot is "substantially parallel with the bottom surface" of the club head, but is rotated either toward the toe or the hosel of the club, so that it is "offset from a virtual centerline that passes transversely through a heel-to-toe axis of the club head."

Much of the debate boils down to (1) the shape of the aerodynamic c-shaped slot (or "c-slot"), and (2) whether the c-slot is confined to the bottom surface of the golf club head, or may extend to the sidewalls. Some of these terms are interrelated; for example, some limitations to the shape of the c-slot

or the concept of "substantially parallel" might imply that it cannot extend to the side wall. When possible, I will address interrelated aspects together.

A. "Substantially parallel with/to" and "c-shaped slot"

The dispute here is whether, in the context of this patent, "substantially parallel" refers only to the relationship between flat surfaces, as Nike argues, or whether it can also "encompass parallelism between curved surfaces," as the Trust suggests. (*Compare* Pl. Opening Br. at 10 *with* Def. Opening Br. at 12–18.)

If Nike is right, then the '754 patent covers only club heads where the c-slot has a "flat bottom surface" that is substantially parallel to the flat plane of the bottom surface of the club head. *See* Joint Statement Ex. B. In other words, the patent's claims would be limited to club heads wherein the bottom surface of the c-shaped slot and the bottom surface of the club head are both flat planes, and those two planes are substantially parallel.

On the other hand, if the Trust is right, then the '754 patent may also encompass club heads where the bottom surface of the c-slot is curved, and is "substantially parallel with" the bottom surface of the club head, which may also be curved. Depending on the meaning of "substantially parallel," the Trust's construction might include a wide variety of c-shaped slots. *See* Joint Statement Ex. B ¶2 ("Any generally c-shaped channel").

1. The Trust's proposed construction

Before addressing the construction of these claim terms, I must address a preliminary argument. According to the Trust, the adverb "substantially," which modifies "parallel," cannot be construed in a *Markman* hearing; it is "relative," not "absolute," and it therefore presents an issue of fact for the jury. *See* Pl. Opening Br. at 10. I disagree.

First, the Trust itself relies heavily on the term "substantially" to impute "flexibility" to the word "parallel," which might otherwise require an unattainable mathematical precision. Thus, for example, the Trust argues that the word "substantially" "provides flexibility to the manner in which the entire phrase may be construed, and, as such, is clearly supportive of Plaintiff's argument . . . that the phrase substantially parallel certainly includes parallelism between curved surfaces . . . ." Pl. Opening Br. at 10. The Trust cannot have it both ways.

Second, the Trust's proposed bifurcation of issues between judge and jury would undermine the well-settled rule that claim construction is for the court. The "purpose of a *Markman* hearing is for the court and the parties to settle conclusively on the interpretation of disputed claims. Indeed, the need

for uniformity of claim construction and concerns about fairness to competitors inform the policy of reserving the claim construction function to the trial judge." *Novartis Corp.*, 565 F. Supp. 2d at 603 (internal citation omitted). I find no support for the notion that such claim construction issues should be allocated piecemeal to the judge or jury. And the cases cited by the Trust do not so hold.[6] Accordingly, as part of that claim construction process, I will construe the phrase "*substantially parallel with*" in its entirety.

The Trust maintains that "'substantially parallel' is not a complicated term that requires construction or an expert opinion. It is undisputed that primarily 'parallel' means 'everywhere' equidistant. The ordinary meaning of the phrase 'substantially parallel' envisions some amount of deviation from exactly parallel." Pl. Opening Br. at 11. "Substantially," then, tolerates a limited degree of deviation from an otherwise precise term or concept. The Court of Appeals for the Federal Circuit has explained:

> [W]ords of approximation, such as "generally" and "substantially," are descriptive terms "commonly used in patent claims 'to avoid a strict numerical boundary to the specified parameter.' " *Ecolab, Inc. v. Envirochem, Inc.*, 264 F.3d 1358, 1367 (Fed. Cir. 2001) (quoting *Pall Corp. v. Micron Separations, Inc.*, 66 F.3d 1211, 1217 (Fed. Cir. 1995)); *see, e.g., Andrew Corp v. Gabriel Elecs. Inc.*, 847 F.2d 819, 821-22 (Fed. Cir. 1988) (noting that terms such as "approach each other," "close to," "substantially equal," and "closely approximate" are ubiquitously used in patent claims and that such usages, when serving reasonably to describe the claimed subject matter to those of skill in the field of the invention and to distinguish the claimed subject matter from the prior art, have been accepted in patent examination and upheld by the courts). And, while ideally,

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[6] *See* Pl. Opening Br. at 10, citing *Modine Mfg. Co. v. U.S. Int'l Trade Comm'n*, 75 F.3d 1545, 1551 (Fed. Cir. 1996) *abrogated by Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd.*, 234 F.3d 558 (Fed. Cir. 2000) (considering the term "relatively small," and finding that "[o]rdinarily a claim element that is claimed in general descriptive words, when a numerical range appears in the specification and in other claims, is not limited to the numbers in the specification or the other claims. . . . It is usually incorrect to read numerical precision into a claim from which it is absent, particularly when other claims contain the numerical limitation.") (internal citations omitted), and *Anchor Wall Sys., Inc. v. Rockwood Retaining Walls, Inc.*, 340 F.3d 1298, 1310–11 (Fed. Cir. 2003) (noting that words of approximation, such as "generally" and "substantially," are descriptive terms that are "commonly used in patent claims 'to avoid a strict numerical boundary to the specified parameter.'") (quoting *Ecolab, Inc. v. Envirochem, Inc.*, 264 F.3d 1358, 1367 (Fed.Cir.2001)). In none of these cases did the court find that the modifying adverbs "relatively" or "generally" presented questions of fact for a jury. Rather, these cases stand for the proposition that modifiers like "relatively," "generally," and "substantially" envision some amount of deviation from what otherwise could be read as a term of precision.

> all terms in a disputed claim would be definitively bounded and clear, such is rarely the case in the art of claim drafting. In this case, exact parallelism is sufficient, but not necessary, to meet the limitation of the claim term "generally parallel."

Anchor, 340 F.3d at 1310–11 (Fed. Cir. 2003).

Thus, while "exact parallelism" is not necessary to meet the limitation of the claim term "substantially parallel," there will always be a question as to the permissible degree of deviation. The c-slot and the bottom surface of the club head need not be exactly, mathematically parallel, but the Patent indicates some degree, that is, a substantial degree, of parallelism between the c-slot and the bottom surface of the club head. *See* Claim 1 ("An aerodynamic configuration on, *and substantially parallel with*, said bottom surface adjacent said rear surface in the form of a c-shaped slot.").

When does a deviation from perfect parallelism exceed the bounds of being "substantially" parallel? The Trust does not suggest, for example, how many degrees of tilt would be too many, or how much curvature would preclude treatment as a straight line. Instead, "substantially" is interpreted to mean, more or less, "close enough."[7] Perhaps not much more can be said without reference to a specific claim of infringement against a particular accused device. Suffice it to say, as the Federal Circuit did, that this is a "word of approximation."

Of course, we cannot define "substantially parallel" unless we know what "parallel" means. On that score, the Trust suggests that, because there is no limitation on the general definition of "parallel," it should be construed broadly to include curved, as well as flat, surfaces:

> Since the patent does not include any limitation on the manner in which the planes of the parallel surface are defined, the patent allows a broad interpretation that the general plane of the slot and the plane of the bottom surface may be substantially parallel regardless of the center of the club head. Likewise, the patent broadly allows the plane of the c-shaped slot to be defined relative to the plane of the bottom surface. . . . The patent does not include the Defendant's proposed limitation that the bottom surface of the slot and the bottom surface of the golf club both be flat. In fact, the patent never uses the term "flat" or the like. As is known in the art of golf club design, the bottom surfaces of golf clubs typically are not flat.

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[7] The Merriam-Webster Online Dictionary defines "substantial" in this context as "being largely but not wholly that which is specified." *See* www.merriam-webster.com.

Pl. Opening Br. 10–11. The Trust points to several of the '754 patent's drawings, which represent various embodiments of the Patent. Those drawings have shading or contour lines which, according to the Trust, depict c-slots "whose bottom is not flat." *Id.* at 13; '754 patent, Figures 1, 2, 6, 9, 10.

The Trust also relies on statements made during the Patent's re-examination by John P. Gillig ("Gillig"), a professional golfer and club designer who was "retained by [the] Trust as a consultant for the purpose of assisting in the licensing of the many patents of Antonious which were still unexpired at the time of his passing." *See* Declaration of John P. Gillig under 37 CFR 1.132[8] in Support of Re-Examination Respondent / Patentee, April 20, 2009, Ex. B to Pl. Opening Br., ECF No. 38 ("Gillig Decl.") ¶ 5. Gillig discusses the shape and positioning of the c-slot in the Antonious club in relation to the "Air Bear 1 driver golf club." The Air Bear, manufactured by the Nicklaus Golf Company and designed by Thomas Stites, a Nike employee, is considered prior art of record for the '754 patent. *See id.* ¶ 7. Gillig explains:

> The concept of the Air Bear was to reduce so-called airflow separation (AFS) distance because the greater the AFS, the greater the resultant drag force at the toe of the club. . . . [t]he heel-to-toe aerodynamic channel of the Air Bear was formed within the sidewalls of the club which . . . possessed a very small bottom or bottom surface plate. Further, the curvature of the aerodynamic channel of the Air Bear *was not parallel to either the bottom surface plate or the crown of the club.* . . . [T]he heel end of the Air Bear channel tails upward, away from the face plate and toward the hosel, while the toe end of the Air Bear channel is larger and tails downward toward the face plate. As such, the channel of the Air Bear *is not substantially parallel to either the bottom surface plate or the crown of the club.* In distinction, the structure of all embodiments of the club taught in the Antonious '754 patent was very different. . . . Antonious sought to reduce aerodynamic drag by providing a smoother, so-called laminar type of front-to-rear airflow around the club head to enable a golfer to hit the ball longer and straighter. Antonious also sought to increase aerodynamic stability of the club head to provide increased control of club head position to the golfer during club swing and to provide more consistent ball strikes and therefore launches. Antonious sought to achieve the above by providing a c-shaped aerodynamic slot adjacent to the rear surface of the club and upon the bottom

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[8] "When any claim of an application or a patent under reexamination is rejected or objected to, any evidence submitted to traverse the rejection or objection on a basis not otherwise provided for must be by way of an oath or declaration under this section." 37 C.F.R. § 1.132.

> surface at a position generally following the contour of the club body. . . . [The c-shaped slot] is common to all embodiments of the '754 patent regardless of whether or not a venturi opening, such as opening 232 (shown in Figs. 6 & 7), was included as part of the c-shaped slot. . . . As may be noted in Fig. 5, *the aerodynamic slot 130* (which as above noted is common to all embodiments) *defines a plane which is substantially parallel to both the bottom surface, or bottom surface plate, and the crown of the club.* Therein, the aerodynamic slots 330 and 430 shown in Figs. 9 and 10 [respectively] occupy the same plane as the slot shown in Fig. 5, i.e. *a plane substantially parallel with the bottom and top surfaces of the club.*

Gillig Decl. ¶¶ 10-19 (emphasis added).

Gillig clearly relies on the nature of the c-slot as being "substantially parallel to both the bottom surface, or bottom surface plate, and the crown of the club" to distinguish the '754 patent from the Air Bear. He also indicates that this "substantially parallel c-shaped slot" is "common to all embodiments." The Trust, while relying on Gillig's opinion, has one reservation about it. Because the claims at issue do not anywhere reference "the crown of the club," says the Trust, "Gillig's comments relative [to the crown] do not relate to any issue of claim construction." Pl. Opening Br. at 14; Gillig Decl. ¶ 19. The required parallelism in Claims 1 and 9, according to the Trust, relates only to the bottom surface, not the crown.[9] Setting that aside, the Trust maintains that Gillig's Declaration generally supports the Trust's view "that any limitation of 'flatness' to either the bottom surface of the club, the plane of the c-shaped slot, or the base of the c-shaped slot, is without basis in the specification or PTO file histories." Pl. Opening Br. at 14–15.

In short the '754 patent's requirement that the c-slot and the bottom surface be "substantially parallel" refers to their general orientation; it does not imply that those surfaces must be flat. Or so says the Trust.

2. Nike's proposed construction

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9 In other words, neither Claim 1 nor Claim 9 describes the position of the c-slot in relation to the "crown of the club." Gillig's description of the c-slot as being positioned on a plane that is "substantially parallel to *both* the bottom surface, or bottom surface plate, *and* the crown of the club" therefore contains surplusage that should be disregarded. While perhaps not fatal, this imparts some awkwardness to the Trust's absolute reliance on Gillig's remarks "to the effect that the C-shaped aerodynamic slot adjacent to the rear surface of the club and upon the bottom surface generally follows the contour of the club body." Pl. Opening Br. at 14.

First, Nike points out that the term "substantially parallel" did not appear anywhere in the original '754 patent. *See* Def. Opening Br. at 12–13. That language appeared for the first time during the reexamination, in amended Claim 1 and newly added Claim 9. Because "no 'new matter' can be added during reexamination," Nike maintains, the "substantially parallel" limitation, to be valid, "must have existed somewhere in the original '754 patent, even though those words were not used in the patent." *Id.* at 13 (citing 35 U.S.C. §§ 305, 132). The only possible origin for this limitation, says Nike, is the '754 patent's Figure 5. Figure 5 shows a cross-sectional diagram of a club head wherein the c-shaped slot has a flat bottom surface that is parallel to the bottom surface of the club head, which also appears flat. *Id.*; *see also id.* at 14, Illustration 10 of Figure 5. Nike notes that the Trust itself represented to the PTO during reexamination that the "antecedent support" for the "substantially parallel" relationship between the aerodynamic configuration and the bottom surface of the club "appears in Figure 5 of the '754 patent which is also incorporated in the description of Figs. 9 and 10 . . . ." *See* Decl. of Erik S. Maurer in Support of Nike's Opening Claim Construction Brief, November 7, 2012, ECF No. 39-6 ("Maurer Decl.") at Ex. 4, NIKE00006685. Nike also relies on Gillig's Declaration, which states that "the cross-sectional view of Fig. 5 [is] controlling with regard to the shape and geometry of the slot that was common to all embodiments of the invention." Gillig Decl. ¶ 24.[10]

Second, Nike maintains that the Trust was compelled to add the "substantially parallel" limitation to Claim 1 and Claim 9 as a "narrowing amendment" in order "to overcome a prior art rejection." Def. Opening Br. at 14, 15. According to Nike, it was to distinguish the '754 patent from prior art, especially the Air Bear club, that the Trust made the following representation:

> Claim 1 as amended also makes explicit that the c-shaped slot is formed within the substantially flat bottom surface. . . . These amendments, in pertinent portion, express that the aerodynamic configuration is substantially parallel with the bottom surface of the club and that said configuration transects a face-to-rear centerline of the club.

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10 The full quotation from paragraph 24 of Gillig's Declaration is as follows:

> In my opinion, Antonious's objectives of minimizing front-to-rear turbulence and reduction of drag upon that club, while enhancing club speed and stability, could not have been achieved if his aerodynamic slot was located within any of the sidewalls or side surfaces of the embodiments set forth in the '754 patent, or if the slot was not substantially parallel with the bottom and crown of the club. As such, I consider the cross-sectional view of Fig. 5 to be controlling with regard to the shape and geometry of the slot that was common to all embodiments of the invention.

Id. at 15 (citing Maurer Decl. Ex. 4, Nike 00006692–93 (pp. 6-11 of the "Remarks/Arguments," submitted by the Trust in connection with reexamination).

In addition, Nike relies on a number of statements made during reexamination (including those made by Gillig, discussed above). In those statements, experts refer to the aerodynamic slot as occupying a plane that is substantially parallel to the sole or bottom surface of the club head and attempt to distinguish the '754 patent from the Air Bear on that basis. *See id.* at 15–16.

Third, Nike submits that the Trust, by stipulating during reexamination that the "c-shaped slot does not extend into the sidewalls of the club head," has "surrendered any interpretation of its claims that would allow the c-shaped slot to be anything but a flat surface that is 'substantially parallel' to a flat bottom surface. . . ." *Id.* at 17 (citing Gillig at ¶¶ 11, 19, 24).

3. The Court's construction

The parties' positions on the construction of *substantially parallel* and *c-shaped slot* represent two extremes. The Trust's construction imposes very little in the way of limitation; Nike's construction requires that both the bottom surface of the club head and the c-slot have a flat surface, that those flat surfaces be parallel to each other, and that it necessarily follows that the c-slot cannot extend into the club's sidewalls. I find that the proper construction lies in the middle, perhaps tending toward that of Nike. In so finding, I consider the declaratory statements made during the reexamination process as being part of the intrinsic patent record that is relevant to the construction of revised Claim 1 and newly added Claim 9.

As the Federal Circuit has said, "'generally parallel' envisions some amount of deviation from exactly parallel." *Anchor Wall Sys.*, 340 F.3d at 1311. I accept that general principle, and I find the same to be true of "substantially parallel." But does "substantially parallel," or just "parallel," for that matter, presuppose two surfaces that are flat?

Start simple. Two-dimensional lines may, of course, be parallel. // That reasoning is easily extended to two flat surfaces that are everywhere equidistant. Take, for example, Figure 5. That Figure shows a cross section wherein the bottom surface of the club head and the bottom surface of the c-slot are both visibly flat. And those two flat surfaces (each extended as a plane) seem to be substantially parallel, *i.e.*, substantially equidistant from each other at every point. The parallelism concept, says Nike, can go no further.

In many embodiments, however—Figures 9 & 10, for example—one or more relevant surfaces appear to be curved. The contour lines, for example, suggest that the c-slot, viewed in cross section, has a curved bottom: a "∩" rather than a "Π". And the Trust suggests that the c-slot may extend up into the sidewalls of the club. Is it possible to apply the "substantially parallel" concept there? Yes, says the Trust. No, says Nike— flatness is a requirement.

Again, start from a simple two-dimensional concept. A pair of curved lines may be equidistant at every point.)) It does not torture the meaning of the term to say they are "parallel."[11] Similarly, two curved surfaces may be equidistant at every point. How to apply that concept, however, when one curve is a cross-sectional side view of a slot that, viewed from the top, resembles a C? (And when the bottom surface of the club, to which the first curve must be parallel, might also be a curved surface?)

Gillig's statements, taken in context, provide some guidance. He repeatedly refers to the "aerodynamic configuration" (*i.e.*, the c-shaped slot) as "defining" or "occupying a plane" that is "substantially parallel" to the bottom (and top) surface of the club.

> Regarding the embodiment of Figs. 9 and 10, Antonious employed a golf club head similar in shape to the golf club head described in Figs. 1-5 of the '754 patent (See Col. 3, Line 24.) As may be noted in Fig. 5, *the aerodynamic slot 130* (which as above noted is common to all embodiments) *defines a plane which is substantially parallel to both the bottom surface, or bottom surface plate, and the crown of the club.* Therein, the aerodynamic slots 330 and 430 shown in Figs. 9 and 10 [respectively] occupy the same plane as the slot shown in Fig. 5, i.e., *a plane substantially parallel with the bottom and top surfaces of the club.*

Gillig Decl. ¶ 19 (emphasis added).

Gillig compares the *planes* that the aerodynamic slots (130, 330, and 440) occupy, or define, as opposed to the slots themselves. According to this view, an element that lacks flat surfaces may nevertheless lie in, or define, a

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11 Also parallel are straight lines that are tangent to the corresponding point on each curve. Parallel surfaces can quickly get us into deep water, mathematically. *See, e.g., www.encyclopediaofmath.org/index.php/Parallel_surfaces.* There is something, however, to the notion that a surface, although not itself a plane, may substantially *define* a plane, and that one such defined plane may be parallel to another plane. *See id.* Or it may be that two congruent curved surfaces may be everywhere equidistant, and therefore parallel. Those background concepts may assist in the discussion.

plane.[12] And that plane may be "substantially parallel" to other elements in the figure. In other words, the c-slot itself does not have to have an identifiably flat bottom, but it may occupy, or be positioned within, a plane that is "substantially parallel" to the bottom surface (and, says Gillig, the crown) of the club head. Thus, a c-shaped channel with a rounded bottom that is of uniform depth with respect to the plane of the club head's bottom surface might be said to lie in, occupy or define a plane. [13]

By contrast, consider a c-slot with the heel end of the channel cut deep, tilting the plane upward toward the hosel of the club, and the toe end of the channel cut shallow, tilting the plane downward toward the face plate. Such a c-slot might not define a plane parallel to that of the bottom surface of the club head; it might be tilted with respect to the bottom surface. I believe that Gillig envisioned a variant of this when he contrasted the Air Bear design thus: "[T]he heel end of the Air Bear channel tails upward, away from the face plate and toward the hosel, while the toe end of the Air Bear channel is larger and tails downward toward the face plate. As such, the channel of the Air Bear is not

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12 Neither party, by the way, has addressed or defined the term "plane," and it is not a term that is subject to construction here. I ignore the theoretical constructs of plane geometry. A serviceable definition of "plane" as used in this context would encompass any bounded, flat surface:

> **a** : a surface in which if any two points are chosen a straight line joining them lies wholly in that surface
> **b :** a flat or level surface

See http://www.merriam-webster.com/dictionary/plane.

13 It may help in visualization to consider an example, highly simplified for purposes of illustration only, of a c-slot that has a rounded, not flat, bottom. At least in one possible embodiment, its interior shape may resemble a quarter of a doughnut. (I mean one of the four identically shaped pieces that result when a doughnut is cut lengthwise, then across.) Lay that quarter-doughnut on the table, flat side down. Is it meaningful to say that the rounded top is parallel to the table? Yes, if we consider the plane that is defined by the rounded top of the doughnut. For example, if we were to lay a rigid cardboard square on top of the quarter-doughnut, it would lie parallel to the table. (Note that the quarter-doughnut's c-shape helps define the plane. Although the slot has a rounded top, it defines a unique plane, *i.e.,* it supports the cardboard in only one position.)

Now consider a lopsided quarter-doughnut, thick on one side and thinner on the other. Again, lay it on the table, flat side down. Lay the cardboard on top. That piece of cardboard is not parallel but tilted with respect to the table.

substantially parallel to either the sole plate or the crown of the club." Gillig Decl. ¶14.[14]

"Substantially" allows for some wiggle room, both in the concept of the parallelism and in the acceptable deviation from perfect parallelism. But in common, not overly technical parlance, the observer should be able to recognize such substantial parallelism. That is, it should be discernible whether the slot occupies a plane that is parallel with, or tilted with respect to, the plane of the bottom surface.

I next consider the issue of whether the c-slot may extend into the sidewalls. The plain language of the relevant Claims suggests not. Claim 1 (as amended) states that aerodynamic configuration, which is "in the form of a c-shaped slot," is "on ... said bottom surface." Claim 9 states that the c-slot is "within ... said bottom surface." Reexamination Certificate at p. 2, lines 21–23, 45–46. The "substantially parallel" limitation, too, would appear to rule out many, if not all, embodiments in which the c-slot extends into the sidewalls. Of key importance, however, is the prosecution history of the reexamination. The Gillig Declaration, on which the Trust heavily relies, endorses this limitation:

> (a) After noting that the c-slots in Figs. 5, 9 and 10 are substantially parallel to the top and bottom surfaces of the club, Gillig states that "the c-shaped aerodynamic slot of Antonious is separate and *apart from the sidewall surfaces* . . . of the respective embodiments of the invention." *Id.* ¶19 (emphasis added).
>
> (b) Considering the aerodynamic function of the slot design, Gillig states that "Antonious' objectives of minimizing front-to-rear turbulence and reduction of drag upon the club, while enhancing club speed and stability, *could not have been achieved if his aerodynamic slot was located within any of the sidewalls* or side surfaces of the embodiments set forth in the '754 patent or if the slot was not substantially parallel with the bottom and crown of the club." *Id.* ¶ 24 (emphasis added).
>
> (c) Distinguishing the Air Bear prior art, Gillig states that "the heel-to-toe *aerodynamic channel of the Air Bear was formed within the sidewalls* of the club," *id.* ¶11 (emphasis added), and notes that the aerodynamic objective of the Air Bear slot "could not

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14 That is not to say that the court, in a *Markman* hearing, should distort its interpretation to avoid a later finding of invalidity based on prior art. But prior art is properly considered here because, in the '754 reexamination, the Trust contrasted its design with prior art, including the Air Bear. That contrast, explicitly embraced by the Trust, sheds light on the meaning of the terms of the '754 patent.

> have been accomplished if the aerodynamic channel of the Air Bear was disposed in or upon the bottom or sole plate of the club," *id.* ¶ 13.

All of these statements place the c-slot within the bottom surface, and draw a sharp distinction between the bottom surface and the sidewalls. I conclude that the c-slot cannot extend into the sidewalls.

Finally, I consider the club head's bottom surface (to which the c-slot must be parallel). Nike, as we have seen, argues that parallelism implies that the bottom surface must be flat. But even if curved, the club head's bottom surface may theoretically be substantially parallel to the c-slot, *if* the two curvatures are congruent. (That is to say that Nike's example, in which both are flat, is a valid example, but not, as Nike claims, the *only* possible example.) "Substantially" may also encompass some limited degree of departure from perfect flatness. The preceding discussion limits the range of possibilities, but perhaps one could be imagined.

The question remains, however, whether the Trust, in the course of reexamination, disclaimed any embodiment with a curved bottom surface. As to Claim 1, it did: "Claim 1 as amended also makes explicit that the c-shaped slot is formed within the *substantially flat bottom surface* . . . ." Nike 00006692–93 (pp. 6-11 of the "Remarks/Arguments," submitted by the Trust in connection with reexamination, quoted more fully at p. 19, *supra*) emphasis added). I see no explicit disclaimer as to Claim 9, but I also see no basis to construe "substantially parallel" or "c-shaped slot" differently as to these two claims. (And claim 9, added only on reexamination, could not expand the scope of the prior claims.)

In sum, then, I find that parallelism does not logically rule out the relation between curved surfaces, but that the exclusion of slots extending into the sidewalls (*see infra*), as well as the nature of the c-slot design, probably leave little if any room for embodiments with parallel curved surfaces. To that, I add the concession in the reexamination history that the bottom surface be "substantially flat." These factors, put together, lead me to the conclusion that a substantially—not perfectly, but substantially—flat bottom surface is inherent in Claims 1 and 9.

This construction is broader than the one proposed by Nike, but narrower than the one proposed by the Trust. It has the virtue of common sense; the thought behind "substantially parallel" seems to be that the orientation of the slot not be tilted with respect to the bottom surface of the club. It has the virtue of consistency with all of the Figures. The elements in Figure 5 have flat surfaces, and the elements in in Figures 9 & 10 do not, but the c-slot in each case can still be said to occupy or define a plane that is "substantially parallel" to the bottom surface of the club head. On the

assumption that "substantially parallel" must mean *something*, this construction, or something like it, may be the only way to reconcile the Figures. This construction also tends to avoid a conflict with prior art, especially the Air Bear, wherein the aerodynamic channel occupies a plane that is tilted or sloped with respect to the bottom surface of the club, or extends into the sidewalls. And it honors the concessions and representations made by the Trust in connection with the reexamination.

Thus, in light of the preceding analysis, I construct these disputed patent terms, contained in Claims 1 and 9, as follows:

Substantially parallel with/to means that the plane defined by the c-shaped slot and the plane defined by the substantially flat bottom surface/sole of the club are essentially parallel to each other, and the c-shaped slot does not extend into the side walls or skirt.

C-shaped slot means an aerodynamic slot characterized by a c-shaped profile, in the sole/bottom surface, not the sidewalls, of the golf club head.

B. "Skid surface" and "Wall separating said skid surface from said bottom surface" (Claim 1 only)

1. The Parties' proposed constructions

Plaintiff	*Defendant*
Skid surface: A surface of the golf club head formed on and raised from the bottom surface so as to extend outwardly from the bottom surface/bottom surface, and as designed to skim across the ground when the club head is swung.	***Skid surface***: A surface of the golf club head formed on and raised from the bottom surface so as to extend outwardly from the bottom surface/bottom surface, separated from the bottom surface by the spacer wall, and designed to skim across the ground when the club head is swung.
Wall separating said skid surface from said bottom surface: The only term in this phrase not otherwise construed or discussed herein is 'wall.' Wall means any non-horizontal surface that separates the skid surface from the bottom surface.	***Wall separating said skid surface from said bottom surface:*** A spacer wall separating the bottom surface from the skid surface, where the spacer wall is separate and distinct from the perimeter walls of the c-shaped slot.

The issue here boils down to a dispute as to whether the club head's skid surface[15] must be separated from the bottom surface of the club head by a standalone or discrete "spacer wall," or whether the definition encompasses a wall that is an extension of the perimeter wall of the c-slot.

The Trust proffers the broader interpretation (a), wherein "wall" encompasses any "non-horizontal surface." In the Trust's view, the terms "'skid surface' and 'spacer wall' are defined by their function, as opposed to their exact location or geometry." Pl. Opening Br. at 21. Nothing in the Claim language "or otherwise in the intrinsic evidence precludes where the front of the wall separating the skid surface from the bottom surface can begin and does not preclude the possibility that such wall may simply constitute an extension or elevation of the inner wall of the c-shaped slot," *id.* at 26. The Trust proffers hypothetical variations on Patent Figures 5 and 2 to illustrate its point.[16] *Id.* at 22–23, 25.

Nike maintains, more narrowly, that the '754 patent requires a discrete "spacer wall." In Nike's view, the language of Claim 1 is inherently *structural*, not just functional, and it requires three distinct structural elements: (1) a bottom surface, (2) a skid surface, and (3) a wall separating the bottom surface and the skid surface. *See* Def. Opening Br. at 22. Again, Nike relies on Patent Figure 5, which shows a distinct separating wall, as the controlling representation.

2. The Court's construction

The plain language of Claim 1 defines the crucial features of the skid surface element:

> said aerodynamic configuration further including a **skid surface** formed on and *raised* from said bottom surface; said **skid surface *having* a wall *separating* said skid surface from said bottom surface.**

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15 There is no meaningful dispute as to the definition of "skid surface." The Parties agree that a *skid surface* is "a surface of the golf club head formed on and raised from the bottom surface so as to extend outwardly from the bottom surface/bottom surface . . . and designed to skim across the ground when the club head is swung." *See* Joint Statement.

16 Nike challenges the Trust's reliance on these "hypothetical illustrations," which are not part of the record. While it is true that these figures do not appear in the record, I see nothing wrong with the Trust's offering them as a visual aid to demonstrate its verbal point.

Revised Claim 1 (terms in bold are disputed; terms in italics reflect my emphasis). Thus (a) the skid surface must be *raised* from the bottom surface of the bottom surface; (b) the skid surface must *have a wall,* and (c) the wall must *separate* the skid surface from the bottom surface.

Element (a) at least suggests separateness, in that the skid surface is "raised," *i.e.,* it must rise *from,* the bottom surface. While neither party addresses element (b)—the skid surface "*having*" a wall—it seems to imply that the separating wall in some sense belongs to the skid surface. Element (c)—the requirement that the wall *separate* the skid surface from the bottom surface—tends to suggest that the wall must have an independent existence, *i.e.,* that it must arise from the bottom surface.

I am unconvinced, however, by the Trust's proffered "functional" approach. Taken to an extreme, that approach might open the door to any embodiment that accomplishes the same result, which I find too broad. Moreover, the plain language of Claim 1 does not describe the skid surface in terms of its function. To the contrary, the Claim language requires that the *skid surface have a wall that separates the skid surface from the bottom surface.* That description, while perhaps not wholly structural, emphasizes the physical "what-and-where," not the functional "how."

These factors, to me, suggest that a face of the "wall" that is merely an extension or continuation of the c-slot wall does not arise from the bottom surface, and does not separate the skid surface from the bottom surface. Any face, or portion, of the skid-surface wall that is a mere continuation of the c-slot wall, with no break or offset that is identifiable as part of the bottom surface, does not separate the bottom surface from the skid surface. At least along that portion of the wall's width, there *is* no bottom surface. *See* Pl. Opening Br. at 26.

The question remains, however, whether it is fatal if part, but not all, of the wall merges with the wall of the c-slot. The skid-surface wall may have more than one face or dimension. Suppose, for example, that it merges with the wall of the c-slot on its trailing side (*i.e.,* the side away from the striking surface of the club), but arises from an identifiable bottom surface on the other two sides? Such a wall, I think, could still be said to separate the skid surface from the bottom surface. Separating the skid surface from the bottom surface is not the *only* thing it does along its entire length, but it is *one* of the things it does. The definition, then, should include any wall that, for a substantial portion of its length, arises from an actual, physical portion of the bottom surface[17] and separates that portion of the bottom surface from the skid surface.

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17 In saying this, I mean to include the physical bottom surface, but exclude a mere theoretical extension of the plane of the bottom surface. Remember, too, that the fourth side of the skid surface—the one near the ball striking surface—there does not

Accordingly, I modify Defendant's construction and adopt a limitation that the skid surface and bottom surface must be separated by a "spacer wall" that is distinct from the c-shaped slot itself *along a substantial portion of its width.* This modification does not require clarification of the definition of "skid surface," but does require clarification of the definition of "wall separating said skid surface from said bottom surface," as follows:

> *Skid surface* means a surface of the golf club head formed on and raised from the bottom surface so as to extend outwardly from the bottom surface/sole, *separated from the bottom surface by the spacer wall,* and designed to skim across the ground when the club head is swung.
>
> [and]
>
> *Wall separating said skid surface from said bottom surface* means a spacer wall separating the bottom surface from the skid surface, where the spacer wall, along a substantial portion of its width, is separate and distinct from the perimeter walls of the c-shaped slot.

C. *"Offset from"* (Claim 9 only)

Plaintiff	*Defendant*
Existing or disposed at a displacement from the virtual centerline of the club head.	Substantially, rotationally offset relative to the virtual centerline.

The parties disagree as to whether the c-slot must be "rotationally" offset from the virtual centerline of the club head, or whether it can just be "at a displacement from," the virtual centerline of the club head. Imagine a c-slot that is perfectly bisected by the virtual centerline. The "offset" of such a c-slot might involve a lateral movement, or a rotational movement. The interpretive dispute is whether the displacement must be rotational (Nike), or whether it may be either (the Trust).[18]

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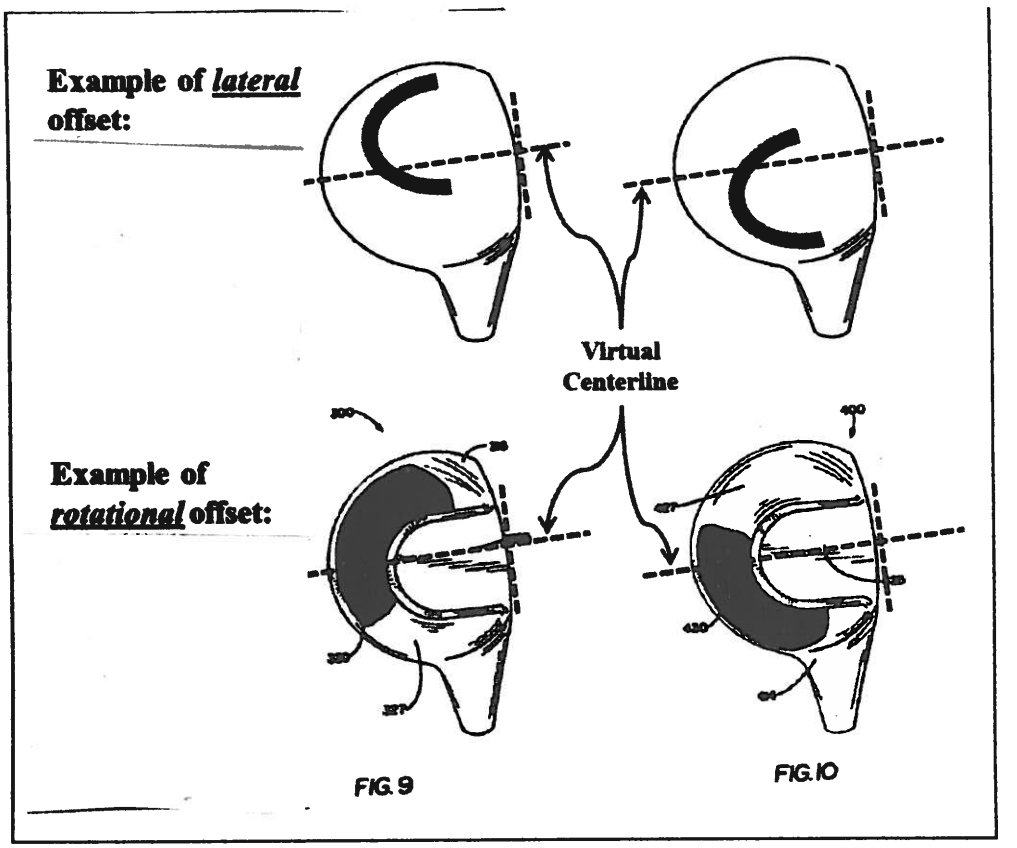
seem to be a "wall" at all, but this is not raised as an objection to the notion that the wall separates the skid surface from the bottom surface.

[18] The parties agree that, irrespective of the nature of the offset, the transverse line must still pass through the c-slot at some point.

ILLUSTRATION

The following illustration, taken from Nike's brief, may assist the reader in visualizing the two forms of offset:



The relevant language of Claim 9 provides:

> . . . . **said slot offset from**, and a portion thereof passing through, a virtual centerline passing transversely through a heel-to-toe axis of said club head.

The Trust maintains that the Patent's specification "does not recite or suggest a form of 'offset' relative to the term 'centerline' that must be accomplished using a vertical axis of rotation through the center of gravity of the club head." Pl. Opening Br. at 30. The Trust submits that "offset" should be defined "[i]n accordance with the 'heavy presumption' in the Federal Circuit's rules of claim construction [that] simple terms such as 'offset' should be interpreted according to [their] customary and ordinary meaning." *Id.* The ordinary dictionary definition of "offset" is a "displacement." Any displacement

from the virtual centerline of the club head, whether rotational or lateral, should therefore satisfy Claim 9, according to the Trust.

I accept that either a rotational or lateral displacement would satisfy the ordinary definition of "offset."[19] Nike, however, finds a further limitation in the Trust's statements on reexamination, especially those statements that were intended to neutralize the Air Bear prior art.[20] The broad dictionary definition of offset, says Nike, conflicts with the Trust's manifest purpose of adding Claim 9 in reexamination to "save" the Patent from a prior-art invalidation.

The issue is trickier than it looks. The Trust's broad definition of offset would appear to encompass any slot *except* one that is bilaterally symmetric along the axis of the centerline. As the Trust acknowledges,[21] however, the Air Bear slot appears to embody just that exception: that is, it appears to be bilaterally symmetric along the axis of the centerline. Thus any offset, whether lateral or rotational, might be sufficient to avoid the Air Bear prior art on this basis.

But that is not the basis on which the Trust *did* distinguish the prior art. In reexamination, the Trust submitted that the Air Bear channel was not offset, like the claimed invention, *because* the forward ends of the Air Bear channel (i.e., the two free ends of the "C") were equidistant from the club face. That configuration rules out a rotational offset; a rotational displacement would result in one end's being nearer, and the other farther, from the club face. But it does not rule out a lateral offset; the slot could be laterally offset with both ends of the C still remaining equidistant from the club face.

Nevertheless, I am inclined to be ruled by the broader interpretation, *i.e.*, the ordinary definition of offset, which encompasses either a lateral or a rotational displacement. It appears likely that Gillig subjectively had a rotational offset in mind when he penned paragraph 14 of his Declaration. But he also had in front of him an Air Bear slot that clearly was not offset in any

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19 *See www.merriam-webster.com/dictionary/offset.* It does not necessarily imply rotation. An offset in a wall, for example, involves a diminution in thickness that creates a sort of ledge. *Id.*

20 As noted above, the issue before the Court is patent construction, not patent validity or infringement. But the prior art was very much on the minds of the drafters and the examiner, and may shed light on the meaning of the patent.

21 "The aerodynamic channel of the Air Bear, while not precisely symmetric about a front to rear centerline of the club, was not significantly offset from the centerline." Maurer Decl. Ex. 4, Nike 00006650 (Winfield Decl. ¶ 8). The Air Bear channel "was not significantly offset from the centerline. In fact, the forward ends of the Air Bear Channel are nearly parallel with, and each end is the same distance from, the plane of the club face." (Gillig Decl. ¶ 14).

manner, whether lateral or rotational. To be sure, Gillig's reasons for concluding as he did were incomplete; his statement that the Air Bear slot was not offset, though correct, was underdetermined. But that, in my view, does not suffice to displace the ordinary and customary meaning of the word "offset." Under the canons of construction set forth above, that plain and ordinary meaning should control.

This term may legitimately encompass either a lateral or a rotational displacement from the virtual centerline described in Claim 9. Accordingly, I adopt the Trust's construction, which is that "offset from" means "existing or disposed at a displacement from the virtual centerline of the club head."

CONCLUSION

For the foregoing reasons, I construct the disputed terms of the '754 patent as follows.

> (Claims 1 and 9) *Substantially parallel with/to* means that the plane defined by the c-shaped slot and the plane defined by the substantially flat bottom surface/sole of the club are essentially parallel to each other, and the c-shaped slot does not extend into the side walls or skirt.
>
> (Claims 1 and 9) *C-shaped slot* means an aerodynamic slot characterized by a c-shaped profile, in the sole/bottom surface, not the sidewalls, of the golf club head.
>
> (Claim 1) *Skid surface* means a surface of the golf club head formed on and raised from the bottom surface so as to extend outwardly from the bottom surface/sole, separated from the bottom surface by the spacer wall, and designed to skim across the ground when the club head is swung.
>
> (Claim 1) *Wall separating said skid surface from said bottom surface* means a spacer wall separating the bottom surface from the skid surface, where the spacer wall, along a substantial portion of its width, is separate and distinct from the perimeter walls of the c-shaped slot.
>
> (Claim 9) *Offset from* means existing or disposed at a displacement from the virtual centerline of the club head.

Dated: January 8, 2014

Kevin McNulty
United States District Judge

US005735754A

United States Patent [19]

Antonious

[11] Patent Number: 5,735,754

[45] Date of Patent: Apr. 7, 1998

[54] AERODYNAMIC METAL WOOD GOLF CLUB HEAD

[76] Inventor: Anthony J. Antonious, 7738 Calle Facil, Sarasota, Fla. 34238

[21] Appl. No.: 759,924

[22] Filed: Dec. 4, 1996

[51] Int. Cl.[6] A63B 53/04

[52] U.S. Cl. 473/328; 473/345

[58] Field of Search D21/214, 215, D21/216, 217, 218, 219, 220; 473/327, 328, 324, 228, 286, 345, 346

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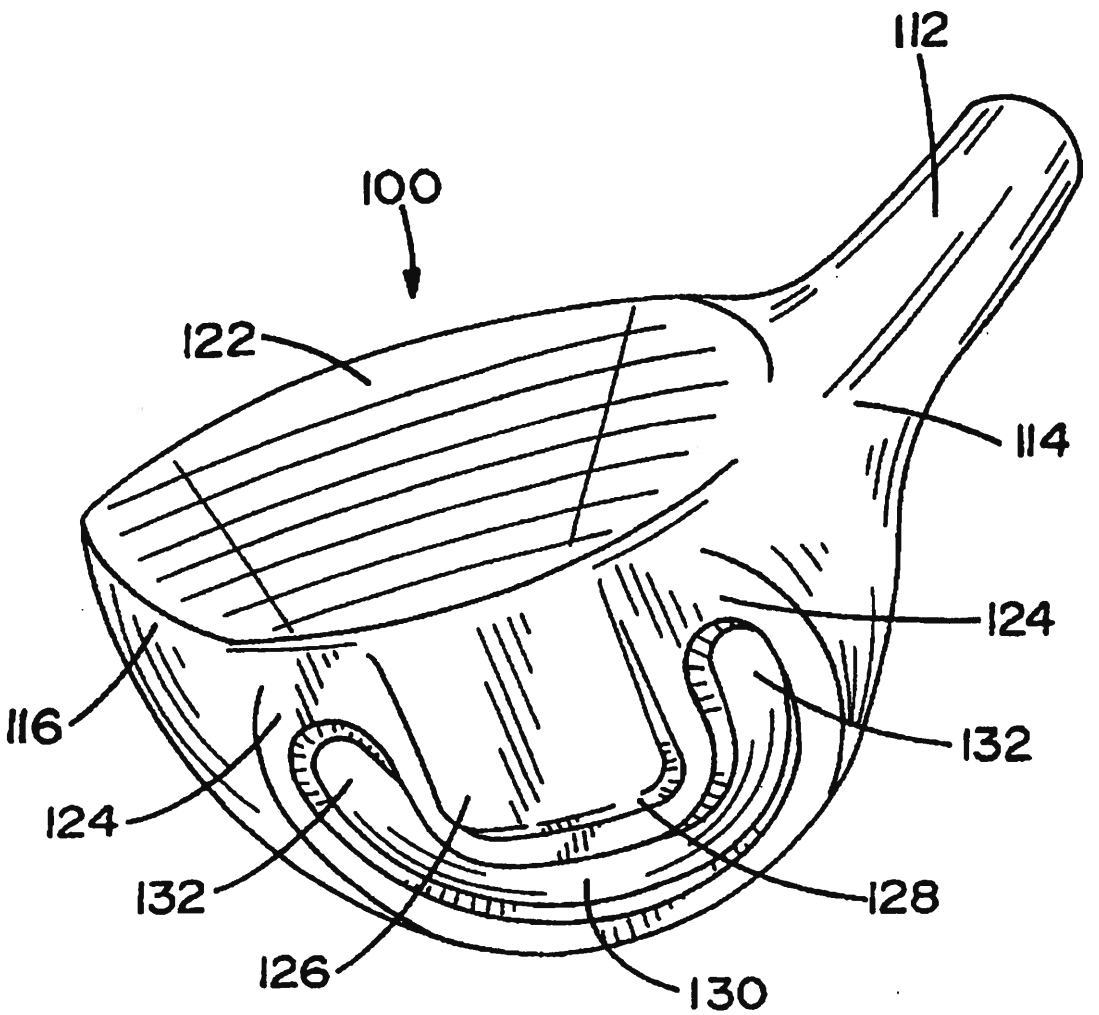
Primary Examiner—Sebastiano Passaniti

Attorney, Agent, or Firm—Aquilino & Welsh

[57] ABSTRACT

A metal wood type golf club head having a c-shaped aerodynamic configuration formed in the bottom surface adjacent a rear surface and having an open end extending forwardly toward the ball striking face in combination with a skid surface.

8 Claims, 3 Drawing Sheets



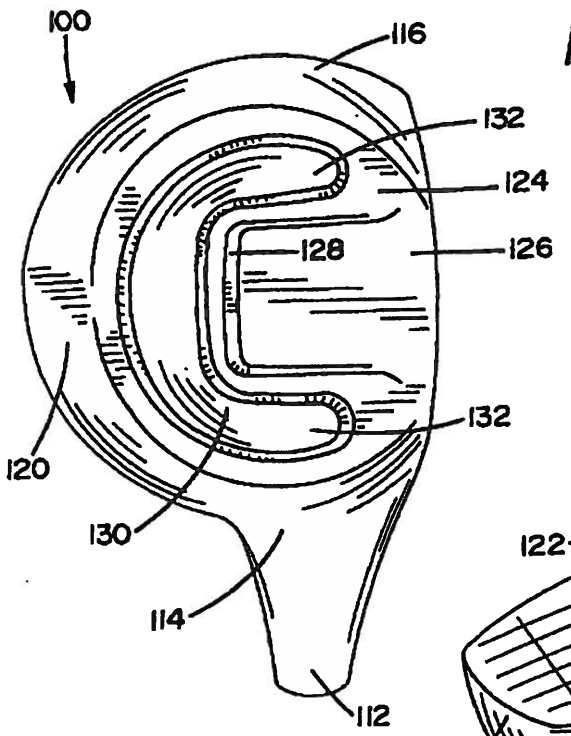


FIG. 1

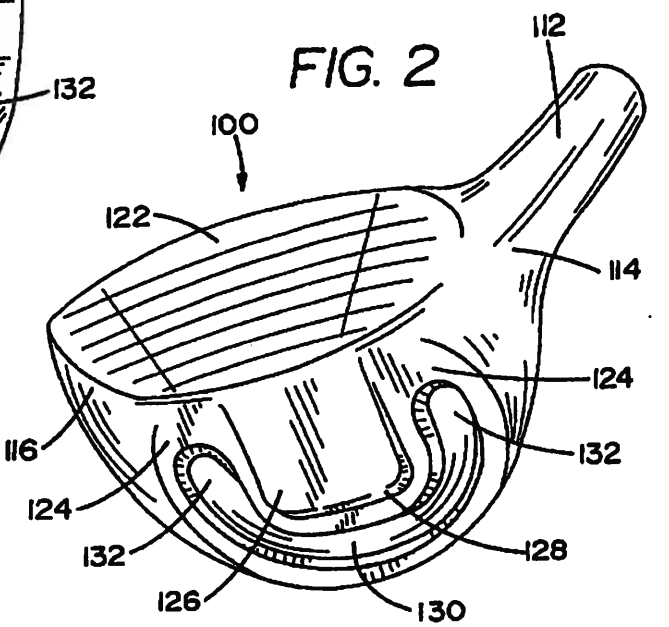


FIG. 2

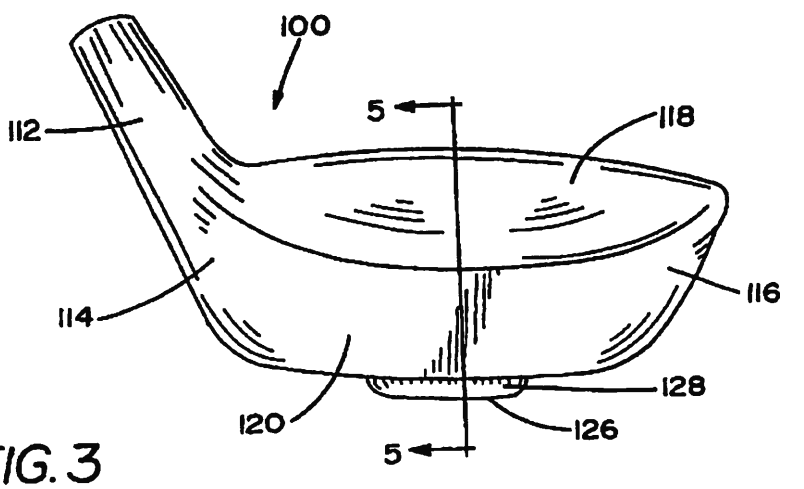


FIG. 3

FIG. 4

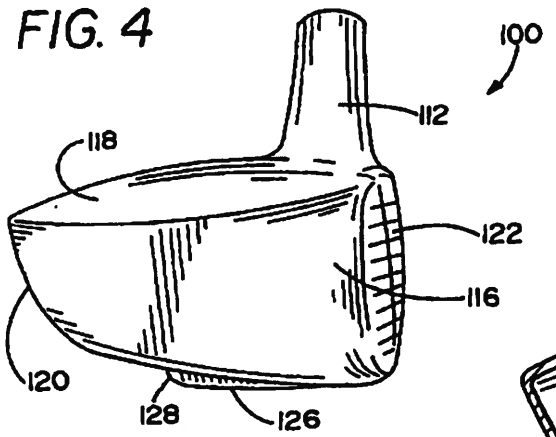
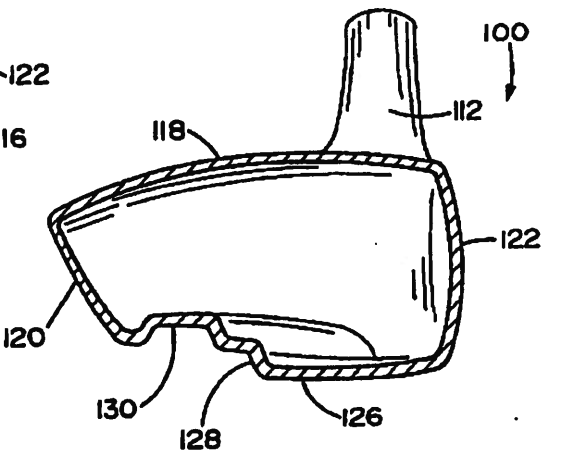


FIG. 5



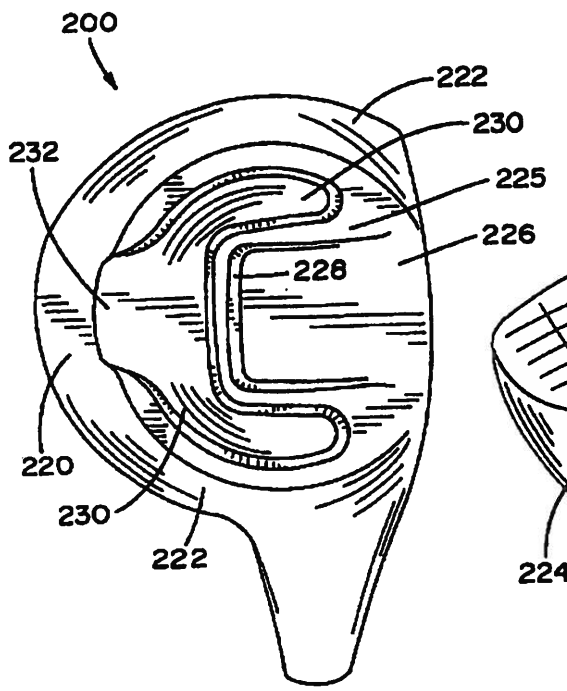


FIG. 6

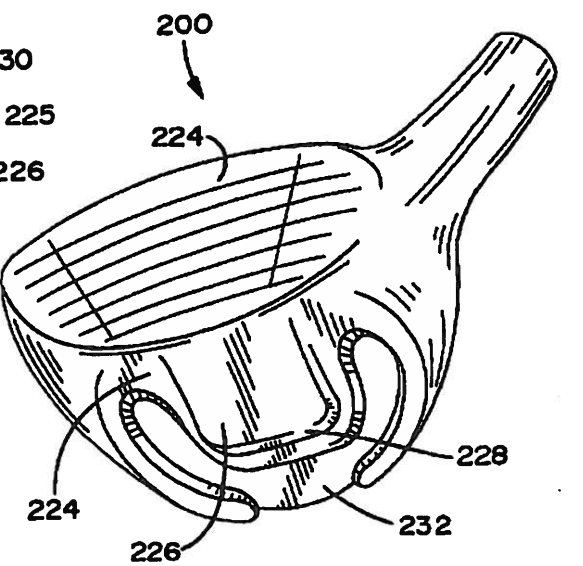
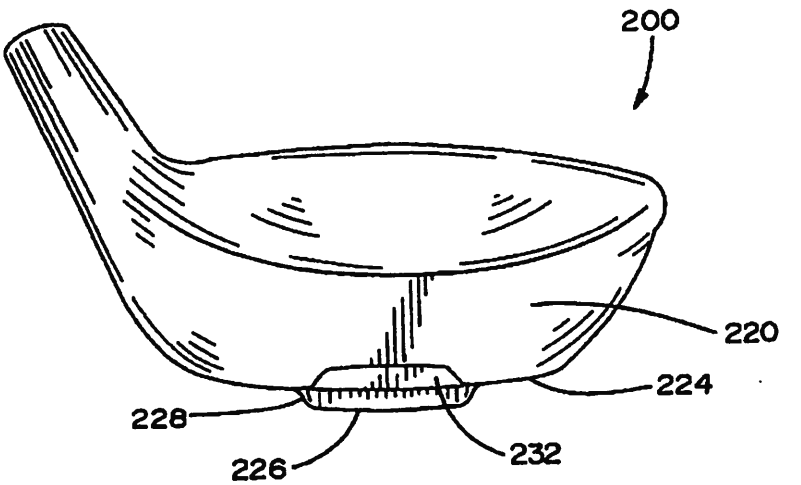


FIG. 7

FIG. 8



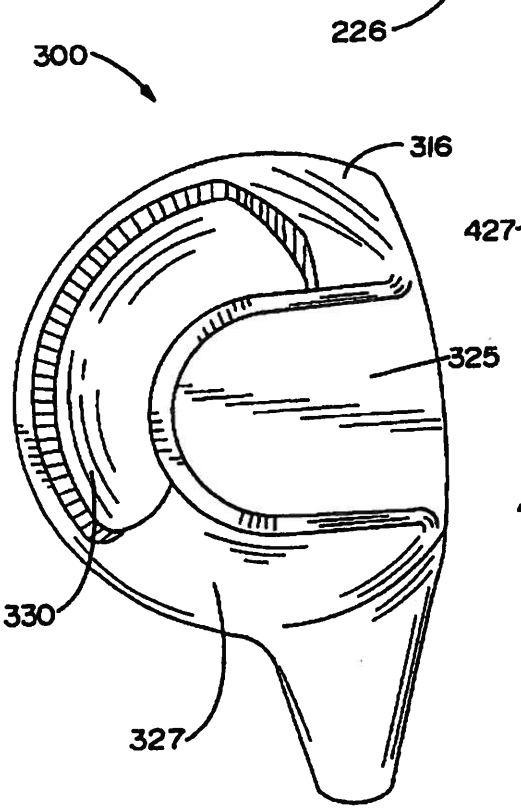


FIG. 9

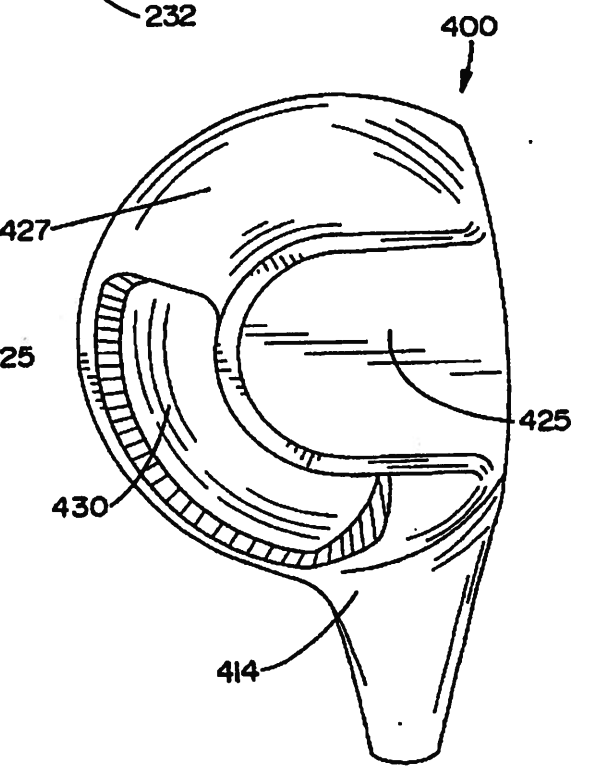


FIG. 10

AERODYNAMIC METAL WOOD GOLF CLUB HEAD

BACKGROUND OF THE INVENTION

The present invention relates to golf club heads and in particular to a metal wood type golf club head having an improved aerodynamic surface on the bottom rear of the sole.

Wood and metal wood type golf club heads are used for hitting a golf ball a longer distance and are usually used for the first shot of a given golf hole from a tee position. Fairway clubs of the same type are also used "through the green" on a golf hole to obtain maximum distance in the direction of or onto a putting surface. The distance the ball travels is determined by the club head speed at the moment of impact and the weight of the club head in accordance with well known laws of physics. Typical wood and metalwood golf club of this type have aerodynamic surfaces, but conventional shapes create substantial air turbulence, which, in turn, causes adverse erratic movement and aerodynamic drag that reduces the club head speed generated for a given force developed by a golfer for a particular golf swing.

Over the years, club heads have been developed with aerodynamic shapes to increase club head speed by reducing the aerodynamic drag of the club head as it is swung. Prior art examples of these type of golf club heads include U.S. Pat. Nos. D275,412 to Simmons, 2,550,840 to Milligan, 3,997,170 to Goldberg, 4,065,133 to Gordos, 4,900,029 to Sinclair, 5,203,565 to Murray et al, and 5,467,989 to Good et al. as well as my own U.S. Pat. Nos. 4,828,265, 4,930,783, 5,004,241, 5,193,810, 5,221,086 and 5,511,786 among others.

SUMMARY OF THE INVENTION

The present invention represents an improvement over known prior art wood type golf club heads by providing an aerodynamic surface on the bottom sole adjacent the rear edge of the club head, which produces greater club head speed when the club head is swung. This aerodynamic surface reduces undesirable air turbulence which causes aerodynamic drag and creates a smoother, laminar type air flow around the club head. A golf club using this improvement permits a golfer to hit longer and straighter golf shots for a given applied swing force. The aerodynamic structure also creates increased aerodynamic stability of the club head resulting in increased control of the club head position during the swing, especially at impact, thereby producing more consistent golf shots.

The golf club head of the present invention includes a c-shaped aerodynamic slot formed on the bottom sole surface of the club head. In a preferred embodiment, a metal wood type golf club head, having a smooth upper surface and sloped side walls, includes a c-shaped aerodynamic slot located adjacent the rear surface on the bottom surface or sole which generally follows the contours of the peripheral edges of the club head between the sole and the side walls. The open end of the c-shaped slot faces forwardly toward the front ball striking face of the club. The club head may also include a raised sole plate on the bottom surface having a spacer wall which also provides an aerodynamic effect and creates a skid structure enabling the club to skim across the ground surface when the club head is swung to hit a golf ball.

In another preferred embodiment, a venturi slot is provided between the c-shaped slot and the rear surface of the club head to further direct air flow adjacent the rear surface of the club head where most turbulence occurs.

The aerodynamic surfaces of the club head create aerodynamic effects which minimize turbulence and increase laminar air flow to reduce drag resulting in a more stable club head with higher speed for a given application of swing force by the golfer.

A primary object of the present invention is to provide a golf club head having an improved aerodynamic surface on the bottom sole adjacent the rear of the club head to substantially reduce drag and improve swing stability.

Another object is to provide a golf club head which increases club head speed and lift by concentrating air flow near the rear surface of the club head where turbulence occurs to reduce drag on the club head as it is swung.

Other objects and advantages of the present invention will become apparent in the following description of the preferred embodiments taken into conjunction with the accompanying drawings which are incorporated in and constitute a part of the specification and together with the description, serve to explain the principles of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a bottom view of an aerodynamic golf club head in accordance with the present invention.

FIG. 2 is a bottom perspective view of the golf club head of FIG. 1.

FIG. 3 is a rear elevational view thereof.

FIG. 4 is an end elevational view thereof.

FIG. 5 is a sectional view taken along the lines 5—5 of FIG. 3.

FIG. 6 is a bottom view of a second embodiment of an aerodynamic golf club in accordance with the present invention.

FIG. 7 is a bottom perspective view of the golf club head of FIG. 6.

FIG. 8 is rear elevational view thereof.

FIG. 9 is a bottom view of a third embodiment of the present invention.

FIG. 10 is a bottom view of a forth embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The detailed embodiments of the present invention are disclosed herein. It should be understood, however, that the disclosed embodiments are merely exemplary of the invention, which may be embodied in various forms. Therefore, the details disclosed herein are not to be interpreted as limited, but merely as the basis for the claims and as a basis for teaching one skilled in the art how to make and/or use the invention.

FIGS. 1–5 show a first embodiment of a golf club head 100 in accordance with the present invention. The golf club head 100 is conventional in shape, except for the aerodynamic surfaces and includes a hosel 112, heel 114, toe 116, upper surface 118, rear surface 120, ball striking face 122 and bottom surface 124. The bottom sole 124 includes a skid member 126 which extends outwardly from the bottom sole 124 and is separated therefrom by a spacer wall 128. A c-shaped aerodynamic slot 130 is formed on the bottom surface 124 and faces forwardly with open ends 132 of the c-shaped slot 130 being toward the ball striking face 122. Preferably, the c-shaped slot 130 extends from a point adjacent the interface of the bottom surface 124 and rear surface 120 across approximately two thirds of the distance to the ball striking face 122.

The aerodynamic slot 130 catches air just behind the ball striking face 122 and directs it toward the rear surface 120 within the curved walls of the c-shaped slot 130 of the club head 100. The air is expelled rearwardly out of the slot to minimize turbulence and reduce drag as the club head 100 is swung. At the same time, the skid 126 and spacer walls 128 also serve to direct the air flow rearwardly to increase laminar flow in that area of the club head 100.

FIGS. 6, 7, and 8 show a second embodiment of a golf club head 200 in accordance with the present invention. This club head 200 is similar to that described to the club head hereinabove and includes a hosel 212, heel 214, toe 216, upper surface 218, rear surface 220, upper toe 230, side walls 222, a ball striking face 224, bottom surface 225, a skid 226 and a spacer wall 228 separating the skid 226 from the bottom surface 225. A c-shaped aerodynamic slot 230 is formed on the bottom surface 225 adjacent the rear surface 220. The open end of the slot 230 faces forwardly toward the ball striking face 224.

The slot 230 is formed with a venturi opening 232 which extends rearwardly and upwardly into the rear surface 220 creating an additional air channel to direct the air flow.

FIG. 9 shows another embodiment of the present invention. A golf club head 300 is similar to the club head described in FIGS. 1–5 and includes a bottom surface 325, a side surface 327 and an aerodynamic slot 330 which is offset in the direction of the toe 316 of the club head 300.

FIG. 10 shows another embodiment similar to FIG. 9. A golf club head 400 and includes a bottom surface 425, a side surface 427 and an aerodynamic slot 430 which is offset in the direction of the heel 414 of the club head 400.

It will be appreciated that the offset aerodynamic slots of FIGS. 9 and 10 allow greater club head speed at the heel or toe selectively in order to more effectively accommodate the swing characteristics of a particular golfer, whether left-handed or right-handed.

While various preferred embodiments have been shown and described, it will be understood that there is no intent to limit the invention by such disclosure, but rather, is intended to cover all modifications and alternate constructions falling within the spirit and scope of the invention as defined in the appended claims.

I claim:

1. An aerodynamic golf club head including a club head body having a heel, toe, rear surface, ball striking face, upper surface and bottom surface, wherein the improvement comprises:

an aerodynamic configuration on said bottom surface adjacent said rear surface in the form of a c-shaped slot having an open end facing forwardly toward said ball striking face; said aerodynamic configuration further including a skid surface formed on and raised from said bottom surface; said skid surface having a wall separating said skid surface from said bottom surface.

2. The aerodynamic golf club head of claim 1 further including a venturi opening in fluid communication with and extending rearwardly from said c-shaped aerodynamic slot toward said rear surface.

3. The aerodynamic golf club head of claim 1 wherein said slot is further defined by being offset from said heel of said club head.

4. An aerodynamic golf club head including a club head body having a heel, toe, rear surface, ball striking face, upper surface and bottom surface, wherein the improvement comprises:

an aerodynamic configuration on said bottom surface adjacent said rear surface in the form of a c-shaped slot having an open end facing forwardly toward said ball striking face; said slot being offset from a center of said bottom surface centerline passing through a longitudinal in a heel-to-toe direction.

5. The aerodynamic golf club head of claim 4 wherein said slot is offset toward said heel.

6. The aerodynamic golf club head of claim 3 wherein said slot is offset toward said toe.

7. The aerodynamic golf club of claim 1 wherein said slot is further defined by being offset from said toe of said club head.

8. An aerodynamic golf club head including a club head body having a heel, toe, rear surface, ball striking face, upper surface and bottom surface, wherein the improvement comprises:

an aerodynamic configuration on said bottom surface adjacent said rear surface in the form of a c-shaped slot having an open end facing forwardly toward said ball striking face; said aerodynamic configuration further including a venturi opening in fluid communication with and extending rearwardly from said c-shaped aerodynamic slot toward said rear surface.

* * * * *

US005735754C1

(12) EX PARTE REEXAMINATION CERTIFICATE (7290th)
United States Patent
Antonious

(10) Number: US 5,735,754 C1
(45) Certificate Issued: Jan. 5, 2010

(54) AERODYNAMIC METAL WOOD GOLF CLUB HEAD

(75) Inventor: Anthony J. Antonious, Sarasota, FL (US)

(73) Assignee: Anthony J Antonious Irrevocable Trust, Wanaque, NJ (US)

Reexamination Request:
No. 90/010,266, Sep. 2, 2008

Reexamination Certificate for:
Patent No.: 5,735,754
Issued: Apr. 7, 1998
Appl. No.: 08/759,924
Filed: Dec. 4, 1996

Certificate of Correction issued Jul. 1, 2008.

(51) Int. Cl.
A63B 53/04 (2006.01)

(52) U.S. Cl. 473/328; 473/345
(58) Field of Classification Search ..... None
See application file for complete search history.

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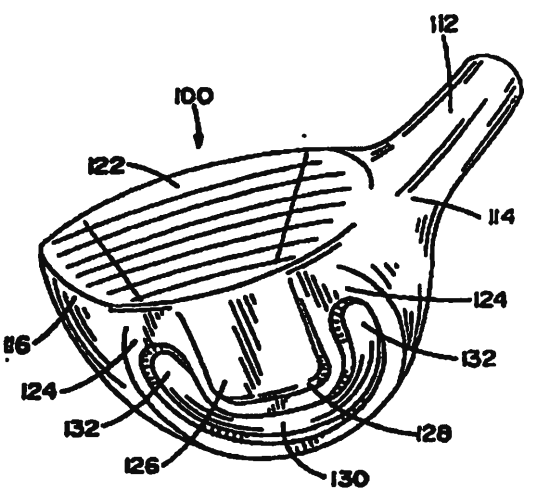
Primary Examiner—Peter C. English

(57) ABSTRACT

A metal wood type golf club head having a c-shaped aerodynamic configuration formed in the bottom surface adjacent a rear surface and having an open end extending forwardly toward the ball striking face in combination with a skid surface.



EX PARTE REEXAMINATION CERTIFICATE ISSUED UNDER 35 U.S.C. 307

THE PATENT IS HEREBY AMENDED AS INDICATED BELOW.

Matter enclosed in heavy brackets [ ] appeared in the patent, but has been deleted and is no longer a part of the patent; matter printed in italics indicates additions made to the patent.

ONLY THOSE PARAGRAPHS OF THE SPECIFICATION AFFECTED BY AMENDMENT ARE PRINTED HEREIN.

Column 2, lines. 53–67:

FIGS. 1–5 show a first embodiment of a golf club head 100 in accordance with the present invention. The golf club head 100 is conventional in shape, except for the aerodynamic surfaces and includes a hosel 112, heel 114, toe 116, upper surface 118, rear surface 120, ball striking face 122 and bottom surface 124. The bottom sole 124 includes a skid member 126 which extends outwardly from the bottom sole 124 and is separated therefrom by a spacer wall 128. A c-shaped aerodynamic slot 130 is formed on, *and substantially parallel with*, the bottom surface 124 and faces forwardly with open ends 132 of the c-shaped slot 130 being toward the ball striking face 122. *As shown in FIG. 1, c-shaped aerodynamic slot 130 transects a virtual centerline that passes through ball striking face 122 and rear surface 120 of the club head.* Preferably, the c-shaped slot 130 extends from a point adjacent the interface of the bottom surface 124 and rear surface 120 across approximately two thirds of the distance to the ball striking face 122.

Column 3, lines 22–26:

FIG. 9 shows another embodiment of the present invention. A golf club head 300 is similar to the club head described in FIGS. 1–5 and includes a bottom surface 325, a side surface 327 and an aerodynamic slot 330 *on said bottom surface* which is *substantially parallel with the bottom surface, and* offset *from a virtual centerline that passes transversely through a heel-to-toe axis of the club head,* in the direction of the toe 316 of the club head 300, *with a portion of slot 330 passing through the virtual centerline.*

Column 3, lines 27–30:

FIG. 10 shows another embodiment similar to FIG. 9. A golf club head 400 [and] includes a bottom surface 425, a side surface 427 and an aerodynamic slot 430 *on said bottom surface* which is offset *from a virtual centerline that passes transversely through a heel-to-toe axis of the club head,* in the direction of the heel 414 of the club head 400, *with a portion of slot 430 passing through the virtual centerline.*

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim 8 is confirmed.

Claim 4 is cancelled.

Claims 1, 3, 5, 6 and 7 are determined to be patentable as amended.

Claim 2 dependent on an amended claim, is determined to be patentable.

New claim 9 is added and determined to be patentable.

1. An aerodynamic golf club head including a club head body having a heel, toe, rear surface, ball striking face, upper surface and bottom surface, wherein the improvement comprises:

an aerodynamic configuration on, *and substantially parallel with,* said bottom surface adjacent said rear surface in the form of a c-shaped slot having an open end facing forwardly toward said ball striking face; said aerodynamic configuration further including a skid surface formed on and raised from said bottom surface; said skid surface having a wall separating said skid surface from said bottom surface, *said c-shaped slot transecting a virtual centerline passing through said ball striking face and said rear surface of said club head.*

3. The aerodynamic golf club head of claim 1 wherein said slot is [further defined by being] offset from said heel of said club head.

5. The aerodynamic golf club head of claim [4] *9* wherein said slot is offset toward said heel.

6. The aerodynamic golf club head of claim [4] *9* wherein said slot is offset toward said toe.

7. The aerodynamic golf club of claim 1 wherein said slot is [further defined by being] offset from said toe of said club head.

9. An aerodynamic golf club head including a club head body having a heel, toe, rear surface, ball striking face, upper surface and bottom surface, in which the improvement comprises:

an aerodynamic configuration within, and substantially parallel to, said bottom surface, adjacent said rear surface, in the form of a c-shaped slot having an open end facing forwardly toward said ball striking face, said slot offset from, and a portion thereof passing through, a virtual centerline passing transversely through a heel-to-toe axis of said club head.

* * * * *