Filed on behalf of Taylor Made Golf Company, Inc.
By: Richard D. Coller III
David K.S. Cornwell
Jason A. Fitzsimmons
Trevor M. O'Neill
Sterne, Kessler, Goldstein & Fox P.L.L.C.
1100 New York Avenue, N.W.
Washington, D.C. 20005-3934
Tel: (202) 371-2600
Fax: (202) 371-2540

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TAYLOR MADE GOLF COMPANY, INC.
Petitioner

v.

PARSONS XTREME GOLF, LLC
Patent Owner

PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 9,878,220

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1042	Edward M. Petrie, HANDBOOK OF ADHESIVES AND SEALANTS (2nd ed. 2007)
1043	INTENTIONALLY LEFT BLANK
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I. Introduction

Taylor Made Golf Company, Inc. ("Taylor Made") petitions for *inter partes* review of claims 1-20 of U.S. Patent No. 9,878,220 to Parsons *et al.* ("the '220 patent").

In related district court litigation, Patent Owner Parsons Xtreme Golf, LLC ("PXG"), described its 2014 development of a hollow-bodied golf iron filled with an elastic polymer and with perimeter weighting as a "eureka moment" in golf-club design. (TMG1011, "Application for TRO," 4.) That could have been a "eureka moment" only for a golf-club designer who was unaware of the state of the art over the past 25 years, for both (1) hollow-bodied designs filled with elastic polymers and (2) perimeter weighting have been well-known expedients in club-head design for decades. (TMG1003, "Mase Decl.", ¶¶25, 28-41.)

The '220 patent, which broadly claims this combination of prior art features, should never have been granted. Below, Taylor Made demonstrates a reasonable likelihood that all 20 claims of the '220 patent are unpatentable.

II. Mandatory Notices (37 C.F.R. § 42.8(a)(1))

REAL PARTY IN INTEREST: The real parties-in-interest are Petitioner Taylor Made Golf Company, Inc., and KPS Capital Partners, LP.

RELATED MATTERS: The '220 patent is the subject of the following civil action: *Parsons Xtreme Golf, LLC. v. Taylor Made Golf Company, Inc.*, No. 2:17-cv-03125-JJT (D. Ariz. filed Sept. 12, 2017; ongoing); *Parsons Xtreme Golf LLC v. Worldwide Golf Enterprises, Inc.*, No. 8:17-cv-01602-JLS-DFM (C.D. Cal. Filed Sept. 14, 2017; stayed); and *Parsons Xtreme Golf, LLC v. Golf & Tennis Pro Shop, Inc., et al*, No. 1:17-cv-06672 (N.D. Ill. Filed Sep. 15, 2017; stayed).

The '220 patent is related to the following patents Taylor Made has also filed *inter partes* review petitions against:

Patent No.	**IPR Case No.**	**Filing Date**
9,199,143	IPR2018-00675	February 21, 2018
8,961,336	IPR2018-00702	February 26, 2018
9,345,938	IPR2018-00768	March 12, 2018
9,346,203	IPR2018-00769	March 12, 2018
9,533,201	IPR2018-00826	March 23, 2018
9,468,821	IPR2018-00891	April 11, 2018
9,610,481	IPR2018-00915	April 13, 2018
9,364,727	IPR2018-00925	April 18, 2018

9,675,853	IPR2018-00983	April 27, 2018
9,814,952	IPR2018-01542	August 22, 2018
9,610,481	IPR2018-01681	September 12, 2018

LEAD AND BACKUP COUNSEL: Under 37 C.F.R. § 42.8(b)(3) and 42.10(a), Petitioner appoints **Richard D. Coller III** (Reg. No. 60,390) as lead counsel, **David K.S. Cornwell** (Reg. No. 31,944) as first back-up counsel, and **Jason A. Fitzsimmons** (Reg. No. 65,367) and **Trevor M. O'Neill** (Reg. No. 72,981) as additional back-up counsel, all at the address: STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C., 1100 New York Avenue, N.W., Washington, D.C., 20005, phone (202) 371-2600, and facsimile (202) 371-2540.

SERVICE INFORMATION: Petitioner consents to electronic service by email at: **rcoller-PTAB@sternekessler.com**, **davidc-PTAB@sternekessler.com**, **jfitzsimmons-PTAB@sternekessler.com**, **toneill-PTAB@sternekessler.com**, and **PTAB@sternekessler.com**.

III. Grounds for Standing (37 C.F.R. § 42.104(a))

The undersigned and Taylor Made certify that the '220 patent is available for *inter partes* review. Taylor Made is not barred or estopped from requesting this *inter partes* review on the grounds herein. PXG filed a complaint against Taylor

Made alleging infringement of the ’220 patent on February 2, 2018. This Petition is filed within one year of service.

IV. Identification of Challenge (37 C.F.R. § 42.104(b))

A. Citation of Prior Art

The ’220 patent contains multiple priority claims, the earliest to Provisional Application No. 62/118,403, filed February 19, 2015.[1] The prior-art documents applied herein were published prior to this date.

U.S. Patent No. 8,088,025 to Wahl *et al.* (TMG1004, “Wahl”) is prior art under 35 U.S.C. § 102(a) as of January 3, 2012.

U.S. Patent No. 6,811,496 to Wahl *et al.* (TMG1005, “Wahl ’496”) is prior art under 35 U.S.C. § 102(a) as of November 2, 2004.

Japanese Patent Application Publication 2002-143356 to Chaen *et al.* (TMG1072, “Chaen”) is prior art under 35 U.S.C. § 102(a) as of May 21, 2002.

U.K. Patent Application Publication No. 2249031 to Lahaix *et al.* (TMG1021, “Lahaix”) is prior art under 35 U.S.C. § 102(a) as of April 29, 1992.

[1] Taylor Made does not concede that the ’220 patent is entitled to the priority benefit of this document or any of the other documents to which priority is claimed.

German Utility Model No. 29715997 to Linphone Golf Co., Ltd. (TMG1035, "Linphone") is prior art under 35 U.S.C. § 102(a) as of March 26, 1998.

B. Statutory Grounds for the Challenge

Ground	References	Basis	Claims Challenged
1	Wahl	§103	1–8, 10–20
2	Wahl, Linphone	§103	9
3	Chaen, Lahaix	§103	1–8, 10–20
4	Chaen, Lahaix, Linphone	§103	9

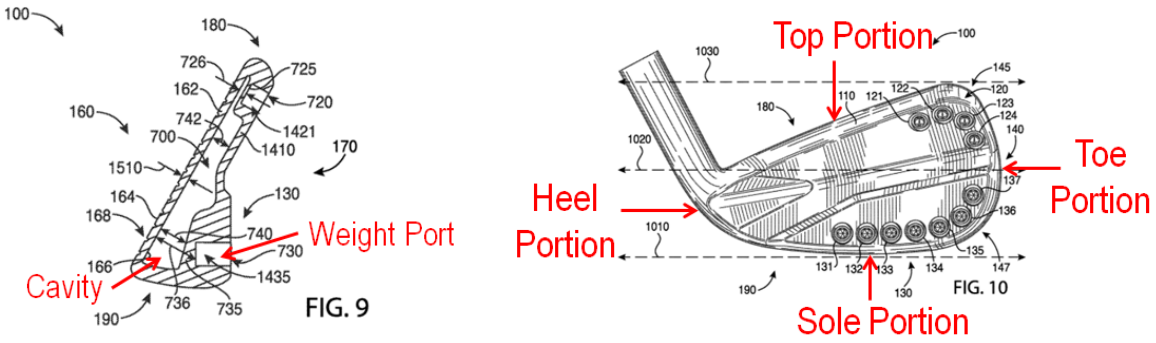
V. The '220 Patent

A. Technology Overview

The '220 patent is directed to golf club heads, particularly iron-type golf club heads. (TMG1001, Abstract, 3:48-53.) The Background acknowledges, "[b]y using multiple materials to manufacture golf club heads, the position of the center of gravity (CG) and/or the moment of inertia (MOI) of the golf club heads may be *optimized* to produce certain trajectory and spin rate of a golf ball." (*Id.*, 1:43-47 (emphasis added).) The '220 patent merely describes designs to optimize the CG and MOI, known long before the '220 patent. (*Id.*, 6:48-51, 9:57-62; TMG1003, ¶¶28-31, 42.)

None of the claimed features are critical to the alleged inventions. (TMG1003, ¶43.) In fact, after describing at least fifty-three club head features, the

’220 patent declares that the club heads “are not limited in this regard.” (TMG1001, *passim*.)



(TMG1001, Figs. 9, 10 (Annotated).)

Polymer-filled cavities and perimeter weights in exactly the locations described and claimed in the ’220 patent were in the prior art for decades. (*Id.*, Abstract, 3:19-25, 6:57-66, 11:4-18, Figs. 9-10; TMG1003, ¶44.) The ’220 patent claims also recite widths (*e.g.*, numerals 736 and 740 of Figure 9) related to the interior cavity, filler material, and weight portions. (*See*, TMG1001, claims 6, 8, 13.) As discussed below, textual description for these claim elements was added by Examiner’s Amendment. (*Infra* Section V.B.)

B. Prosecution History Summary

The ’220 patent issued after one Office Action. (TMG1002, (“’220 Prosecution History,”), 133-155.) The Office Action rejected all claims under twelve double-patenting grounds and as obvious under 35 U.S.C. § 103. (*Id.*) The Office Action repeatedly noted that “[i]t is **WELL-KNOWN** in the golf club head

art" to include claimed features such as "peripheral weighting…to allocate mass to specific areas of the head in order to change the weight balance of the head and relocate the location of the center of gravity…" and "a thin face…[that] allows the face to deform to a greater extent and provide increased momentum to a golf ball during a shot." (*Id.*, 145, 147, 151, 153 (emphasis in original); TMG1003, ¶¶45-46.)

In response, PXG amended claims 1-12, canceled claims 13-20, added new claims 21-28, and filed terminal disclaimers. (TMG1002, 187-192, 196-201.) Notably, the *canceled* claims were the only claims against which the Office applied Wahl '496–applied in this Petition as incorporated-by-reference in Wahl '025. PXG argued that the cited references did not disclose the elements added to the claims, specifically "at least one weight portion located closer to the heel portion than the at least one port" and "wherein a portion of the at least one weight portion is closer to the face portion than a portion of the polymer material in the interior cavity." (*Id.*, 203; TMG1003, ¶47.)

An Interview Summary indicated that "[t]he examiner noted that some of the claim language presented with the 08/28/2017 amendment lacks proper antecedent basis." (TMG1002, 232.) Afterwards, an Examiner's Amendment to three paragraphs in the specification added language directed to the interior cavity and filler ("polymer") material width relationships added to the claims. (*Id.*, 224-228.)

Presumably, the Examiner did not find any textual support for the claimed width relationships. (TMG1003, ¶48.) Based on the claims and prosecution history, it appears that claims 14–20 should all have been amended to depend from claim 13. (*Id.*, 200-201, 229, 232, 249-251.) The Examiner's reasons for allowance simply restated the amended claim language. (*Id.*, 235-236.)

C. Level of Ordinary Skill in the Art

A person having ordinary skill in the art ("POSA") at the relevant time would have had (1) at least a bachelor's degree in mechanical engineering, materials science engineering, physics, or equivalent coursework, and (2) at least one year of experience researching or developing golf-club heads, and/or methods of their manufacture. (TMG1003, ¶24.)

D. Claim Construction

Under 37 C.F.R. §42.100(b), the challenged claims must be given their broadest reasonable interpretation ("BRI") in light of the '220 patent

specification.[2] *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2142-2146 (2016). Terms in need of construction are discussed below.[3] (TMG1003, ¶¶49-50.)

1. "weight portion" (independent claims 1, 8, 13)

The '220 patent describes the purpose of the weight portions: "[b]y coupling the first and second sets of weight portions 120 and 130, respectively, to the body portion 110…the location of the center of gravity (CG) and the moment of inertia (MOI) of the golf club head 100 may be optimized." (TMG1001, 9:57-62.) In particular, the weight portions "may be partially or entirely made of a high-density material such as a tungsten based material or other suitable types of materials." (*Id.*, 3:39-42, 19:25-28.) This was common in club design to lower the CG, as the '220 patent recognizes. (*Id.*, 9:57-62; TMG1003, ¶¶51-52.)

[2] The claims here are construed using BRI because this Petition is filed before November 13, 2018, when the claim construction standard in *inter partes* review changes. *See* 83 Fed. Reg. 51,340 (Oct. 11, 2018).

[3] Taylor Made's proposed constructions for the purpose of this proceeding are not an admission that the claims are valid under 35 U.S.C. § 112. Taylor Made reserves the right to challenge the validity of the claims under 35 U.S.C. § 112 in other proceedings and fora.

Accordingly, a POSA would have interpreted "weight portion" to mean "a discrete piece of material coupled to the club head for the purpose of optimizing the center of gravity and/or moment of inertia." (TMG1003, ¶52.)

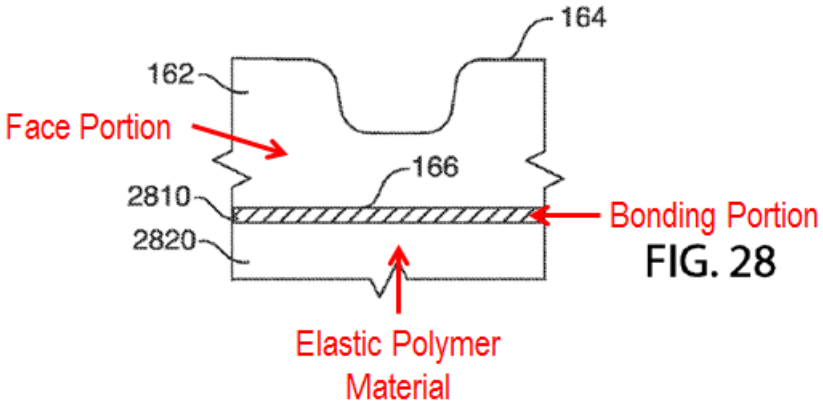
2. "bonding portion" (dependent claim 9)

A "bonding portion" is not a term of art that would have been known to a POSA. (TMG1003, ¶53.) The '220 patent does not define "bonding portion," but describes that a "bonding portion 2810 may be applied to the back surface 166 to bond the elastic polymer material 2820 to the face portion 162 (e.g., extending between the back surface 166 and the elastic polymer material 2820)." (TMG1001, 16:39-43.)

The '220 patent provides examples of bonding portions: "bonding portion 2810 may be low-viscosity, organic, solvent-based solutions/and or dispersions of polymers or other reactive chemicals." (TMG1001, 16:32-37; TMG1003, ¶54.) The '220 patent also lists, as examples of bonding portions, commercially available products such as "MEGUM™, ROBOND™, and/or THIXON™," and LOC-TITE© brand epoxies and adhesives. (TMG1001, 16:35-39.)

A POSA would have understood that the bonding portion is a *discrete* agent; the bonding portion *cannot* merely be a part of the face portion or the elastic polymer material. (*See id*., 16:39-43, "the bonding portion 2810 may be *applied to* the back surface 166 *to bond* the elastic polymer material 2820 to the face portion

162." (emphasis added); TMG1003, ¶55.) Annotated Figure 28 from the '220 patent shows bonding portion 2810 disposed *between*, and discrete from, face portion 162 and elastic polymer material 2820. (TMG1001, Fig. 28, 16:39-43; TMG1003, ¶55.)



(TMG1001, Fig. 28 (Annotated).)

Accordingly, a POSA would have interpreted "bonding portion" to mean "an adhesive agent, distinct from the elastic polymer material and from the body portion, that joins the elastic polymer material to the body portion." This is consistent with the language of claim 9–reciting "bonding portion" as a separate element from the "face portion" and the "elastic polymer material"–how a POSA would have interpreted the term in light of the '220 patent specification. (TMG1001, 16:25-47; TMG1003, ¶56.)

3. "top portion," "toe portion," "sole portion," "back portion," and "heel portion" (independent claims 1, 8, 13)

The '220 patent does not define "top portion" (180) "toe portion" (140), "sole portion" (190), "back portion" (170), and "heel portion" (150) of the club

head. (TMG1003, ¶57.) The Figures reference these "portions" by pointing to a general area of the club head. A POSA would have interpreted these "portions" as the *surface* at the referenced part of the club head. (*Id.*)

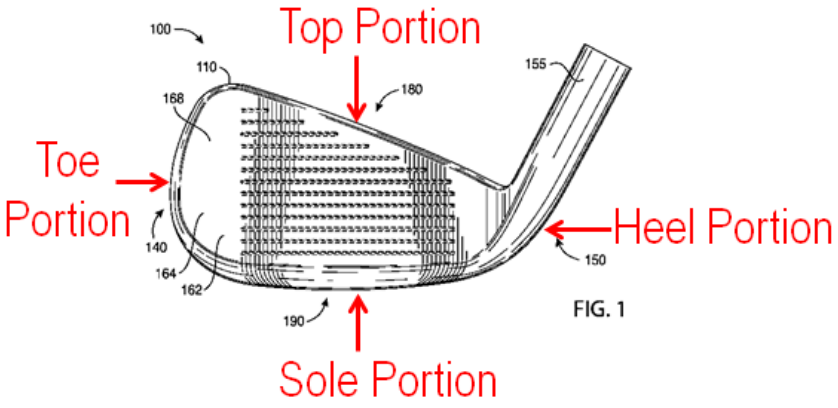


FIG. 1

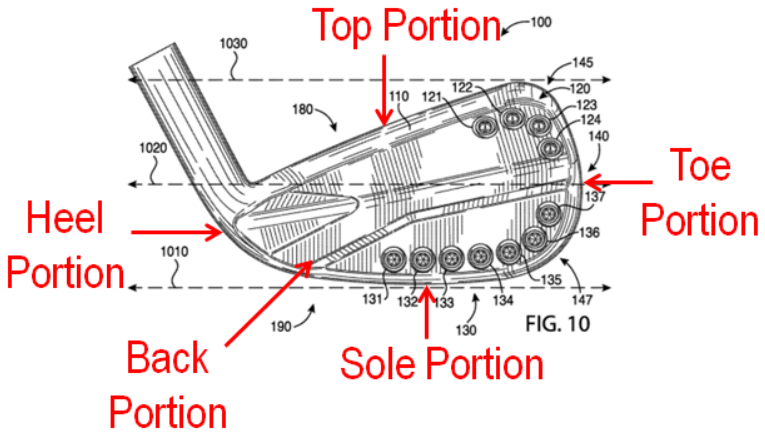
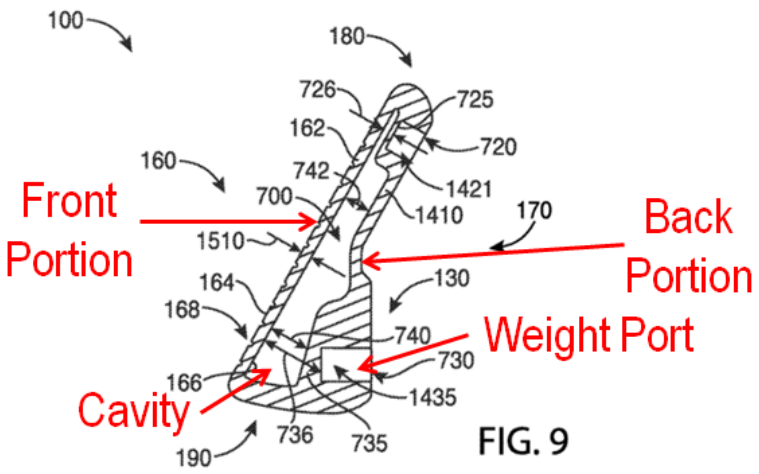


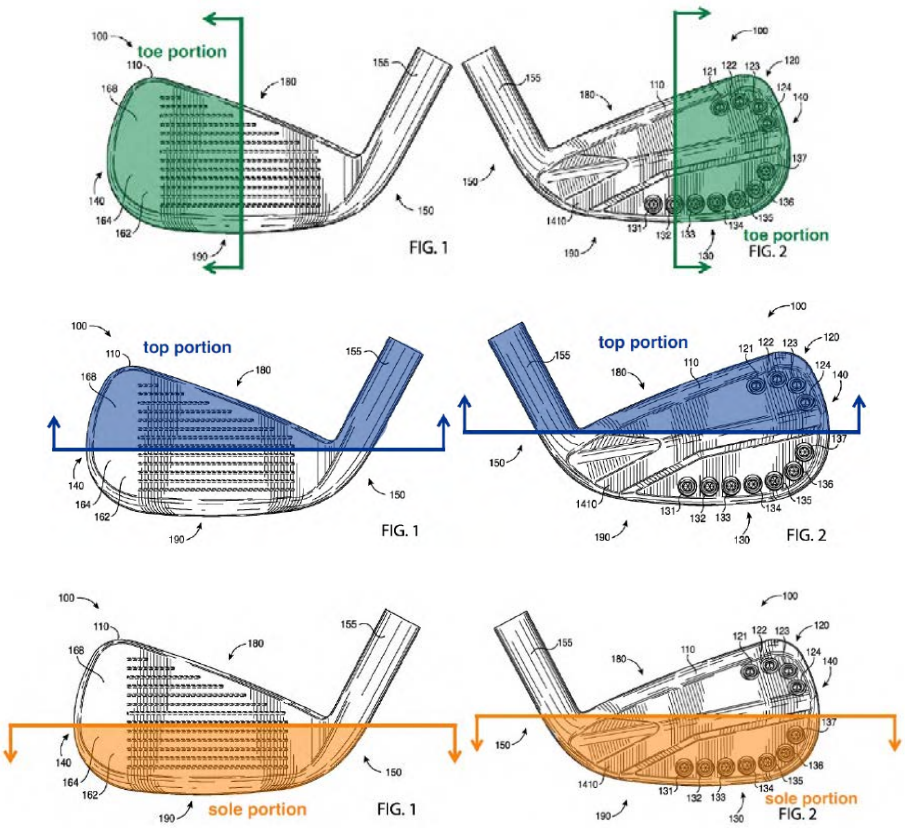
FIG. 10



(TMG1001, Figs. 1, 2, 9 (Annotated).)

The "toe" of a club head is the *point* farthest from the shaft. (TMG1003, ¶¶26-27, 58-59.) Thus, a POSA would have interpreted "toe portion" to mean "the surface along the end of the club head." (*Id.*) The "sole" is the bottom of the club head. (*Id.*) Thus, a POSA would have interpreted "sole portion" to mean "the surface along the bottom of the club head." (*Id.*) Similarly, a POSA would have interpreted "top portion" to mean "the surface along the top of the club head" (also known as the top line) and "heel portion" to mean "the surface along the nearest end of the club head." (*Id.*) Likewise, a POSA would have interpreted "back portion" to mean "the exterior surface of the club head that is opposite the front surface of the face." (*Id.*)

In related district court litigation, PXG supplies unreasonably broad interpretations, alleging each "portion" is one half of the horizontally or vertically bisected club head, as shown below. (TMG1012, ¶¶40-61.)



(TMG1012, ¶¶49, 55, 61.)

Nothing in the '220 patent specification supports PXG's interpretations and this is not how a POSA would have interpreted these terms. (TMG1003, ¶¶60-65.) As discussed in Dr. Mase's accompanying declaration, PXG's interpretations exceed the BRI. (*Id.*)

VI. Overview of the Applied References

Each applied reference discloses an iron-type golf-club head. (TMG1003, ¶66.) A POSA would have easily combined their teachings—such as filling

cavities and adding perimeter weights—using only routine skill because these well-known features had been applied in the industry for decades. (*Id.*)

A. Wahl

Wahl discloses "a hollow iron-type golf club head," where the hollow cavity (120) is filled with a filler material (121) through an exterior port. (TMG1004, 1:39-42, 8:5-16.) Filler materials include viscoelastic elastomers, polyurethanes, thermoplastic rubbers, and foamed polymers. (*Id.*, 4:51-5:11, Figs. 1A-1B.)

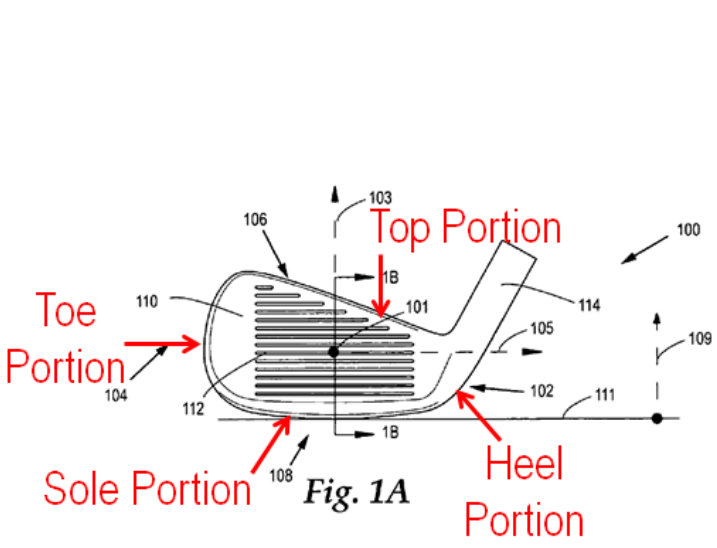


Fig. 1A

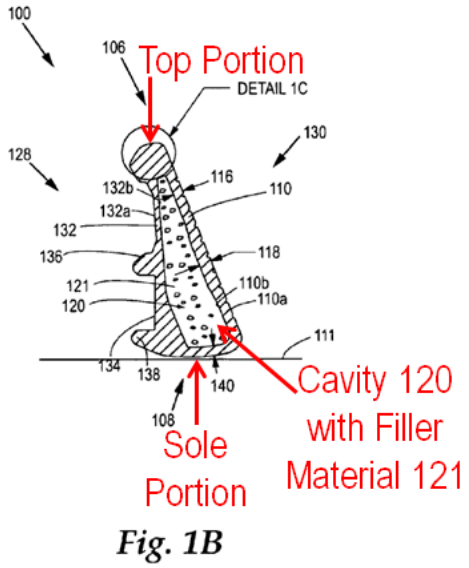


Fig. 1B

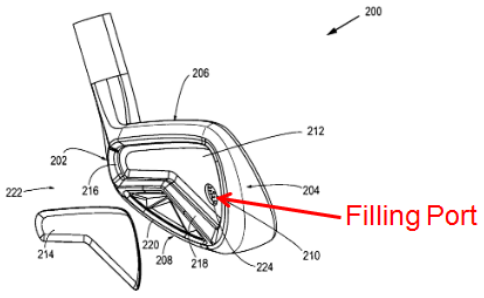


Fig. 2A

(TMG1004, Figs. 1A, 1B, 2A (Annotated).)

Advantages of filling the cavity include damping the sound upon impacting the ball and reducing vibrations to provide a softer "feel" in comparison to hollow, unfilled club heads. (*Id.*, 13:65-14:32, Fig. 8; TMG1003, ¶¶67-68.) A lightweight filler achieves these benefits while maintaining a low CG, the purpose of the hollow club head. (TMG1004, 11:20-21, 11:51-53, 14:28-32; TMG1003, ¶68.)

Wahl also discloses including weighting elements. For example:

> body portion 309 can include various features such as *weighting elements*, cartridges, and/or inserts or applied bodies as *used for CG placement, vibration control or damping, or acoustic control or damping. For example, U.S. Pat. No. 6,811,496, incorporated herein by reference in its entirety*, discloses the attachment of *mass altering pins* or cartridge *weighting elements*.

(TMG1004, 9:51-57 (emphasis added).)

U.S. Patent No. 6,811,496, also to Wahl *et al.*, is discussed below. Though Wahl discloses including weighting elements on its own, because Wahl incorporates Wahl '496 in its entirety—specifically for its disclosure of weighting elements used for CG placement, vibration damping, and acoustic damping—Wahl '496 is part of the disclosure of Wahl. (TMG1003, ¶69.) *Callaway Golf Co. v. Acushnet Co.*, 576 F. 3d 1331, 1346 (Fed. Cir. 2009); *Advanced Display Sys., Inc. v. Kent State Univ.*, 212 F.3d 1272, 1282-83 (Fed. Cir. 2000). The Board has routinely found similar incorporation by reference statements to be sufficient, including specifically for these references. *See, e.g., TaylorMade Golf Company,*

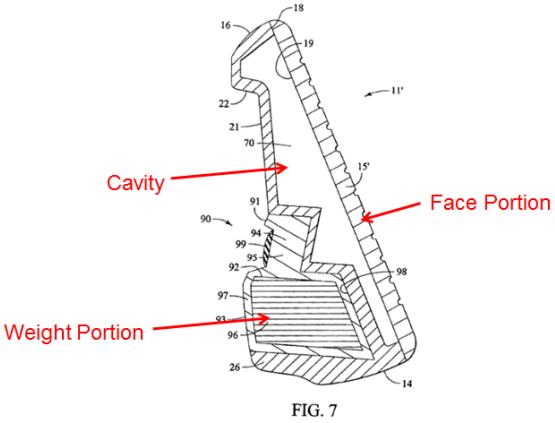
Inc. et al v. Parsons Xtreme Golf, LLC, IPR2018-00675, Paper 21 at 17-18 (P.T.A.B. Aug. 30, 2018); *Apple, Inc. v. Realtime Data LLC.,* IPR2016-01365, Paper No. 26, 37-39 (P.T.A.B. Apr. 3, 2015).

B. Wahl '496 (incorporated by reference in Wahl)[4]

Wahl describes that moving weight peripherally to lower the CG provides additional forgiveness, resulting in more consistent distance and directional control. (TMG1005, 1:30-41.) Perimeter weighting also increases the MOI, resulting in less twisting and thus more accurate shots. (*Id.*, 1:41-44; TMG1003, ¶¶70-71.)

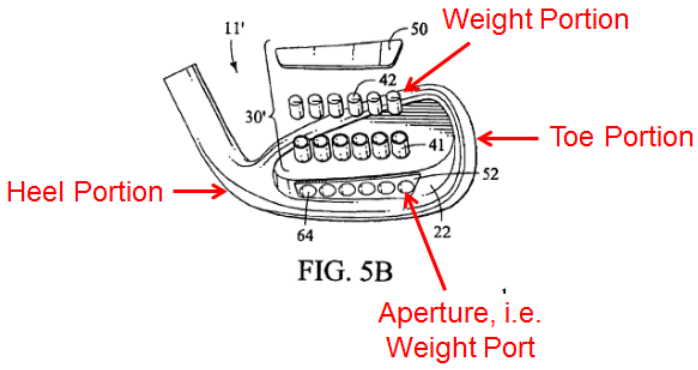
Wahl states: "[t]he most common way that [lowering the CG] has been accomplished for irons is to move as much weight as possible to the area proximate the sole of the club." (TMG1005, 2:2-5.) Another way to increase the MOI is with a "hollow" iron "that incorporate[s] a rear wall that is spaced from the front striking face."(*Id.*, 1:45-48.) For example, Wahl '496 discloses a club head having a hollow cavity (front recess 70) defined by the main body (11') of the club including striking face (15') and cavity wall (21)—similar to the cavity in Wahl, except without filler material. (*Id.*, 7:1-5, Fig. 5A; TMG1003, ¶72.)

[4] Because Wahl '496 is part of Wahl's disclosure, it is generally referenced as "Wahl" and only occasionally as "Wahl '496" for clarity.



(TMG1005, Fig. 7 (Annotated).)

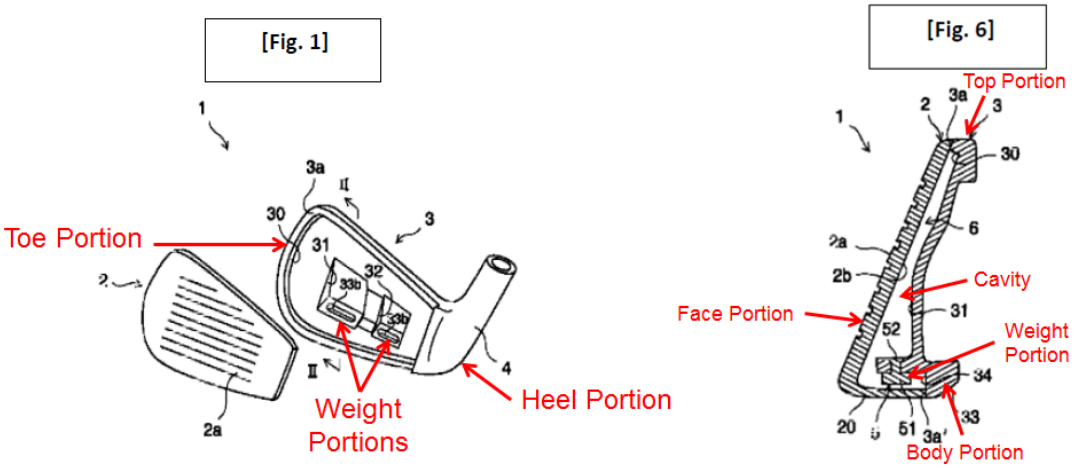
The club head can include pins (42), i.e., the "weighting elements" such as "mass altering pins" referenced in Wahl. (TMG1005, 7:18-23; TMG1004, 9:51-57; TMG1003, ¶¶73-74.) The pins are inserted into apertures (64) in the back of the club near the sole portion. (TMG1005, 6:16-22, 7:18-23, Fig. 5B.) The pin material (e.g., tungsten) has a density greater than the club body material. (*Id.*, 5:47-53.)



(TMG1005, Fig. 5B (Annotated).)

C. Chaen

Like Wahl and Wahl '496, Chaen discloses a hollow, iron-type golf club. (TMG1072, ¶¶1, 10, 11, 25, 37, 49, Fig. 6; TMG1003, ¶75.) The club includes one or more weight portions coupled to the sole. (TMG1072, ¶¶11, 38-39, 49, Fig. 6.) These weight portions provide a lower center of gravity without requiring excessively thick club sections. (*See*, *id*., ¶¶8-10; TMG1003, ¶75.) Chaen discloses weight portions (5) embedded in ports (33b), for example, through holes penetrating the sole portion. (TMG1072, ¶38; TMG1003, ¶75.)

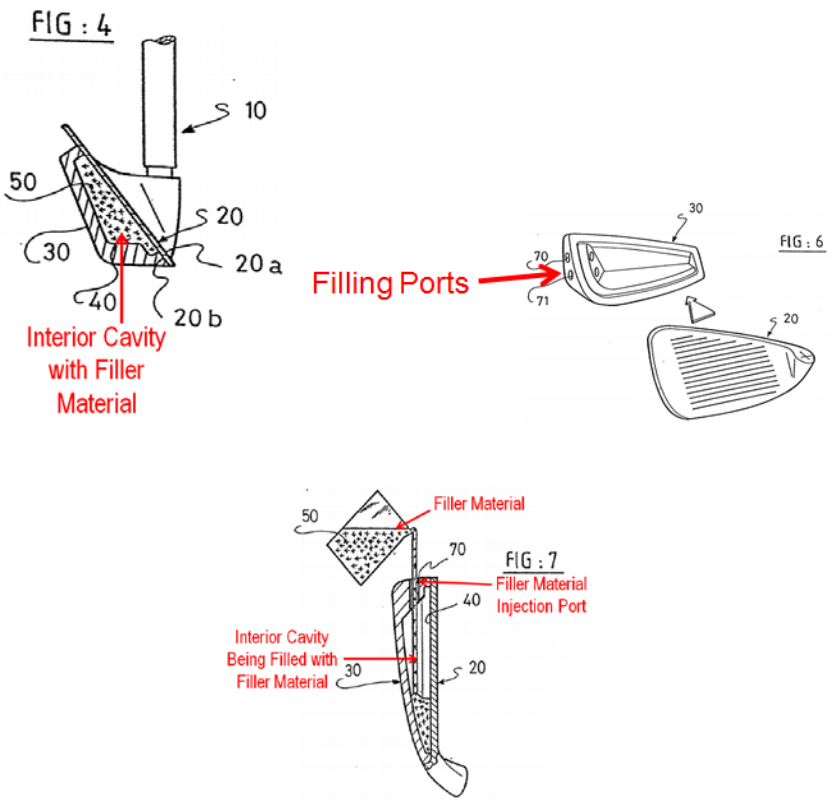


(TMG1072, Figs. 1, 6.)

D. Lahaix

Lahaix discloses filling a hollow club head with a non-metal filling material, such as a thermoplastic or elastomer, through an orifice by reaction injection molding. (TMG1021, Abstract, 2, 5, 7, claim 1; TMG1003, ¶76.) The filler

material "acts as a support in order to prevent the plate from collapsing because of its thinness." (TMG1021, 6, ¶4.)



(TMG1021, Fig. 4 (Annotated), Fig. 6, Fig. 7 (Annotated).)

E. Linphone

Linphone also discloses a hollow iron-type golf club head. (TMG1035, 0003; TMG1003, ¶77.) Linphone discloses a shock absorbing rubber filler bonded to the back surface of the face portion by an adhesive. (TMG1035, 0003; TMG1003, ¶77.) The back surface of the face portion is sand-blasted to form a rough surface before applying the adhesive solution. (TMG1035, 0004.) The adhesive solution uniformly coats the back surface of the face portion. (*Id*., 0003.)

Bonding the shock absorbing rubber 4 to the back surface of the striking face 12 improves the shock absorbing qualities of the club head. (TMG1035, 0003; TMG1003, ¶77.)

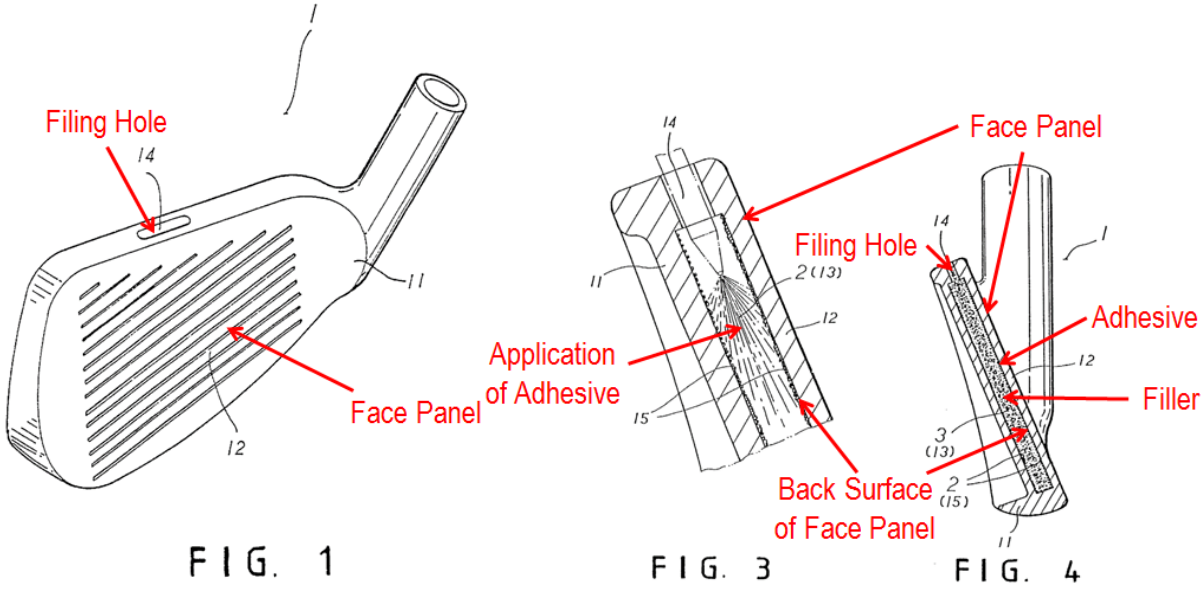


FIG. 1 FIG. 3 FIG. 4

(TMG1035, Figs. 1, 3, and 4 (Annotated).)

VII. Overview of the Grounds

Independent claims 1, 8, and 13 include many similar elements. (TMG1003, ¶¶78-81.) A table comparing the independent claim elements is provided in Dr. Mase's declaration. (*Id.*)

VIII. Ground 1: Wahl Renders Claims 1–8 and 10–20 Obvious

A. Motivation for Combining Embodiments of Wahl

As discussed below in Sections VIII.C-P, the embodiments of Wahl disclose all of the elements in claims 1-8 and 10-20. And a POSA would have been strongly motivated to combine Wahl's embodiments as presented here. (TMG1003, ¶82.) As discussed above in Section VI.A, Wahl incorporates Wahl '496 in its entirety—

and specifically for including weighting elements for CG placement, vibration damping, and acoustic damping. (TMG1004, 9:51-57.)

Indeed, Wahl ’496 discloses a weight assembly with a series of high density material pins. (TMG1005, 7:18-23, 5:47-50, Fig. 5B.) As shown below in Figure 5B, for example, these pins can be arranged in heel-toe orientation on the back portion of the club head. (*Id.*; TMG1003, ¶83.)

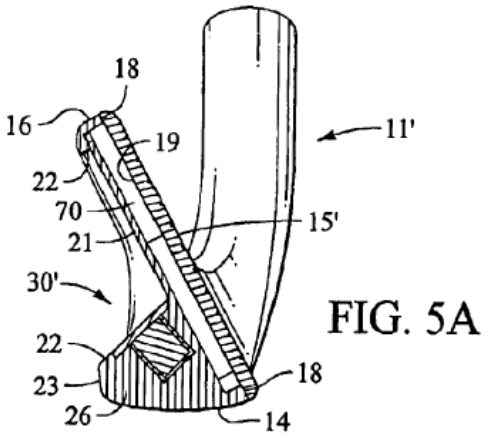


FIG. 5A

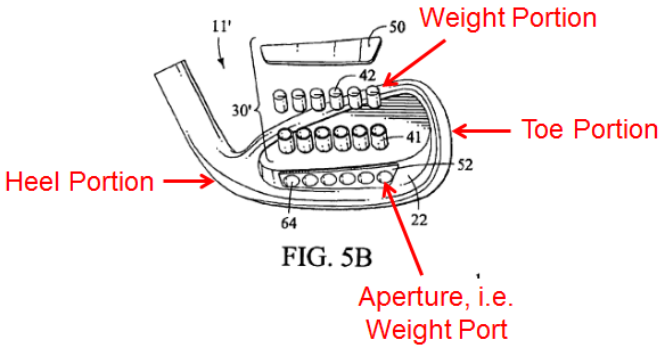


FIG. 5B

(TMG1005, Figs. 5A-B (Annotated).)

And as shown below in Figure 7, a variation of the Figure 5B embodiment, the width of the cavity may be modified to accommodate the weight assembly. (TMG1005, 4:12-13, 7:38-8:3, Fig. 7; TMG1003, ¶84.)

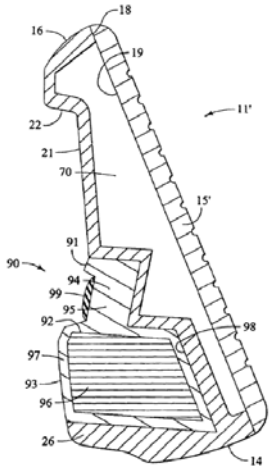


FIG. 7

(TMG1005, Fig. 7.)

Thus, it would have been obvious to a POSA to incorporate the weighting elements of Wahl ’496 into the rear surface of Wahl, as Wahl expressly suggests where it incorporates Wahl ’496 by reference. (TMG1004, 9:51-57; TMG1003, ¶85.) Moreover, a POSA would have been continually trying to optimize the CG and MOI, and thus it would have been obvious to add the weight elements of Wahl ’496 into the club head of Wahl. (TMG1004, 9:51-57; TMG1005, 1:37-44, 5:47-53, 6:16-22, 7:18-23; TMG1003, ¶85.) Modifying Wahl’s club head to incorporate the weight elements of Wahl ’496 would have been nothing more than using a known technique to improve similar devices in the same way. (TMG1003, ¶86.) *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007). And adding these weight elements would have simply been combined prior art elements according to known methods to yield predictable results—improved control over CG and MOI. (TMG1003, ¶86.) *KSR Int’l Co.*, 550 U.S. at 416.

B. The Board Should Not Deny Institution Under Section 325(d) Because Wahl Was Not Applied During Prosecution and Wahl '496 Was Applied for a Different Purpose

The Board has discretion to deny institution if "the same or substantially the same prior art or arguments previously were presented to the Office." 35 U.S.C. § 325(d). This situation is not present here. Although Wahl was cited during prosecution of the '220 patent, it was *not applied*. (TMG1002, 5, 153.) And although Wahl '496 was applied during prosecution, it was *applied against claims that were canceled* (and different) than the eventually allowed claims. (*Id.*, 140-153.) Here, Wahl '496 is *applied in a different manner*–for the weight portions incorporated by reference into Wahl, and thus how the inclusion of weight portions may provide modified cavity widths. The *combination* of Wahl with the embodiment(s) of Wahl '496 incorporated by reference therein was *not* previously presented to the Office.

Accordingly, the Board should not deny institution merely because Wahl and Wahl '496 were part of the prosecution history. As demonstrated in this Petition, the unapplied combination of embodiments in Wahl discloses all of the elements in the claims, including the allegedly novel elements, for example "at least one weight portion located closer to the heel portion than the at least one port," "wherein a portion of the at least one weight portion is closer to the face portion than a portion of the polymer material in the interior cavity," and the

relative cavity and polymer widths. (*Infra* Sections VIII.C-P.) Thus, the Board should not deny institution under Section 325(d).

C. Wahl Renders Claim 1 Obvious

1. "[a] golf club head" [1.1]

Wahl discloses "[a]n iron-type golf club head…." (TMG1004, Abstract, 1:39-44, 3:26-28; TMG1003, ¶87.) Accordingly, Wahl renders element [1.1] obvious. (TMG1003, ¶87.)

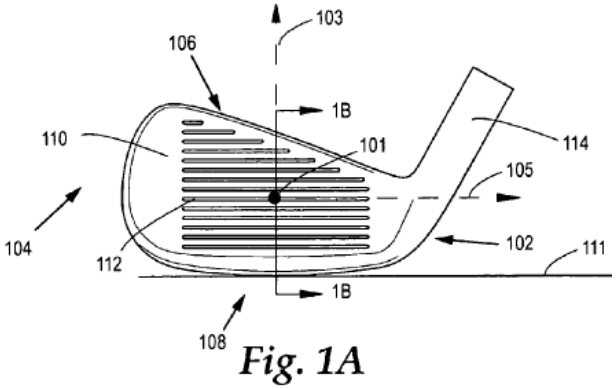


Fig. 1A

(TMG1004, Fig. 1A.)

2. "a face portion"[1.2]

Wahl's club head includes a "striking face 110." (TMG1004, 3:28, Figs. 1A; TMG1003, ¶88.)

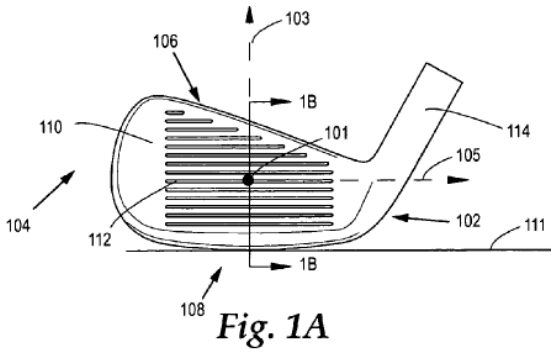


Fig. 1A

(TMG1004, Fig. 1A)

Accordingly, Wahl renders element [1.2] obvious. (TMG1003, ¶88.)

3. "[1.3a] a body portion having, a toe portion, a heel portion, a top portion, a sole portion, a back portion, and [1.3b] an interior cavity extending between the top and sole portions"

(a) Element [1.3a]

Wahl discloses "a hollow iron golf club head 100 including a heel 102, toe 104, sole portion 108, and top line portion 106" and that "[t]he hollow iron golf club head 100 further includes a back portion 128." (TMG1004, 3:26-28, 3:61-62, Fig. 1A; TMG1003, ¶89.)

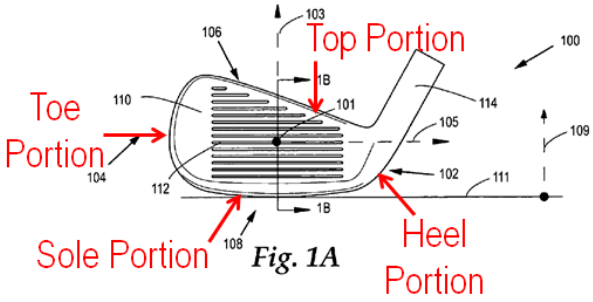


Fig. 1A

(TMG1004, Fig. 1A (Annotated).)

Accordingly, Wahl renders element [1.3a] obvious. (TMG1003, ¶89.)

(b) Element [1.3b]

Wahl discloses that "back wall 132 encloses the entire back portion 128 of the club head to define a *cavity 120* that is primarily filled with a filler material 121." (TMG1004, 4:15-17 (emphasis added), Fig. 1B.) The interior cavity (120) extends between the top line portion (106) and the sole portion (108). (*Id.*, Fig. 1B; TMG1003, ¶90.) Accordingly, Wahl renders element [1.3b] obvious. (TMG1003, ¶90.)

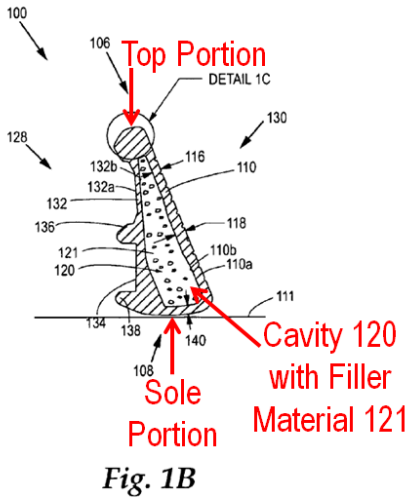


Fig. 1B

(TMG1004, Fig. 1B (Annotated).)

4. "at least one port located closer to the toe portion than the heel portion and connected to the interior cavity" [1.4]

Wahl discloses that "[a]n aperture 210 is located in the back wall 212 and can be used for filling the hollow iron 200 with a sound dampening filler material 224." (TMG1004, 8:14-16.) Thus, the aperture (i.e., port) is connected to the interior cavity. (TMG1003, ¶91.) As shown below in Figure 2A, aperture 210 is

closer to the toe portion than the heel portion. (*Id*.) And describing a similar embodiment, Wahl discloses that "the aperture 338 *can be located anywhere on the club head body surface* other than the front striking face. For example, the aperture 338 can be located on the sole, toe, heel, or top line surfaces." (TMG1004, 10:53-57 (emphasis added).) Thus, at the very least, it would have been obvious to locate the port closer to the toe portion than the heel portion given the finite number of possible port locations and space available on the back surface of the club. (TMG1003, ¶92.) *KSR Int'l Co.*, 550 U.S. at 402.

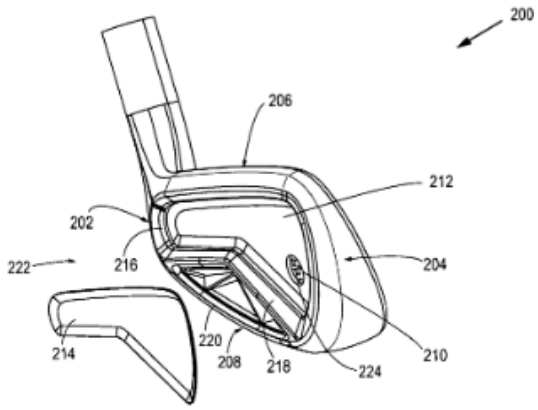


Fig. 2A

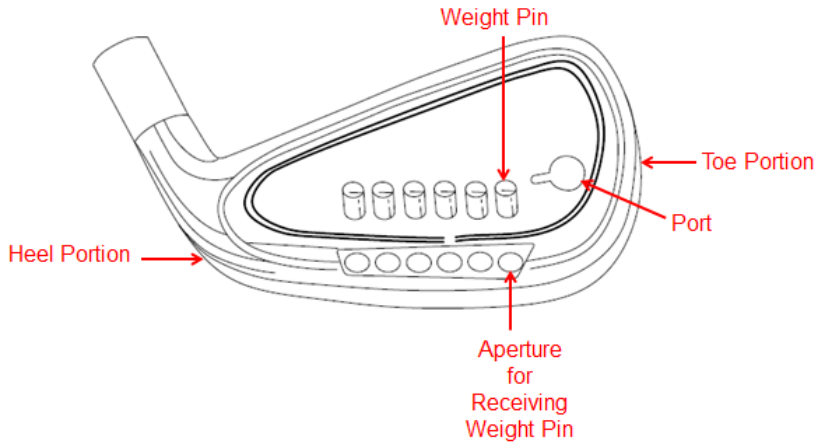
(TMG1004, Fig. 2A.)

Accordingly, Wahl renders element [1.4] obvious. (TMG1003, ¶92.)

5. "at least one weight portion located closer to the heel portion than the at least one port" [1.5]

The combination of the Wahl '496 weight insert, and corresponding weight pins, with Wahl's club head, discloses element [1.5]. (TMG1003, ¶93.) The composite image below illustrates how a POSA would have combined the weight

insert of Wahl ’496 on the back surface of Wahl’s club head, with a fill port location as shown in Figure 2A of Wahl. (*Id.*) It would have been obvious to place the weights in approximately the locations shown below at least because it corresponds with Figure 5A of Wahl ’496 and because of the well-known desirability of lowering the club head CG. (TMG1004, 9:51-57; TMG1003, ¶93.)



(TMG1004, Fig. 4; TMG1005, Fig. 5B (Modified, Annotated).)

As shown above, in the combined club head, at least one weight aperture, and corresponding weight pin, is “located closer to the heel portion than the at least one port,” as recited in element [1.5]. (TMG1003, ¶93.) Accordingly, Wahl renders element [1.5] obvious. (*Id.*)

6. “wherein the interior cavity is filled with a polymer material from the at least one port” [1.6]

Wahl discloses that “[a]n aperture 210 is located in the back wall 212 and can be used for filling the hollow iron 200 with a sound dampening filler material,” and thus Wahl’s port is used to fill the interior cavity. (TMG1004, 8:14-16;

TMG1003, ¶94.) Wahl discloses that "the filler material [324] occupies about 50% to about 99% of the total club head cavity volume." (TMG1004, 15:7-8.) A POSA would have understood "about 99%" to mean filling the entire club head. (TMG1003, ¶94.) Filler materials can include viscoelastic elastomers, vinyl copolymers, polyesters, polyurethanes, thermoset and thermoplastic rubbers, and foamed polymers. (TMG1004, 4:18-25, 4:51-5:3.) A POSA would have known that, at least, "viscoelastic elastomers" and "foamed polymers" are "polymer materials." (TMG1003, ¶94.) Accordingly, Wahl renders element [1.6] obvious. (*Id*.)

7. "wherein more than 50% of a mass of the body portion is located below a horizontal midplane of the golf club head" [1.7]

First, a POSA would have understood that Wahl and Wahl '496 both disclose club head designs where more than 50% of the mass of the body portion is below the horizontal midplane. (TMG1003, ¶95.) For example, Figure 3B of Wahl illustrates an enlarged sole bar (highlighted). (*Id*.; TMG1004, 10:15-57.) Likewise, Figures 5A and 7 of Wahl '496 illustrate enlarged sole bars (26), even when adding weights to the club head. (TMG1005, 7:18-26; TMG1003, ¶95.) Indeed, a POSA would have understood that even when adding weights, it is advantageous to maintain more than 50% of the mass of the body portion below the horizontal midplane. (TMG1003, ¶95.) Thus, Wahl renders element [1.7] obvious. (*Id*.)

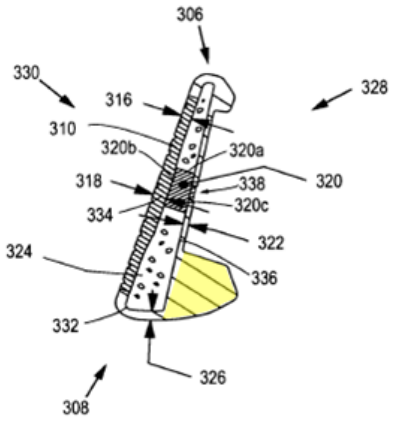


Fig. 3B

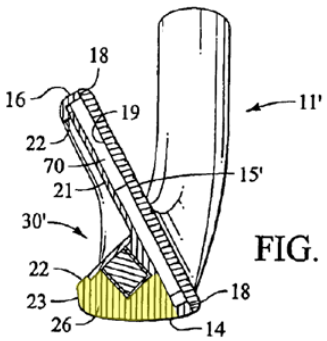


FIG. 5A

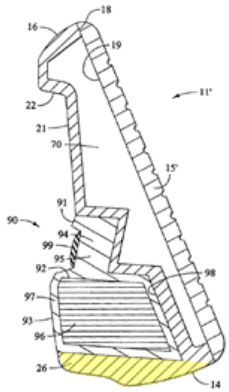


FIG. 7

(TMG1004, Fig. 3B; TMG1005 Figs. 5A, 7.)

Second, it would have, at least, been obvious to a POSA–and in fact, typical–to locate more than 50% of the body portion mass below the horizontal midplane. (TMG1003, ¶96.) Because CG and mass distribution are directly related, having more than 50% of the mass of the body portion below the horizontal midplane means having a CG that is below the horizontal midplane. (*Id.*) And the advantages of a lower CG, and thus a lower mass distribution, were well-known in the art. (*Id*.)

More specifically, a POSA would have known of authorities in golf club design that discuss the benefits of having the CG below the horizontal midplane. (*Id*., ¶¶97-99 (*citing* TMG1031, 48, 56-57).) These teachings were also in patent literature. For example, U.S. Patent Publication 2013/0316842 ("Demkowski")

discloses where "CG1"–"the nominal CG before adding the weight," i.e., the CG of the body portion of the club head before adding a weight–is located below the horizontal midplane of the club head, and thus more than 50% of the body portion mass is below the horizontal midplane. (TMG1071, ¶71, Fig. 2B; TMG1003, ¶¶100-101.)

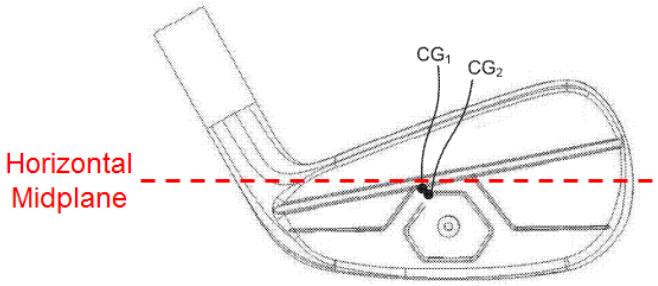


FIG. 2B

(TMG1071, Fig. 2B (Annotated).)

Additionally, the claimed limitation would have required mere routine experimentation with a well-known variable, the club head mass distribution, that is taught in the prior art. (TMG1003, ¶102.) *In re Aller*, 220 F.2d 454, 459 (C.C.P.A. 1955) (holding that the discovery of an optimum value of a variable in a known process is obvious). And there are a finite number of options for the body portion mass distribution with respect to the horizontal midplane: more than 50% of the body portion mass may be above the midplane, below the midplane, or equally distributed above and below the midplane. *See KSR Int'l Co.*, 550 U.S. at

402. For this additional reason, Wahl renders element [1.7] obvious. (TMG1003, ¶103.)

Still further, PXG does not describe any criticality or novelty to the claimed range of weight distributions that would rebut a finding of obviousness. *See In re Geisler*, 116 F.3d 1465, 1469–70 (Fed. Cir. 1997) (quoting *In re Woodruff*, 919 F.2d 1575, 1578 (Fed Cir. 1990)) (discussing the need to show criticality or unexpected results to show nonobviousness over a prior art range). In fact, outside of the claim, the ’220 patent does not describe having 50% of the mass of the body portion below the horizontal midplane. (TMG1003, ¶103.) Accordingly, distributing more than 50% of the body portion mass below the horizontal midplane would have been obvious to a POSA as nothing more than optimizing a variable according to a well-known process that is disclosed in the prior art. (*Id*.) *See KSR Int’l Co.*, 550 U.S. at 421 (holding that a design which is “obvious to try” may be obvious). For this additional reason, Wahl renders element [1.7] obvious. (TMG1003, ¶103.)

8. “wherein a portion of the at least one weight portion is closer to the face portion than a portion of the polymer material in the interior cavity” [1.8]

The combination of Wahl’s embodiments discloses the claimed relationship between the weight portion and polymer material. (TMG1003, ¶104.) As discussed above, a POSA would have been motivated to add the weights of Wahl ’496 into

Wahl's club head to optimize the CG. (*Id.*; *supra* Sections VIII.A and VIII.C.5.) So, a POSA would have turned to Wahl '496 for ways to integrate the weights into Wahl's club head. (TMG1003, ¶104.) Figure 7 of Wahl '496 illustrates a modified embodiment of Figure 5A, previously discussed, and demonstrates one way to incorporate the weights of Wahl '496 into a hollow, iron-type club, like Wahl. (*Id.*; TMG1005, 7:38-64.) It would have been obvious to modify Wahl's cavity as configured in Figure 7 of Wahl '496 to accommodate the weight portion at least because it would have been using a known technique to improve similar devices in the same way. (TMG1003, ¶104.) *KSR Int'l Co.*, 550 U.S. at 416. The resulting club head would have the cavity shape shown in Figure 7 of Wahl '496, filled with a polymer material as disclosed in Wahl. (TMG1003, ¶104.)

The '220 patent does not describe how to measure the distances of the claimed elements to determine which is "closer" to the face portion, nor does it provide specific distances from these features to the face portion. (*Id.*, ¶105.) Instead, PXG relies on the Figures as disclosing the relative distances. (TMG1002, 223-224, 232.) The '220 patent Figures show the distances from the back surface of the face portion in a direction perpendicular to the back surface. (*See, e.g.*, TMG1001, Figs. 37-41; TMG1003, ¶105.) Without any other guidance, a POSA would have taken the distance from a feature along a line perpendicular to the back surface of the face portion. (TMG1003, ¶105.)

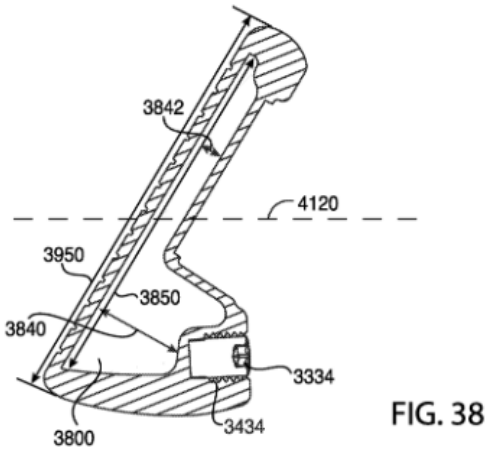


FIG. 38

(TMG1001, Fig. 38.)

As shown below in annotated Figure 7 of Wahl ’496, a portion of the weight portion is closer to the face portion than a portion of the polymer material in the combined Wahl-Wahl ’496 club head having the cavity configuration in Figure 7 of Wahl ’496, filled with the polymer material as disclosed in Wahl. (TMG1003, ¶¶106-107.) Distance “A” between a portion of the polymer material and the face portion is greater than distance “B” between a portion of the weight portion and the face portion. (*Id.*)

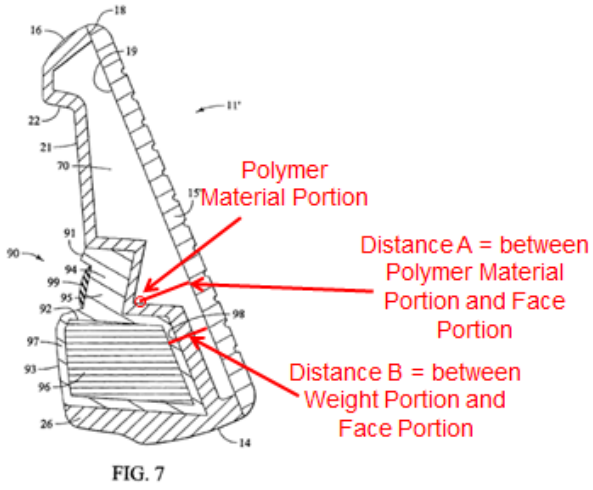


FIG. 7

(TMG1005, Fig. 7 (Annotated).)

Although, like the '220 patent, Wahl '496 does not disclose specific distances, a POSA would have found the relative relationship disclosed by the Figures. (TMG1003, ¶¶106-107.) *See Seoul Semiconductor Co., Ltd v. Sharp Kabushiki Kaisha*, IPR2014-00879, Paper 33, pp. 10 (P.T.A.B. Oct. 15, 2015) (citing *In re Aslanian*, 590 F.2d 911, 914 (CCPA 1979) ("A drawing is evaluated on the basis of what it reasonably discloses and suggests to a person of ordinary skill in the art."). Accordingly, Wahl renders element [1.8] obvious. (TMG1003, ¶107.)

D. Wahl Renders Claim 8 Obvious

1. "[a]n iron-type golf club head" [8.1]

Element [8.1] is similar to element [1.1] discussed above. (TMG1003, ¶¶108-109.) The above analysis applies and Wahl renders element [8.1] obvious. (*Id.*; Section VIII.C.)

2. "a face portion" [8.2]

Element [8.2] is identical to element [1.2] discussed above. (TMG1003, ¶110.) The above analysis applies and Wahl renders element [8.2] obvious. (*Id*.; Section VIII.C.2.)

3. "[8.3a] a body portion having, a toe portion, a top portion, a sole portion, a back portion, and [8.3b] an interior cavity extending between the top and sole portions"

(a) Element [8.3a]

Element [8.3a] is similar to element [1.3a] discussed above. (TMG1003, ¶111.) The above analysis applies and Wahl renders element [8.3a] obvious. (*Id*.; Section VIII.C.3.a.)

(b) Element [8.3b]

Element [8.3b] is similar to element [1.3b] discussed above. (TMG1003, ¶112.) The above analysis applies and Wahl renders element [8.3b] obvious. (*Id*.; Section VIII.C.3.b.)

4. "at least one port connected to the interior cavity" [8.4]

Element [8.4] is similar to element [1.4] discussed above. (TMG1003, ¶113.) The above analysis applies and Wahl renders element [8.4] obvious. (*Id*.; Section VIII.C.4.)

5. "an elastic polymer material injection molded in the interior cavity through the at least one port" [8.5]

As discussed above in element [1.6], Wahl discloses filling the cavity with a polymer material through the port. (*Supra* Section VIII.C.6; TMG1003, ¶114.) Filler materials can include viscoelastic elastomers, vinyl copolymers, polyesters, polyurethanes, thermoset and thermoplastic rubbers, and foamed polymers. (TMG1004, 4:18-25, 4:51-5:3.) A POSA would have known that, at least, "viscoelastic elastomers" and "foamed polymers" are "elastic polymer materials." (TMG1003, ¶115.)

The remaining portion of this claim element—filling the polymer material through injection molding—recites a process step in an apparatus claim. The process of making an apparatus claim is generally not considered for patentability unless "the process limitation connotes specific structure and may be considered a structural limitation." *In re Nordt Dev. Co.*, 881 F.3d 1371, 1374 (Fed. Cir. 2018). Here, unlike in *Nordt*, the '220 patent does not discuss any structural differences by filling the cavity through injection molding as opposed to other filling techniques, nor would a POSA have found injection molding to result in structural changes. (TMG1003, ¶116.) Thus, the "injection molding" element of this claim element should not be considered during a patentability analysis.

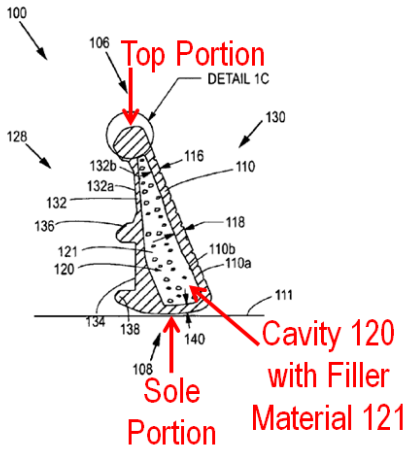


Fig. 1B

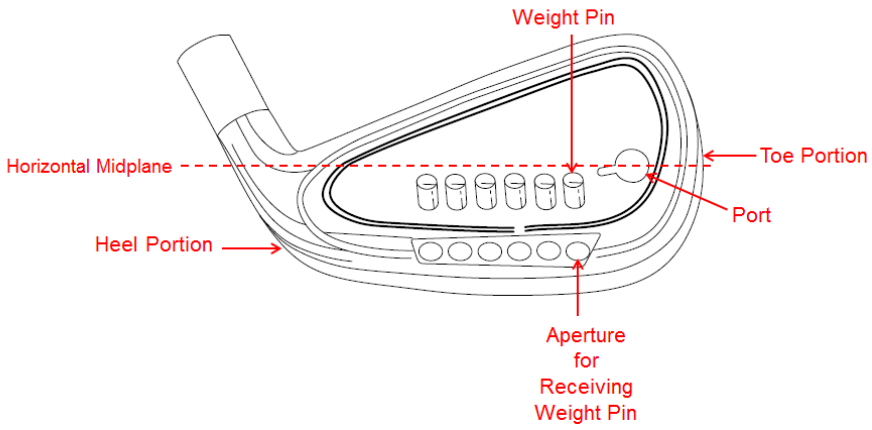
(TMG1004, Fig. 1B (Annotated).)

Nevertheless, Wahl discloses that one method of filling the cavity uses "an injection foam." (TMG1004, 13:49-64; TMG1003, ¶116.) This would have suggested to a POSA that the foam is injected into the cavity. (TMG1003, ¶116.) And injection molding filling material into hollow club heads was well-known in the art. (*See, e.g.*, TMG1021, Abstract, p. 5, ¶5, p. 7, ¶4, Figs. 4, 6-7; TMG1003, ¶116.) Thus, at the very least, it would have been obvious to fill Wahl's cavity by injection molding. (TMG1003, ¶116.) Accordingly, Wahl renders element [8.5] obvious. (*Id*.)

6. "at least one weight portion coupled to the body portion at a location below a horizontal midplane of the golf club head" [8.6]

As discussed above in element [1.5], it would have been obvious to combine the weights of Wahl '496 into Wahl's club head. (*Supra*, Section VIII.C.5; TMG1003, ¶¶93, 117.) As shown below, the weight apertures, and corresponding

weight pins, of the combined club would be located below the horizontal midplane. (TMG1003, ¶117.) Accordingly, Wahl renders element [8.6] obvious. (*Id.*)

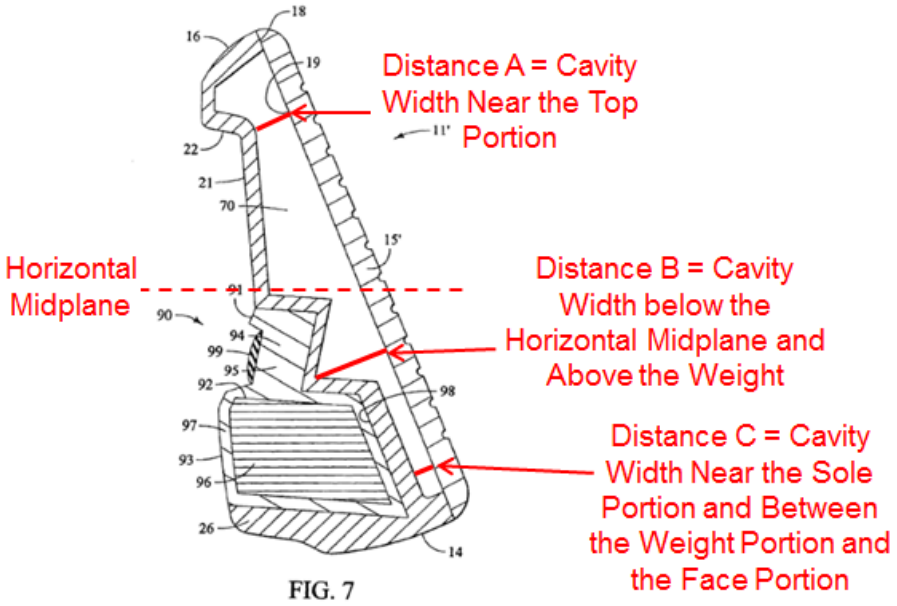


(TMG1004, Fig. 4 (Modified and Annotated).)

7. "wherein a width of the interior cavity at or below the horizontal midplane and above the at least one weight portion is greater than a width of the interior cavity near the top portion and greater than a width of the interior cavity between the at least one weight portion and the face portion" [8.7]

As discussed above in element [1.8], it would have been obvious to modify Wahl's cavity as configured in Figure 7 of Wahl '496 to accommodate the weight portions. (*Supra*, Section VIII.C.8; TMG1003, ¶¶104, 118.) These cavity widths, measured as discussed in element [1.8], disclose the relationships recited in element [8.7]. (TMG1003, ¶¶105-107, 118-120.) As shown below in annotated Figure 7 of Wahl '496, cavity width "A" near the top portion and cavity width "C" between the weight portion and the face portion are both less than cavity width "B," located between the horizontal midplane and the weight portion. (*Id.*, ¶120.)

Again, although Wahl '496 does not disclose specific distances, a POSA would have found the relative relationships disclosed by the Figures. (*Id.*, ¶¶119-120.) Accordingly, Wahl renders element [8.7] obvious. (*Id.*)



(TMG1005, Fig. 7 (Annotated).)

E. Wahl Renders Claim 13 Obvious

1. "[a] golf club head" [13.1]

Element [13.1] is identical to element [1.1] discussed above. (TMG1003, ¶¶121-122.) The above analysis applies and Wahl renders element [13.1] obvious. (*Id.*; *supra* Section VIII.C.1.)

2. "a face portion" [13.2]

Element [13.2] is identical to element [1.2] discussed above. (TMG1003, ¶123.) The above analysis applies and Wahl renders element [13.2] obvious. (*Id*.; *supra* Section VIII.C.2.)

3. "[13.3a] a body portion having a toe portion, a heel portion, a top portion, a sole portion, a back portion, and [13.3b] an interior cavity extending between the top and sole portions"

(a) Element [13.3a]

Element [13.3a] is identical to element [1.3a] discussed above. (TMG1003, ¶124.) The above analysis applies and Wahl renders element [13.3a] obvious. (*Id*.; *supra* Section VIII.C.3.a.)

(b) Element [13.3b]

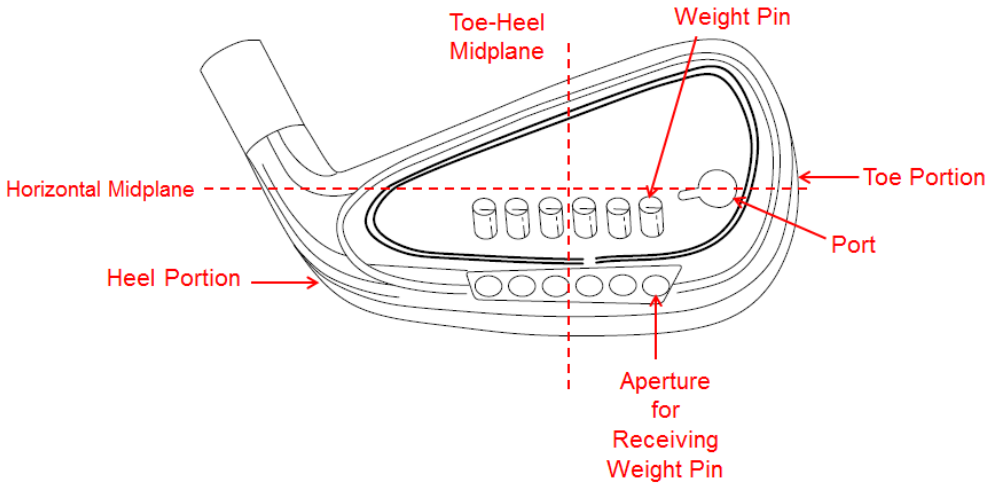
Element [13.3b] is identical to element [1.3b] discussed above. (TMG1003, ¶125.) The above analysis applies and Wahl renders element [13.3b] obvious. (*Id*.; *supra* Section VIII.C.3.b.)

4. "at least one port located closer to the toe portion than the heel portion and connected to the interior cavity" [13.4]

Element [13.4] is identical to element [1.4] discussed above. (TMG1003, ¶¶126-127.) The above analysis applies and Wahl renders element [13.4] obvious. (*Id*.; *supra* Section VIII.C.4.)

5. "at least one weight portion located closer the toe portion than the heel portion and located between the at least one port and the heel portion" [13.5]

Element [13.5] is similar to element [1.5] discussed above. (*Supra* Section VIII.C.5; TMG1003, ¶128.) This claim element differs by requiring that the weight portion also be located closer to the toe portion than the heel portion. (TMG1003, ¶128.) As shown below, Wahl modified to include the weight portions of Wahl '496 discloses the claimed relationship between the port and the weight portion. The identified weight is closer to the toe portion than the heel portion and between the port and the heel portion. (*Id.*) Accordingly, Wahl renders element [13.5] obvious. (*Id.*)



(TMG1004, Fig. 4 (Modified, Annotated).)

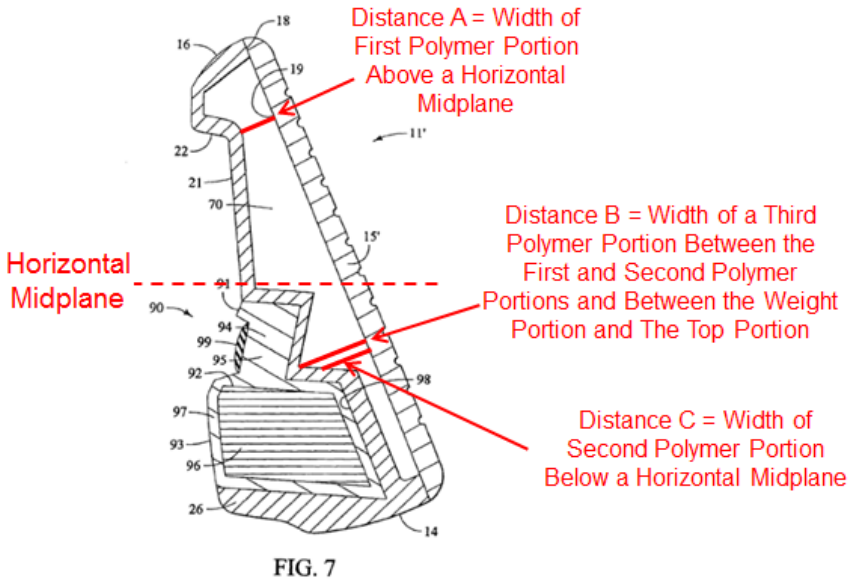
6. "wherein the interior cavity is filled with a polymer material from the at least one port" [13.6]

Element [13.6] is identical to element [1.6] discussed above. (TMG1003, ¶129.) The above analysis applies and Wahl renders element [13.6] obvious. (*Id.*; *supra* Section VIII.C.6.)

7. "wherein a first portion of the polymer material above a horizontal midplane of the body portion has a first width, a second portion of the polymer material below the horizontal midplane has a second width greater than the first width, and a third portion of the polymer material between the first portion and the second portion has a third width greater than the first width and greater than the second width, and wherein the third portion is located between the at least one weight portion and the top portion" [13.7]

Element [13.7] is similar to element [8.7], but differs by reciting the polymer material widths instead of the cavity widths and requiring that the second width, located below the horizontal midplane, be greater than the first width in addition to requiring that the third width be greater than both the first and second widths. As discussed regarding element [1.6], the cavity may be completely filled, in which case the cavity width and polymer width are equal. (*Supra* Section VIII.C.6; TMG1003, ¶130.) And as discussed above regarding element [1.8], it would have been obvious to modify Wahl's cavity as configured in Figure 7 of Wahl '496 to accommodate weight portions. (*Supra* Section VIII.C.8; TMG1003, ¶130.) The polymer widths, measured as discussed in element [1.8], disclose the relationships recited in element [13.7]. (TMG1003, ¶¶131-132.) As shown below in annotated

Figure 7 of Wahl ’496, cavity width “A” above the horizontal midplane is less than cavity width “C” below the horizontal midplane, and both are less than cavity width “B,” which is located between “A” and “C” and between the weight portion and the top portion. (*Id.*, ¶132.) Again, although Wahl ’496 does not disclose specific distances, a POSA would have found the relative relationships disclosed by the Figures. (*Id.*)



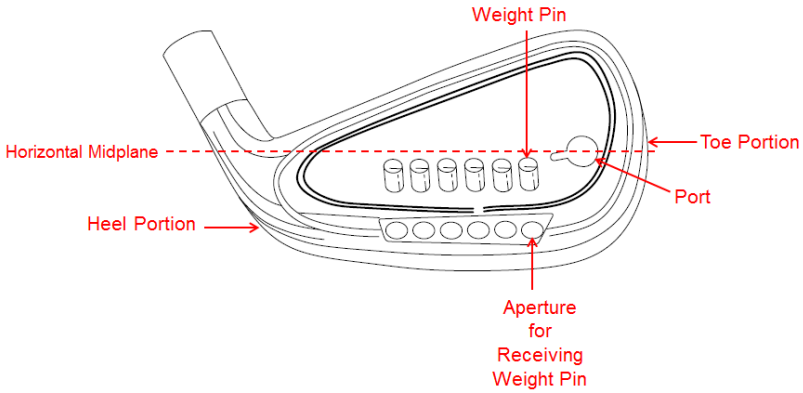
(TMG1005, Fig. 7 (Annotated).)

Accordingly, Wahl renders element [13.7] obvious. (*Id.*, ¶¶130-132.)

F. Wahl Renders Claim 2 Obvious

Claim 2 recites “wherein the at least one port is located at or near a periphery of the body portion.” The ’220 patent does not define “periphery,” but based on the port locations in the ’220 patent Figures and the plain meaning of

"periphery," the location of the port shown below in modified Figure 4 of Wahl discloses a port located at or near a periphery of the body portion. (TMG1003, ¶133.)

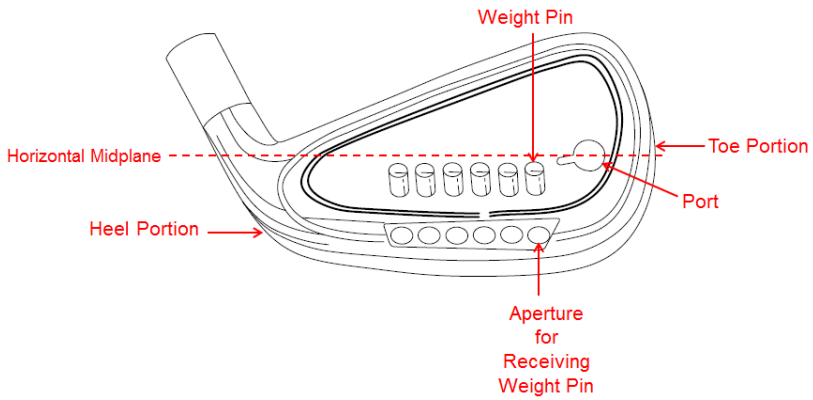


(TMG1004, Fig. 4 (Modified, Annotated).)

As discussed above in Section VIII.C.4, Wahl also discloses that "the aperture 338 can be located anywhere on the club head body surface other than the front striking face. For example, the aperture 338 can be located on the sole, toe, heel, or top line surfaces." (TMG1004, 10:53-57.) Thus, it would have also been obvious to position the port at or near the periphery of the body portion, for example, on the toe, because of the limited space on the back surface of the club. (TMG1003, ¶134.) *KSR Int'l Co.*, 550 U.S. at 402. Accordingly, Wahl renders claim 2 obvious. (TMG1003, ¶¶133-134.)

G. Wahl Renders Claims 3 and 16 Obvious

Claims 3 and 16 recite "wherein the at least one port is located at or below the horizontal midplane." As shown below in modified Figure 4 of Wahl, the port is located at or below the horizontal midplane.



(TMG1004, Fig. 4 (Modified, Annotated).)

Furthermore, Wahl discloses that the port may be located anywhere on the body portion other than the front face. (TMG1004, 10:53-57.) Thus, it would have also been obvious to position the port at or below the horizontal midplane of the head because of the limited space on the back surface of the club. (TMG1003, ¶¶135-136.) *KSR Int'l Co.*, 550 U.S. at 402. Accordingly, Wahl renders claims 3 and 16 obvious. (*Id.*)

H. Wahl Renders Claims 4 and 19 Obvious[5]

Claims 4 and 19 recite "wherein the polymer material is an elastic polymer material." These claims are similar to claim element [8.5]. (*Supra* Section VIII.D.5; TMG1003, ¶137.) The above analysis applies and Wahl renders claims 4 and 19 obvious. (TMG1003, ¶137.)

I. Wahl Renders Claims 5 and 17 Obvious[6]

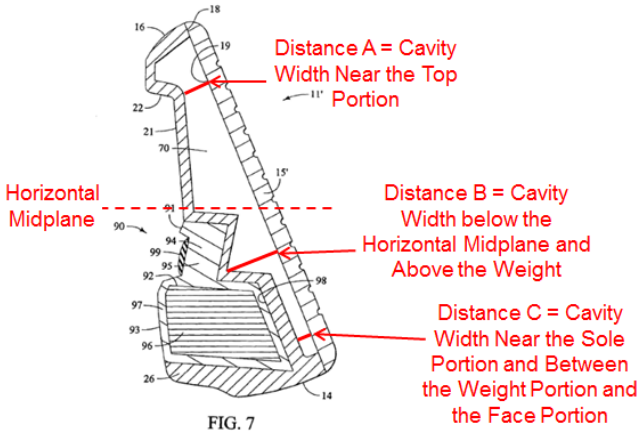
Claim 5 recites "wherein the at least one weight portion is located below the horizontal midplane and is located closer to the toe portion than the heel portion" and claim 17 recites "wherein the at least one weight portion is located below the horizontal midplane." Claims 5 and 17 are similar to claim elements [8.6] and [13.5]. (*Supra* Sections VIII.D.6, VIII.E.5; TMG1003, ¶¶138-139.) The above analyses apply and Wahl renders claims 5 and 17 obvious. (TMG1003, ¶¶138-139.)

[5] Taylor Made notes that claim 19 depends on claim 1, as-issued, and thus claims 4 and 19 add identical limitations to claim 1. The analysis below applies regardless of whether claim 19 depends from claim 1 or claim 13.

[6] Taylor Made notes that claim 17 depends on claim 1, as-issued; however, the analysis below applies regardless of whether claim 17 depends from claim 1 or claim 13.

J. Wahl Renders Claim 6 Obvious

Claim 6 recites "wherein a width of the interior cavity at or below the horizontal midplane and above the at least one weight portion is greater than a width of the interior cavity near the top portion and greater than a width of the interior cavity near the sole portion." This claim is similar to claim element [8.7]. (*Supra* Section VIII.D.7; TMG1003, ¶140.) The only difference is that the lower cavity width is "near the sole portion" instead of between the weight portion and the face portion. (TMG1003, ¶¶140-142.) The lower cavity width shown in the Figure in element [8.7], reproduced below, is also "near the sole portion." As shown below, cavity width "A" near the top portion and cavity width "C" near the sole portion are both less than cavity width "B," which is located between the horizontal midplane and the weight portion. (*Id.*) Accordingly, the above analysis applies and Wahl renders claim 6 obvious. (*Id.*)



(TMG1005, Fig. 7 (Annotated).)

K. Wahl Renders Claims 7, 12, and 20 Obvious

Claims 7, 12, and 20 recite "wherein the face portion comprises a thickness of less than or equal to 1.9 millimeters (0.075 inch)." Wahl discloses that "[t]he thin face thickness can be within a range of about 1.0 mm-3.0 mm." (TMG1004, 7:65-66.) Accordingly, Wahl renders claims 7, 12, and 20 obvious. (TMG1003, ¶¶143-144.)

L. Wahl Renders Claim 10 Obvious

Claim 10 recites "wherein the interior cavity comprises a cavity having at least 50% filled with a thermoplastic elastomer material." Wahl discloses that "the filler material occupies about 50% to about 99% of the total enclosed cavity volume." (TMG1004, 1:65-66, 4:14-17, 11:12-15, Fig. 1B.)

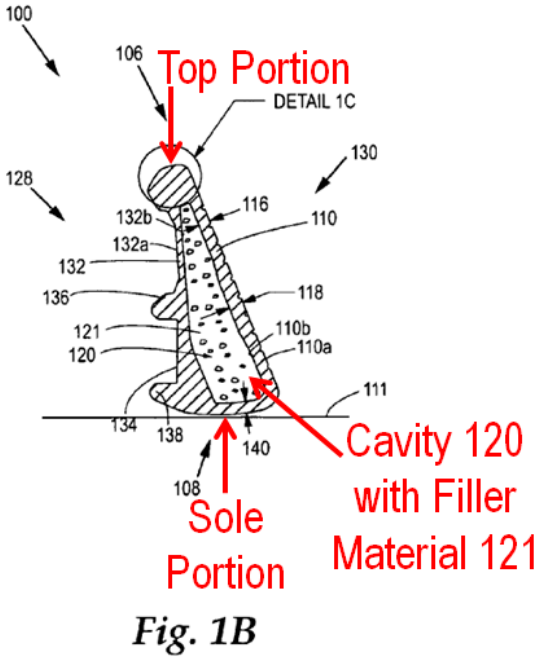


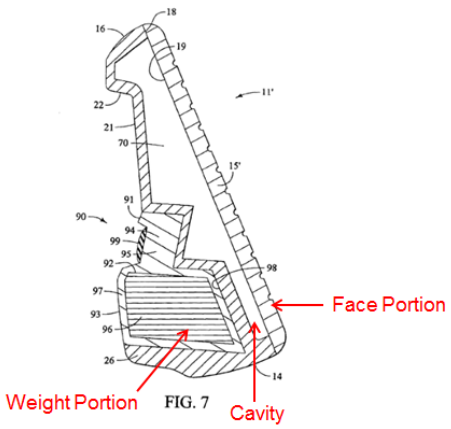
Fig. 1B

(TMG1004, Figure 1B (Annotated).)

Wahl discloses many filler materials, including *viscoelastic elastomers*, vinyl copolymers, polyesters, polyurethanes, thermoset and *thermoplastic rubbers*, and foamed polymers. (*Id.*, 4:18-25, 4:51-5:3.) A POSA would have known that these materials include "thermoplastic elastomer material[s]." (TMG1003, ¶145.) Accordingly, Wahl renders claim 10 obvious. (*Id.*)

M. Wahl Renders Claim 11 Obvious

Claim 11 recites "wherein a portion of the interior cavity is configured to separate the face portion and the at least one weight portion." As discussed in element [8.7], it would have been obvious to modify Wahl's cavity as configured in Figure 7 of Wahl '496. (*Supra* Section VIII.D.7; TMG1003, ¶146.) And as shown below, Wahl's cavity is "configured to separate the face portion and the at least one weight portion." Accordingly, Wahl renders claim 11 obvious. (TMG1003, ¶146.)



(TMG1005, Fig. 7 (Annotated).)

N. Wahl Renders Claim 14 Obvious[7]

Claim 14 recites "wherein the third width is between the at least one weight portion and the horizontal midplane." Claim 14 is similar to element [13.7], and the analysis above applies here. (*Supra* Section VIII.E.7.) As shown below in annotated Figure 7, cavity width "A" above the horizontal midplane and cavity width "C" below the horizontal midplane are both less than cavity width "B," which is located between "A" and "C" and between the weight portion and the horizontal midplane. (TMG1003, ¶¶147-148.) Accordingly, Wahl renders claim 14 obvious. (*Id.*)

[7] Taylor Made notes that claim 14 depends on claim 1, as-issued; however, claim 1 does not recite a "third width." It appears that claim 14 should depend from claim 13. The analysis below applies regardless of whether claim 14 depends from claim 1 or claim 13.

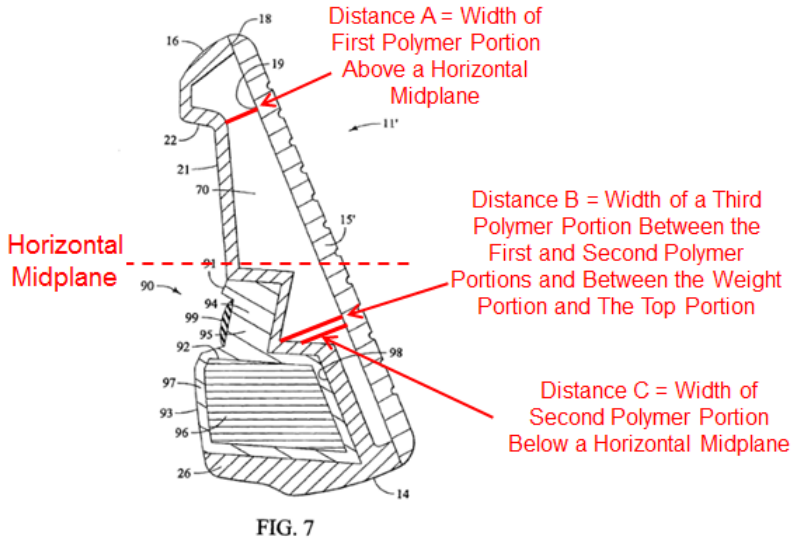


FIG. 7

(TMG1005, Fig. 7 (Annotated).)

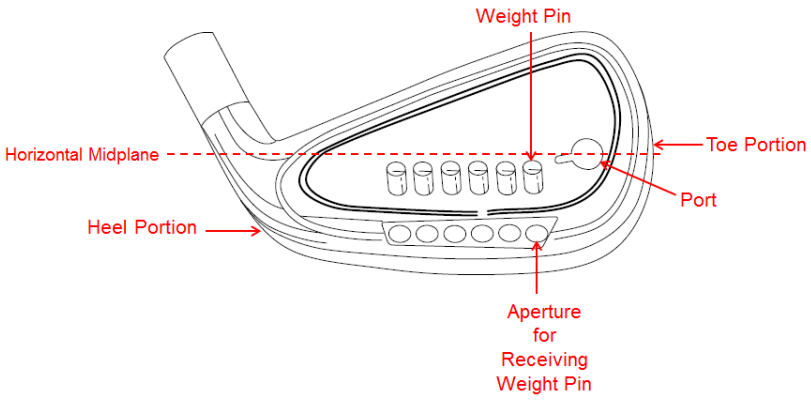
O. Wahl Renders Claim 15 Obvious

Claim 15 recites "wherein a portion of the at least one weight portion is closer to the face portion than a portion of the polymer material in the interior cavity." Claim 15 is identical to element [1.8]. (*Supra* Section VIII.C.8.) The above analysis applies and Wahl renders claim 15 obvious. (TMG1003, ¶¶149-152.)

P. Wahl Renders Claim 18 Obvious

Claim 18 recites "wherein the at least one weight portion is closer to the sole portion than the at least one port." As shown in the Figure below, the weight portion and port locations discussed in element [13.5] disclose a weight aperture, and corresponding weight pin, that is closer to the sole than the port. (*Supra*

Section VIII.E.5; TMG1003, ¶¶128, 153.) Accordingly, Wahl renders claim 18 obvious. (TMG1003, ¶153.)



(TMG1004, Fig. 4 (Modified, Annotated).)

IX. Ground 2: The Combination of Wahl and Linphone Renders Claim 9 Obvious

A. Motivation for Combining Wahl and Linphone

Wahl and Linphone are from the same field—iron-type golf clubs. (TMG1003, ¶154.) A POSA would have recognized Wahl's preference for minimizing "undesirable sounds and vibrations upon impact." (TMG1004, 1:28-29; *Id*., ¶¶154-155.) Linphone discloses a club head with shock absorbing qualities to minimize undesirable sounds and vibrations. (TMG1035, 0003; TMG1003, ¶156.) Linphone teaches bonding the club's filler material to the cavity of the club head using an adhesive to more effectively dissipate the vibrations of the front face in the filler material. (TMG1035, 0004-0005; TMG1003, ¶156.) A POSA would have recognized the benefits of applying Linphone's bonding method to Wahl's

filled club to produce a club head with improved shock absorption. (TMG1003, ¶156.) This would have been nothing more than improving a similar device—Wahl's club head—using a known method—Linphone's bonding method. (*Id.*) *KSR Int'l Co.*, 550 U.S. at 401.

Accordingly, it would have been obvious to combine Linphone's teachings with Wahl. (TMG1003, ¶¶154-156.)

B. The Combination of Wahl and Linphone Should Not Prevent Institution Under Section 325(d)

The combination of Wahl and Linphone should not prevent institution at least for the same reasons as discussed above regarding Ground 1. (*Supra* Section VIII.B.) Furthermore, Linphone was not cited or applied during prosecution, and as discussed below, Linphone discloses the elements of claim 9. Accordingly, the Board should not deny institution under Section 325(d).

C. The Combination of Wahl and Linphone Renders Claim 9 Obvious

Claim 9 recites "a bonding portion configured to bond the elastic polymer material to the face portion." Linphone discloses a bonding portion, as claimed. (TMG1035, 0004; TMG1003, ¶157.) Linphone describes an iron head 1 formed from a body 11 and striking face 12 defining a hollow cavity 13. (TMG1035, 0004.) An adhesive solution 2 is injected into the cavity 13 via through-hole 14 so

that the inner walls, including the back surface of the striking face 12, are uniformly coated with the adhesive solution 2. (*Id.*)

Linphone describes sand-blasting the inner cavity walls, enabling the adhesive solution 2 to adhere better to the back surface of the striking face 12. (*Id.*; TMG1003, ¶158.) Thus, a POSA would have understood that the adhesive solution bonds to the back surface of the front face. (TMG1003, ¶158.) And Linphone's adhesive solution is a bonding portion because it is an adhesive agent, distinct from the elastic polymer material and the body portion, that joins the elastic polymer material to the body portion. (*Id.*)

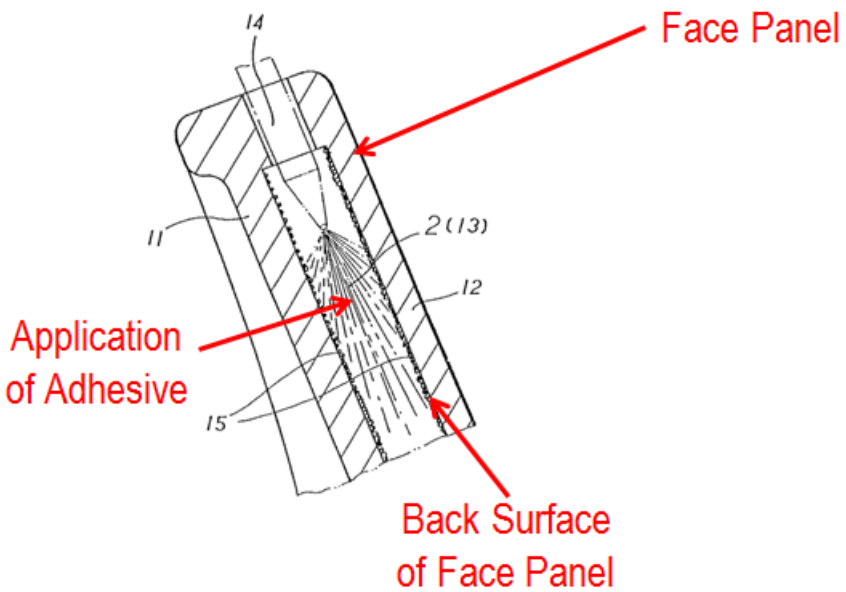


FIG. 3

(TMG1035, Fig. 3 (Annotated).)

Linphone also describes that a shock-absorbing rubber 3 is injection-molded through the through-hole 14 to fill the adhesive-coated cavity 13, as shown in

Figure 4. (TMG1035, 0004.) Thus, the process "serves to enable the adhesive solution 2, *and also the shock-absorbing rubber 4*, to adhere better to the inner wall of the cavity 13." (*Id*. (emphasis added); TMG1003, ¶159.)

A POSA would have understood that the shock-absorbing rubber described in Linphone adheres to the inner wall of the cavity—including the back of the striking face 12—via the intermediary adhesive bonding portion. (TMG1003, ¶160.) Indeed, Linphone's efficient vibration dissipation relies on bonding the back surface of the front face to the elastic polymer filler material because this facilitates transmission of energy from the front face to the elastic polymer filler material. (*Id*.) Further, the purpose of adhesive solutions is to bond *two* or more surfaces together. (*Id*.) Therefore, when Linphone describes applying the adhesive solution between the back surface of the face portion and the elastic polymer material, a POSA would have understood that the adhesive solution bonds the elastic polymer material to the back surface of the face portion. (*Id*.)

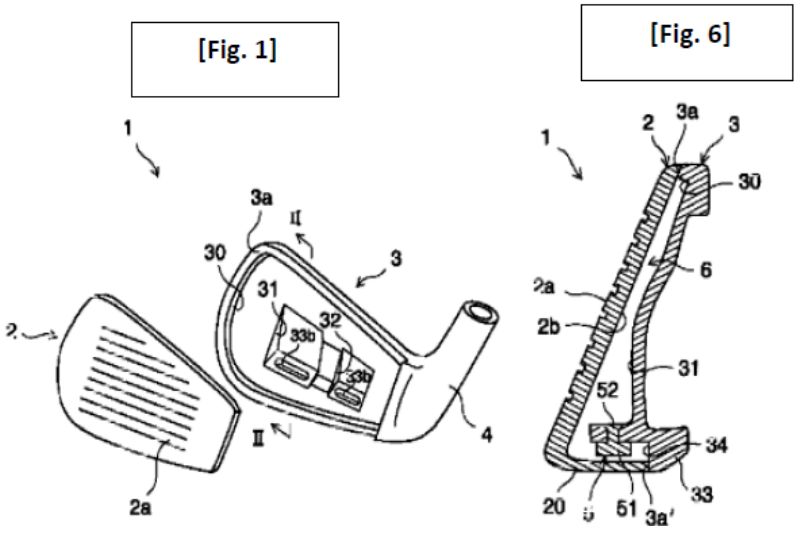
Accordingly, the combination of Wahl and Linphone renders claim 9 obvious. (*Id*., ¶¶157-160.)

X. Ground 3: The Combination of Chaen and Lahaix Renders Claims 1-8 and 10-20 Obvious

A. Motivation for Combining Chaen and Lahaix

Chaen and Lahaix are both from the same field—iron-type golf clubs. (TMG1072, ¶1; TMG1021, 1-2; TMG1003, ¶161.) Furthermore, both club heads are, at least initially, hollow. (TMG1072, ¶¶11, 37, 43; TMG1021, 4, Figs. 4-7.)

Chaen discloses a hollow, iron-type golf club with weight portions in the sole. (TMG1072, ¶¶11, 37, 43 Fig. 2; TMG1003, ¶162.) The weight portion is configured to lower the center of gravity of the club head. (TMG1072 ¶¶10-11, 49-51; TMG1003, ¶162.) One goal of Chaen is maximizing the "repulsive force" of the face portion while maintaining a low center of gravity. (TMG1072, ¶10; TMG1003, ¶162.) This performance characteristic is also known as the "trampoline effect." (*See, e.g.*, TMG1023, "Chao", ¶0007; TMG1003, ¶162.)

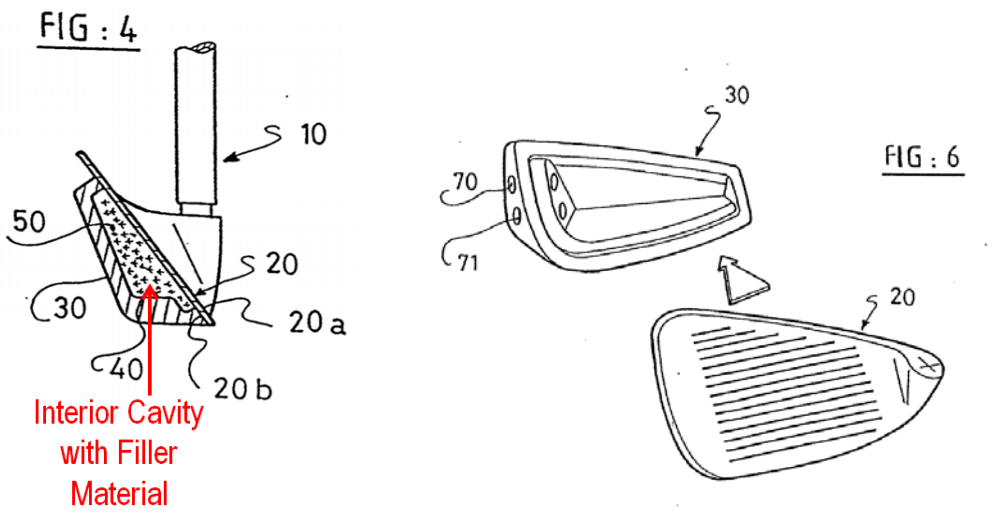


(TMG1072, Figs. 1, 6.)

Based on Chaen's disclosure, a POSA would have sought to improve the mass distribution and the so-called "trampoline effect" of Chaen's club head to improve club performance. (TMG1003, ¶163.) This would have led a POSA to Lahaix, which describes a hollow, iron-type club with a thin face (between one and two millimeters) supported by a filled interior cavity. (*Id*.; TMG1021, 2-4.) Lahaix describes advantages of a thin face supported by filling material, as compared to a hollow club head. (TMG1003, ¶163.) The thinner face allows more weight to be distributed around the periphery of the club head, improving the moment of inertia. (*Id*.; TMG1021, 6.) The thinner face also improves club feel upon impact and, in combination with the filler material, produces a more pleasing sound. (TMG1021, 2; TMG1003, ¶163.) As Lahaix describes, the filling material "acts as a support in order to prevent the plate from collapsing because of its thinness." (TMG1021, 6; TMG1003, ¶163.)

Accordingly, it would have been obvious to a POSA to combine Chaen and Lahaix because of the advantages of Lahaix's thin face. (TMG1003, ¶164.) Incorporating Lahaix's thin face and filler into Chaen's club would have simply been combining prior art elements according to known methods to yield predictable results. (*Id.*) *KSR Int'l Co.*, 550 U.S. at 416. Doing so would have improved the function of Chaen's similar device in the same way–optimizing weight distribution, improving club feel, and attenuating sound upon impact.

(TMG1003, ¶164.) Likewise, the combination would have improved a similar device—Chaen's club head—using a known method—a thin face plate with a hollow, filled cavity described in Lahaix. (*Id.*; TMG1021, 6-7.) *KSR Int'l Co.*, 550 U.S. at 401.

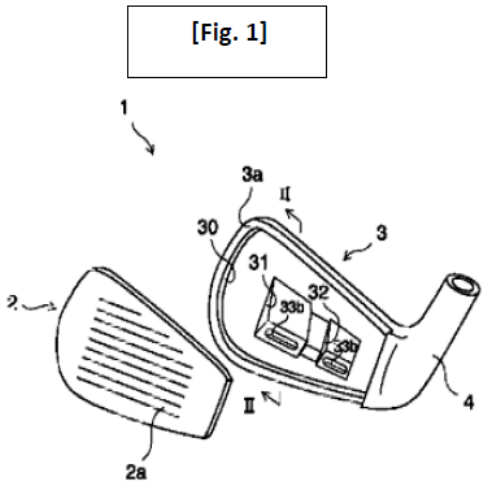


(TMG1021, Figs. 4 (annotated), 6.)

B. The Combination of Chaen and Lahaix Renders Claim 1 Obvious

1. "[a] golf club head" [1.1]

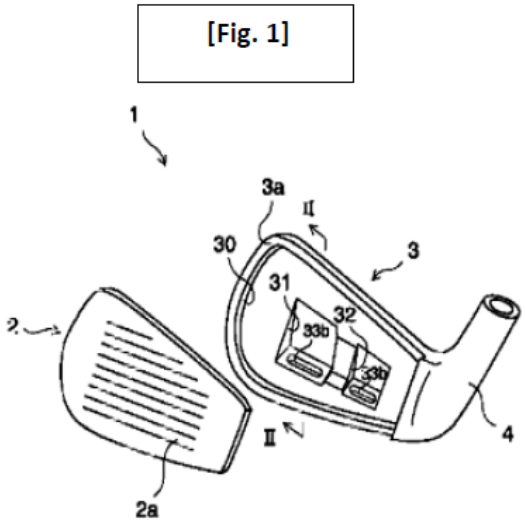
Chaen discloses an iron-type golf club head. (TMG1072, ¶¶1, 49, Fig. 1.) Accordingly, the combination of Chaen and Lahaix renders element [1.1] obvious. (TMG1003, ¶165.)



(TMG1072, Fig. 1.)

2. "a face portion"[1.2]

Chaen's club head includes a "face member 2." (TMG1072, ¶¶36, 50, Fig. 1; TMG1003, ¶166.)



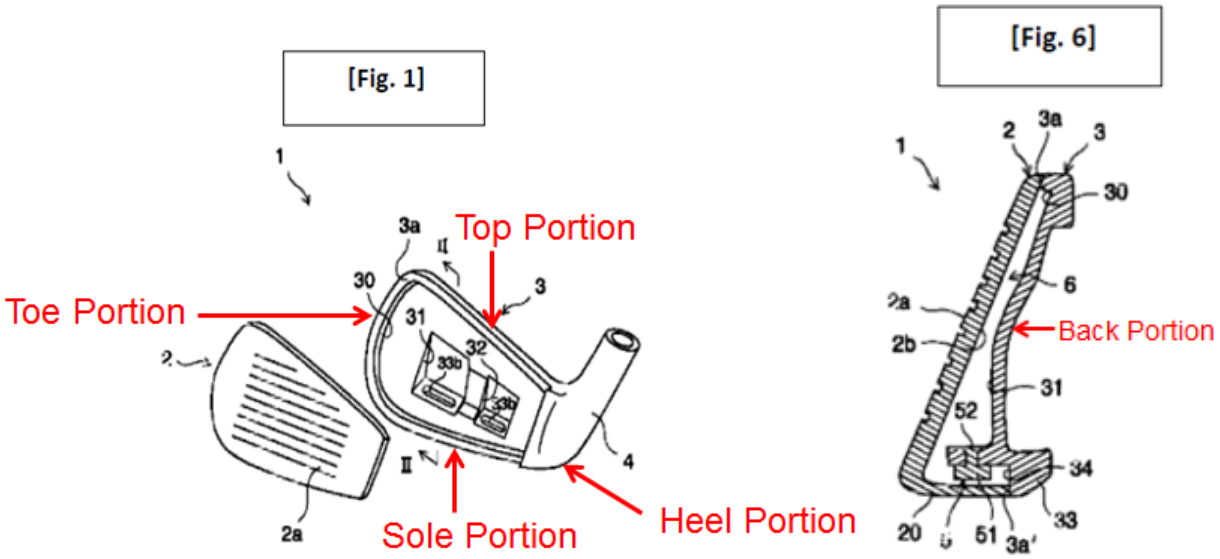
(TMG1072, Fig. 1.)

Accordingly, the combination of Chaen and Lahaix renders element [1.2] obvious. (TMG1003, ¶166.)

3. "[1.3a] a body portion having, a toe portion, a heel portion, a top portion, a sole portion, a back portion, and [1.3b] an interior cavity extending between the top and sole portions"

(a) Element [1.3a]

Chaen discloses a "Sole 33" and "Back Face Member 3" that a POSA would have understood to be a back portion. (TMG1072, ¶¶36-37, 50; TMG1003, ¶167.) Like all golf clubs, Chaen's club head includes a toe portion, heel portion, and top portion, shown below. (TMG1003, ¶167.)



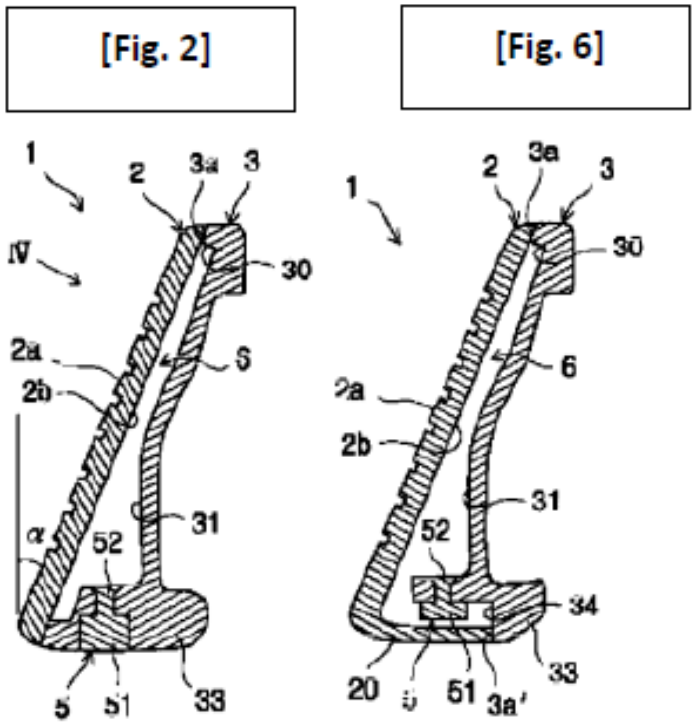
(TMG1072, Figs. 1, 6 (Annotated).)

Accordingly, the combination of Chaen and Lahaix renders element [1.3a] obvious. (TMG1003, ¶167.)

(b) Element [1.3b]

Chaen discloses "a hollow area 6" formed in the interior of the club head. (TMG1072, ¶¶37, 50; TMG1003 ¶168.) As shown below, the hollow portion, or

cavity, extends from the top portion to the sole portion. Accordingly, the combination of Chaen and Lahaix renders element [1.3b] obvious. (TMG1003, ¶168.)

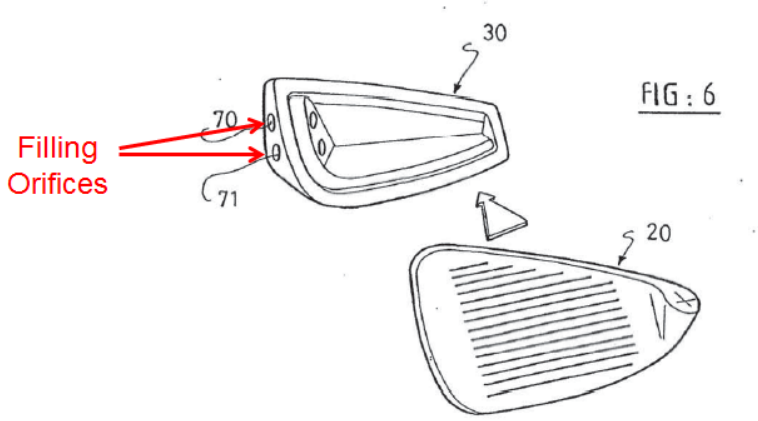


(TMG1072, Figs. 2, 6.)

4. "at least one port located closer to the toe portion than the heel portion and connected to the interior cavity" [1.4]

As discussed above, a POSA would have been motivated to fill Chaen's cavity, as disclosed in Lahaix. (*Supra* Section X.A; TMG1003, ¶169.) Thus, it would have been obvious to include Lahaix's filling orifices (70, 71) in Chaen's club head to fill the cavity. (TMG1003, ¶169.) This would have been a simple combination of prior art elements. (*Id.*) *KSR Int'l Co.*, 550 U.S. at 416. As shown below, Lahaix's orifices are located in the toe portion—and thus closer to the toe

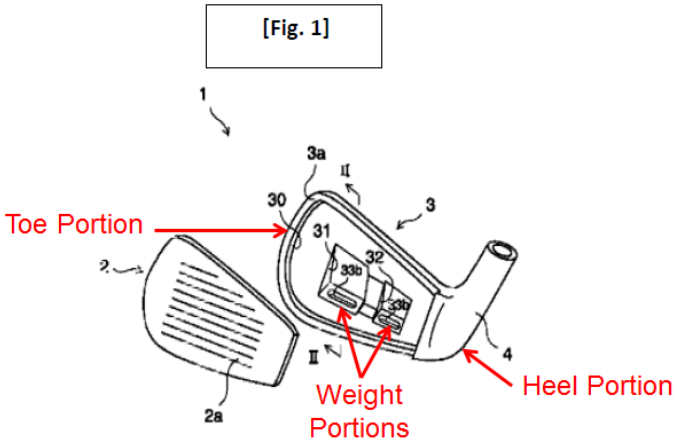
portion than the heel portion—and connected to the interior cavity. (TMG1021, Fig. 6, 7; TMG1003, ¶169.) Accordingly, the combination of Chaen and Lahaix renders element [1.4] obvious. (TMG1003, ¶169.)



(TMG1021, Fig. 6 (Annotated).)

5. "at least one weight portion located closer to the heel portion than the at least one port" [1.5]

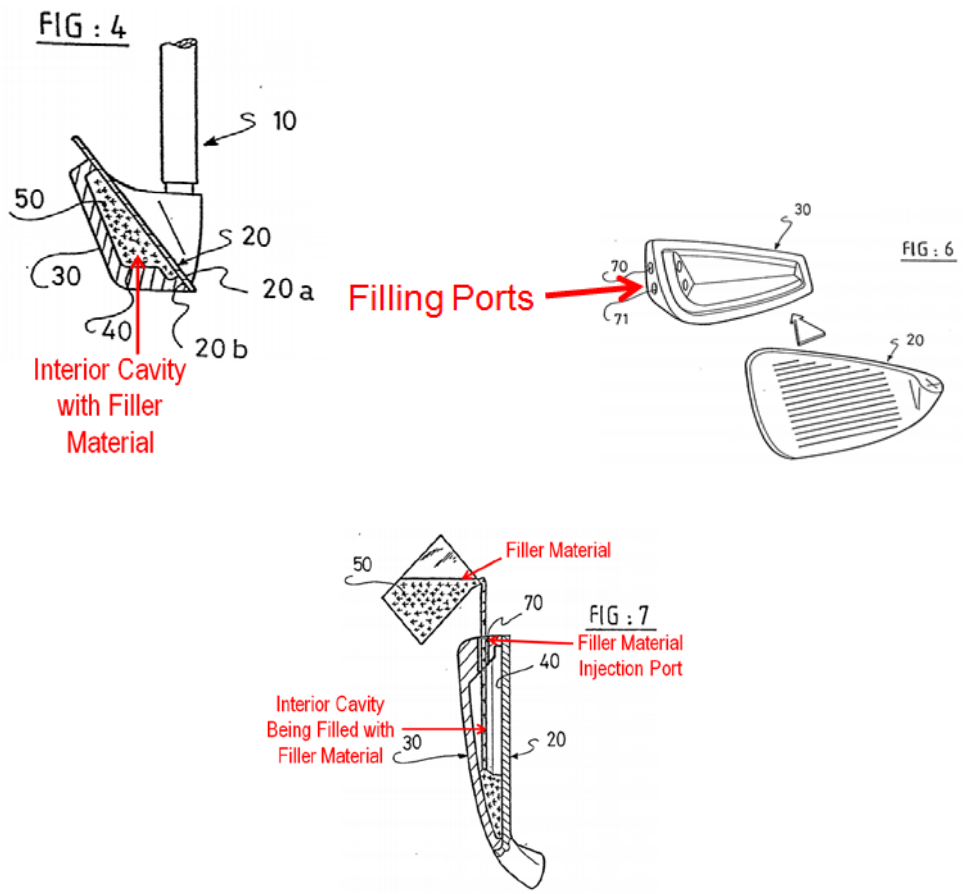
As shown below in Figure 1, Chaen discloses weight portions in the sole of the club head. (TMG1072, ¶¶38, 49-51, Figs. 1, 6; TMG1003, ¶170.) As discussed above in element [1.4], the combined Chaen-Lahaix club head would include the filling orifices in the toe portion. (*Supra* Section X.B.4; TMG1003, ¶170.) Thus, both weight portions shown below are "located closer to the heel portion than the at least one port" because the port is in the toe portion–the farthest location from the heel. (TMG1003, ¶170.) Accordingly, the combination of Chaen and Lahaix renders element [1.5] obvious. (*Id.*)



(TMG1072, Fig. 1 (Annotated).)

6. "wherein the interior cavity is filled with a polymer material from the at least one port" [1.6]

Lahaix discloses that the internal cavity can be "wholly filled by the filling material." (TMG1021, 2, 4, 5, Fig. 4.) Further, "[t]he filling material may be a thermoplastics or elastomer material," which a POSA would have understood to include "polymer material[s]." (*Id.*, 4; TMG1003, ¶171.) And Lahaix discloses "introducing filling material 50 by low pressure pouring or by gravity in the RIM process through a filling orifice (70, 71) which communicates with the internal cavity." (TMG1021, 7.)



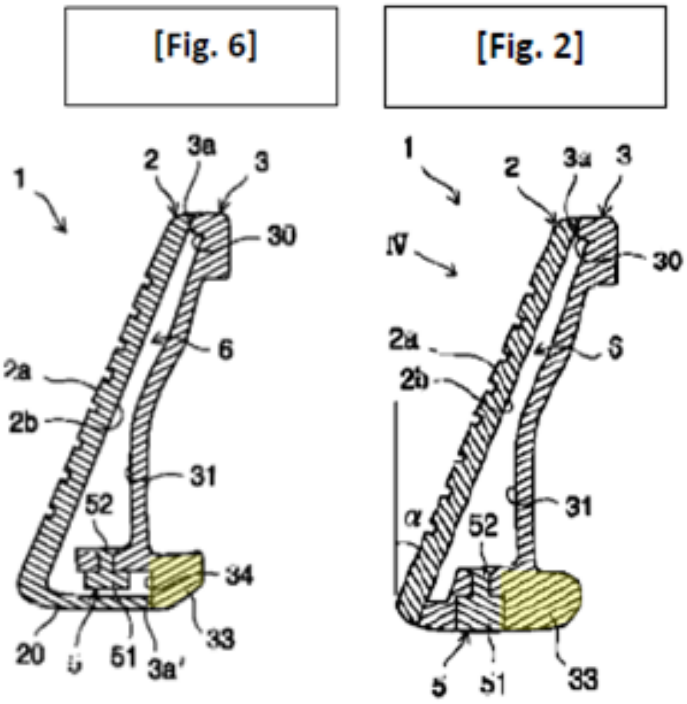
(TMG1021, Figs. 4, 6, 7 (Annotated).)

Accordingly, the combination of Chaen and Lahaix renders element [1.6] obvious. (TMG1003, ¶171.)

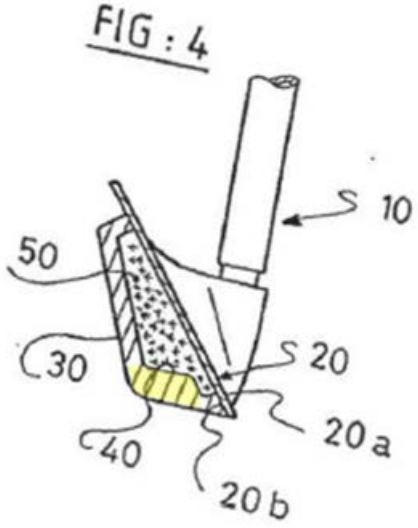
7. "wherein more than 50% of a mass of the body portion is located below a horizontal midplane of the golf club head" [1.7]

First, a POSA would have understood that Chaen and Lahaix both illustrate club head designs where more than 50% of the mass of the body portion is below the horizontal midplane. (TMG1003, ¶172.) For example, Figures 2 and 6 of Chaen illustrate an enlarged sole bar (highlighted) even with the sole-mounted

weight portions. (*Id*.; TMG1072, ¶¶36-39, 49-51.) Likewise, Figure 4 of Lahaix illustrates an enlarge sole bar. (TMG1021, 3-4; TMG1003, ¶172.) Indeed, a POSA would have understood that even when adding weights to the club head, it is advantageous to maintain more than 50% of the mass of the body portion below the horizontal midplane. (TMG1003, ¶172.) Thus, the combination of Chaen and Lahaix renders element [1.7] obvious. (*Id*.)



(TMG1072, Figs. 2, 6 (Annotated).)



(TMG1021, Fig. 4 (Annotated).)

Second, it would have, at least, been obvious to a POSA–and in fact, typical–to locate more than 50% of the body portion mass below a horizontal midplane. (TMG1003, ¶173.) Because CG and mass distribution are directly related, having more than 50% of the mass of the body portion below the horizontal midplane means having a CG that is below the horizontal midplane. (*Id.*) The advantages of a lower center of gravity, and thus a lower mass distribution, were well-known in the art. (*Id*.)

More specifically, a POSA would have known of authorities in golf club design that discuss the benefits of having the CG below the horizontal midplane. (*Id.*, ¶¶174-176 (*citing* TMG1031, 48, 56-57).) These teachings were also in patent literature. For example, U.S. Patent Publication 20013/0316842 ("Demkowski")

discloses where "CG1"–"the nominal CG before adding the weight," i.e., the CG of the body portion of the club head before adding a weight–is located below the horizontal midplane of the club head, and thus more than 50% of the body portion mass is below the horizontal midplane. (TMG1071, ¶¶71-73, Fig. 2B; TMG1003, ¶¶177-178.)

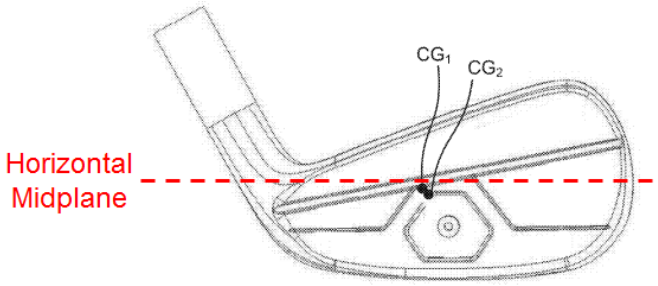


FIG. 2B

(TMG1071, Fig. 2B (Annotated).)

Additionally, the claimed limitation would have required nothing more than routine experimentation with a well-known variable, the club head mass distribution, that is taught in the prior art. (TMG1003, ¶179.) *In re Aller*, 220 F.2d 454, 459 (C.C.P.A. 1955) (holding that the discovery of an optimum value of a variable in a known process is obvious). And there are a finite number of options for the body portion mass distribution with respect to the horizontal midplane: more than 50% of the body portion mass may be above the midplane, below the midplane, or equally distributed above and below the midplane. (TMG1003, ¶179.)

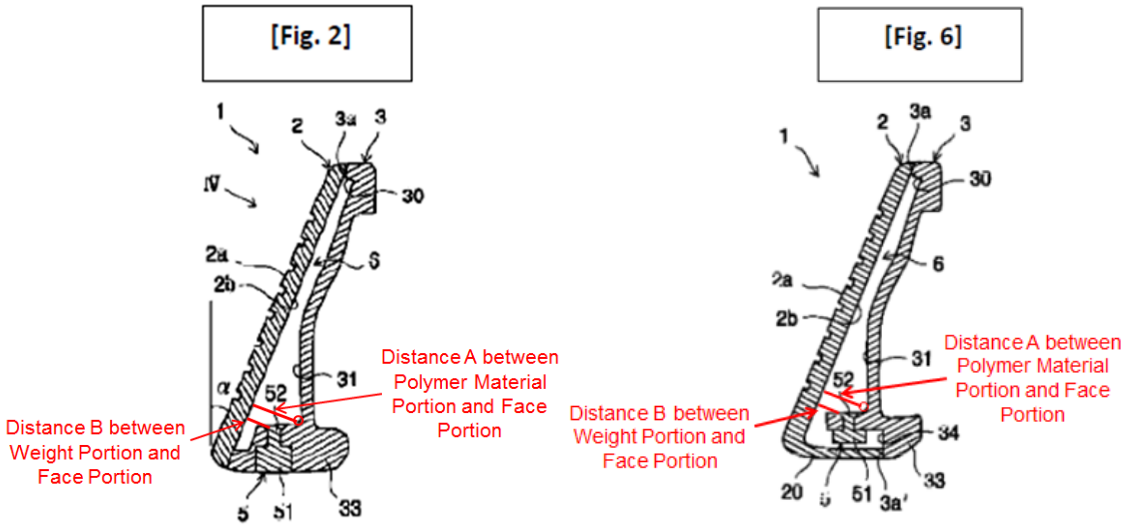
See KSR Int'l Co., 550 U.S. at 402. For this additional reason, the combination of Chaen and Lahaix renders element [1.7] obvious. (TMG1003, ¶179.)

Further, PXG does not describe any criticality or novelty to the claimed range of weight distributions that would rebut a finding of obviousness. *See In re Geisler*, 116 F.3d 1465, 1469–70 (Fed. Cir. 1997) (quoting *In re Woodruff*, 919 F.2d 1575, 1578 (Fed Cir. 1990)) (discussing the need to show criticality or unexpected results to show nonobviousness over a prior art range). In fact, outside of the claims, the '220 patent does not describe having 50% of the mass of the body portion below the horizontal midplane. (TMG1003, ¶180.) Accordingly, distributing more than 50% of the body portion mass below the horizontal midplane would have been obvious to a POSA as nothing more than optimizing a variable according to a well-known process that is disclosed in the prior art. (*Id*.) *See KSR Int'l Co.*, 550 U.S. at 421 (holding that a design which is "obvious to try" may be obvious). Thus, the combination of Chaen and Lahaix renders element [1.7] obvious. (TMG1003, ¶¶172-180.)

8. "wherein a portion of the at least one weight portion is closer to the face portion than a portion of the polymer material in the interior cavity" [1.8]

The combination of Chaen and Lahaix discloses the claimed relationship between the weight portion and polymer material. (TMG1003, ¶181.) As discussed above, a POSA would have been motivated to fill Chaen's cavity. (*Id*.; *Supra*

Section X.A.) As discussed in the corresponding section in Ground 1, measurements are shown perpendicular to the plane of the back surface of the face portion. (*Supra* Section VIII.C.8; TMG1003, ¶182.)



(TMG1072, Figs. 2, 6 (Annotated).)

Several of Chaen's embodiments, as modified by Lahaix to fill the cavity, disclose this claim element. (TMG1003, ¶¶183-184.) As shown above by way of example in annotated Figures 2 and 6, when Chaen's cavity is filled, a portion of the weight (e.g., near protrusion member 52) is closer to the face portion than a portion of the polymer material in the interior cavity (e.g., at the back of the cavity). (*Id.*) Indeed, the distance "A" between a portion of the polymer material and the face portion is greater than the distance "B" between a portion of the weight portion and the face portion, and thus a portion of the weight portion is closer to the face portion than a portion of the polymer material. (*Id.*) And

although, like the ’220 patent, Chaen does not disclose specific distances, a POSA would have found the relative relationship disclosed by the Figures. (*Id.*; *supra* Section VIII.C.8.) Accordingly, the combination of Chaen and Lahaix renders element [1.8] obvious. (TMG1003, ¶¶183-184.)

C. The Combination of Chaen and Lahaix Renders Claim 8 Obvious

1. “[a]n iron-type golf club head” [8.1]

Element [8.1] is similar to element [1.1] discussed above. (TMG1003, ¶¶185-186.) The above analysis applies and the combination of Chaen and Lahaix renders element [8.1] obvious. (*Id.*; *supra* Section X.B.1.)

2. “a face portion” [8.2]

Element [8.2] is identical to element [1.2] discussed above. (TMG1003, ¶187.) The above analysis applies and the combination of Chaen and Lahaix renders element [8.2] obvious. (*Id.*; *supra* Section X.B.2.)

3. “[8.3a] a body portion having, a toe portion, a top portion, a sole portion, a back portion, and [8.3b] an interior cavity extending between the top and sole portions”

(a) Element [8.3a]

Element [8.3a] is similar to element [1.3a] discussed above. (TMG1003, ¶188.) The above analysis applies and the combination of Chaen and Lahaix renders element [8.3a] obvious. (*Id.*; *supra* Section X.B.3.a.)

(b) Element [8.3b]

Element [8.3b] is similar to element [1.3b] discussed above. (TMG1003, ¶189.) The above analysis applies and the combination of Chaen and Lahaix renders element [8.3b] obvious. (*Id*.; *supra* Section X.B.3.b.)

4. "at least one port connected to the interior cavity" [8.4]

Element [8.4] is similar to element [1.4] discussed above. (TMG1003, ¶190.) The above analysis applies and the combination of Chaen and Lahaix renders element [8.4] obvious. (*Id*.; *supra* Section X.B.4.)

5. "an elastic polymer material injection molded in the interior cavity through the at least one port" [8.5]

As discussed above in element [1.6], Lahaix discloses filling the cavity with a polymer material through the port. (*Supra* Section X.B.6; TMG1003, ¶191.) And as discussed above, the remaining portion of this claim element recites a process step—injection molding the filler material—in an apparatus claim that should not be considered when analyzing patentability. (*Supra* Section VIII.D.5.) Nevertheless, Lahaix discloses that filler materials "which can be worked by the RIM (Reaction Injection Moulding) Process are preferred." (TMG1021, 5; TMG1003, ¶191.) Thus, it would have been obvious to a POSA to use the well-known process of injection molding to fill the cavity with filler material. (*See, e.g.*, TMG1021, Abstract, 5, ¶5, 7, ¶4, Figs. 4, 6-7; TMG1003, ¶191.) Accordingly, the

combination of Chaen and Lahaix renders element [8.5] obvious. (TMG1003, ¶191.)

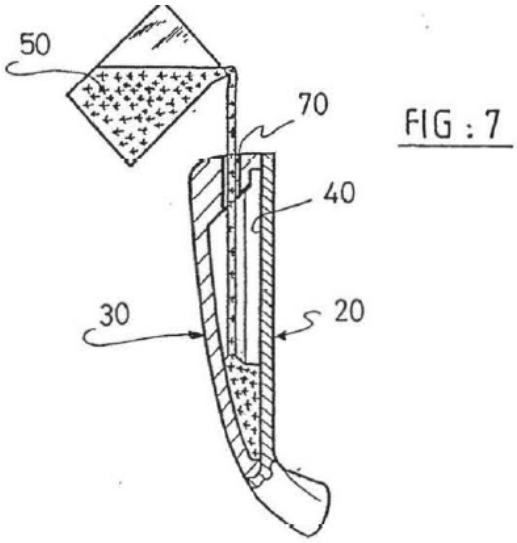
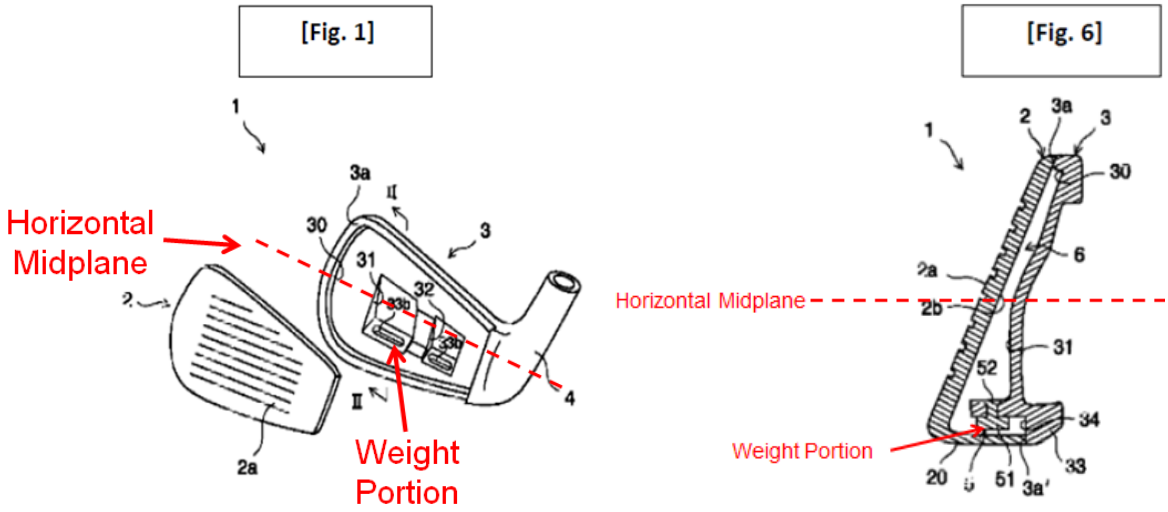


FIG : 7

(TMG1021, Fig. 7.)

6. "at least one weight portion coupled to the body portion at a location below a horizontal midplane of the golf club head" [8.6]

As shown below, Chaen's weight portion is located below the horizontal midplane. (TMG1072, Figs. 1, 6; TMG1003, ¶192.) Accordingly, the combination of Chaen and Lahaix renders element [8.6] obvious. (TMG1003, ¶192.)

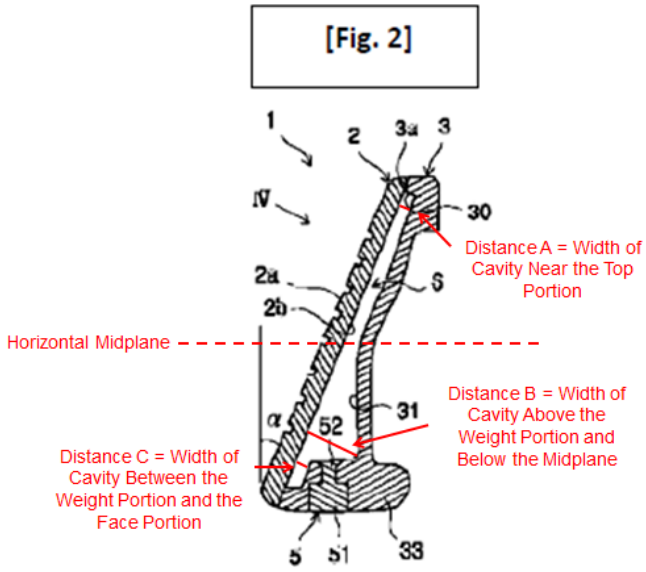


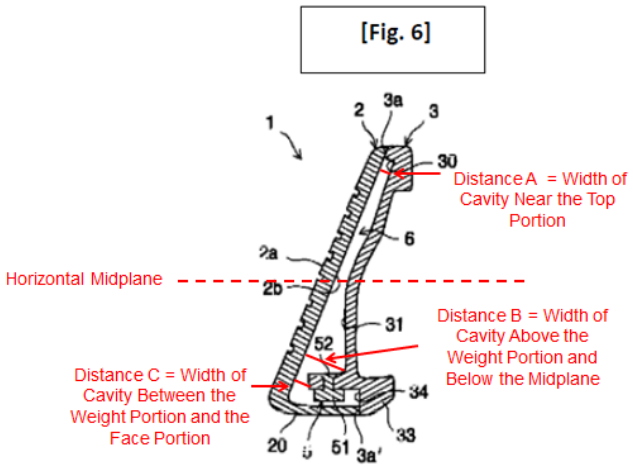
(TMG1072, Figs. 1, 6 (Annotated).)

7. "wherein a width of the interior cavity at or below the horizontal midplane and above the at least one weight portion is greater than a width of the interior cavity near the top portion and greater than a width of the interior cavity between the at least one weight portion and the face portion" [8.7]

As shown below, multiple embodiments in Chaen disclose the elements of this claim–that a width of the cavity at or below the horizontal midplane and above the weight portion is greater than a width of the cavity near the top portion and greater than a width of the cavity between the weight portion and the face portion. (TMG1003, ¶193.) The cavity widths are measured perpendicular to the plane of the face portion for the reasons discussed above in element [1.8]. (*Id.*, ¶194; *supra* Section X.B.8.) As shown below, cavity width "A" near the top portion and cavity width "C" between the weight portion and the face portion are both less than cavity width "B," which is located between the horizontal midplane and the weight

portion. (TMG1003, ¶195.) Again, although Chaen does not disclose specific distances, a POSA would have found the relative relationships disclosed by the Figures. (*Id.*) Accordingly, the combination of Chaen and Lahaix renders element [8.7] obvious. (*Id.*)





(TMG1072, Figs. 2, 6 (Annotated).)

D. The Combination of Chaen and Lahaix Renders Claim 13 Obvious

1. "[a] golf club head" [13.1]

Element [13.1] is identical to element [1.1] discussed above. (TMG1003, ¶¶196-197.) The above analysis applies and the combination of Chaen and Lahaix renders element [13.1] obvious. (*Id*.; *supra* Section X.B.1.)

2. "a face portion" [13.2]

Element [13.2] is identical to element [1.2] discussed above. (TMG1003, ¶198.) The above analysis applies and the combination of Chaen and Lahaix renders element [13.2] obvious. (*Id*.; *supra* Section X.B.2.)

3. "[13.3a] a body portion having a toe portion, a heel portion, a top portion, a sole portion, a back portion, and [13.3b] an interior cavity extending between the top and sole portions"

(a) Element [13.3a]

Element [13.3a] is identical to element [1.3a] discussed above. (TMG1003, ¶199.) The above analysis applies and the combination of Chaen and Lahaix renders element [13.3a] obvious. (*Id*.; *supra* Section X.B.3.a.)

(b) Element [13.3b]

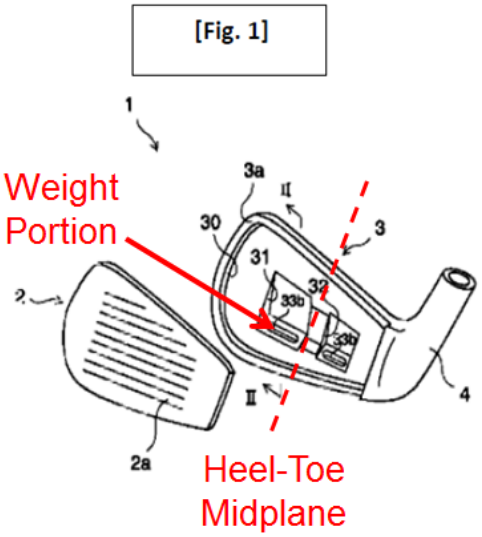
Element [13.3b] is identical to element [1.3b] discussed above. (TMG1003, ¶200.) The above analysis applies and the combination of Chaen and Lahaix renders element [13.3b] obvious. (*Id*.; *supra* Section X.B.3.b.)

4. "at least one port located closer to the toe portion than the heel portion and connected to the interior cavity" [13.4]

Element [13.4] is identical to element [1.4] discussed above. (TMG1003, ¶201.) The above analysis applies and the combination of Chaen and Lahaix renders element [13.4] obvious. (*Id*.; *supra* Section X.B.4.)

5. "at least one weight portion located closer the toe portion than the heel portion and located between the at least one port and the heel portion" [13.5]

Element [13.5] is similar to element [1.5] discussed above. (*Supra* Section X.B.5; TMG1003, ¶201.) This claim element differs by requiring that the weight portion also be located closer to the toe portion than the heel portion. (TMG1003, ¶202.) As discussed above, it would have been obvious to include the filling orifices of Lahaix, located in the toe portion, to fill Chaen's club head. (*Id*.; *supra* Section X.B.5.) The identified weight below is located closer to the toe portion than the heel portion and between the port and the heel portion. (TMG1003, ¶202.) Accordingly, the combination of Chaen and Lahaix renders element [13.5] obvious. (*Id*.)



(TMG1072, Fig. 1 (Annotated).)

6. "wherein the interior cavity is filled with a polymer material from the at least one port" [13.6]

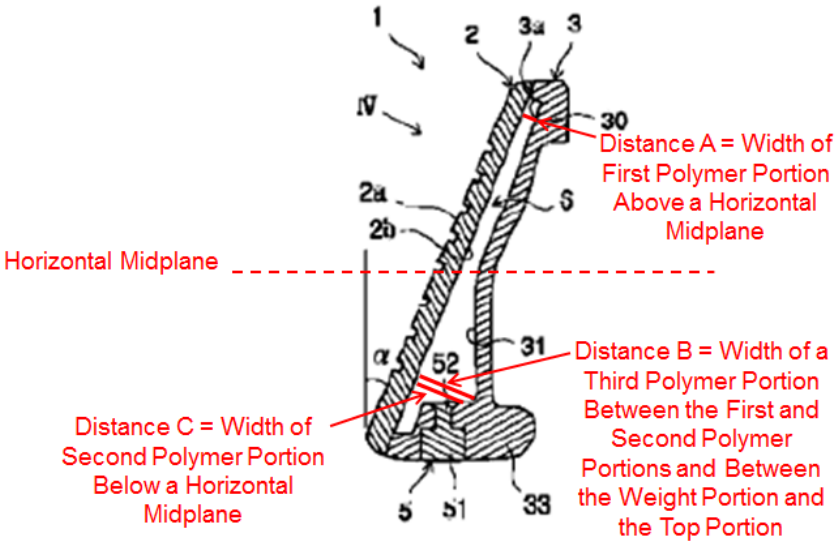
Element [13.6] is identical to element [1.6] discussed above. (TMG1003, ¶203.) The above analysis applies and the combination of Chaen and Lahaix renders element [13.6] obvious. (*Id*.; *supra* Section X.B.6.)

7. "wherein a first portion of the polymer material above a horizontal midplane of the body portion has a first width, a second portion of the polymer material below the horizontal midplane has a second width greater than the first width, and a third portion of the polymer material between the first portion and the second portion has a third width greater than the first width and greater than the second width, and wherein the third portion is located between the at least one weight portion and the top portion" [13.7]

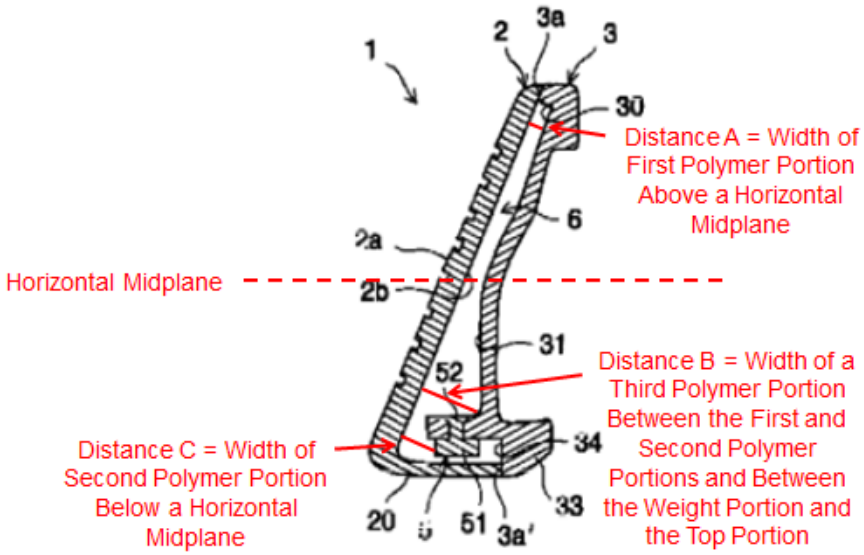
Element [13.7] is similar to element [8.7], but differs by reciting the polymer material widths instead of the cavity widths and requiring that the second width,

located below the horizontal midplane, be greater than the first width in addition to requiring that the third width be greater than both the first and second widths. (TMG1003, ¶204.) As discussed above in element [1.6], the cavity may be completely filled, and thus the cavity width and polymer width are equal. (*Supra* Section X.B.6; TMG1003, ¶205.) As shown below, Chaen's cavity, when filled, measured as discussed in element [1.8], discloses the elements of this claim. (*Supra* Section X.B.8; TMG1003, ¶207.) Indeed, a first portion of the polymer material above the horizontal midplane has a first width, a second portion of the polymer material below the horizontal midplane has a second width greater than the first width, and a third portion of the polymer material between the first portion and the second portion and between the weight portion and the top portion has a third width greater than the first width and the second width. (TMG1003, ¶¶205-207.) As shown below, cavity width "A" above the horizontal midplane is less than cavity width "C" below the horizontal midplane, both of which are less than cavity width "B," which is located between "A" and "C" and between the weight portion and the top portion. (*Id*.) Again, although Chaen does not disclose specific distances, a POSA would have found the relative relationships disclosed by the Figures. (*Id.*)

[Fig. 2]



[Fig. 6]

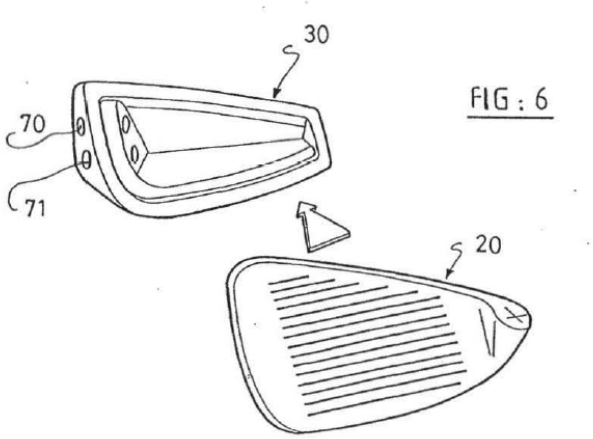


(TMG1072, Figs. 2, 6 (Annotated).)

Accordingly, the combination of Chaen and Lahaix renders element [13.7] obvious. (TMG1003, ¶¶205-207.)

E. The Combination of Chaen and Lahaix Renders Claim 2 Obvious

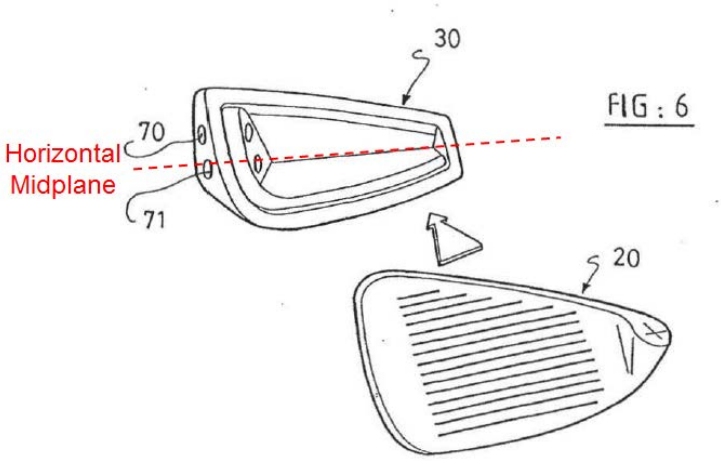
Claim 2 recites "wherein the at least one port is located at or near a periphery of the body portion." As discussed above in element [1.5], it would have been obvious to combine Lahaix's filling orifices into Chaen's club head. (*Supra* Section X.B.5; TMG1003, ¶208.) The '220 patent does not define "periphery," but based on the port locations in the '220 patent Figures and the plain meaning of "periphery," the port (i.e., in the toe) shown below in Figure 6 of Lahaix is located at or near a periphery of the body portion. (TMG1003, ¶208.) Accordingly, the combination of Chaen and Lahaix renders claim 2 obvious. (*Id.*)



(TMG1021, Fig. 6.)

F. The Combination of Chaen and Lahaix Renders Claims 3 and 16 Obvious

Claims 3 and 16 recite "wherein the at least one port is located at or below the horizontal midplane." As discussed above, it would have been obvious to combine Lahaix's filling orifices into Chaen's club head. (*Supra* Section X.B.4; TMG1003, ¶209.) As shown below, a least one of Lahaix's ports is "at or below the horizontal midplane." (TMG1003, ¶209.) Accordingly, the combination of Chaen and Lahaix renders claims 3 and 16 obvious. (*Id*.)



(TMG1021, Fig. 6 (Annotated).)

G. The Combination of Chaen and Lahaix Renders Claims 4 and 19 Obvious[8]

Claims 4 and 19 recite "wherein the polymer material is an elastic polymer material." These claims are similar to element [8.5]. (*Supra* Section X.C.5; TMG1003, ¶210.) The above analysis applies and the combination of Chaen and Lahaix renders claims 4 and 19 obvious. (*Id.*)

H. The Combination of Chaen and Lahaix Renders Claims 5 and 17 Obvious[9]

Claim 5 recites "wherein the at least one weight portion is located below the horizontal midplane and is located closer to the toe portion than the heel portion" and claim 17 recites "wherein the at least one weight portion is located below the horizontal midplane." Claims 5 and 17 are similar to elements [8.6] and [13.5]. (*Supra* Sections X.C.6, X.D.5; TMG1003, ¶¶211-212.) The above analyses apply and the combination of Chaen and Lahaix renders claims 5 and 17 obvious. (TMG1003, ¶¶211-212.)

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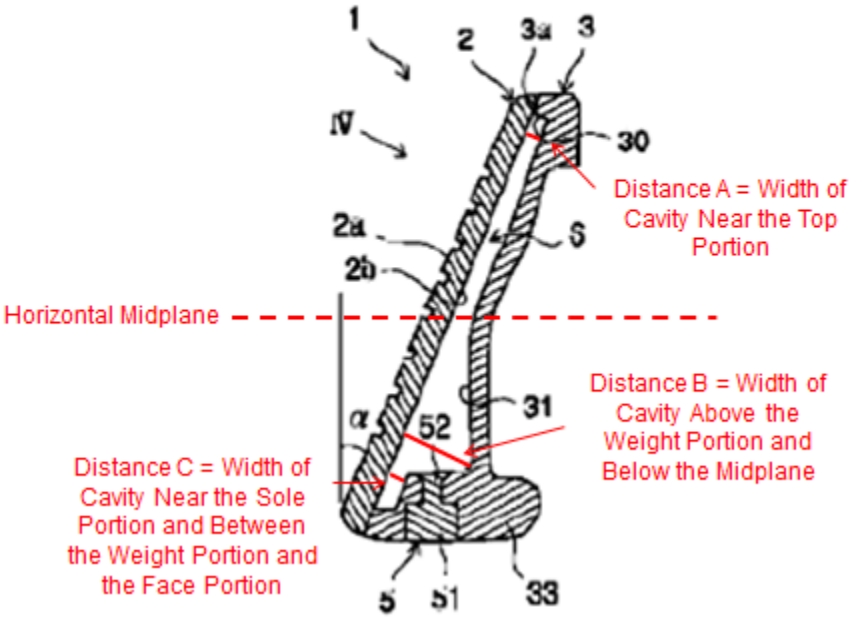
[8] Taylor Made notes that claim 19 depends on claim 1, as-issued, and thus claims 4 and 19 add identical limitations to claim 1. The analysis below applies regardless of whether claim 19 depends from claim 1 or claim 13.

[9] Taylor Made notes that claim 17 depends on claim 1, as-issued; however, the analysis below applies regardless of whether claim 17 depends from claim 1 or claim 13.

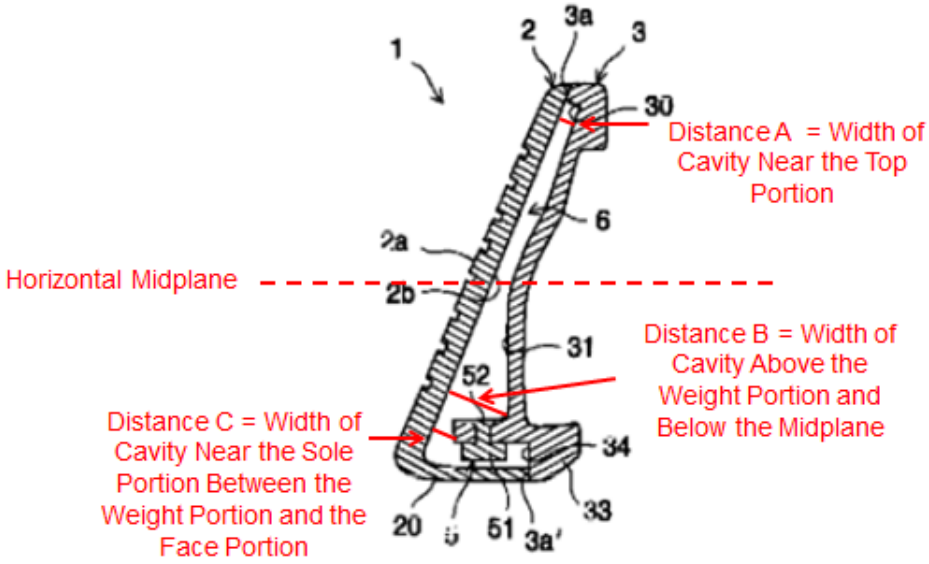
I. The Combination of Chaen and Lahaix Renders Claim 6 Obvious

Claim 6 recites "wherein a width of the interior cavity at or below the horizontal midplane and above the at least one weight portion is greater than a width of the interior cavity near the top portion and greater than a width of the interior cavity near the sole portion." Claim 6 is similar to element [8.7]. (*Supra* Section X.C.7; TMG1003, ¶213.) The only difference is that the lower cavity width must be "near the sole portion" instead of between the at least one weight portion and the face portion. (TMG1003, ¶213.) The lower cavity width shown in the Figures in element [8.7], reproduced below, are also "near the sole portion." As shown below, cavity width "A" near the top portion and cavity width "C" near the sole portion are both less than cavity width "B," which is located between the horizontal midplane and the weight portion. (*Id.*, ¶¶214-215.) Accordingly, the above analysis applies and the combination of Chaen and Lahaix renders claim 6 obvious. (*Id.*)

[Fig. 2]



[Fig. 6]



(TMG1072, Figs. 2, 6 (Annotated).)

J. The Combination of Chaen and Lahaix Renders Claims 7, 12, and 20 Obvious

Claims 7, 12, and 20 recite "wherein the face portion comprises a thickness of less than or equal to 1.9 millimeters (0.075 inch)." Lahaix discloses that "the striking plate preferably has a thickness of between 1 and 2 millimetres." (TMG1021, 4; TMG1003, ¶216.) Accordingly, the combination of Chaen and Lahaix renders claims 7, 12, and 20 obvious. (TMG1003, ¶216.)

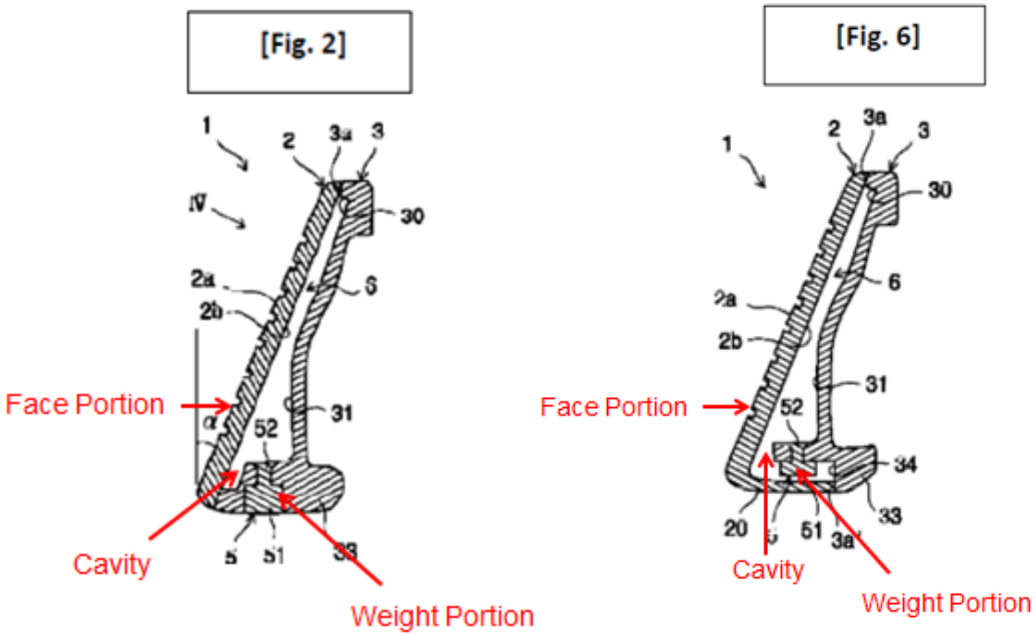
K. The Combination of Chaen and Lahaix Renders Claim 10 Obvious

Claim 10 recites "wherein the interior cavity comprises a cavity having at least 50% filled with a thermoplastic elastomer material." As discussed above, Lahaix discloses that the cavity can be "wholly filled by the filling material," which is at least 50%. (TMG1021, 4, Fig. 4; *supra* Section X.B.6; TMG1003, ¶217.) Lahaix also discloses that "[t]he filling material may be a thermoplastics or elastomer material," which a POSA would have understood to include "thermoplastic elastomer material[s]." (TMG1021, 4; TMG1003, ¶217.) Accordingly, the combination of Chaen and Lahaix renders claim 10 obvious. (TMG1003, ¶217.)

L. The Combination of Chaen and Lahaix Renders Claim 11 Obvious

Claim 11 recites "wherein a portion of the interior cavity is configured to separate the face portion and the at least one weight portion." Multiple

embodiments of Chaen's club head disclose the claimed cavity configuration, as shown below. (TMG1003, ¶218.) Accordingly, the combination of Chaen and Lahaix renders claim 11 obvious. (*Id.*)



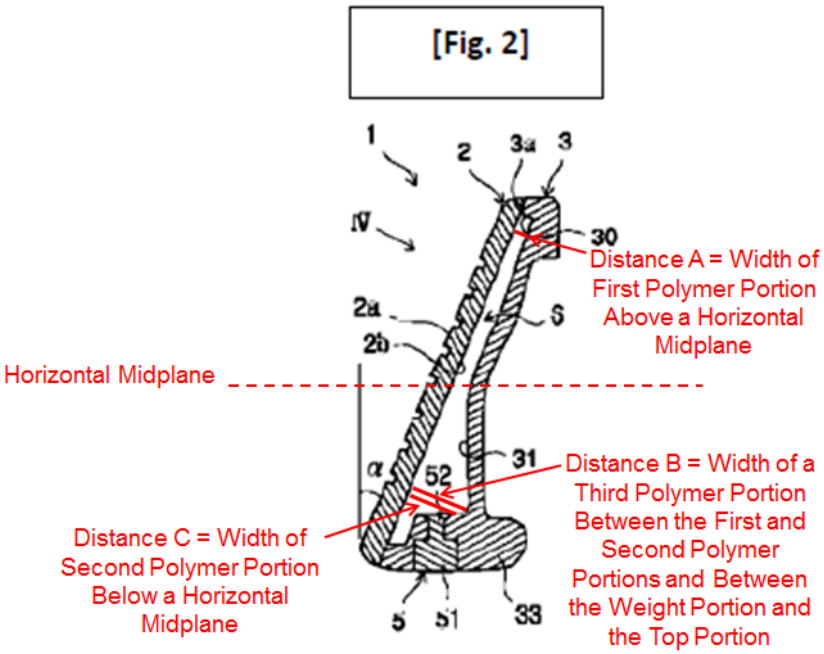
(TMG1072, Figs. 2, 6 (Annotated).)

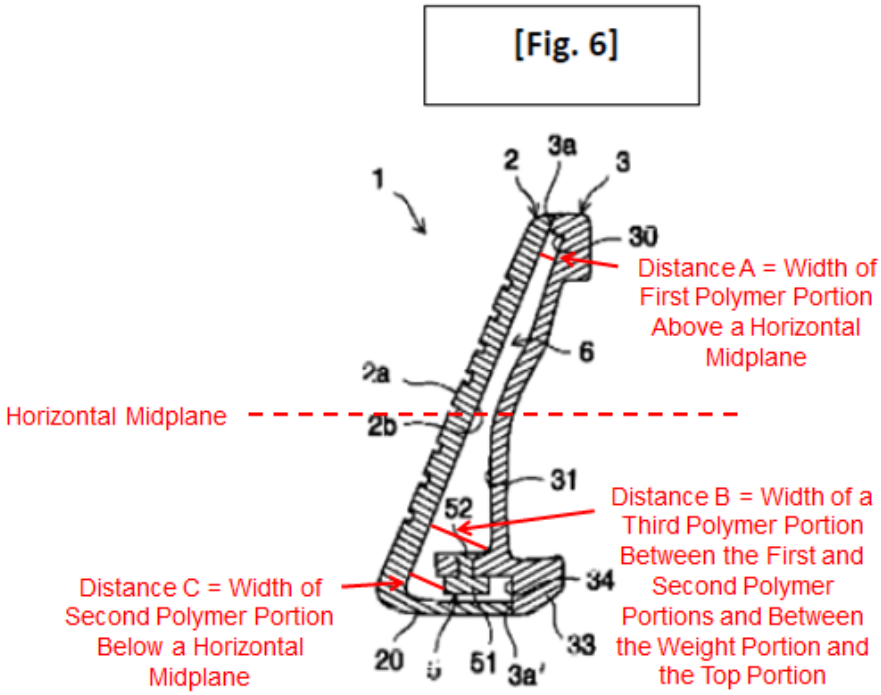
M. The Combination of Chaen and Lahaix Renders Claim 14 Obvious[10]

Claim 14 recites "wherein the third width is between the at least one weight portion and the horizontal midplane." Claim 14 is similar to element [13.7], and

[10] Taylor Made notes that claim 14 depends on claim 1, as-issued; however, claim 1 does not recite a "third width." It appears that claim 14 should depend from claim 13. The analysis below applies regardless of whether claim 14 depends from claim 1 or claim 13.

the analysis above applies here. (*Supra* Section X.D.7; TMG1003, ¶219.) As shown below, the third width ("B") is "between the at least one weight portion and the horizontal midplane." Accordingly, the combination of Chaen and Lahaix renders claim 14 obvious (TMG1003, ¶219.)





(TMG1072, Figs. 2, 6 (Annotated).)

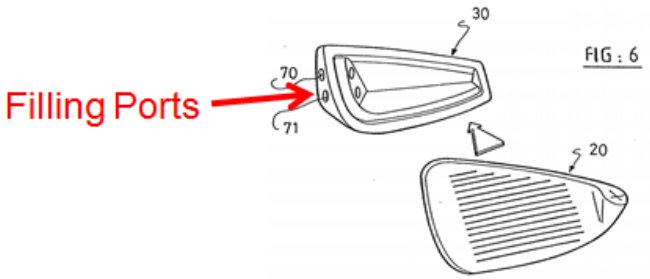
N. The Combination of Chaen and Lahaix Renders Claim 15 Obvious

Claim 15 recites "wherein a portion of the at least one weight portion is closer to the face portion than a portion of the polymer material in the interior cavity." Claim 15 is identical to element [1.8]. (*Supra* Section VIII.B.8; TMG1003, ¶220.) The above analysis applies and the combination of Chaen and Lahaix renders claim 15 obvious. (TMG1003, ¶¶221-223.)

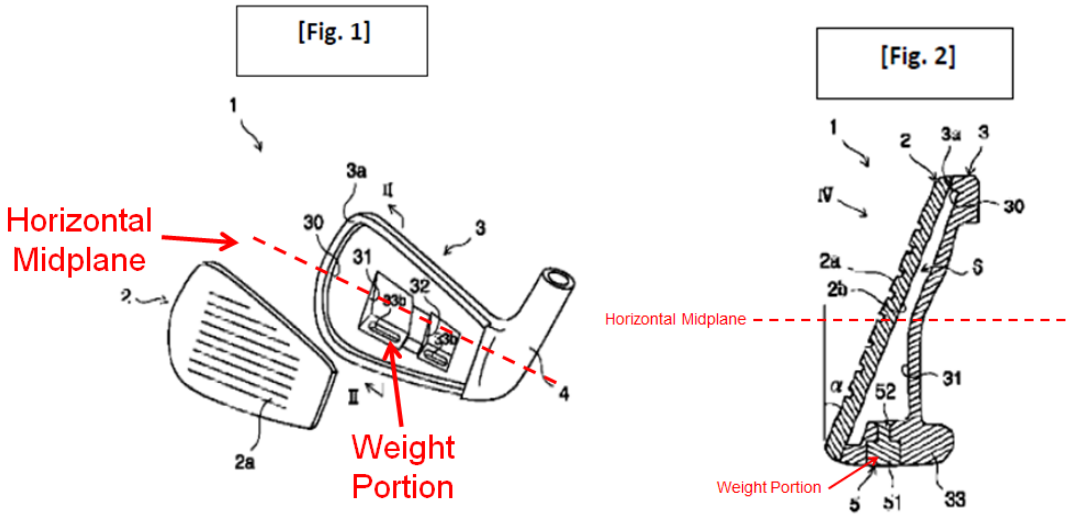
O. The Combination of Chaen and Lahaix Renders Claim 18 Obvious

Claim 18 recites "wherein the at least one weight portion is closer to the sole portion than the at least one port." As discussed above, it would have been obvious

to combine Lahaix's filling orifices into Chaen's club head. (*Supra* Section X.D.4; TMG1003, ¶224.) As shown below, Chaen's sole-mounted weight portions are located closer to the sole than orifice 71 of Lahaix. (TMG1003, ¶224.) Accordingly, the combination of Chaen and Lahaix renders claim 18 obvious. (*Id*.)



(TMG1021, Fig. 6 (Annotated).)



(TMG1072, Figs. 1, 2 (Annotated).)

XI. Ground 4: The Combination of Chaen, Lahaix, and Linphone Renders Claim 9 Obvious

A. Motivation for Combining Chaen, Lahaix, and Linphone

Chaen, Lahaix, and Linphone are from the same field—iron-type golf clubs. (TMG1003, ¶225.) The motivation for combining Chaen and Lahaix discussed above applies equally here. (*Id*.; *supra* Section X.A.) Lahaix discloses the desirability of improving club feel and sound upon impact with a golf ball. (TMG1021, 2; TMG1003, ¶¶225-226.) Linphone discloses a club head with shock absorbing qualities to minimize undesirable sounds and vibrations. (TMG1035, 0003; TMG1003, ¶227.) Linphone teaches bonding the club's filler material to the cavity of the club head using an adhesive to more effectively dissipate the vibrations of the front face in the filler material. (TMG1035, 0004-0005; TMG1003, ¶227.) A POSA would have recognized the benefits of applying Linphone's bonding method to Wahl's filled club to produce a club head with improved shock absorption. (TMG1003, ¶227.) This would have been nothing more than improving a similar device—Chaen's club head as modified by Lahaix—using a known method—Linphone's bonding method—to achieve predictable results. (*Id.*) *KSR Int'l Co*., 550 U.S. at 401.

Accordingly, it would have been obvious to a POSA to consider combining the teachings of Linphone with Chaen and Lahaix. (*Id.*)

B. The Combination of Chaen, Lahaix, and Linphone Renders Claim 9 Obvious

Claim 9 recites "a bonding portion configured to bond the elastic polymer material to the face portion." Linphone discloses a bonding portion, as claimed. (TMG1035, 0004; TMG1003, ¶228.) Linphone describes an iron head 1 with a hollow cavity 13 defined by the body 11 and striking face 12. (TMG1035, 0004.) An adhesive solution 2 is injected into the cavity 13 via through-hole 14 so that the inner walls, including the back surface of the striking face 12, are uniformly coated with the adhesive solution 2. (*Id*.; TMG1003, ¶228.)

Linphone describes sand-blasting the inner cavity walls, enabling the adhesive solution 2 to adhere better to the back surface of the striking face 12. (TMG1035, 0004; TMG1003, ¶229.) Thus, a POSA would have understood that the adhesive solution bonds to the back surface of the front face. (TMG1003, ¶229.) And Linphone's adhesive solution is a bonding portion because it is an adhesive agent, distinct from the elastic polymer material and the body portion, that joins the elastic polymer material to the body portion. (*Id*.)

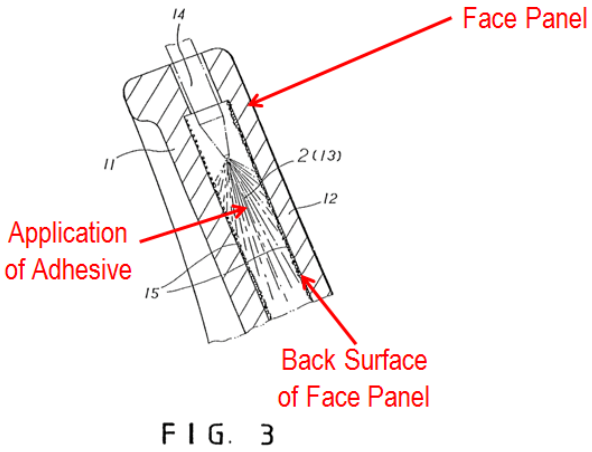


FIG. 3

(TMG1035, Fig. 3 (Annotated).)

Linphone also describes that a shock-absorbing rubber 3 is injection-molded through the through-hole 14 to fill the adhesive-coated cavity 13, as shown in Figure 4. (TMG1035, 0004.) Thus, the process "serves to enable the adhesive solution 2, *and also the shock-absorbing rubber 4*, to adhere better to the inner wall of the cavity 13." (*Id*. (emphasis added); TMG1003, ¶230.)

A POSA would have understood that the shock-absorbing rubber described in Linphone can only adhere to the inner wall of the cavity—including the back of the striking face 12—via the intermediary adhesive bonding portion. (TMG1003, ¶231.) Indeed, Linphone's efficient vibration dissipation relies on bonding the back surface of the front face to the elastic polymer filler material because this facilitates transmission of energy from the front face to the elastic polymer filler material. (*Id*.) Further, the purpose of adhesive solutions is to bond *two* or more surfaces together. (*Id*.) Therefore, when Linphone describes applying the adhesive solution

between the back surface of the face portion and the elastic polymer material, a POSA would have understood that the adhesive solution bonds the elastic polymer material to the back surface of the face portion. (*Id*.)

Accordingly, the combination of Chaen, Lahaix, and Linphone renders claim 9 obvious. (*Id*.)

XII. Taylor Made is Unaware of Any Objective Indicia of Non-Obviousness with a Nexus to the Claimed Inventions

PXG has the burden of coming forth with evidence of objective indicia of non-obviousness, if it so chooses. *Medtronic Inc. v. NuVasive Inc.*, IPR2014-00087, Paper No. 44 at 21 (P.T.A.B. Apr. 3, 2015); *see also Prometheus Labs v. Roxane Labs*, 805 F.3d 1092, 1101-02 (Fed. Cir. 2015). Taylor Made is not aware of any such evidence having any nexus to the ’220 patent claims, and none was presented in the ’220 patent file history.

While PXG has made general allegations of copying, commercial success, and industry praise for its product in related district-court litigation (TMG1011, 2, 4), it has not even attempted to show that any putatively novel feature of the claims of the ’220 patent has a nexus to any objective indicia. Such features are well known, obvious, and unrelated to any such indicia. (TMG1003, ¶232.) Taylor Made reserves its right to respond to any specific assertion of objective indicia of

non-obviousness later advanced by PXG in this proceeding.[11]

XIII. Conclusion

For the reasons above, *inter partes* review of claims 1-20 of U.S. Patent No. 9,878,220 is requested.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

Richard D. Coller III (Reg. No. 60,390)
Attorney for Petitioner
Taylor Made Golf Company, Inc.

Date: October 31, 2018
1100 New York Avenue, N.W.
Washington, D.C. 20005-3934
(202) 371-2600

[11] In related IPR preliminary responses, PXG cites three Board decisions for the proposition that Taylor Made should have somehow preemptively addressed PXG's yet-to-be-made arguments on objective indicia prior to institution of trial. *See, e.g., TaylorMade Golf Company, Inc. et al. v. Parsons Extreme Golf, LLC*, IPR2018-00702, Paper No. 6 at 49-50 (P.T.A.B. Jun. 12, 2018). None of these decisions support that proposition, and their facts are distinguishable. One decision rested on the presence of prior objective indicia evidence *in a reexamination file history*. The other two decisions do not even relate to considering objective indicia *prior to institution*.

CERTIFICATION OF SERVICE (37 C.F.R. §§ 42.6(e), 42.105(a))

The undersigned hereby certifies that on October 31, 2018, true and correct copies of the foregoing **PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 9,878,220**, Petitioner's Power of Attorney, and all associated exhibits were served in their entireties on the following parties via FedEx Express® or Express Mail:

LOEB & LOEB LLP
321 NORTH CLARK STREET. SUITE 2300
CHICAGO, IL 60654
PAIR Correspondence Address for U.S.P.N. 9,878,220

BRIAN W. LACORTE
BALLARD SPAHR LLP
1 EAST WASHINGTON ST., SUITE 2300
PHOENIX AZ 85004-2555
Other address known to the petitioner as likely to effect service

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

Richard D. Coller III (Reg. No. 60,390)
Attorney for Petitioner
Taylor Made Golf Company, Inc.

Date: October 31, 2018

1100 New York Avenue, N.W.
Washington, D.C. 20005-3934
(202) 371-2600

CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITATION, TYPEFACE REQUIREMENTS, AND TYPE STYLE REQUIREMENTS

1. This Petition complies with the type-volume limitation of 14,000 words, comprising 13,990 words, excluding the parts exempted by 37 C.F.R. § 42.24(a).

2. This Petition complies with the general format requirements of 37 C.F.R. § 42.6(a) and has been prepared using Microsoft® Word 2010 in 14 point Times New Roman.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

Richard D. Coller III (Reg. No. 60,390)
Attorney for Petitioner
Taylor Made Golf Company, Inc.

Date: October 31, 2018

1100 New York Avenue, N.W.
Washington, D.C. 20005-3934
(202) 371-2600