

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

M & P GOLF, LLC d/b/a COOL CLUBS, ROGER DUNN INC.,
GOLFSMITH INTERNATIONAL, INC., and GOLFTEC
ENTERPRISES, LLC,
Petitioner,

v.

MAX OUT GOLF, LLC,
Patent Owner.

Case IPR2016-00785
Patent 8,696,497 B2

Before JOSIAH C. COCKS, HYUN J. JUNG, and
MICHAEL L. WOODS, *Administrative Patent Judges*.

WOODS, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

M & P Golf, LLC, d/b/a Cool Clubs, Roger Dunn Inc., Golfsmith International, Inc., and GolfTEC Enterprises, LLC (collectively, “Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting *inter partes* review of claims 1–8 of U.S. Patent No. 8,696,497 B2 (Ex. 1001, “the ’497 patent”). Pet. 1. We issued a Decision to Institute an *inter partes* review of claims 1–8 of the ’497 patent as unpatentable under 35 U.S.C. § 103 over (1) Gobush and Maltby and (2) Gobush, Maltby, and Erlichson. Paper 13 (“Inst. Dec.”), 22; *see infra* Section I.C. (providing full citation to the references).

After institution of trial, Max Out Golf, LLC (“Patent Owner”) filed a Response (Paper 17, “PO Resp.”), to which Petitioner replied (Paper 34, “Pet. Reply”).

Oral argument was conducted on May 25, 2017, and a transcript of the hearing is entered in the record. Paper 42.

We have jurisdiction under 35 U.S.C. § 318(a). After considering the evidence and arguments of both parties, and for the reasons set forth below, we determine that Petitioner met its burden of showing, by a preponderance of the evidence, that claims 1–8 of the ’497 patent are unpatentable.

A. *The ’497 Patent (Ex. 1001)*

The ’497 patent is titled “SYSTEMS AND METHODS FOR FITTING GOLF EQUIPMENT.” Ex. 1001, (54). The ’497 patent describes a system to “identify the optimum equipment for a golfer” and to “identify and help correct swing flaws so that the golfer can achieve optimum performance on the golf course.” *Id.* at 1:66–2:3.

B. Illustrative Claim

Claim 1 is the sole independent claim, with claims 2–8 depending therefrom. Ex. 1001, 14:45–15:19. Claim 1 is illustrative of the subject matter at issue and is reproduced below, with emphasis added to a particular limitation discussed in this decision:

1. A system for fitting a golfer with golf equipment comprising:
 - a launch monitor;
 - a launch module running on a processor, the launch module configured to
 - receive launch data from the launch monitor related to how the golfer launches a golf ball using a golf club, the golf club comprising a club head, the club head comprising a loft, center of gravity, an orientation, and a weight distribution;
 - determine velocity information, spin information, and launch angle information imparted to the golf ball based on the launch data;
 - extrapolate a distance and flight path based on the velocity, spin, and launch angle information; and
 - an optimization engine running on the processor, the *optimization engine configured to determine optimized information for the spin and launch angle-to achieve at least one optimal ball flight condition, based on the determined velocity, spin, and launch angle information, the extrapolated distance, and a maximum ceiling height for golf ball trajectory* that is not based on how the golfer hits the golf ball.

C. References Relied Upon

The Petitioner relies on the following references:¹

Name	Reference	Date	Ex. No.
Gobush	US Pat. No. 6,241,622 B1	June 5, 2001	1012
Maltby	Ralph Maltby, <i>Golf Club Design, Fitting, Alteration & Repair</i> , (Ralph Maltby Enterprises, Inc., 4th ed., 1995)	January 1995	1010
Erlichson	Herman Erlichson, <i>Maximum projectile range with drag and lift, with particular application to golf</i> , Am. J. Phys, 51(4), Apr. 1983, at 357	April 1983	1011

II. ANALYSIS

A. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are given their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard). A presumption exists that a claim term should be construed in light of its ordinary and customary meaning. *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002). Under the broadest reasonable construction standard, claim terms are generally given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire

¹ We declined to institute trial based on GolfAchiever and Maltby, as Petitioner failed to establish a reasonable likelihood of prevailing on this ground. Inst. Dec. 14–16.

disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

In our decision instituting trial, we interpreted the following terms/phrases: (1) “maximum ceiling height;” and (2) “optimization engine configured to determine optimized information for the spin and launch angle-to achieve at least one optimal ball flight condition, based on the determined velocity, spin, and launch angle information, the extrapolated distance, and a maximum ceiling height.” Inst. Dec. 7–9. Patent Owner does not dispute our construction of phrase (1), but disputes our construction of phrase (2). *See* PO Resp. 15–19. Petitioner accepts the Board’s interpretation. *See* Pet. Reply 1–2 (citing Paper 13, 8–9).

1. “*optimization engine configured to determine optimized information for the spin and launch angle . . .*”

In construing phrase (2), we found that the specification does not refer to the term “optimization engine,” and that based on the plain language of the claims, we concluded that claim requires an “optimization engine” that is “configured to determine optimized information for the spin and launch angle” “based on the determined velocity, spin, and launch angle information, the extrapolated distance, and a maximum ceiling height” “to achieve at least one optimal ball flight condition.” Inst. Dec. 8–9.

In its Response, Patent Owner argues that the proper interpretation requires a determination of *optimal values* of launch angle and spin rate, which is narrower than the claimed “*optimized information* for the spin and launch angle.” *See* PO Resp. 18 (proposing “that the term ‘optimization engine’ be interpreted to require determining optimal values of ‘Launch angle’ and ‘Spin Rate’”). In support of this particular interpretation, Patent

Owner relies on the testimony of Dr. Elias Balaras (Ex. 2007) and cites to the specification of the '497 patent. *See id.* (citing Ex. 1001, 6:35–9:9, Fig. 3).

Dr. Balaras testifies that the specification “describes collecting data to fine tune equipment to achieve optimum ball flight characteristics (e.g., ‘launch angle, velocity, and spin’) by iteratively fine tuning various aspects of the equipment.” Ex. 2007 ¶ 35 (citing Ex. 1001, 6:35–9:9, Fig. 3). Based on this description, Dr. Balaras testifies, “a POSA would have understood at the time of the invention that the ‘optimization engine’ be required to determine optimal values of ‘Launch angle’ and ‘Spin Rate’ ‘based on the determined velocity, spin, and launch angle information, the extrapolated distance, and a maximum ceiling height’ ‘to achieve at least one optimal ball flight condition.’” *Id.* ¶ 36; *see also id.* ¶ 37.

In addition to arguing that the claimed limitation requires determining optimal values for launch angle and spin rate, throughout its Response, Patent Owner argues that “[i]n order for the ‘optimization engine’ to determine optimal values of ‘Launch angle’ and ‘Spin Rate’ . . . the optimization must be done in a three-dimensional variable space that looks at velocity as a variable.” PO Resp. 30 (citing Ex. 2007 ¶¶ 47–49). Patent Owner explains that the claimed optimization requires a variable velocity, launch angle, and spin rate, and optimization does not occur if velocity is fixed. *See id.* at 28 (citing Ex. 2007 ¶¶ 44–46) (“one cannot simply fix one of the three variables (in this case velocity) and extrapolate to find optimal values of the other two variables (angle and spin rate)” . . . “merely fixing

one variable (such as Velocity) does not allow optimization of the three specific variables claimed.”).

Accordingly, Patent Owner proposes that the proper interpretation of the claimed “optimization engine” requires at least: (1) determining an optimal value of launch angle; (2) determining an optimal value of spin rate; and (3) that the optimization be done in a three-dimensional variable space that looks at velocity as a variable. PO Resp. 30 (citing Ex. 2007 ¶¶ 47–49)

In referencing the specification, Patent Owner and its expert cite to Figure 3 of the ’497 patent, and its accompanying description. PO Resp. 18 (citing Ex. 1001, 6:35–9:9, Fig. 3); *see also* Ex. 2007 ¶ 35 (citing Ex. 1001, 6:35–9:9, Fig. 3). We reproduce Figure 3 of the ’497 patent, below:

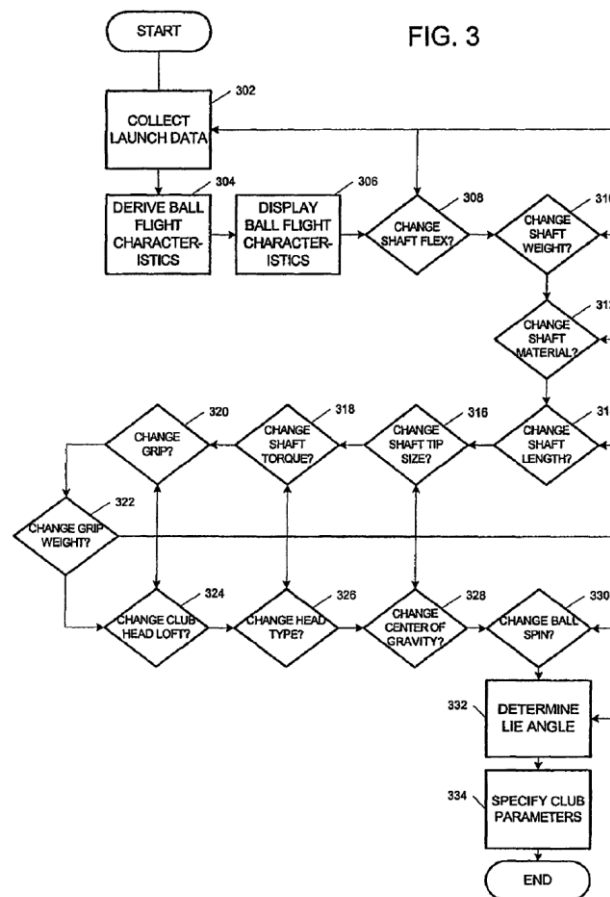


Figure 3 is a flow chart depicting an example of an embodiment for collecting launch data. Ex. 1001, 2:28–29. Figure 3 describes the launch evaluation step (step 118 of Figure 2), “to fit the golfer with optimized equipment including shaft, club, and ball.” *Id.* at 4:37–40. In particular, a golfer hits golf balls and data is collected and displayed in steps 302–306. *Id.* at 7:17–19. The shaft flex can be fine-tuned in step 308, “by continuing to use clubs with various shaft flexes until a shaft flex that appears optimal is determined.” *Id.* at 7:21–24. Different clubs (i.e., clubs with different weights, materials, lengths, etc.) can be tested in steps 310–318, and steps 302–306 may be repeated, “until an optimum ball flight is achieved,” and as may be depicted in step 306. *Id.* at 7:24–28. Steps 320–322 provide for the testing of various grips and grip weights. *Id.* at 7:28–29. When fitting a golfer with a driver, various driver lofts (step 324), head types (step 326), and club head centers of gravity (step 328) can be tested “to arrive at an optimal driver ball flight characteristic.” *Id.* at 7:48–51. Further, at step 330, different ball types can also be tested to “optimize distance when using the driver.” *Id.* at 7:51–53. At step 332, the lie angle of the golfer’s clubs can be measured so that “[a]djustments in the lie angle can then be made until the golfer is striking the ball constantly with the ‘sweet spot’ of the club face.” *Id.* at 8:66–9:7. At this point, the information needed to fit the golfer with equipment resulting in “optimum performance” is known and “the optimum equipment” can be derived in step 334. *Id.* at 9:8–11.

Although the specification sets forth a detailed process for “fine-tuning the golfer’s equipment to achieve the optimum ball flight” (*id.* at 7:12–13) and states that “one needs to match the golfer’s ball speed with an

optimized combination of launch angle and spin rate” (*id.* at 7:15–17), the specification does not refer specifically to “optimization engine,” determining an optimal launch angle, or determining an optimal spin rate, and fails to discuss variable velocity. As such, we find nothing in the specification to support Patent Owner’s proposed interpretation that requires a construction different from the claim term’s ordinary and customary meaning. *See CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) (holding that a “claim term will not receive its ordinary meaning if the patentee acted as his own lexicographer and clearly set forth a definition of the disputed claim term in either the specification or prosecution history”).

Moreover, the claimed limitation is broader than the particular embodiment of Figure 3, and we do not import the particular steps of this embodiment that are otherwise not part of the claims. *See SuperGuide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004) (“Though understanding the claim language may be aided by the explanations contained in the written description, it is important not to import into a claim limitations that are not a part of the claim. For example, a particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment.”)

For the foregoing reasons, we conclude that the broadest reasonable interpretation of the claimed “optimization engine” does not require an engine configured to determine optimal values of launch angle or spin rate, and does not require that “optimization be done in a three-dimensional space that looks at velocity as a variable,” as Patent Owner proposes. PO Resp.

18, 30. Rather, we conclude that, as we did in our decision instituting trial, under the broadest reasonable construction standard, giving the claimed terms their ordinary and customary meaning, the claim requires an “optimization engine” that is “configured to determine optimized information for the spin and launch angle” “based on the determined velocity, spin, and launch angle information, the extrapolated distance, and a maximum ceiling height” “to achieve at least one optimal ball flight condition.” Inst. Dec. 9 (citing Ex. 1001, 14:60–67).

2. *Remaining Claim Terms*

We determine that no other terms require express construction for the purposes of this Decision. *See Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) (“[C]laim terms need only be construed ‘to the extent necessary to resolve the controversy.’”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

B. Prosecution History of the ’497 Patent

In addressing the prosecution history, Patent Owner summarizes arguments made by the patent applicant in overcoming rejections based on prior art. *See* PO Resp. 9–15. Notably, however, the prior art rejections overcome during prosecution did not rely on the same prior art relied on in this *inter partes* review. *See id.* (referencing prior art patent documents to Boehm, ’759 Gobush, and Naruo).²

² The ’759 Gobush patent cited during prosecution of the ’497 patent refers to U.S. Patent No. 6,758,759 (Pet. 6; Resp. 9), whereas the Gobush patent relied on in this *inter partes* review refers to U.S. Patent No. 6,241,622 (Ex. 1012).

Because the prior art rejections overcome during prosecution of the '497 patent relied on prior art different from the prior art before us in this *inter partes* review, absent any specific discussion otherwise, patent applicant's arguments made during prosecution bear little relevance to our Decision.

C. Reexamination of the '497 Patent

The '497 patent is subject to co-pending reexamination in *Ex Parte* Reexamination Control Number 90/013,618 ("the Reexamination"). Ex. 1019, 181–88. In the Reexamination, the Office rejected claims 1–3, 7, and 8 as unpatentable over Gobush and Erlichson and rejected claims 2–6 as unpatentable over Gobush, Erlichson, and Maltby. *Id.* at 196–205. Patent Owner filed an Appeal Brief on February 28, 2017, appealing, in relevant part, the Examiner's rejections of claims 1–8 as unpatentable over either (1) Gobush and Erlichson, or (2) Gobush, Erlichson, and Maltby. Ex. 3002, 4–5, 31–32.

On March 10, 2017, the Board stayed the Reexamination pending the termination or completion of this *inter partes* review. Paper 32, 2, 5.

D. Obviousness

A claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are "such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which such subject matter pertains." 35 U.S.C. § 103(a). The question of obviousness under 35 U.S.C. § 103 is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences

between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

E. Person of Ordinary Skill in the Art

In its Petition, Petitioner proposed that a person of ordinary skill in the art would have had, among other things, a bachelor’s degree in engineering, physics, or related technical field. Pet. 17. In its Preliminary Response, Patent Owner proposed that a person of ordinary skill in the art would have been a professional golfer. Prelim. Resp. 14. In our decision instituting trial, we determined that such a person need not have been a professional golfer or have a bachelor’s degree in a technical field, as proposed by Patent Owner and Petitioner, respectively, and instead determined “that one of ordinary skill in the relevant art at the time of the invention would have had at least some familiarity and technical understanding of golf equipment and golf ball flight.” Inst. Dec. 6.

Notwithstanding our determination in our institution decision, Petitioner argues that “the Board should give no weight” to the testimony of Patent Owner’s expert, Dr. Elias Balaras, because “he is unqualified as an expert.” Pet. Reply. 1. In support of this argument, Petitioner points out that Dr. Balaras is not a professional golfer, contrary to Patent Owner’s own argument that a person of ordinary skill in the art would have been a professional golfer. *See id.* at 21. Petitioner did not file a motion to exclude Dr. Balaras’s testimony.

Although Patent Owner *initially* proposed that a person of ordinary skill in the art would have been a professional golfer (Prelim. Resp. 14), and

Patent Owner's expert is not a professional golfer (*see* Ex. 2007 ¶¶ 21–25), we find that Dr. Balaras is a person of ordinary skill in the art as he “would have had at least some familiarity and technical understanding of golf equipment and golf ball flight,” as set forth in our institution decision. Inst. Dec. 6.

Furthermore, *even if* Dr. Balaras does not qualify as a person of ordinary skill in the relevant art, to testify as an expert under Federal Rule of Evidence 702, a person need not be a person of ordinary skill in the art, but rather may be “qualified in the pertinent art.” *Sundance, Inc. v. DeMonte Fabricating Ltd.*, 550 F.3d 1356, 1363–64 (Fed. Cir. 2008); *Mytee Prods., Inc. v. Harris Research, Inc.*, 439 F. App'x 882, 886–87 (Fed. Cir. 2011) (non-precedential) (upholding admission of the testimony of an expert who “had experience relevant to the field of the invention,” despite admission that he was not a person of ordinary skill in the art). Here, we give appropriate weight to the testimony of Dr. Balaras as having an educational and coursework background in fluid dynamics and mechanical engineering. Ex. 2007 ¶¶ 5–11. Dr. Balaras's consulting and publication work are relevant in understanding the ballistic flight of a golf ball. *See id.*

F. Prior Art

1. Summary of Gobush (Ex. 1012)

Gobush discloses a “launch monitor system for measuring launch characteristics of a golf ball.” Ex. 1012, 1:66–2:1. Gobush discloses that its system is “useful in improving the swing and in selecting advantageous equipment for use.” *Id.* at 1:60–65.

Gobush further discloses that “the system, including a computer algorithm, [] computes the trajectories for the tests using the initial velocity and initial spin rate.” *Id.* at 14:23–25 (referencing Fig. 18, which is a flowchart describing the operation of the Gobush system, step *S109*). Gobush “displays the average of each of the shots taken by the golfer,” including “the total distance, the spin rate, the launch angle, distance in the air, and golf ball speed.” *Id.* at 16:19–23 (referencing step *S113*). Gobush’s system “shows the golfer the results if the launch angle and spin rate of the golf ball were slightly changed, allowing the golfer to optimize the equipment and/or swing.” *Id.* at 16:24–27 (referencing step *S114*). Gobush explains that “[t]he operator is able to choose which launch angles and spin rates are used to calculate the distances.” *Id.* at 16:36–40 (referencing step *S114*).

Figure 22 of Gobush is reproduced below:

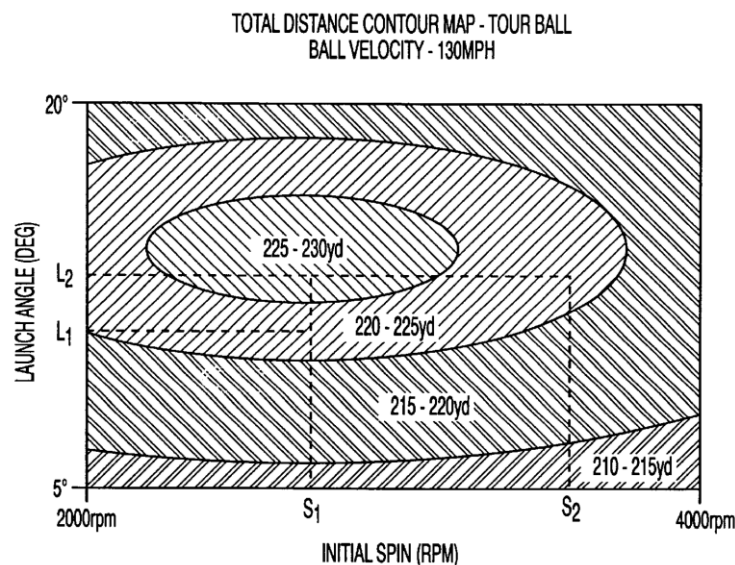


Figure 22 depicts “an example of a contour map of the total distance a golf ball travels under specified conditions.” *Id.* at 3:19–20. According to

Gobush, at step *S114*, “the system calculates the distances of a golf ball struck at a variety of launch angles and spin rates . . . [and from the calculated] graphical data in FIG. 22, the golfer can determine which of these two variables[, launch angle and initial spin,] could be changed to improve the distance.” *See id.* at 16:36–53. Gobush explains that “[t]he spin rate and launch angle can be altered simultaneously to change the distances [and that] the golfer can make the appropriate adjustments to achieve this increase in distance.” *Id.* at 16:61–64.

2. *Summary of Maltby (Ex. 1010)*

Maltby is a book published in January 1995 (Ex. 1010, 1) and discloses a process for fitting a golfer with golf clubs (*id.* at 698–784). In particular, Maltby discloses reasons, variables to consider, and processes for custom fitting golf clubs. *See id.* at 692–784. Maltby also discloses the use of computerized monitoring systems (*id.* at 799–815) for obtaining golf club performance information for fitting a golfer with golf clubs and golf balls (*see id.*).

Maltby seeks to achieve “normal ball trajectories” during the fitting process. *See id.* at 699–701. Figure 65–2 of Maltby is reproduced below:

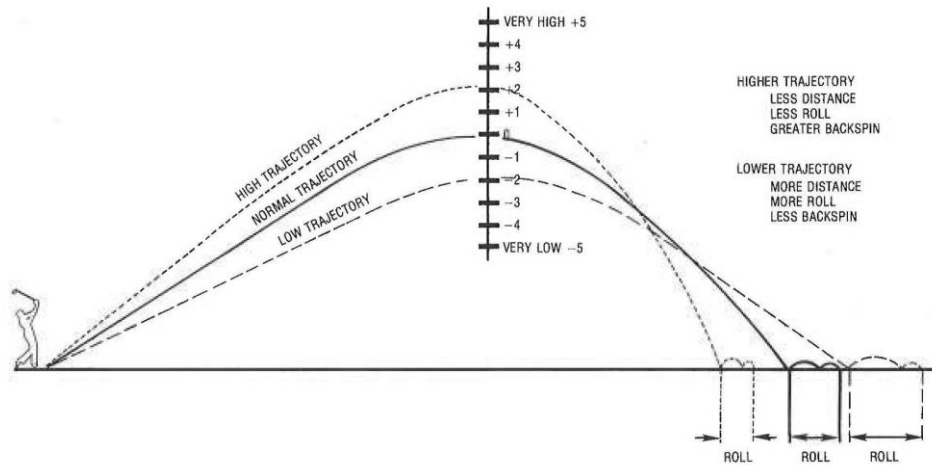


Figure 65-2
Effect of trajectory on distance, backspin and roll

Figure 65-2 shows the effect of trajectory on distance, backspin, and roll. In reference to the above figure, Maltby explains that a higher ball trajectory will travel less distance and have less roll, whereas a lower ball trajectory will travel longer and roll more. *See id.* at 700–701. Maltby discloses that “the ideal situation would be to make a fitting recommendation that would result in ‘normal ball trajectory.’” *Id.* at 700.

3. Summary of Erlichson (Ex. 1011)

Erlichson is a technical article titled “Maximum projectile range with drag and lift, with particular application to golf.” Ex. 1011, 357. Erlichson explains that golf ball trajectories, including maximum range, is a function of various factors, including projection angles, drag, and lift. *See id.* at 357–360. Erlichson also discloses golf ball trajectories for various projection angles and drag forces in Figures 1–4, 6, and 7. *Id.* at 358–61.

To illustrate an example of these projections, we reproduce Figure 1 of Erlichson, below:

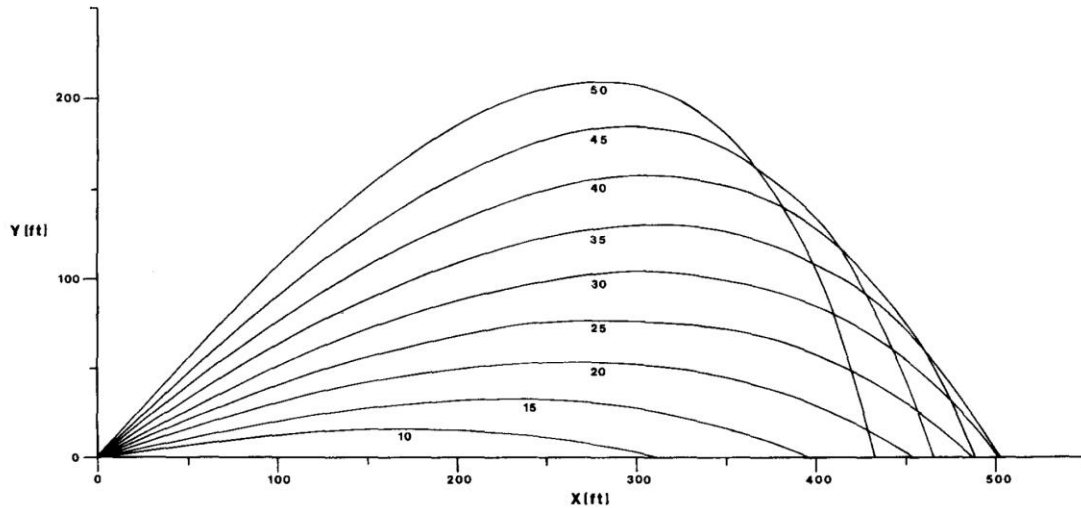


Fig. 1. Trajectories for various projection angles, linear drag, $c/m = 0.25$.

Figure 1 depicts particular golf ball trajectories based on a variety of factors, and based on these particular factors, shows that a maximum golf ball range of about 500 feet is achieved at a projection angle between 30° and 35°. *Id.* at 358.

G. *Obviousness over Gobush and Maltby*

Petitioner contends that claims 1–8 are unpatentable as obvious over Gobush and Maltby. Pet. 44.

1. *Independent Claim 1*

Petitioner asserts that Gobush teaches “measuring golf ball launch data with a launch monitor . . . and using that launch data to calculate a golf ball trajectory with a computer.” Pet. 44 (citations omitted). Petitioner also asserts that Gobush teaches “using the computer to iteratively calculate different golf ball trajectories based on a variety of golf ball launch angles and golf ball spin rates . . . to optimize golf equipment, optimize the golf

swing, improve distance, and optimize trajectory.” *Id.* (citing Ex. 1012, 16:23–27, 16:36–64).

In support of its assertion that Gobush teaches “optimizing” the swing and equipment, Petitioner explains that Gobush’s system predicts distances that a golf ball will travel based on a variety of launch angles and spin rates and a golfer’s measured launch speed. *See id.* at 45–46 (citing Ex. 1012, 16:19–64). Petitioner relies on Gobush’s Figure 22, reproduced *supra*, as an example of the “iterative optimization calculations” performed by Gobush’s system and for showing the interrelationship of golf ball launch angles, spin rates, and distance. *See id.* at 46 (citing Ex. 1012, 16:36–64).

In relying on Maltby, Petitioner asserts that Maltby teaches a process for fitting golf clubs that considers many different variables (*see id.* at 50–52 (citing Pet. 30–32); *id.* at 33–34 (citing Ex. 1010, 698)) and cites to Maltby’s disclosure that “the ideal situation would be to make a fitting recommendation that would result in [a] ‘normal ball trajectory,’” which is neither too high nor too low (*id.* at 33–34 (citing Ex. 1010; 699, 700)).

In combining Gobush with Maltby, Petitioner relies on the declaration testimony of Mr. Ogg and reasons that “it would have been obvious to combine these teachings from Gobush with the maximum ceiling height limitations taught by Maltby to optimize a golfer’s equipment.” Pet. 47 (citing Ex. 1014 ¶¶ 101–106). Petitioner further explains that the “operator would [therefore] be able to optimize the golfer’s equipment such that the projected trajectories for all recommended combinations of launch angle and spin rate are under the maximum ceiling height.” *Id.* (citing Ex. 1014 ¶¶ 102–106). We find that the portions of Gobush and Maltby cited by

Petitioner, as summarized above, teach or suggest the limitations of claim 1. The record also persuades us that Petitioner's articulated reasoning for combining Gobush and Maltby has support in the portions of Maltby cited at least in paragraphs 104–106 of the Ogg Declaration.

In challenging this ground, Patent Owner presents several arguments, which we address separately, below.

First, Patent Owner argues that Gobush does not disclose the claimed “optimization engine.” See PO Resp. 23–44; *id.* at 40 (“Gobush Patent does not teach ‘optimization engine . . .’”). In support of this argument, Patent Owner makes the following assertions:

- (1) “the specification describes the apparatus uses a non-linear, iterative process that is informed by launch data, e.g., a launch monitor. Gobush does not disclose or even fairly suggest an apparatus that uses a non-linear, iterative process that is informed by launch data.” *Id.* at 24.
- (2) “Gobush relies on known equations, which are typically used to compute the trajectory of an object moving in a viscous fluid, to model launch conditions.” *Id.* at 25–26 (citations omitted).
- (3) “if the optimization to achieve maximum distance is based on modeling relying on semi-empirical correlations for the prediction of the drag and lift coefficients, as is done in Gobush, then the uncertainly introduced by the model simply renders the optimization useless.” *Id.* at 27–28.
- (4) “merely fixing one variable (such as Velocity) does not allow optimization of the three specific variables claimed.” *Id.* at 28 (citations omitted).
- (5) “Gobush is simply an extension of a 2-Dimensional measured space and not an optimization process, especially when it comes to club fitting.” *Id.* at 29 (citations omitted).
- (6) “‘to achieve at least one optimal ball flight condition’, the optimization must be done in a three-dimensional space that looks at velocity as a variable.” *Id.* at 30 (citations omitted).

Patent Owner's argument is unpersuasive, as it is based on an unsupported interpretation that relies on limitations not appearing in the claims, which cannot be relied upon for patentability. *See In re Self*, 671 F.2d 1344, 1348 (CCPA 1982). Here, the claims do not recite; a “non-linear, iterative process,” unknown or known “equations,” any level of “certainty” derived from a particular model or equation, or use of a 3-dimensional model in a 3-dimensional space.

In particular, and as discussed *supra*, the claims do not require a variable velocity. *See, e.g.*, PO Resp. 28 (arguing that fixing velocity “does not allow optimization of the three specific variables claimed”). Rather, the plain and ordinary meaning of the claim requires an “optimization engine” that is “configured to determine optimized information for the spin and launch angle” “based on the determined velocity, spin, and launch angle information, the extrapolated distance, and a maximum ceiling height” “to achieve at least one optimal ball flight condition.” Ex. 1001, 14:60–67. Based on this interpretation, we find that the combination of Gobush and Maltby satisfies this limitation.

Furthermore, Gobush discloses a system in which a golfer takes repeated swings to generate data, including initial ball velocity, launch angle, and spin rate. Ex. 1012, 9:11–15, 16:10–23 (disclosing that at step *S113*, information, including launch angle, initial spin rate, initial velocity, distance, height, and other information may be displayed).

To illustrate our finding, we reproduce Figure 18 of Gobush, below:

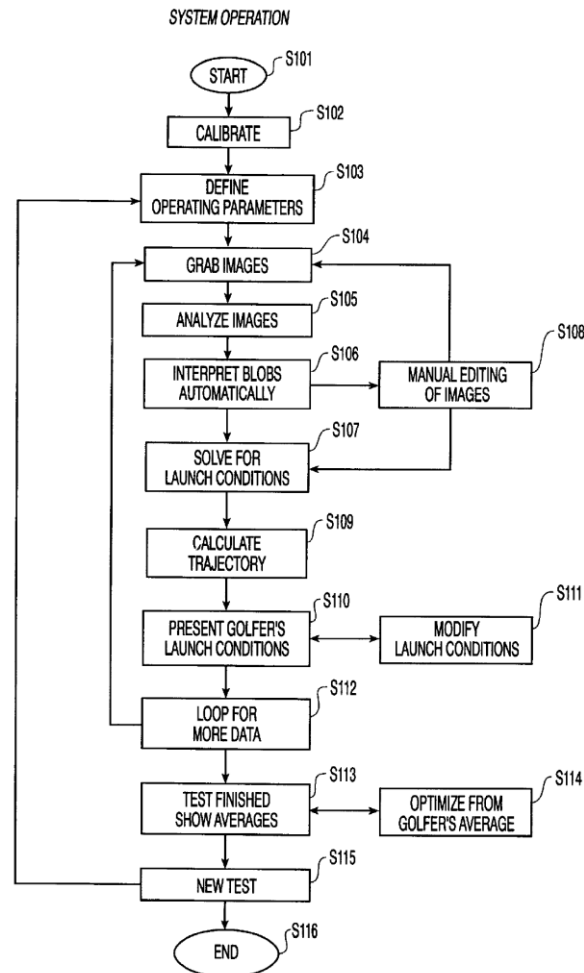


FIG. 18

Figure 18 depicts a flow chart describing the operation of Gobush's system. *Id.* at 3:11–12. Gobush discloses that at step S114, “the system presents the golfer with the ideal launch conditions for the player’s specific capabilities, thereby allowing the player to make changes and maximize distance.” *Id.* at 9:15–19. The ideal conditions include “the distances of a golf ball struck at a variety of launch angles and spin rates that are close to those for the golfer.” *Id.* at 16:36–38. Gobush’s system “shows the golfer the results if the launch angle and spin rate of the golf ball were slightly

changed, allowing the golfer to optimize the equipment and/or swing.” *Id.* at 16:23–27.

To further illustrate how Gobush discloses an “optimization engine configured to determine optimized information for the spin and launch angle-to achieve at least one optimal ball flight condition,” namely, the maximum distance, we reproduce Figure 22 of Gobush, below:

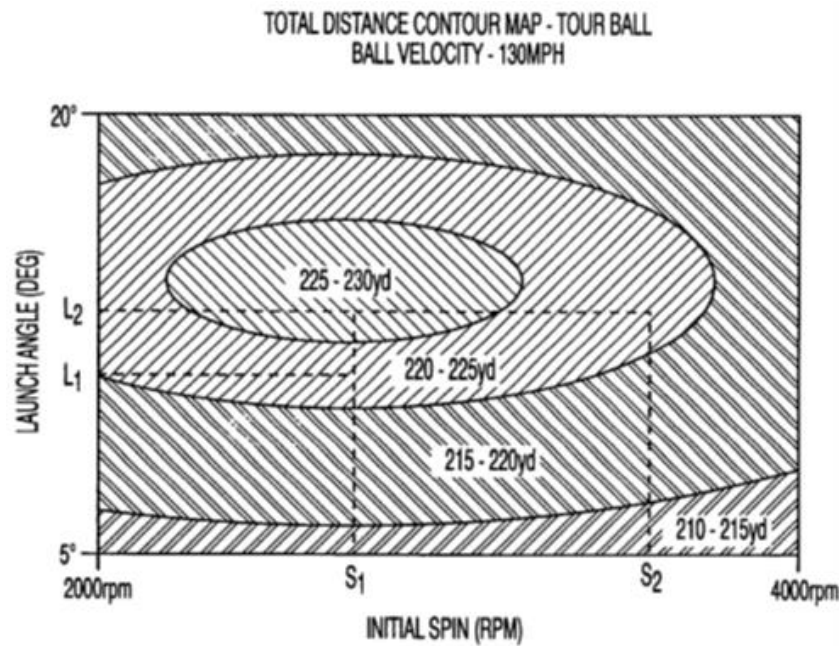


FIG. 22

Figure 22 of Gobush graphically depicts launch angles (vertical axis) and initial spin rates (horizontal axis) for a particular golfer with a ball velocity of 130 miles-per-hour. *Id.* at 16:40–44. From Figure 22, various golf ball distances can be achieved from a low range of 210–215 yards to a high range of 225–230 yards, and a golfer can select from a range of launch angles and spin rates to improve distance. *Id.* at 16:51–53; *see also id.* at 16:61–62 (“The spin rate and launch angle can be altered simultaneously to

change the distances.”); *see also id* at 16:62–64 (“Knowing this information, the golfer can make the appropriate adjustments to achieve this increase in distance.”). Notably, at initial spin *S1* and launch angle *L2*, the maximum distance range of between 225–230 yards is achieved. *See id.* at 16:54–58. Gobush further discloses that “[t]he system allows the golfer to start a new test with a new golf club, for example at step S115, or to end the session at S116.” *Id.* at 9:19–21.

Accordingly, *even if* Gobush’s initial ball velocity is fixed—such as at 130 MPH as shown in the example of Gobush’s Figure 22—we are not persuaded by Patent Owner’s argument that the claimed “optimization engine” is not disclosed by the prior art. *See* PO Resp. 39 (“FIG. 22 [of Gobush] is merely a two-dimensional model associated with a single constrained velocity . . . that may be unrelated to the absolute optimal values for a specific golfer.”). Rather, we find that Gobush discloses a system for fitting a golfer with golf equipment comprising an “optimization engine configured to determine optimized information for the spin and launch angle” (as shown in Figure 22) “to achieve at least one optimal ball flight condition” (the maximum distance), as recited in independent claim 1.

Second, Patent Owner also argues that “Gobush seems to teach away from” the “informed, iterative process performed by the system described and claimed in the ’497 Patent.” PO Resp. 41 (citing Ex. 2007, ¶ 75). Patent Owner explains, “[r]ather than measuring changes in launch data produced from actual changes in equipment and then determining the effect on trajectory, the Gobush Patent teaches that the operator can manually input different ranges of launch angle and spin rates.” *Id.* (citing Ex. 1012, 16:38–

40).

Patent Owner's second argument is unpersuasive. As mentioned above, the claim does not require an "informed" or "iterative" process. Moreover, we disagree with Patent Owner's characterization of Gobush. Gobush discloses that at step *S114*, "the system presents the golfer with the ideal launch conditions for the player's specific capabilities, thereby allowing the player to make changes and maximize distance." Ex. 1012, 9:15–18; *see also id.* at Fig. 18 (identifying step *S114* as OPTIMIZE FROM GOLFER'S AVERAGE). Although Gobush discloses that "[t]he operator is able to choose which launch angles and spin rates are used to calculate the distances" (Ex. 1012, 16:38–40), ultimately, it is Gobush's system at step *S114* that performs the calculations to generate, for example, the graphical data on Figure 22. *See id.* at 16:36–53 ("At step **S114**, the system calculates the distances of a golf ball struck at a variety of launch angles and spin rates."); *see id.* at 16:62–64 ("Knowing [the spin rate and launch angle], the golfer can make the appropriate adjustments to achieve this increase in distance.").

Accordingly, and as discussed above, Gobush's system, including at Figure 22 and step *S114* (illustrated in Figure 18), discloses the claimed "optimization engine configured to determine optimized information for the spin and launch angle-to achieve at least one optimal ball flight condition," that optimal ball flight condition being the maximum distance.

Third, Patent Owner argues that Maltby does not disclose the claimed "optimization engine" or "maximum ceiling height limitations . . . to optimize a golfer's equipment." PO Resp. 43–44. In support of this

argument, Patent Owner cites to Maltby's disclosure that lower trajectory shots will be compressed more by the club face, and that increased golf ball compression requires greater accuracy in striking the ball, as it is more important to hit the ball at the club head's center of gravity, rather than the toe or heel. *See id.* at 44. Accordingly, Patent Owner argues that "Maltby certainly does not put this into the context of ballistics optimization." *Id.* (citing Ex. 2007, ¶¶ 78–79).

Patent Owner's third argument is unpersuasive, as it fails to address the ground of unpatentability. As discussed above, to satisfy the claimed limitation "optimization engine configured to determine optimized information . . . to determine at least one optimal ball flight condition, based [in-part on] . . . a maximum ceiling height," Petitioner reasons that it would have been obvious to combine Gobush "with the maximum ceiling height limitations taught by Maltby to optimize a golfer's equipment." Pet. 47 (citing Ex. 1014 ¶¶ 101–106). Petitioner argues that the "operator would therefore be able to optimize the golfer's equipment such that the projected trajectories for all recommended combinations of launch angle and spin rate are under the maximum ceiling height." *Id.* (citing Ex. 1014 ¶¶ 102–106). Turning to Patent Owner's argument, *even if* Maltby discloses that lower trajectory shots may result in greater golf ball compression, thereby increasing the importance of hitting the ball on the club head's center of gravity, this is not relevant to Maltby's teaching regarding maximum ceiling height or the proposed combination with Gobush. *See* PO Resp. 43–44. Maltby also discloses that "the best approach is to achieve what would be considered normal ball trajectory, not too high or not too low [and that this]

will maximize average carry against and with the wind, provide adequate backspin to hold iron shots that land on the green and give some roll on shots which land on the fairway.” Ex. 1010, 699; *see also id.* at Fig. 65-2, reproduced *supra*; Ex. 1014 ¶ 74 (testifying that “Maltby teaches fitting clubs to hit balls with different trajectories based at least in part on a maximum ceiling height”). We also are persuaded that a skilled artisan would have had adequate reason to combine the teachings of Gobush and Maltby so as to optimize a golfer’s equipment such that the projected trajectories for all recommended combinations of launch angle and spin rate are under the maximum ceiling height. *See* Pet. 47 (citations omitted).

For the foregoing reasons, and as set forth in the Petition supported by the underlying evidence cited therein, we find that the combination of Gobush and Maltby satisfies the limitations of claim 1 and are persuaded that a preponderance of the evidence supports the conclusion that claim 1 is unpatentable over Gobush and Maltby.

2. *Dependent Claims 2 and 3*

Claim 2 further requires that the “optimization engine is further configured to correlate the optimized spin and launch angle information *with changes in at least one of the golf ball and club head*,” and claim 3 further recites, “wherein the change in the club head is related to the loft.” Ex. 1001, 15:1–7 (emphasis added). In addressing these limitations, Petitioner relies on Gobush’s disclosure that “the system may compare the data from successive clubs (e.g., a 5-iron to a 6-iron to a 7-iron) to determine if there are gaps in the clubs (inconsistent distances between each of the clubs).” Pet. 52–53 (citing in relevant part Ex. 1012, 17:4–7 and Ex. 1014 ¶¶ 83,

107).

Patent Owner does not present arguments for claims 2 and 3 apart from those presented for claim 1. *See* PO Resp. 44.

We have reviewed Petitioner’s arguments and the underlying evidence cited in support and are persuaded Petitioner sufficiently establishes that Gobush discloses the features added by those claims. *See, e.g.*, Ex. 1012, 17:4–7. We also credit Mr. Ogg’s testimony to that effect. *See* Ex. 1014 ¶¶ 83, 107, 108. Accordingly, we find that the combination of Gobush and Maltby also satisfies the limitations of claims 2 and 3 and are persuaded that a preponderance of the evidence supports the conclusion that claims 2 and 3 are unpatentable over Gobush and Maltby.

3. *Dependent Claims 4–6*

Claims 4–6 further recite wherein the change in the club head is related to “center of gravity” (claim 4), “orientation” (claim 5), and “weight distribution” (claim 6). Ex. 1001, 15:8–13. In addressing these claims, Petitioner relies on Maltby’s disclosure of lie angle for satisfying the claimed “orientation” (Pet. 40) and Maltby’s disclosure of center of gravity for satisfying the claimed “center of gravity” and “weight distribution” (*id.* at 39, 41). *See id.* at 54 (referring to Pet. 39–42 and citing Ex. 1014 ¶¶ 112–113); *see also id.* at 35 (citing Ex. 1010, 699–784).

Patent Owner does not present arguments for claims 4–6 apart from those presented for claim 1. *See* PO Resp. 44.

Based on the record before us, including the Petition and its underlying supporting evidence, the combination of Gobush and Maltby satisfies the limitations of claims 4–6, and we are persuaded that a

preponderance of the evidence supports the conclusion that claims 4–6 are unpatentable over Gobush and Maltby.

4. *Dependent Claims 7 and 8*

Claims 7 and 8 further require a display for the launch data (claim 7) and that the launch data be displayed in graphical format (claim 8). Ex. 1001, 15:14–19. Petitioner relies on Gobush’s disclosure of a monitor and that “the analysis method displays graphical representation of the trajectories for the golf ball types” in satisfying these limitations. See Pet. 54–56 (citing in relevant part Ex. 1012, 5:46–52, 16:14–18 and Ex. 1014 ¶¶ 82–83, 112).

Patent Owner does not present arguments for claims 7 and 8 apart from those presented for claim 1. See PO Resp. 44.

We also conclude that, in light of the record at hand, the combination of Gobush and Maltby satisfies the limitations of claims 7 and 8, and we are persuaded that a preponderance of the evidence supports the conclusion that claims 7 and 8 are unpatentable over Gobush and Maltby.

5. *Conclusion—Unpatentable Over Gobush and Maltby*

With the foregoing discussion in mind, and in considering the totality of the record now before us, we are persuaded that Petitioner has shown—by a preponderance of the evidence—that claims 1–8 are unpatentable as obvious over Gobush and Maltby.

H. *Obviousness over Gobush, Erlichson, and Maltby*

Petitioner relies on the same findings discussed *supra* based on Gobush and Maltby (Pet. 56), and further relies on Erlichson for its disclosure relating to “how the maximum height of the ball is affected by the wind” (*id.* (citing Ex. 1011, 357–61)). As discussed above, Erlichson

discloses “[c]omputer solutions” (Ex. 1011, 357) used in determining the maximum height in a golf ball’s trajectory (*id.*, Figs. 1–4, 6, 7 (y-axes)).

In addressing the claimed “selecting a maximum ceiling height,” and in combining Erlichson with Gobush and Maltby, Petitioner reasons that one of skill in the art “would understand how to use the Gobush system, the teachings in Maltby regarding trajectories, and the principles of Erlichson to optimize using a maximum ceiling height.” Pet. 59 (citing Ex. 1014 ¶¶ 114–126). Petitioner explains that “one of skill in the art would know and understand that establishing a maximum ceiling height in the club fitting process allows skilled golfers to account for environmental factors such as wind when fitting their clubs.” *Id.*

In contesting this ground, and in addition to the same unpersuasive arguments discussed *supra* with regards to Gobush and Maltby, Patent Owner criticizes Erlichson’s assumptions regarding the coefficient of drag and lift, relying on the testimony of its expert, Dr. Balaras. *See* PO Resp. 45–47 (citing in relevant part Ex. 2007 ¶¶ 80–82). In particular, Patent Owner argues that Erlichson’s assumptions regarding the coefficient of drag are incorrect, as Erlichson erroneously assumes that “for large ball speeds the drag force is a linear function of velocity . . . while for low speeds drag force goes with the square of velocity.” *Id.* at 46.

In view of Petitioner’s evidence and arguments, *even if* we take Dr. Balaras’s criticisms of Erlichson to be true—in that Erlichson’s assumptions regarding the coefficient of drag and lift are incorrect—we, nevertheless, find persuasive that a person of ordinary skill in the art would have combined Gobush’s system with Maltby’s teaching regarding trajectories

and Erlichson's teachings regarding the impact that wind would have on a golf ball, to further optimize a golfer's equipment by imposing a maximum ceiling height constraint, as required in claim 1.

Dr. Balaras's testimony does not specifically address this ground of unpatentability, and does not dispute Erlichson's general disclosure regarding the forces that affect a golf ball's trajectory. *See* Ex. 2007 ¶¶ 80–83. For example, Figures 1–4, 6, and 7 of Erlichson depict the trajectories for various projection angles, including height in feet (Y axis) and range in feet (X axis), and Dr. Balaras's testimony does not address these figures, even though Petitioner's expert, Mr. Ogg, relies upon them in testifying in support of the proposed combination. *Compare* Ex. 2007 ¶¶ 80–83, *with*, *e.g.*, Ex. 1014 ¶ 114 (relying on Erlichson's projection angle and maximum range shown in Figure 2). We also credit the testimony of Mr. Ogg who testifies that

one of ordinary skill in the art reading Maltby in view of the *principles of physics discussed in Erlichson* would realize immediately that one way to optimize the golfers['] equipment would be to impose a constraint on the calculations done by the Gobush equipment to exclude all trajectories . . . that had an apex above the maximum ceiling height. This type of analysis was recognized well before November 26, 2003, as a useful tool for highly skilled golfers, especially, such golfers who were optimizing their equipment for windy course conditions.

Ex. 1014 ¶ 115 (emphasis added).

With the foregoing discussion in mind, and in considering the totality of the record now before us, we are persuaded that Petitioner has shown—by a preponderance of the evidence—that claims 1–8 are unpatentable as obvious over Gobush, Maltby, and Erlichson.

III. CONCLUSION

We determine that Petitioner has shown by a preponderance of the evidence that: (1) claims 1–8 are unpatentable as obvious over Gobush and Maltby; and (2) claims 1–8 are unpatentable as obvious over Gobush, Maltby, and Erlichson.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1–8 are held unpatentable; and

FURTHER ORDERED that this is a Final Written Decision. Parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2016-00785
Patent 8,696,497 B2

PETITIONER:

Marshall Schmitt
Gilberto Espinoza
Kjersten Bakke
Paul Coble
Elias Swanson
Michael Best & Friedrich LLP
mjschmitt@michaelbest.com
geespinoza@michaelbest.com
kbbake@michaelbest.com
pcoble@michaelbest.com
erswanson@michaelbest.com

PATENT OWNER:

Noel C. Gillespie
Michael C. Jones
Procopio, Cory, Hargreaves & Savitch LLP
gail.poulos@procopio.com
michael.jones@procopio.com