the flotation device having a forward section, a middle section, and a rear section;
a strut having a upper end and a lower end, the upper end fixedly interconnected with the flotation device between the middle section and the rear section of the flotation device;
a hydrofoil fixedly interconnected with the lower end of the strut, the hydrofoil having no movable surface;
a propulsion system for propelling the watercraft in a body of water, wherein the propulsion system is connected to the hydrofoil; and
the watercraft having no movable steering system.

'659 ***Patent***, Claim 16:

A personal **[*6]** hydrofoil watercraft, comprising:

a surfboard-shaped flotation device that has a fore-aft length greater than a lateral width, the flotation device having a top surface and a bottom surface, *wherein the top surface has a substantially horizontal supporting surface configured to support a user in a prone, kneeling, or standing position*, the flotation device having a forward section, a middle section, and a rear section;
a hydrofoil interconnected with the surfboard-shaped flotation device, the hydrofoil having a strut and a first hydrofoil wing, an upper end of the strut being fixedly interconnected with the surfboard-shaped flotation device;
a propulsion system attached to the surfboard-shaped flotation device for propelling the watercraft in a body of water, the propulsion system comprising a battery, an electric motor, a motor speed controller, and a propulsor, wherein the propulsor is selected from a propeller, a ducted propeller, or a pump jet, and the battery and motor speed controller are contained in a watertight compartment integrated into the flotation device;
the watercraft having no movable steering system;
a handheld controller having a throttle; and

a throttle interface, wherein **[*7]** the throttle is adapted to send electronic signals to the throttle interface that cause an output of the propulsion system to change.

III. CONSTRUCTION OF DISPUTED TERMS

A. Term 1: "wherein a user can be disposed on the top surface of the flotation device in a prone, kneeling, or standing position" ('044 ***Patent***, Cl. 1; '659 ***Patent***, Cl. 1)

1. *Plaintiff's proposed construction:* "Wherein a user can be disposed on the top surface of the flotation device in each of the following positions: lying chest down; kneeling; or standing."

2. *Defendants' proposed construction:* Plain and ordinary meaning.

3. *Court's construction:* "'Prone, kneeling, or standing' are alternatives. Only one of them is required."

Plaintiff argues that the top surface of the board must allow the user to use the device in each listed position (prone, kneeling, and standing). Defendants disagree, arguing that the use of the word "or" in the claim limitation means that the board must allow a user to "be in any (or all) of the three positions." (D.I. 62 at 4).

"Or" usually designates alternatives. *See* Kustom Signals, Inc. v. Applied Concepts, Inc., 264 F.3d 1326, 1331 (Fed. Cir. 2001). To deviate from the usual interpretation, a party must show that the deviation is "clearly explained in the ***patent*** documents." *Id.* Here, I do not think **[*8]** that the ***patent*** documents show that "or" has anything other than its common usage.

The claim describes "a flotation device ... wherein a user can be disposed on the top surface of the flotation device in a prone, kneeling, or standing position ...." '044 ***Patent***, Cl. 1. Plaintiff argues, "The conjunction 'or' is necessary because a user cannot be in all three positions at once ...." (D.I. 46 at 14). I do not think that "or" was "necessary"—the patentee could have drafted the claim with more clarity to claim a board that must support all three positions. The claim language, as drafted, claims a top surface that supports a user in a prone position, a kneeling position, or a standing position.

The specification does not clearly explain that "or" ought to be given anything other than its usual meaning. Plaintiff cites an embodiment in support of its proposed construction. (D.I. 46 at 12-14). The embodiment describes a "flotation board ... similar to those used in surfing or sailboarding." '044 ***Patent***, 3:7-8. Figure 1 shows the flotation board to be "substantially flat." (D.I. 46 at 12). The specification further describes, "To operate the watercraft 100, a user initially lies prone on the flotation board 101. **[*9]** The throttle is engaged, causing the craft to accelerate. As the craft gains speed

the user may move to a kneeling or standing position." '044 ***Patent***, 4:33-36.

Defendants argue that Plaintiff seeks to import limitations from embodiments into the claims. (D.I. 46 at 18). I agree. As Defendants argue, "claim 1 (of both ***patents***) and claim 16 (of the '659 ***patent***) are each directed to a 'personal hydrofoil watercraft,' of which a surfboard is just one example." (D.I. 46 at 19). The Figure 1 embodiment, far from clearly explaining that the top surface of the claimed device must support a user in all three positions, suggests that a "flat upper surface to allow an adult human to lie prone, sit, kneel or stand" is merely "preferential[.]" ('044 ***patent***, 3:13-17).

Thus, I reject Plaintiff's proposed construction. I will give "or" its customary meaning of designating alternatives. The claimed top surface must support a user in at least one of the three listed positions, but it need not support a user in more than one of the three.

B. Term 2: "wherein the top surface has a substantially horizontal supporting surface configured to support a user in a prone, kneeling, or standing position" ('659 *Patent*, Cl. 16)

1. *Plaintiff's proposed construction:* ***[*10]*** "Wherein the top surface has a substantially horizontal supporting surface configured to support a user in each of the following positions: lying chest down; kneeling; or standing."

2. *Defendants' proposed construction:* Plain and ordinary meaning.

3. *Court's construction:* 'Prone, kneeling, or standing' are alternatives. Only one of them is required."

For the reasons stated in Section III.A, I reject Plaintiff's proposed construction.

C. Term 3: "designed to provide passive static stability" ('044 *Patent*, Cl. 1)

1. *Plaintiff's proposed construction:* "Designed such that the hydrofoil has an initial tendency to return to its original condition when disturbed without the hydrofoil having any moveable components."

2. *Defendants' proposed construction:* Indefinite or, in the alternative, "designed to provide stability without mechanisms or active control systems."

3. *Court's construction:* "Designed such that the hydrofoil has an initial tendency to return to its original condition when disturbed without the hydrofoil having any moveable components."

Defendants argue this term is indefinite. (D.I. 46 at 38). This is because, according to Defendants, the specification treats stability as simply a "personal preference" **[*11]** and a person of skill in the art ("POSA") would be unable to determine whether "any particular personal hydrofoil watercraft falls inside or outside the scope of the claims." (*Id.* at 39.). Plaintiff responds that there are criteria listed in the specification for determining stability and point to the expert opinion of Mr. Barry. (*Id.* at 46-50). I agree with Plaintiff. The concept of stability appears to be well-known in the art. (*See* D.I. 59, 60). Plaintiffs expert, who considers himself a POSA, has explained how the ***patents*** use the term. (D.I. 39-1, Ex. A ¶¶ 71, 77-79). Thus, I reject Defendants' argument that the term is indefinite.

Defendants also dispute Plaintiff's proposed construction. The dispute is over the role of "static" in the term "passive static stability." Defendants argue for the construction, "designed to provide stability without mechanisms or active control systems" while Plaintiff has proposed the construction "Designed such that the hydrofoil has an initial tendency to return to its original condition when disturbed without the hydrofoil having any moveable components." I requested supplemental letters providing definitions of "stability" from sources such as **[*12]** textbooks. The letters were helpful. Stability in the field of aerodynamics has two categories: static and dynamic. Static stability "deals with the *initial* tendency of a vehicle to return to equilibrium ... after being disturbed. It says nothing about whether it ever reaches its equilibrium position or how it gets there. Such matters are the realm of dynamic stability." (D.I. 60-2, Ex. B at 602).

Defendants' proposed construction does not account for the fact that static stability is a sub-category of stability. Plaintiff's proposed construction, on the other hand, captures the concept of static stability. Thus, I will adopt Plaintiff's proposed construction.

D. Term 4: "A passively stable, weight-shift controlled personal hydrofoil watercraft" ('659 *Patent*, Cl. 1)

1. *Plaintiff's proposed construction:* "A watercraft having a hydrofoil, the hydrofoil having an initial tendency to return to its original condition when disturbed without the hydrofoil having any moveable components and that is controlled by weight-shift of the user."

2. *Defendants' proposed construction:* Indefinite or, in the alternative, "A weight-shift controlled personal hydrofoil watercraft that is stable without mechanisms or active **[*13]** control systems."

3. *Court's construction:* Plain and ordinary meaning.

Unlike the last claim term, this term does not specify "static" stability. As discussed *supra*, stability incorporates both static and dynamic stability. Plaintiff asserts that a person of skill in the art would find "passively stable" and "passive static stability" to be interchangeable. (D.I. 46 at 36). I doubt that. Thus, I reject Plaintiff's proposition that the term here ought to have substantially the same construction as the last term. Defendants' proposed construction, however, does not construe "stable" at all. For now, I will construe the term to have its plain and ordinary meaning. The parties may readdress this issue, if it is important, in case dispositive motions.

E. Term 5: "wherein the design for providing the passive static stability is achieved through a combination of airfoil design, planform design and tailoring of span-wise twist distribution" ('044 *Patent*, Cl. 5)

1. *Plaintiff's proposed construction:* "The design for providing the passive static stability is achieved through a combination of:

- a geometry of a cross-section of the hydrofoil;
- a shape of the hydrofoil as viewed from above; and
- a measure of rotation **[*14]** of a hydrofoil section along the span of the hydrofoil."

2. *Defendants' proposed construction:* "This claim term is not limiting or, in the alternative, no construction is needed at this time."

3. *Court's construction:* Plain and ordinary meaning.

Plaintiff's position is that airfoil design, planform design, and tailoring of span-wise twist distribution are "structural characteristics." (D.I. 46 at 53). Defendants argue that they are methods of design, not structure. (*Id.* at 58). The parties dispute, for instance, whether "tailoring" describes an act or a structure.

"Tailoring" and "design" could be a structure, as Plaintiff argues. At this point, however, I am not convinced that the term means anything other than its plain and ordinary meaning. In support of their proposed construction, Plaintiff largely cites to its expert's declaration, but I give that no weight. (D.I. 46 at 53-57). Neither party has made a strong claim construction argument based on the intrinsic record. The parties are free to address the construction of this term again, if it is important, in case dispositive motions.

IV. CONCLUSION

Within five days the parties shall submit a proposed order consistent with this Memorandum **[*15]** Opinion suitable for submission to the jury.

End of Document

Results for: 9586659 or 9,586,659 Terms and Connectors

Intellectual Property...

Administrative Materials	0
News	1
Legal News	0

No documents found in Legal News filtered by Intellectual Property: Mealey's Litigation Report.

Try the following:

- Remove one or more filters: Intellectual Property...
- Review your results in the other categories.
- Modify your search (edit or remove some search terms or add synonyms).
- Check for spelling errors.

Copyright © 2024 LexisNexis.

Results for: 9586659 or 9,586,659 Terms and Connectors

News 0

Magazines & Journals

Clear

No documents found in News filtered by Magazines & Journals.

Try the following:

- Remove one or more filters: Magazines & Journals
- Review your results in the other categories.
- Modify your search (edit or remove some search terms or add synonyms).
- Check for spelling errors

Copyright © 2024 LexisNexis

LexisNexis

User Name: Patricia Martin
Date and Time: Thursday, April 11, 2024 6:31:00 AM EDT
Job Number: 221685021

Documents (7)

1. *MHL Custom, Inc. v. Waydoo USA, Inc.*
Client/Matter: -None-
Search Terms: 9586659 or 9,586,659
Search Type: Terms and Connectors
Narrowed by:

Content Type	Narrowed by
	-None-

2. *MHL Custom, Inc. v. Waydoo USA, Inc.*
Client/Matter: -None-
Search Terms: 9586659 or 9,586,659
Search Type: Terms and Connectors
Narrowed by:

Content Type	Narrowed by
	-None-

3. *MHL Custom, Inc. v. Waydoo USA, Inc.*
Client/Matter: -None-
Search Terms: 9586659 or 9,586,659
Search Type: Terms and Connectors
Narrowed by:

Content Type	Narrowed by
	-None-

4. *MHL Custom, Inc. v. Waydoo USA, Inc.*
Client/Matter: -None-
Search Terms: 9586659 or 9,586,659
Search Type: Terms and Connectors
Narrowed by:

Content Type	Narrowed by
	-None-

5. *US Patent Issued on March 7 for "Powered hydrofoil board" (Pennsylvania Inventor)*
Client/Matter: -None-
Search Terms: 9586659 or 9,586,659

LexisNexis | About LexisNexis | Privacy Policy | Terms & Conditions | Copyright © 2024 LexisNexis

Search Type: Terms and Connectors

Narrowed by:

Content Type	Narrowed by
	-None-

6. *Langelaan Jacob Willem Secures Patent on Powered Hydrofoil Board*

Client/Matter: -None-

Search Terms: 9586659 or 9,586,659

Search Type: Terms and Connectors

Narrowed by:

Content Type	Narrowed by
	-None-

7. *United States Courts Opinion: United States District Court District of Delaware : 21-091 - MHL Custom, Inc. v. Waydoo USA, Inc. et al*

Client/Matter: -None-

Search Terms: 9586659 or 9,586,659

Search Type: Terms and Connectors

Narrowed by:

Content Type	Narrowed by
	-None-

LexisNexis | About LexisNexis | Privacy Policy | Terms & Conditions | Copyright © 2024 LexisNexis

Neutral
As of: April 11, 2024 10:31 AM Z

MHL Custom, Inc. v. Waydoo USA, Inc.

United States District Court for the District of Delaware

September 6, 2023, Decided; September 6, 2023, Filed

Civil Action No. 21-0091-RGA

Reporter
2023 U.S. Dist. LEXIS 157220 *; 2023 WL 5748755

MHL CUSTOM, INC., Plaintiff, v. WAYDOO USA, INC. and SHENZHEN WAYDOO INTELLIGENCE TECHNOLOGY CO., LTD., Defendants.

Prior History: *MHL Custom, Inc. v. Waydoo USA, Inc., 2022 U.S. Dist. LEXIS 111958, 2022 WL 2290860 (D. Del., June 24, 2022)*

Core Terms

Patents, enabled, infringement, contends, stability, argues, specification, eFoils, publicly, royalty, hydrofoil, prior art, letters, stable, videos, watercraft, reasonable jury, new trial, experimentation, motion for a new trial, willful, matter of law, profit margin, public access, invention, prototype, locate, Boat, flat, weight of the evidence

Counsel: **[*1]** For Plaintiff: Blake A. Bennett, COOCH AND TAYLOR, P.A., Wilmington, DE; Dennis D. Murrell, Robert J. Theuerkauf, Brian P. McGraw, Megan E. Gibson, MIDDLETON REUTLINGER, Louisville, KY.

For Defendants: Kelly E. Farnan, Dorronda R. Bordley, RICHARDS, LAYTON & FINGER, P.A., Wilmington, DE; Edgar H. Haug, Robert E. Colletti, Mark Basanta, Roman Khasidov, HAUG PARTNERS LLP, New York, NY.

Judges: RICHARD G. ANDREWS, UNITED STATES DISTRICT JUDGE.

Opinion by: Richard G. Andrews

Opinion

MEMORANDUM OPINION

September 6, 2023

/s/ Richard G. Andrews

ANDREWS, UNITED STATES DISTRICT JUDGE:

Before me are Defendants Waydoo USA's and Shenzhen Waydoo Intelligence Technology's (collectively, "Waydoo") post-trial motions.

Waydoo moves for renewed judgment as a matter of law on a variety of issues. (D.I. 234). In the alternative, Waydoo moves for a new trial.[1] (*Id.*). The motions have been fully briefed. (D.I. 236, 245, 252).

I. BACKGROUND

Plaintiff MHL Custom ("MHL") filed suit against Waydoo alleging infringement of U.S. ***Patent*** Nos. 9,359,044 (the "'044 ***patent***") and ***9,586,659*** (the "'659 ***patent***") (collectively, the "Asserted ***Patents***"). (D.I. 1). The Asserted ***Patents*** relate to a weight-shift controlled personal hydrofoil watercraft (often referred to as an eFoil). The Asserted ***Patents*** share a common **[*2]** specification.

I held a jury trial from March 24-31, 2023, on claims 1-2, 5, and 6 of the '044 ***patent*** and claims 1-2 of the '659 ***patent***. The jury found the asserted claims to be valid and infringed, the infringement was willful, and MHL was entitled to a reasonable royalty of $500 per board sold by Waydoo (totaling $1,334,000 in damages). (D.I. 219). The parties have now filed post-trial motions.[2]

Waydoo seeks renewed judgment as a matter of law, or

[1] Waydoo does not make any arguments in favor of its new trial motion. Instead, it simply has a perfunctory sentence that it includes at the end of the JMOL arguments. In my view, it has forfeited its new trial arguments.

[2] MHL's post-trial motions (D.I. 230-233) are addressed in a separate opinion.

in the alternative, a new trial, on (1) whether the Evolo Report (a potential prior art reference) was publicly accessible; (2) whether the Evolo Report is enabled; (3) whether the Asserted ***Patents*** are enabled; (4) whether Waydoo infringed the '659 ***patent***; (5) whether Waydoo's infringement of the Asserted ***Patents*** was willful; and (6) whether the jury's award of damages is supported by the evidence. (D.I. 236 at 1-2). I address each issue in turn. I note that Waydoo does not challenge the correctness of any of the jury instructions.

II. LEGAL STANDARD

A. Judgment as a Matter of Law

Judgment as a matter of law is appropriate if "the court finds that a reasonable jury would not have a legally sufficient evidentiary basis to find for [a] party" on an issue. Fed. R. Civ. P. 50(a)(1). "Entry of judgment **[*3]** as a matter of law is a 'sparingly' invoked remedy, 'granted only if, viewing the evidence in the light most favorable to the nonmovant and giving it the advantage of every fair and reasonable inference, there is insufficient evidence from which a jury reasonably could find liability.'" Marra v. Phila. Hous. Auth., 497 F.3d 286, 300 (3d Cir. 2007) (citation omitted).

"To prevail on a renewed motion for JMOL following a jury trial, a party must show that the jury's findings, presumed or express, are not supported by substantial evidence or, if they were, that the legal conclusion(s) implied by the jury's verdict cannot in law be supported by those findings." Pannu v. Iolab Corp., 155 F.3d 1344, 1348 (Fed. Cir. 1998) (cleaned up). "'Substantial' evidence is such relevant evidence from the record taken as a whole as might be accepted by a reasonable mind as adequate to support the finding under review." Perkin-Elmer Corp. v. Computervision Corp., 732 F.2d 888, 893 (Fed. Cir. 1984).

In assessing the sufficiency of the evidence, the Court must give the non-moving party, "as [the] verdict winner, the benefit of all logical inferences that could be drawn from the evidence presented, resolve all conflicts in the evidence in his favor and, in general, view the record in the light most favorable to him." Williamson v. Consol. Rail Corp., 926 F.2d 1344, 1348 (3d Cir. 1991). The Court "must not determine credibility of witnesses, and must not substitute its **[*4]** choice for that of the jury between conflicting elements in the evidence." Perkin-Elmer, 732 F.2d at 893. Rather, the Court must determine whether the evidence supports the jury's verdict. *See* Dawn Equip. Co. v. Ky. Farms Inc., 140 F.3d 1009, 1014 (Fed. Cir. 1998); 9B CHARLES ALAN WRIGHT & ARTHUR R. MILLER, FEDERAL PRACTICE AND PROCEDURE § 2524 (3rd ed. 2008) ("The question is not whether there is literally no evidence supporting the party against whom the motion is directed but whether there is evidence upon which the jury might reasonably find a verdict for that party.")

Where the moving party bears the burden of proof, the Third Circuit applies a different standard. This standard "'requires the judge to test the body of evidence not for its insufficiency to support a finding, but rather for its overwhelming effect.'" Fireman's Fund Ins. Co. v. Videfreeze Corp., 540 F.2d 1171, 1177, 13 V.I. 382 (3d Cir. 1976) (quoting *Mihalchak v. Am. Dredging Co., 266 F.2d 875, 877 (3d Cir. 1959)*). The Court "must be able to say not only that there is sufficient evidence to support the finding, even though other evidence could support as well a contrary finding, but additionally that there is sufficient evidence for permitting any different finding.'" Id. at 1171 (quoting *Mihalchak, 266 F.2d at 877*).

B. Motion for a New Trial

Federal Rule of Civil Procedure 59(a)(1)(A) provides, in pertinent part: "The court may, on motion, grant a new trial on all or some of the issues—and to any party—... after a jury trial, for any reason **[*5]** for which a new trial has heretofore been granted in an action at law in federal court...." Among the most common reasons for granting a new trial are: (1) the jury's verdict is against the clear weight of the evidence, and a new trial must be granted to prevent a miscarriage of justice; (2) newly discovered evidence exists that would likely alter the outcome of the trial; (3) improper conduct by an attorney or the court unfairly influenced the verdict; or (4) the jury's verdict was facially inconsistent. *See* Zarow-Smith v. New Jersey Transit Rail Operations, Inc., 953 F. Supp. 581, 584-85 (D.N.J. 1997).

The decision to grant or deny a new trial is committed to the sound discretion of the district court. *See* Allied Chem. Corp. v. Daiflon, Inc., 449 U.S. 33, 36, 101 S. Ct. 188, 66 L. Ed. 2d 193 (1980); Olefins Trading, Inc. v. Han Yang Chem. Corp., 9 F.3d 282, 289 (3d Cir. 1993) (reviewing district court's grant or denial of new trial motion under the "abuse of discretion" standard). Although the standard for granting a new trial is less rigorous than the standard for granting judgment as a

matter of law—in that the Court need not view the evidence in the light most favorable to the verdict winner—a new trial should only be granted where "a miscarriage of justice would result if the verdict were to stand," the verdict "cries out to be overturned," or where the verdict "shocks [the] conscience." *Williamson, 926 F.2d at 1352-53*.

III. DISCUSSION

One of the significant issues at **[*6]** trial and now at JMOL was whether the "Evolo Report" anticipated the asserted ***patent*** claims. The jury did not reach the merits of the anticipation issue because it found that the Evolo Report was not publicly accessible and that it was not enabled. (D.I. 219 at 2). Each finding alone is sufficient to support the verdict. Waydoo challenges both of these findings. In order to obtain any relief, Waydoo must be successful on both challenges. I address the two findings separately.

A. Public Accessibility of The Evolo Report

1. Legal Standard

"Whether a reference qualifies as a 'printed publication' under *§ 102(b)* is a legal conclusion based on underlying factual findings." *Jazz Pharm., Inc. v. Amneal Pharms., LLC, 895 F.3d 1347, 1356 (Fed. Cir. 2018)*. "A reference is considered publicly accessible if it was disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, can locate it." *Acceleration Bay, LLC v. Activision Blizzard Inc., 908 F.3d 765, 772 (Fed. Cir. 2018)* (citation and internal quotation marks omitted). "The test for public accessibility is not 'has the reference been indexed,'" *id. at 774*, and 'public accessibility' requires more than technical accessibility," *id. at 773*. The ***patent*** challenger bears the burden of establishing that a particular document is a printed **[*7]** publication by clear and convincing evidence. *See Medtronic, Inc. v. Barry, 891 F.3d 1368, 1380 (Fed. Cir. 2018); Pfizer, Inc. v. Apotex, Inc., 480 F.3d 1348, 1359 (Fed. Cir. 2007)* ("Since we must presume a ***patent*** valid, the ***patent*** challenger bears the burden of proving the factual elements of invalidity by clear and convincing evidence.").

2. Analysis

The Evolo Report is a document detailing the capstone project of a group of engineering students in Sweden. (D.I. 242 at 783:13-19 (Triantafyllou); *see also* D.I. 243 at 968:21-24 (Barry)). The students' capstone project was essentially "to create a vehicle which looks like an eFoil." (D.I. 242 at 783:15-16 (Triantafyllou)).

At trial, Waydoo argued the Evolo Report was a printed publication that anticipated the Asserted ***Patents***. The priority date of the Asserted ***Patents*** is October 10, 2013. (D.I. 212 at 8). The jury found the Evolo Report was not publicly accessible. (D.I. 219 at 2).

Waydoo argues that it is entitled to judgment as a matter of law, or a new trial, because it presented unchallenged evidence that the Evolo Report was publicly accessible. (D.I. 236 at 4). Waydoo cites Mr. Lanterman's testimony that the Evolo Report was posted on the Evolo project webpage of Prof. Kuttenkeuler's course website in June 2009. (*Id.* (citing D.I. 242 at 724:23-725:4 (Lanterman))). **[*8]** Waydoo contends that the record shows there was "successful activity" on the course website almost every day from November 2011 to October 2013 (*id.* (citing DTX068A; D.I. 242 at 734:8-16 (Lanterman))), the Evolo project webpage had 120 unique visitors, and 17 unique visitors downloaded the Evolo Report from the webpage (*id.* (citing (DTX068A; D.I. 242 at 734:22-735:9 (Lanterman)). Mr. Lanterman further testified that Google crawled and indexed the Evolo Report in January 2010. (*Id.* (citing D.I. 242 at 725:4-726:6 (Lanterman))).

In addition to accessing the Evolo Report through Google, Waydoo argues the Evolo Report was publicly accessible through the August 2009 issue of the Swedish magazine "Båtnytt" ("Boat News"). An article in that issue featured a link to the Evolo project webpage. (*Id.* at 4).

In short, Waydoo argues the Evolo Report was publicly accessible through two avenues: Google Search and the Boat News article.

MHL concedes the evidence shows the "Evolo Report existed online and may have been downloaded by 17 different people prior to the critical date." (D.I. 245 at 5). MHL, however, contends that "online availability, standing alone, is not enough to demonstrate public accessibility." **[*9]** (*Id.*). MHL argues it was reasonable for the jury to conclude that Waydoo failed to meet its burden to show the Evolo Report was not publicly

accessible because Waydoo did not (1) present evidence that anyone accessed the Evolo Report through the Boat News article or (2) show how an interested person could find the Evolo Report through a Google Search. (*Id.* at 7).

I agree with MHL that a reasonable jury could conclude that Waydoo did not meet its heavy evidentiary burden to show the Evolo Report was publicly accessible. Waydoo's evidence establishes that the Evolo Report was technically accessible. MHL concedes that. But "'public accessibility' requires more than technical accessibility." *Acceleration Bay*, 908 F.3d at 773. I find there is sufficient evidence for a reasonable jury to conclude that the Evolo Report was not publicly accessible, despite being technically accessible, and that Waydoo has not shown that there is "insufficient evidence for permitting any" finding other than public accessibility.

First, the Boat News article may have provided an adequate roadmap for an interested party to arrive at the Evolo Report by linking to the Evolo project page. *See Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1350 (Fed. Cir. 2016) ("An adequate roadmap need not give turn-by-turn directions, **[*10]** but should at least provide enough details from which we can determine that an interested party is reasonably certain to arrive at the destination: the potentially invalidating reference."). What is lacking in Waydoo's argument is evidence to establish that an interested party would be able to find or locate the Boat News magazine. Waydoo has not pointed to any evidence regarding whether Boat News, a Swedish boating magazine, is a publication that the "interested public" would have access to, have been aware of, or have been able to locate. *Cf. Voter Verified, Inc. v. Premier Election Sols., Inc.*, 698 F.3d 1374, 1380 (Fed. Cir. 2012) (finding article was publicly accessible when it was posted on a website that was "was well known to the community" interested in that subject matter); *Cornell Univ. v. Hewlett-Packard Co.*, 2009 U.S. Dist. LEXIS 39343, 2009 WL 1127580 at *6 (N.D.N.Y. May 14, 2009) (finding an article in a "seminal publication" to be a "research aid" for locating a prior art reference). Therefore, I think a reasonable jury could conclude that Waydoo did not meet its burden in showing that the Evolo Report was publicly accessible through the Boat News article. Likewise, I do not think there is such "overwhelming effect" to disturb the jury's decision. *Fireman's Fund*, 540 F.2d at 1177.

Second, I think a reasonable jury could conclude that Waydoo did not meet its burden to prove that the Evolo Report was **[*11]** publicly accessible through Google Search. The Federal Circuit has cautioned that indexing, by itself, is not sufficient to prove public accessibility. *Acceleration Bay, LLC*, 908 F.3d at 774 ("We have explained that where indexing is concerned, whether online or in tangible media, the ultimate question is whether the reference was available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, can locate it." (citation and internal quotation marks omitted)). Mr. Lanterman testified that the Evolo Report was accessible, but his testimony pertained to technical accessibility (i.e., Google confirmed the link was active, crawled, and indexed). (D.I. 242 at 746:12-24 (Lanterman)). While Mr. Lanterman testified that an interested person could have found the Evolo Report through Google (*id.* at 745:7-11), he also testified that he did not perform a Google search to locate the Evolo Report (*id.* at 743:9-13) and that he did not know what a sufficient Google search would have been to locate the Evolo Report (*id.* at 727:18-23, 743:6-8, 743:14-745:11). I think a reasonable jury could conclude from Mr. Lanterman's testimony that the report was only technically accessible, **[*12]** and not publicly accessible such that "persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence," could locate the Evolo Report through Google.

Third, Waydoo contends that it should prevail because the evidence it provided "is uncontradicted and unimpeached," and "MHL did not present any evidence that would permit a different finding." (D.I. 236 at 6-7). I disagree. As the ***patent*** challenger, it was Waydoo's burden to prove by clear and convincing evidence that the Evolo Report was publicly accessible. *See Medtronic*, 891 F.3d at 1280; *Pfizer*, 480 F.3d at 1359. As already discussed, I think a reasonable jury could determine that Waydoo failed to meet its burden.

Therefore, I will deny Waydoo's JMOL motion as it pertains to the public accessibility of the Evolo Report. For the same reasons, I find that the jury's finding that the Evolo Report was not publicly accessible is not against the clear weight of the evidence. Therefore, Waydoo's motion for a new trial on this issue is denied.

B. Enablement

1. Legal Standard

A ***patent***'s "specification must enable the full scope of

the invention as defined by its claims." *Amgen Inc. v. Sanofi*, 598 U.S. 594, 143 S. Ct. 1243, 1254, 215 L. Ed. 2d 537 (2023). For a ***patent*** claim to be enabled, the ***patent*** specification must "contain a written **[*13]** description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same[.]" 35 U.S.C. § 112(a). "The enablement requirement is met where one skilled in the art, having read the specification, could practice the invention without 'undue experimentation.'" *Streck, Inc. v. Research & Diagnostic Sys., Inc.*, 665 F.3d 1269, 1288 (Fed. Cir. 2012) (citation omitted); *see also* *Amgen*, 143 S. Ct. at 1255 ("[A] specification may call for a reasonable amount of experimentation to make and use a ***patented*** invention. What is reasonable in any case will depend on the nature of the invention and the underlying art."). Factors for assessing whether a disclosure would require undue experimentation include:

> (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims.

In re Wands, 858 F.2d 731, 737 (Fed. Cir. 1988).

"Enablement is a question of law based on underlying facts." *Wyeth & Cordis Corp. v. Abbott Lab'ys*, 720 F.3d 1380, 1384 (Fed. Cir. 2013). The party challenging validity must **[*14]** prove lack of enablement by clear and convincing evidence. *Cephalon, Inc. v. Watson Pharms., Inc.*, 707 F.3d 1330, 1336 (Fed. Cir. 2013).

2. Analysis

i. Enablement of Evolo Report

At trial, the jury found that the Evolo Report is not enabled. (D.I. 219). "I presume a prior art printed publication is enabling." *Lambda Optical Sols., LLC v. Alcatel Lucent USA Inc.*, 2015 U.S. Dist. LEXIS 132380, 2015 WL 5734427, at *1 (D. Del. Sept. 30, 2015) (citing *Robocast, Inc. v. Apple, Inc.*, 39 F. Supp. 3d 552, 565 (D. Del. 2014)). It is therefore the patentee's initial burden to show that a prior art reference is not enabled, but, if the patentee presents some evidence of enablement, "the burden still rests on the party asserting invalidity to ultimately demonstrate by clear and convincing evidence that the prior art is enabled." *Robocast*, 39 F. Supp. 3d 552, 566 (D. Del. 2014) (quoting *Forest Labs., Inc. v. Ivax Pharms., Inc.*, 438 F. Supp. 2d 479, 487 n. 3 (D. Del. 2006), ***aff'd***, 501 F.3d 1263 (Fed. Cir. 2007) (internal citations omitted)).

Waydoo argues that it is MHL's burden to prove that the Evolo Report is not enabled. (D.I. 236 at 7 (citing *Apple Inc. v. Corephotonics, Ltd.*, 861 F. App'x 443, 449 (Fed. Cir. 2021))). I do not think shifting the evidentiary burden back to Waydoo after MHL presents some evidence of non-enablement is contrary to *Corephotonics*. *See Corephotonics*, 861 F. App'x at 450 (finding [the PTAB] erred when it refused to consider evidence Apple introduced in support of enablement of a printed publication after Corephotonics raised the issue of non-enablement); *see also* *id.* at 449 ("[T]he [PTAB] shifted the burden to Apple to provide evidence before institution (i.e., in its petition) that [a ***patent*** publication] was enabling **[*15]** as part of its burden to prove anticipation. This was error.").[3]

Waydoo contends that Mr. Barry's opinions about enablement were about the Evolo prototypes, not the final Evolo Report. (D.I. 236 at 8). Waydoo explains that none of the Evolo prototypes reflect the "final" product of the Evolo Report because the last prototype built used a motor that did not have the requisite power. (*Id.* at 9). Waydoo contends the final prototype is not representative of the Evolo Report's full disclosure because the final prototype used a 2 kW motor, but the Evolo Report indicated that a more powerful 4 kW motor was required. (*See* D.I. 243 at 1011:12-1012:21). The Evolo Report discussed using a larger motor to meet the requirements for power and speed. (*Id.* at 1012:16-23 (Barry)). Waydoo argues the Evolo Report's instruction to use a 4 kW motor would render the Report enabled as the larger motor is necessary to achieve stability.

Waydoo further argues that the Evolo Report must be enabled because textbooks from the 1960's teach the same information about stability that is disclosed in the ***patent*** specification. (*Id.* at 11). Waydoo contends that "if the [Asserted] ***Patent***'s disclosure enables a POSA to make **[*16]** a stable eFoil, the same prior art disclosures enable the Evolo Report too." (D.I. 252 at 4).

[3] Even if the evidentiary burden to prove a prior art reference is non-enabled ultimately lies with MHL, it would not alter my analysis because I find there is substantial evidence to support the jury's finding that the Evolo Report is not enabled.

Waydoo argues that Mr. Barry put forth an invalid "inherency" argument based on the Evolo hydrofoils being flat plates. (D.I. 236 at 10-11). Mr. Barry testified that the Evolo hydrofoils could not achieve stability because they were flat plates. (*See* D.I. 243 at 1041:21-1042:2). Waydoo contends this argument must fail because Mr. Barry contradicted himself and stated that flat plates can achieve stability. (D.I. 236 at 10-11). I take Waydoo to be framing Mr. Barry's testimony as saying the Evolo hydrofoils are inherently unstable because they are flat plates, but, because Mr. Barry contradicted himself, that argument does not support his opinion.

MHL argues there was sufficient evidence for the jury to find the Evolo Report is not enabled. Mr. Barry concluded the Evolo Report is not enabled because the Evolo team "didn't ever do the calculations required to produce stability . . . they never considered stability in the physical design of the object." (D.I. 245 at 9 (quoting D.I. 243 at 973:3-9)). Mr. Barry concluded that a POSA would read the Evolo Report and understand that an automatic control **[*17]** system was required rather than understand that the watercraft had a passively stable system. (*Id.* (quoting D.I. 243 at 956:18-957:3)). Mr. Barry testified that using a higher-powered motor would not change his opinion that the Evolo Report was not enabled. (*Id.* (quoting D.I. 243 at 1055:9-15)). Mr. Barry also testified that the "delta wing" in the Evolo Report was a flat plat, which would prevent it from achieving stability. (*Id.* at 11).

I think there is substantial evidence to support the jury's finding that the Evolo Report is not enabled.

First, Mr. Barry testified that the Evolo Report was not enabled, independent of the watching the YouTube videos of the different Evolo prototypes. (D.I. 243 at 973:1-13). Therefore, MHL's evidence was about the Evolo Report itself, not just about the Evolo prototypes.

Second, Mr. Barry testified that the Evolo Report's instruction to use a 4 kW motor in the watercraft, as opposed to the 2 kW motor actually used in the final prototype, would not change his opinion that the Evolo Report was not enabled. Waydoo argues the Evolo Report instructed that a 4 kW motor was required and, as a result, would make the Evolo Report enabled. **(D.I.** 236 at 8). Mr. **[*18]** Barry explained that a more powerful motor would not make the watercraft stable because the watercraft would not reach the requisite speed to achieve stability without crashing first. (D.I. 243 at 1054:25-1055:15).

Third, Mr. Barry expressed that using a flat plate could achieve stability, but it was unlikely to do so. (*Id.* at 973:10-11 ("And, further, the use of the hydrofoil they selected is unlikely to produce stability."), 1041:18-24). I agree with Waydoo that this does not support an argument that the Evolo Report discloses a watercraft that is inherently unstable because the hydrofoils are flat plates. I think, however, the fact that the Evolo Report discloses using flat plates, which may not be conducive to stability (per Mr. Barry's testimony), makes it a relevant aspect for Mr. Barry, and therefore the jury, to consider in the context of the full Evolo Report.

For each of these three points, the jury was entitled to assess the credibility of Mr. Barry and believe him over Waydoo's expert. It is not for me to weigh the credibility of the witnesses.

Fourth, I reject Waydoo's argument that the Evolo Report must be enabled because the Asserted ***Patents*** disclose information about stability **[*19]** that existed in textbooks. Mr. Barry testified that the Asserted ***Patents*** teach stability at the same level of detail as textbooks from the 1960's. (D.I. 243 at 1037:23-1038:11). Mr. Barry testified that the Evolo Report referred to and cited those textbooks and that the Report's authors therefore "would have had all the information." (*Id.* at 1041:3-9). Waydoo's argument seems to be that the Evolo Report must be enabled because a POSA would, or could, use the information that is disclosed in other prior art references with the Evolo Report. (*See* D.I. 236 at 11).

But the Report's authors having access to other prior art references does not mean the Evolo Report teaches how to apply that information such that the disclosure of the Evolo Report is enabled. Waydoo cites *SRI Int'l, Inc. v. Internet Sec. Sys., Inc.*, 511 F.3d 1186, 1194 (Fed. Cir. 2008) for support, but that case is distinguishable. In *SRI*, the anticipating prior art reference was found to be enabling because it provided a "similar, or even a partially identical" disclosure to the specification of the ***patent*** in that case. *Id.* ("Thus, the 1997 publication with its similarities in technical scope and description to the specification of the '212 ***patent*** meets the enabling hurdle for a prior art reference.").

I do not think **[*20]** the fact that the Asserted ***Patents***' disclosures about stability existed in textbooks (i.e., other prior art references) means the Evolo Report must be enabled. Even though the ***patent***'s information about stability may have been well-known in the art (D.I. 243 at 1038:12-22 (Barry)), and accessible to a POSA, I

think the proper focus for determining enablement is how the Evolo Report teaches a POSA to apply those principles. Mr. Barry testified that the Evolo Report does not enable a passively stable eFoil. (*See* D.I. 243 at 998:5-14). Another way of phrasing this is that the Evolo Report applies those well-known principles to achieve an unstable watercraft. I do not think a prior art reference that applies the knowledge of a POSA to achieve a non-enabled embodiment necessarily enables a different, enabled embodiment just because it is possible to apply that same knowledge in a different manner. As such, I think it is reasonable for a jury to determine that the Evolo Report is not enabled because, if they chose to credit Mr. Barry's testimony, there was sufficient evidence to determine that the Evolo Report only teaches one to apply the principles from the textbooks to achieve an unstable **[*21]** watercraft. As such, the jury could conclude that undue experimentation would be required to practice a stable watercraft. Therefore, I do not think the Evolo Report is automatically enabled just because the information disclosed in the Asserted ***Patents*** existed in textbooks.

I find a reasonable jury could have considered Mr. Barry's testimony and determined that the Evolo Report is not enabled. Therefore, Waydoo's JMOL motion is denied.

For the same reasons, I find the jury's finding that the Evolo Report is not enabled is not against the clear weight of the evidence. Therefore, Waydoo's motion for a new trial is denied.

ii. Enablement of the Asserted *Patents*

Waydoo advances two arguments for why the Asserted ***Patents*** are not enabled. First, Waydoo argues that if the Evolo Report is not enabled, then the Asserted ***Patents*** must not be enabled. (D.I. 236 at 11-13). More specifically, Waydoo contends that the Asserted ***Patents*** are not enabled because they fail to disclose key information regarding stability and hydrofoil design that the Evolo Report teaches. (*Id.* at 12 (listing concepts in the Evolo Report such as longitudinal dihedral wing arrangement, location of the center of gravity, and **[*22]** the importance of speed with respect to stability, that are not in the ***patent*** specification); *see also* D.I. 242 at 805:2-25 (Dr. Triantafyllou); D.I. 244 at 1149:1-18 (arguing such concepts are disclosed in the Evolo Report) (Waydoo closing)). If the Evolo Report, which discloses more than the Asserted ***Patents***, is not enabled, then, Waydoo argues, it must logically follow that the Asserted ***Patents*** are not enabled.

Waydoo appears to contend that the Asserted ***Patents*** needed to describe the missing information rather than rely on a POSA to supply it. Waydoo cites *Auto. Techs. Int'l, Inc. v. BMW of N. Am., Inc.*, 501 F.3d 1274, 1284 (Fed. Cir. 2007), for the proposition that "'it is insufficient to merely state that known technologies can be used to 'achieve passive stability." (D.I. 236 at 14 (citing *Auto. Techs.*, 501 F.3d at 1283)).

In *Auto. Techs.*, the Federal Circuit found an electronic side impact sensor was not enabled in part because "side impact sensing was a new field and . . . there were no electronic sensors in existence that would detect side impact crashes." *Auto. Techs.*, 501 F.3d at 1284.

The case here is distinguishable. The Evolo Report may teach additional content not found in the ***patent*** specification, but I do not think that is sufficient to find the Asserted ***Patents*** not to be enabled. Waydoo does not argue and fails to cite **[*23]** evidence (e.g., expert testimony) that would indicate that the absence of this information in the Asserted ***Patents*** would mean undue experimentation is required to practice the invention. (*See* D.I. 236 at 12). In *Auto. Techs.*, the record was far more developed to show that the ***patent*** was not enabled because it was missing key information. *See* 501 F.3d at 1284 (noting expert testimony identified two problems in practicing the invention and that a "'great deal of experimentation' would have been necessary to make an electronic side impact sensor after reading the specification"). Such evidence is lacking here.

Second, Waydoo argues that the Asserted ***Patents*** do not enable dual-wing crafts and, therefore, do not enable the full scope of the claims.[4] Waydoo reiterates its points that the Asserted ***Patents*** do not enable a passively stable watercraft, generally. (D.I. 236 at 12).

---

[4] This is the first time that Waydoo is raising the argument that the claims are not enabled for practicing dual-wing crafts, specifically. At trial, Waydoo moved for judgment as a matter of law for lack of enablement because the ***patents*** "teach you nothing new." (D.I. 243 at 1067:14-16). Thus, Waydoo may have forfeited this argument. *See* *United States v. Dowdell*, 70 F.4th 124, 140 (3d Cir. 2023) ("[A]n example of [forfeiture] is an inadvertent failure to raise an argument." (alteration in original) (quoting *Barna v. Bd. of Sch. Dirs. of Panther Valley Sch. Dist.*, 877 F.3d 136, 147 (3d Cir. 2017))). MHL, however, does not object to Waydoo raising this argument now. Because MHL fails to argue the issue is forfeited, MHL has forfeited any forfeiture argument, and I address the issue.

As already discussed, I reject that argument. Waydoo further argues that the specification does not describe how to arrange or design two hydrofoil wings to achieve stability. (*Id.* at 13). Waydoo contends the specification disparages dual-wing hydrofoils as only being suitable for training purposes. (*Id.* at 13).

I think a reasonable jury could **[*24]** conclude that Waydoo failed to meet its burden to show that the Asserted ***Patents*** are not enabled. Waydoo contends the specification lacks guidance in designing or arranging two hydrofoil wings but offers no support that undue experimentation would be required to practice a dual-wing craft. (*See* D.I. 236 at 13). Waydoo contends that the ***patents*** are not enabled because they do not contain any experimental data or working examples. (*Id.*). Actual working examples, however, are not required to satisfy the enablement requirement. *Allergan, Inc. v. Sandoz Inc.*, 796 F.3d 1293, 1310 (Fed. Cir. 2015).

I also disagree that the ***patent*** disparages dual-wing hydrofoils or that the statements in the specification would prevent a POSA from practicing a dual-wing hydrofoil without undue experimentation. The ***patent*** indicates that hydrofoils can be designed to have certain tradeoffs (i.e., lower speed, but greater stability). (*See* '044 ***patent*** at col. 2:26-35). The specification indicates that designs with greater stability may be better used for training. (*Id.*). The specification indicates that a hydrofoil design that includes a "fixed canard" (i.e., a second wing) increases stability and is "suitable for training." (*Id.* at col. 5:36-37; *see also id.* at col. 5:45-50). The specification **[*25]** does not state that these designs are only suitable for training, or that even being suitable for training is undesirable. The specification is just explaining an advantage of a particular embodiment.

I think a reasonable jury could conclude that Waydoo failed to carry its burden in showing the Asserted ***Patents*** are not enabled. Therefore, Waydoo's JMOL motion is denied.

For the same reasons, I find the jury's finding that the Asserted ***Patents*** are enabled is not against the clear weight of the evidence. Therefore, Waydoo's motion for a new trial is denied.

C. Infringement of the '659 *Patent*

Waydoo contends there is insufficient evidence to show that the Waydoo eFoils are stable. As such, Waydoo argues there is insufficient evidence to show that Waydoo infringed the '659 ***Patent***.[5] Waydoo contends that the only evidence regarding whether Waydoo's eFoils are dynamically stable[6] are Mr. Barry's testimony from watching videos of individuals riding Waydoo's boards and Mr. Barry's eigenvalue analysis. (D.I. 236 at 14-15). Waydoo contends that stability cannot be assessed from watching videos of the eFoils being ridden. Waydoo argues Mr. Barry's determination about stability from the video clips was unscientific for the **[*26]** additional reason that the clips viewed were shorter than 20 seconds, which was the shortest time frame he indicated was necessary to make a determination about stability. (*Id.* at 15).

Waydoo argues the results from the eigenvalue analysis show Waydoo's eFoils are dynamically unstable as each board has at least one positive sigma value.[7] (D.I. 236 at 15). Waydoo contends that Mr. Barry's "damping" theory to explain why the eFoils are stable, despite the positive sigma values, is unsupported.

MHL contends that Mr. Barry did not rely solely on videos to determine if the Waydoo eFoils were stable. (D.I. 245 at 13). MHL argues that Mr. Barry explained that the eigenvalue analysis was a conservative estimate and that in the real world there would be damping effects that would stabilize the eFoil. (*Id.* at 14 (citing D.I. 241 at 472:20-473:2)).

I find a reasonable jury could have determined the '659 ***patent*** was infringed. Mr. Barry testified that the Waydoo eFoils were stable based on watching videos. The jury saw at least some of the same videos. (*See e.g.*, D.I. 241 at 487:11-24 (playing a video Mr. Barry used to "make a positive determination of stability of the Waydoo products")). Waydoo contends that **[*27]** whether a watercraft is stable cannot be evaluated just from watching videos. (D.I. 236 at 14-15). The record shows that watching a video of a watercraft can, at

---

[5] I construed the preamble of claim 1 of the '659 ***patent*** to be limiting and to require static and dynamic stability. (D.I. 212 at 7). Claim 2 of the '659 ***patent*** depends from claim 1.

[6] Waydoo does not argue that its eFoils are not statically stable.

[7] As I noted when addressing Waydoo's motion for summary judgment on non-infringement of the '659 ***patent***, "The parties agree that this type of analysis can be used to assess whether a watercraft is dynamically stable." (D.I. 153 at 8 (citing D.I. 83 at 31; and then citing D.I. 91 at 43)). "If an eigenvalue analysis reports a positive 'sigma value,' it indicates that [a watercraft] is unstable." (D.I. 153 at 8 (quoting D.I. 83 at 3)).

least, give some indication about stability. (D.I. 242 at 840:24-841:11 (Triantafyllou); D.I. 241 at 482:2-5 (Barry)). Therefore, it was reasonable for the jury to consider Mr. Barry's testimony about stability based on the videos of the Waydoo eFoils.

The jury did not just have the video evidence and Mr. Barry's testimony about the stability of Waydoo's eFoils. The jury also had Mr. Barry's testimony about the eigenvalue analysis he performed, from which he concluded that the eFoils were stable. (D.I. 241 at 423:10-424:15).

The eigenvalue analysis produced at least one marginally positive sigma value for the Waydoo eFoil, indicating that the eFoils are dynamically unstable. (*Id.* at 471:22-25). Mr. Barry, however, testified that there are real-world damping effects that the analysis program did not consider. (*Id.* at 474:1-5, 474:11-16). The damping effects, if considered, would result in lesser sigma values than the program would indicate. (*Id.* at 471:6-10). Mr. Barry did not quantify the damping effects, but provided testimony **[*28]** that the damping effects would be "very large." (*Id.* at 476:6-17). Mr. Barry concluded the eigenvalue analysis supported his dynamic stability conclusion notwithstanding the one marginally positive sigma value.

Thus, the jury was free to consider Mr. Barry's testimony about the videos and his eigenvalue analysis and weigh it against the testimony of Waydoo's expert. It is not my place to determine the credibility of the witnesses. *Perkin-Elmer*, 732 F.2d at 893.

I think there is substantial evidence to support the jury's determination. Therefore, Waydoo's JMOL motion is denied.

Likewise, I find that the jury's determination that Waydoo infringed the '659 ***patent*** is not against the clear weight of the evidence. Therefore, Waydoo's motion for a new trial is denied.

D. Damages

Waydoo contends that the jury's damages award of a reasonable royalty of $500 per board is not supported by the evidence. Waydoo contends that damages should be limited to a 2.5% royalty rate. (D.I. 236 at 20). Waydoo raises four arguments as to why the royalty rate of $500 per board is not a *reasonable* royalty. I address each one in turn.

First, Waydoo challenges the comparability of the Fliteboard Agreement, which Dr. Stec used as a comparable license agreement, **[*29]** because it was made under the threat of litigation and Dr. Stec did not account for such threats in his analysis. (D.I. 236 at 18). MHL counters that the Fliteboard Agreement was not the product of threats of litigation nor was it used to settle active litigation.

I addressed a similar "threat of litigation" argument in Waydoo's *Daubert* motions. (D.I. 155 at 3). When I denied Waydoo's *Daubert* motion to exclude Dr. Stec's testimony, I noted that the Fliteboard Agreement was not used to settle litigation and that Dr. Stec had a "plausible case for economic comparability." (*Id.*). The jury was free to consider Dr. Stec's testimony regarding the Fliteboard Agreement.

Second, Waydoo contends that the Fliteboard Agreement is not comparable because it included two other ***patents***, in addition to the Asserted ***Patents***, and Dr. Stec failed to apportion any value to those two ***patents*** in the Fliteboard Agreement. (D.I. 236 at 19). MHL contends that Dr. Stec did an apportionment analysis of the Fliteboard Agreement and concluded that the two non-asserted ***patents*** here had no value. I agree with MHL that Dr. Stec did an apportionment analysis. He testified that he apportioned no value to the two non-asserted **[*30]** ***patents*** as they were "thrown in" as Mr. Wagner, President of MHL Custom, informed him that those ***patents*** "didn't guide the license in any way, shape or form." (D.I. 241 at 617:16-25). Waydoo contends that Dr. Stec relied on Mr. Wagner's representation about the value of the other ***patents*** and Mr. Wagner never valued a ***patent*** before. Dr. Stec, however, clarified he relied on Mr. Wagner for his perspective of the negotiations. (*Id.* at 618:1-7). The jury was free to consider Dr. Stec's testimony.

Third, Waydoo maintains that the $500 per board royalty is not reasonable because it exceeds Waydoo's 15% profit margin (i.e., $450 per board) and, thus, would not have been the agreed upon royalty in a hypothetical negotiation. (D.I. 236 at 19). MHL argues that the $500 per board royalty is reasonable because Mr. Ping testified, at least at one point, that Waydoo's profit margin was 35%. Even though Mr. Ping also testified that Waydoo's profit margin was 15%, MHL argues it was up to the jury to consider the inconsistent testimony to ascertain Waydoo's profit margin.

I think there is substantial evidence to support the jury's determination that $500 per board is a reasonable

royalty. Mr. Ping's **[*31]** testimony about Waydoo's profit margin is inconsistent. At one time he indicated it was 35%. (D.I. 241 at 535:17-536:9). At another time he indicated it was 15% and the 35% value was just a goal. (D.I. 241 at 616:3-5). When a party's witness gives conflicting testimony about something that is solely within the party's knowledge, a jury will usually have a substantial basis to credit either version. Thus, I think the jury to determine that Waydoo's profit margin is 35%.

Even if the 35% profit margin was just Waydoo's goal, however, I think a jury could still consider it when determining a reasonable royalty from a hypothetical negotiation. A hypothetical negotiation takes place on the eve of infringement. *LaserDynamics, Inc. v. Quanta Computer, Inc.*, 694 F.3d 51, 78 (Fed. Cir. 2012) ("Indeed, the basic question posed in a hypothetical negotiation is: if, on the eve of infringement, a willing licensor and licensee had entered into an agreement instead of allowing infringement of the ***patent*** to take place, what would that agreement be?"). It seems reasonable to me that in a hypothetical negotiation the parties would take into account the parties' expectations, such as Waydoo's expected (or even hoped-for) 35% profit margin.

Fourth, Waydoo contends that "the percent **[*32]** royalty of the Fliteboard Agreement is not economically comparable to MHL's per-unit hypothetical negotiation." (D.I. 236 at 19-20). Waydoo contends that for the Fliteboard Agreement to be comparable the royalty should be assessed at $157.50 per board, which is a 5.25% royalty, as used in the Fliteboard Agreement. I addressed a similar issue in Waydoo's *Daubert* motion. (D.I. 155 at 3 ("It is about whether the license should be evaluated on a royalty rate based on percentage of sales price or a royalty rate based on a dollar amount per sales unit."). I determined, "It is for the jury to decide how convincing Dr. Stec's analysis is." (*Id.*). The jury considered Dr. Stec's testimony and chose, at least to some extent, to credit it. Therefore, I do not see this as a reason to grant Waydoo's motion for judgment as a matter of law or a new trial.

I think there was sufficient evidence for the jury to determine a reasonable royalty to be $500 per board. Therefore, Waydoo's JMOL motion is denied.

For the same reasons, I find the jury's award of damages is not against the clear weight of the evidence. Therefore, Waydoo's motion for a new trial is denied.

E. Willfulness

Waydoo contends there is not **[*33]** substantial evidence that Waydoo's infringement was willful. Waydoo argues that MHL did not present any evidence that Waydoo had the specific intent to infringe MHL's ***patents***. (D.I. 236 at 17). Waydoo argues that the only evidence produced at trial were the cease-and-desist letters MHL sent Waydoo on January 31, 2019, April 9, 2019, and April 12, 2019. (*Id.*). Waydoo disputes that it received these letters. (*Id.* at 17 n.13). Waydoo further argues those letters are not sufficient to support a finding of willfulness because the letters, even if received, did not provide specificity regarding the infringement (e.g., no claim charts). (*Id.*). Waydoo argues that none of the cease-and-desist letters refer to Waydoo's Flyer ONE product, which is the product Waydoo is currently selling.

MI-IL contends there is substantial evidence that infringement was willful. MHL argues that the short amount of time between Waydoo's formation as a company and Waydoo's development of an eFoil ready for market implies that Waydoo copied MHL. (D.I. 245 at 15). MHL contends that the cease-and-desist letters informed Waydoo in 2019 that Waydoo was infringing the Asserted ***Patents***. (*Id.* at 16). MHL sent the first **[*34]** two letters to the email address on Waydoo's website and the third letter via mail to Waydoo's physical address. (D.I. 240 at 344:12-19 (Wagner)).

"Under *Halo*, the concept of 'willfulness' requires a jury to find no more than deliberate or intentional infringement." *Eko Brands, LLC v. Adrian Rivera Maynez Enterprises, Inc.*, 946 F.3d 1367, 1378 (Fed. Cir. 2020) (citing *Halo Elecs., Inc. v. Pulse Elecs., Inc.*, 579 U.S. 93, 105, 136 S. Ct. 1923, 195 L. Ed. 2d 278 (2016)). Taking all reasonable inferences in MHL's favor, I think it is reasonable for the jury to infer that Waydoo received the letters given that they were sent to the email address listed on Waydoo's website.

With respect to the content of the cease-and-desist letters, I think they are specific enough for the jury to conclude Waydoo's infringement was willful. The letters referenced the Asserted ***Patents***. (D.I. 240 at 342:24-343:1 (Wagner)). Mr. Wagner testified that the letters referenced the Waydoo Flyer (*id.* at 343:2-5, 343:20-21), which was the eFoil Waydoo was marketing at the time (D.I. 236 at 17).

Waydoo contends that the letters were not specific because they did not include a claim chart. (D.I. 236 at

17). I do not think a claim chart is required to establish that Waydoo had knowledge that it was infringing the Asserted ***Patents***. I think the reference to the ***patents*** and the product Waydoo was marketing is sufficient **[*35]** for the jury to infer that Waydoo knew of the infringement.[8] *See Purewick Corp. v. Sage Prods., LLC, 2023 U.S. Dist. LEXIS 56192, 2023 WL 2734418, at *9 (D. Del. Mar. 31, 2023)* ("Plaintiff must show that the accused infringer knew of the ***patent***-in-suit, and knowingly or intentionally infringed the ***patent*** after acquiring that knowledge." (citation and internal quotation marks omitted)), *appeal dismissed*, *2023 U.S. App. LEXIS 16294, 2023 WL 4230367 (Fed. Cir. June 28, 2023)*.

I also do not think that Waydoo started marketing the Flyer One, the second-generation product, in June 2020, necessarily means Waydoo's infringement with respect to the Flyer One is not willful. Waydoo merely points to the fact that the product was not accused in the 2019 letters, which were sent before Waydoo began marketing the Flyer One. Waydoo does not point to any differences between the models that would lead one to think the Flyer One was different from the Flyer with respect to infringing the Asserted ***Patents***. Taking all reasonable inferences in MI-IL's favor, I think a jury could infer that Waydoo knew the Flyer One was infringing the Asserted ***Patents*** because of its knowledge that the Flyer was infringing.

I think there is substantial evidence that Waydoo knew of the Asserted ***Patents*** and that its products infringed the Asserted ***Patents***. Therefore, Waydoo's JMOL motion is denied.

For the **[*36]** same reasons, I find the jury's finding of willful infringement is not against the clear weight of the evidence. Therefore, Waydoo's motion for a new trial is denied.

IV. CONCLUSION

For the reasons discussed above, Waydoo's renewed JMOL motions and motions for a new trial are denied.

An appropriate order will issue.

ORDER

For the reasons stated in the accompanying opinion, IT IS HEREBY ORDERED that Defendants' Motions for Renewed Judgment as a Matter of Law and Motion for a New Trial (D.I. 234) is DENIED.

IT IS SO ORDERED this 6 day of September 2023.

/s/ Richard G. Andrews

United States District Judge

End of Document

[8] Waydoo appears to argue that the letters only "'assert[]' that a Waydoo eFoil infringes" the Asserted ***Patents***." (D.I. 236 at 17 (citing D.I. 240 at 342:14-343:5 (Wagner)). Even if the letters only referenced a Waydoo eFoil, rather than the Flyer by name, I think that is sufficient to put Waydoo on notice as it was only marketing one eFoil at the time. (D.I. 236 at 17 (noting the Flyer ONE was not introduced until June 2020)).

Caution
As of: April 11, 2024 10:31 AM Z

MHL Custom, Inc. v. Waydoo USA, Inc.

United States District Court for the District of Delaware

September 7, 2023, Decided; September 7, 2023, Filed

Civil Action No. 21-0091-RGA

Reporter
2023 U.S. Dist. LEXIS 158243 *; 2023 WL 5805889

MHL CUSTOM, INC., Plaintiff, v. WAYDOO USA, INC. and SHENZHEN WAYDOO INTELLIGENCE TECHNOLOGY CO., LTD., Defendants.

Subsequent History: Appeal filed, 10/12/2023

Prior History: *MHL Custom, Inc. v. Waydoo USA, Inc., 2022 U.S. Dist. LEXIS 111958, 2022 WL 2290660 (D. Del., June 24, 2022)*

Core Terms

damages, infringement, ongoing, royalty, argues, ***patents***, permanent injunction, supplemental, irreparable harm, enhancing, enhanced damage, market share, contends, parties, injunction, post-judgment, competitors, patentee, license, weighs, factors, judicial estoppel, royalty rate, eFoils, pre-judgment, products, attorney's fees, lost sales, sales, direct competitor

Counsel: **[*1]** For MHL Custom, Inc., Plaintiff: Blake A. Bennett, LEAD ATTORNEY, Cooch and Taylor, Wilmington, DE; Brian P. McGraw, Dennis D. Murrell, Megan E. Gibson, Robert J. Theuerkauf.

For Waydoo USA, Inc., a Delaware corporation, Defendant: Dorronda R. Bordley, Kelly E. Farnan, LEAD ATTORNEYS, Richards, Layton & Finger, PA, Wilmington, DE; Edgar H. Haug, Mark Basanta, Robert E. Colletti, Roman Khasidov.

For Shenzhen Waydoo Intelligence Technology Co., Ltd., a limited liability company of China, Defendant: Dorronda R. Bordley, Kelly E. Farnan, LEAD ATTORNEYS, Richards, Layton & Finger, PA, Wilmington, DE; Edgar H. Haug, Mark Basanta, Robert E. Colletti, Roman Khasidov, PRO HAC VICE.

For Shenzhen Waydoo Intelligence Technology Co., Ltd., a limited liability company of China, Waydoo USA, Inc., a Delaware corporation, Counter Claimants: Dorronda R. Bordley, Kelly E. Farnan, LEAD ATTORNEYS, Richards, Layton & Finger, PA, Wilmington, DE.

For MHL Custom, Inc., Counter Defendant: Blake A. Bennett, LEAD ATTORNEY, Cooch and Taylor, Wilmington, DE; Dennis D. Murrell, Robert J. Theuerkauf.

Judges: Richard G. Andrews, United States District Judge.

Opinion by: Richard G. Andrews

Opinion

MEMORANDUM OPINION

September 7, 2023

/s/ Richard G. Andrews **[*2]**

ANDREWS, UNITED STATES DISTRICT JUDGE:

Before me are Plaintiff MHL's post-trial motions. MHL seeks a permanent injunction (D.I. 230), attorneys' fees (D.I. 231), enhanced damages (D.I. 232), supplemental damages, ongoing damages, and pre- and post-judgment interest (D.I. 233). The motions have been fully briefed. (D.I. 235, 246, 250).

I. BACKGROUND

MHL filed suit against the Waydoo Defendants asserting infringement of U.S. ***Patent*** Nos. 9,359,044 (the "'044 ***patent***") and ***9,586,659*** (the "'659 ***patent***"). (D.I. 1). The asserted ***patents*** relate to a weight-shift controlled personal hydrofoil watercraft, often referred to as an eFoil. The asserted ***patents*** share a common specification.

I held a jury trial from March 24-31, 2023, on claims 1-2,

5, and 6 of the '044 ***patent*** and claims 1-2 of the '659 ***patent***. The jury found the asserted claims to be valid and infringed, the infringement was willful, and MHL was entitled to a reasonable royalty of $500 per board (totaling $1,334,000 in damages). (D.I. 219). The parties have now filed post-trial motions.[1] MHL requests the following: (1) a permanent injunction; (2) supplemental damages and/or ongoing damages; (3) pre- and post-judgment interest; (4) enhanced damages; and (5) attorneys' fees. (D.I. 235 at 1-2).

II. PERMANENT [*3] INJUNCTION

A. Legal Standard

Courts "may grant injunctions in accordance with the principles of equity to prevent the violation of any right secured by ***patent***, on such terms as the court deems reasonable." *35 U.S.C. § 283*. "According to well-established principles of equity, a plaintiff seeking a permanent injunction must satisfy a four-factor test before a court may grant such relief." *eBay Inc. v. MercExchange, L.L.C., 547 U.S. 388, 391, 126 S. Ct. 1837, 164 L. Ed. 2d 641 (2006)*. "A plaintiff must demonstrate: (1) that it has suffered an irreparable injury; (2) that remedies available at law, such as monetary damages, are inadequate to compensate for that injury; (3) that, considering the balance of hardships between the plaintiff and defendant, a remedy in equity is warranted; and (4) that the public interest would not be disserved by a permanent injunction." *Id.*

"The essential attribute of a ***patent*** grant is that it provides a right to exclude competitors from infringing the ***patent***." *Acumed LLC v. Stryker Corp., 551 F.3d 1323, 1328 (Fed. Cir. 2009)*.

B. Analysis

1. Judicial Estoppel

As an initial matter, Waydoo argues that the doctrine of judicial estoppel should prevent MHL from obtaining a permanent injunction. Waydoo cites MHL's closing argument when MHL said, "MHL's not trying to put Waydoo out of business, but is asking for fair compensation for their **[*4]** use of these ***patents***. Just like Fliteboard is paying a fair compensation for the use of the ***patents***." (D.I. 244 at 1126:19-22). Waydoo contends this statement amounts "to telling the jury [MHL] was not seeking [an injunction]." (D.I. 246 at 2). Waydoo argues MHL should be estopped from seeking a permanent injunction now because "[a] permanent injunction would, of course, put Waydoo out of business in the U.S." (*Id.*).

MHL argues that judicial estoppel is inappropriate. MHL contends that it never told the jury it was not seeking a permanent injunction and that the statement in its closing argument is not "irreconcilably inconsistent" with its motion seeking a permanent injunction now. (D.I. 250 at 2-3).

The doctrine of judicial estoppel bars a party that has previously asserted a legal position from asserting an inconsistent or contrary legal position in a later proceeding. *Oneida Motor Freight, Inc. v. United Jersey Bank, 848 F.2d 414, 419 (3d Cir. 1988)*. The equitable remedy of judicial estoppel is applied to preserve the integrity of the system. Its focus is on the relationship between the litigant and the judicial system. *Id.* The elements of judicial estoppel are: (1) the party to be estopped is taking two irreconcilably inconsistent positions; (2) the party to **[*5]** be estopped has changed his or her position in bad faith; and (3) the use of judicial estoppel is tailored to address the harm identified and no lesser sanction would adequately remedy the damage done. *See Montrose Med. Group Participating Savings Plan v. Bulger, 243 F.3d 773, 777-78 (3d Cir. 2001)*.

I agree with MHL that judicial estoppel is inappropriate here. The statements in MHL's closing argument came in the context of discussing what a reasonable royalty would be. (*See* D.I. 244 at 1125:23-1127:13). MHL was asking for a royalty rate of $550 per board, which is approximately the same amount Fliteboard was paying per board.[2] I do not think the statement, "MHL's not trying to put Waydoo out of business," amounts to a declaration that MHL was not seeking apermanent injunction. The issue of injunctive relief was not before the jury. (D.I. 212 at 6 ("The Court held that MHL shall

[1] Waydoo's post-trial motions are addressed in a separate opinion. (D.I. 257).

[2] The Fliteboard Agreement used a royalty rate that was a percentage of the sale price, rather than a flat dollar amount per board. (D.I. 241 at 556:13-14 (Stec)). Based on Fliteboard's sales price, the dollar amount per board was approximately $550. (*See* D.I. 241 at 557:19-558:2, 559:14-560:3 (Stec)).

not present any evidence to the jury related to its claims for fees, costs, or an injunction")). Therefore, I find that neither this statement, nor the comparison with Fliteboard, is irreconcilably inconsistent with seeking a permanent injunction.

Thus, I find the judicial estoppel does not apply here.

2. Irreparable Injury

"To prove irreparable injury, a patentee must show '1) that absent an injunction, **[*6]** it will suffer irreparable harm, and 2) that a sufficiently strong causal nexus relates the alleged harm to the alleged infringement.'" *Presidio Components, Inc. v. Am. Tech. Ceramics Corp., 875 F.3d 1369, 1383 (Fed. Cir. 2017)* (cleaned up) (quoting *Apple Inc. v. Samsung Elecs. Co., 695 F.3d 1370, 1374 (Fed. Cir. 2012)*). "To determine whether the patentee will suffer irreparable harm absent an injunction, the court may consider factors such as the nature of competition between the patentee and the infringer, the willingness of a patentee to license, and any lost sales the patentee has proven." *Presidio Components, 875 F.3d at 1383*.

a. Nature of Competition

Direct competition strongly suggests the potential for irreparable harm absent an injunction. *Id.* at 1363 (vacating denial of a permanent injunction based on finding no irreparable injury because the record showed "direct and substantial competition between the parties"); *see also Douglas Dynamics, LLC v. Buyers Prods. Co., 717 F.3d 1336, 1345 (Fed. Cir. 2013)* ("Where two companies are in competition against one another, the patentee suffers the harm—often irreparable—of being forced to compete against products that incorporate and infringe its own ***patented*** inventions."). A patentee may establish irreparable harm by showing "that [the parties] were competitors and that [the patentee] lost market share while [the infringer] gained it." *See Broadcom Corp. v. Emulex Corp., 732 F.3d 1325, 1338 (Fed. Cir. 2013)* (upholding the district court's grant of a permanent injunction).

MHL argues **[*7]** that MHL and Waydoo are direct competitors and that MHL will be irreparably harmed by losing market share to Waydoo. (D.I. 235 at 3-5). MHL points out that Waydoo and MHL, at one time, had the same distributor and MHL retailers have stated they have lost sales to Waydoo. (*Id.* at 4). MHL contends that they have lost, and will continue lose, market share to Waydoo. From 2018 to 2022, MHL's market share decreased from 100%[3] to 55%, and Waydoo's market share grew from 0% to 10-15%. (*See* D.I. 240 at 340:25-341:16 (Wagner)). Waydoo contends that MHL and Waydoo are not direct competitors. Waydoo argues the two parties cannot be direct competitors as they "occupy different market segments because they sell eFoils at different price points." (D.I. 246 at 4). Waydoo argues the evidence regarding competition is lacking as only one distributor, Mr. Tamayo, is alleged to have represented that he lost MHL sales to Waydoo. (*Id.* at 5).

I find MHL and Waydoo are direct competitors. Mr. Wade, the North American distributor of Waydoo eFoils (D.I. 242 at 687:6-7), admitted there was some overlap in the market between the two companies. (*See id.* at 715:24-716:9 (Wade) (testifying both companies sell eFoils **[*8]** and there is "certainly some overlaps" between them in the market)). While Mr. Wade tried to distinguish the two companies' products by price point by analogizing Waydoo to selling Honda Civics and MHL to selling Ferraris (*id.* at 716:7-9 (Wade)), I do not think the different price points means they are not direct competitors. *See Douglas Dynamics, 717 F.3d at 1344* (finding irreparable harm when analogizing patentee's product to a Mercedes and infringer's product to a Ford). I think what matters here is that MHL and Waydoo both market similar products through similar distribution channels and sellers with similar end users in mind. Therefore, I think the parties are direct competitors, which weighs in favor of MHL suffering an irreparable harm absent an injunction.

b. Willingness of Patentee to License

MHL has licensed the asserted ***patents*** to other competitors in the market, including Fliteboard, which has a larger market share than Waydoo. (D.I. 240 at 206:19-207:4 (Leason); *id.* at 340:25-341:16 (Wagner)). Mr. Leason, MHL's CEO, testified that MHL is open and willing to license the asserted ***patents*** to competitors. (*Id.* at 207:23-25 ("But, ultimately we agreed that a rising tide can raise all boats, right, and there was **[*9]** not much of a market."); 208:5-7 ("And so, it's perfectly fine to have a competitor out there. In fact, it makes you a better brand, you know, when you have somebody to compete with."); 212:6-7 ("I've always left that door open

[3] At that time, MHL was the only manufacturer of eFoils.

for the competitors."). Mr. Leason's statements indicate that MHL would not suffer an irreparable harm by having Waydoo compete in the market.

MHL argues that licensing the asserted ***patents*** to other competitors in the market should not weigh against a permanent injunction because MHL only licensed to parties that "did not force MHL to spend significant money to litigate over the course of many years" and the parties "respected MHL's intellectual property and did the right thing." (D.I. 250 at 4).

I do not think the fact that MHL has only licensed to companies that MHL did not sue is a relevant distinction. To the contrary, I would think MHL's willingness to license the ***patents*** without requiring litigation would be evidence that licensing the ***patents*** is not an irreparable harm. "Litigation costs are undoubtedly undesirable and may take funds away from other endeavors, but they are not an irreparable harm in the injunction calculus." *ActiveVideo Networks, Inc. v. Verizon Commc'ns, Inc.*, 694 F.3d 1312, 1337 (Fed. Cir. 2012). While MHL may justifiably **[*10]** feel that Waydoo disrespected its intellectual property, that is not an irreparable harm.

Therefore, I think MHL's willingness to license its ***patents***, and the fact that it has licensed its ***patents*** to a bigger competitor in the market, weighs against finding that MHL would suffer an irreparable harm absent an injunction.

c. Lost Sales

MHL argues that it has and will lose sales to Waydoo. I do not think MHL has carried its burden in showing this. At trial, the jury awarded damages in the form of a reasonable royalty, not lost sales. (D.I. 219 at 4-5).[4] The only evidence MHL cites regarding lost sales is (1) its termination of its relationship with MacKite, a distributor, and (2) a statement Mr. Tamayo, another distributor, made to Dr. Stec. (D.I. 235 at 4).

MHL, however, chose to terminate its relationship with MacKite because MacKite started carrying Waydoo eFoils. (D.I. 241 at 569:5-11 (Stec)). I do not think MHL's decision to terminate its relationship with MacKite, as opposed to MacKite dropping MHL, is enough to show that it lost sales due to Waydoo infringing the asserted ***patents***. There is also no evidence to quantify the number of sales MHL would have had if that relationship still **[*11]** existed. Likewise, the statement from Mr. Tamayo to Dr. Stec did not detail or quantify the number of sales MHL allegedly lost to Waydoo. (D.I. 241 at 626:22-627:24 (Stec)). Such allegations are not sufficient to demonstrate irreparable harm through lost sales.

MHL argues that it has lost, and will continue to lose, market share to Waydoo. MHL cites the growth of Waydoo's market share over the past four years and MHL's loss of market share over that same time as evidence. (D.I. 235 at 4). I am not persuaded. As MHL concedes, during that same time Fliteboard entered the market and has grown to occupy 25-30% of the market. The absence of a two-player market does not automatically negate irreparable harm, *Robert Bosch LLC v. Pylon Mfg. Corp.*, 659 F.3d 1142, 1151 (Fed. Cir. 2011), but it is still MHL's burden to show that Waydoo's infringement caused MHL's loss in market share. "As [MHL] and [Waydoo] are not the only competitors in this multi-supplier market, [Waydoo's] infringement has not necessarily affected [MHL's] market position." *Belden Techs., Inc. v. Superior Essex Commc'ns LP*, 802 F. Supp. 2d 555, 577 (D. Del. 2011); *see also Wonderland Switzerland AG v. Evenflo Co., Inc.*, 2022 U.S. Dist. LEXIS 118061, 2022 WL 2438750, at *3 (D. Del. July 5, 2022) (finding plaintiff did not show defendant's infringement caused plaintiff to lose market share when there were many additional competitors), *appeal docketed*, No. 23-1947 (Fed. Cir. July 27, 2023). Given that Waydoo markets its products at a significantly **[*12]** lower price point than MHL (D.I. 243 at 716:1-7 (noting there is about a $2000 difference between the cheapest MHL product and the most expensive Waydoo product) (Kline)), I do not think a sale made by Waydoo is automatically a sale lost by MHL.

Furthermore, even if MHL has lost some market share to Waydoo, MHL has lost a more substantial portion of the market to Fliteboard, one of its own licensees. As such, I do not think losing a smaller portion of the market to Waydoo is necessarily an irreparable harm.

Therefore, I do not think that MHL has met its burden in showing that Waydoo's infringement has caused MHL to lose market share or sales such that MHL would suffer an irreparable harm.

3. Remedies Available at Law

MHL raises two arguments for why remedies at law are

[4] MHL did not pursue a damages theory based on lost sales. (*See* D.I. 211, Ex. 3 at 10).

inadequate. First, MHL argues it will continue to lose market share to Waydoo and money alone cannot compensate it for this loss. I disagree for the same reasons that I find MHL will not suffer an irreparable harm.

Second, MHL argues that an ongoing royalty is not an adequate remedy because Waydoo's accounting records are unreliable. MHL cites inconsistencies in Waydoo's accounting of the number of eFoils it sold and Mr. **[*13]** Ping's testimony that Waydoo's accounting records were "not very good." (D.I. 235 at 5-6, 6 n.2). I am not persuaded this makes damages an inadequate remedy. Mr. Ping testified there were accounting issues from 2018-2020. (D.I. 242 at 685:23-686:1). The accounting issues appear to have ceased in 2020, three years ago. MHL does not cite anything to indicate these issues are ongoing or will emerge in the future. Therefore, I find that MHL has not shown that damages are inadequate to compensate for Waydoo's infringement.

4. Balance of Hardships and Public Interest

Given my conclusions regarding irreparable harm and the remedies available at law, I need not make any findings concerning the balance of hardships and public interest factors.

MHL's motion for a permanent injunction is denied.

C. SUPPLEMENTAL DAMAGES

The jury's award covered infringement up through December 31, 2022, the most recent date for which Waydoo had produced sales and financial records. (D.I. 235 at 9). MHL seeks supplemental damages at the $500 per board royalty determined by the jury for the period from January 1, 2023, to the entry of the permanent injunction. (*Id.*). I, however, have denied MHL's motion for a permanent **[*14]** injunction. Given that MHL has moved for ongoing royalties at the jury-determined royalty rate, I take MHL to be arguing for supplemental damages up until the date of judgment in the event I do not grant a permanent injunction or grant ongoing royalties.

Waydoo argues that MHL waived its ability to request supplemental damages by not presenting the issue to the jury. (D.I. 246 at 9). Waydoo further contends that awarding supplemental damages would violate its Seventh Amendment right to a jury trial. (*Id.*). Waydoo does not argue that MHL had any accounting by way of discovery from Waydoo of the eFoils sold after December 31, 2022. (*See id.* at 9-11).

I find that MHL is entitled to supplemental damages. First, awarding MHL supplemental damages does not violate Waydoo's Seventh Amendment right to a jury trial. "[T]he amount of supplemental damages following a jury verdict is a matter committed to the sound discretion of the district court." SynQor, Inc. v. Artesyn Techs., Inc., 709 F.3d 1365, 1384 (Fed. Cir. 2013) (rejecting defendants' argument that they had a right to a jury trial with respect to plaintiff's claim for supplemental damages); *see also* Bayer Healthcare LLC v. Baxalta Inc., 989 F.3d 964, 986-87 (Fed. Cir. 2021) (rejecting Seventh Amendment argument to find "the district court acted within its discretion in awarding supplemental damages" when it calculated pre-verdict supplemental **[*15]** damages by applying the jury's royalty rate to the actual infringing sales base).

Second, I do not think MHL waived its right to supplemental damages. In its reply brief, MHL cites its statement of legal issues for trial in the pretrial order, which recites,

> In addition, in the event that [MHL] prevails at trial, it will seek injunctive relief against further infringement and additional damages and/or an accounting for royalties accruing as a result of [Waydoo's] continuing infringement after September of 2022, the most recent date for which [Waydoo] ha[s] produced financial information in this case.

(D.I. 206-3, Ex. 3 at 11).[5] This issue was preserved in the pre-trial order. Since MHL was not seeking lump sum damages, I think MHL had no basis to ask for reasonable royalty damages for a time period for which, due to recency, it could not possibly present a royalty base. MHL has not waived its right to supplemental damages simply because the issue was not presented to the jury.

Therefore, I find that MHL is entitled to supplemental damages from January 1, 2023, to April 12, 2023, the date of the judgment (D.I. 226).

D. ONGOING DAMAGES

[5] It appears that shortly before trial Waydoo provided an update on what it had sold from August 2022 to December 2022. (D.I. 637:22-638:7 (Stec)). I assume that is why the pre-trial order differs from the trial testimony.

Waydoo argues that MHL waived its ability to request ongoing **[*16]** damages by not presenting the issue to the jury. Waydoo contends that awarding ongoing damages would violate its Seventh Amendment right to have a jury decide damages. I disagree.

As noted above, this issue was included in the pre-trial order. (D.I. 206-3, Ex. 3 at 11). Therefore, MHL did not waive its right to ongoing damages. Furthermore, the Federal Circuit and this Court have held that "there is no Seventh Amendment right to jury trial for ongoing royalties." Godo Kaisha IP Bridge 1 v. TCL Commc'n Tech. Holdings Ltd., 2019 U.S. Dist. LEXIS 70752, 2019 WL 1877189, at *4 (D. Del. Apr. 26, 2019) (citing Paice LLC v. Toyota Motor Corp., 504 F.3d 1293, 1315-16 (Fed. Cir. 2007)), *aff'd*, 967 F.3d 1380 (Fed. Cir. 2020). Therefore, I reject Waydoo's argument that it is unconstitutional to award ongoing damages.

It is within this Court's discretion to impose an ongoing royalty, but granting ongoing remedies is not automatic any time a permanent injunction is denied. Paice, 504 F.3d at 1314-15. While an ongoing royalty is not automatic, "the Federal Circuit has indicated that a prevailing patentee should receive compensation for any continuing infringement." Vectura Ltd. v. GlaxoSmithKline LLC, 2019 U.S. Dist. LEXIS 155768, 2019 WL 4346502, at *6 (D. Del. Sept. 12, 2019) (quoting Apple, Inc. v. Samsung Elecs. Co., 2014 U.S. Dist. LEXIS 165975, 2014 WL 6687122, at *9 (N.D. Cal. Nov. 25, 2014)).

To determine the ongoing royalty rate, courts have used the *Georgia-Pacific* factors. "Generally, the jury's damages award is a starting point for evaluating ongoing royalties." Apple, Inc., 2014 U.S. Dist. LEXIS 165975, 2014 WL 6687122, at *14. In assessing ongoing royalties, I must consider (1) the "change in the parties' bargaining positions, and the resulting change in economic **[*17]** circumstances, resulting from the determination of liability," Amado v. Microsoft Corp., 517 F.3d 1353, 1360 (Fed. Cir. 2008), (2) "changed economic circumstances, such as changes related to the market for the ***patented*** products," XY, LLC v. Trans Ova Genetics, 890 F.3d 1282, 1297 (Fed. Cir. 2018), and (3) any other "post-verdict factor" that would impact "what a hypothetical negotiation would look like after the prior infringement verdict." *Id.*

MHL argues I should award ongoing royalties at the jury-determined royalty rate: $500 per board. (D.I. 235 at 10). The only rationale MHL offers to support this is the fact that the jury's damages award is a starting point (*id.* (citing Apple, 2014 U.S. Dist. LEXIS 165975, 2014 WL 6687122, at *14)) and that ongoing royalty rates are often higher than rates awarded at trial (*id.* (citing Telcordia Techs., Inc. v. Cisco Sys., Inc., 2014 U.S. Dist. LEXIS 51076, 2014 WL 1457797, at *4 (D. Del. Apr. 14, 2014)). Waydoo, however, points out a series of factual issues such as potential changes in the marketplace (e.g., new competitors, new products from MHL at lower price points, etc.), which would change the royalty on which the parties would agree. (D.I. 246 at 11).

I do not think that using the jury's royalty rate of $500 per board is appropriate just because the jury's damages award is a starting point and ongoing royalties are frequently higher. Case law advises to take into consideration "additional economic factors arising out of the imposition of **[*18]** an ongoing royalty." Paice, 504 F.3d at 1315; *see also* Telcordia Techs., 2014 U.S. Dist. LEXIS 51076, 2014 WL 1457797, at *4 ("However, the court must assess an ongoing royalty in light of relevant post-verdict economic circumstances.").

Given that an ongoing royalty only becomes a ripe issue once I deny the request for a permanent injunction, and that neither party has sufficiently addressed the relevant factors in their briefing, I am not now equipped to determine what an appropriate ongoing royalty ought to be. The Federal Circuit has advised that a prudent course of action is to first let the parties attempt to negotiate an ongoing royalty rate, and then the district court can weigh in if necessary. Paice, 504 F.3d at 1315.I think the parties are best positioned to negotiate a royalty. Therefore, I will dismiss MHL's motion for ongoing royalties without prejudice. The parties are directed to attempt to negotiate an ongoing royalty rate. If the parties are unable to come to an agreement, MHL is free to file another motion for ongoing royalties.

E. PRE-AND POST-JUDGMENT INTEREST

MHL seeks pre- and post-judgment interest on its damages.

Pre-judgment interest should be awarded "absent some justification for withholding such an award." Gen. Motors Corp. v. Devex Corp., 461 U.S. 648, 657, 103 S. Ct. 2058, 76 L. Ed. 2d 211 (1983). Waydoo argues MHL should not be entitled to pre-judgment interest **[*19]** because MHL delayed filing suit by two years. (D.I. 246 at 11). Waydoo contends this two-year period is an undue delay as it caused Waydoo's damages to escalate. (*Id.* at 12 (citing Crystal Semiconductor Corp.

v. TriTech Microelectronics Int'l, Inc., 246 F.3d 1336, 1362 (Fed. Cir. 2001)). I disagree.

Crystal Semiconductor does not stand for the rule that a two-year delay is an undue delay. The Federal Circuit rejected such an interpretation in Kaufman v. Microsoft Corp., 34 F.4th 1360, 1375 (Fed. Cir. 2022). The Federal Circuit, instead, has advised that "to show that delay was undue, a defendant must, at least generally, show that it was prejudiced." *Id.* Waydoo has not presented any argument that it was prejudiced by the delay. Waydoo merely argues that its damages are higher due to the delay in filing the suit. (D.I. 246 at 12). Waydoo, however, does not contend that it would have mitigated its damages but for the delay. Kaufman, 34 F.4th 1375 (reversing the district court's decision to withhold pre-judgment interest when the only evidence of prejudice to the defendant was that it "could have," but not that it "would have," altered the infringing product to create a non-infringing alternative). Therefore, I find that MHL is entitled to pre-judgment interest.

MHL argues the interest rate and compounding period should be the prime rate, compounded quarterly. (D.I. 235 at 11). Waydoo does not **[*20]** argue for a different interest rate or compounding period.[6] Therefore, I will award pre-judgment interest at the prime rate, compounded quarterly.[7]

Post-judgment interest is governed by 28 U.S.C. § 1961. Section 1961(a) provides, "Such interest shall be calculated from the date of the entry of the judgment, at a rate equal to the weekly average 1-year constant maturity Treasury yield, as published by the Board of Governors of the Federal Reserve System, for the calendar week preceding the date of the judgment." Waydoo has not presented any argument as to why I should not assess post-judgment interest. Accordingly, I will award MHL post-judgment interest at the Treasury bill rate as defined in § 1961(a), compounded annually.

[6] Waydoo disputes the amount of damages on which the interest is assessed by contending the amount of damages awarded by the jury is against the clear weight of the evidence. (D.I. 246 at 12). Waydoo raises this issue in its motion for renewed judgment as a matter of law. (D.I. 234). I denied that motion. (D.I. 257 & 258).

[7] This is what I have done for a number of cases. *See* Bayer Healthcare LLC v. Baxalta Inc., 2019 U.S. Dist. LEXIS 144464, 2019 WL 4016235, at *7 n.9 (D. Del. Aug. 26, 2019) (collecting cases), *aff'd*, 989 F.3d 964 (Fed. Cir. 2021).

F. ENHANCED DAMAGES

1. Legal Standard

"[T]he court may increase the damages up to three times the amount found or assessed." 35 U.S.C. § 284. Enhanced damages are "designed as a 'punitive' or 'vindictive' sanction for egregious infringement behavior," which is "willful, wanton, malicious, bad-faith, deliberate, consciously wrongful, flagrant, or—indeed—characteristic of a pirate." Halo Elecs., Inc. v. Pulse Elecs., Inc., 579 U.S. 93, 103-04, 136 S. Ct. 1923, 195 L. Ed. 2d 278 (2016). Enhanced damages are "not to be meted out in a typical infringement case." Id. at 103. A jury's finding of willful infringement is a prerequisite **[*21]** to the enhancement of damages but is not by itself sufficient. Presidio Components, Inc. v. Am. Tech. Ceramics Corp., 875 F.3d 1369, 1382 (Fed. Cir. 2017).

Although not required, the court may consider the non-exclusive *Read* factors as part of its analysis. Id. at 1382-83 (citing Read Corp. v. Portec, Inc., 970 F.2d 816 (Fed. Cir. 1992)). The *Read* factors include: (1) whether the infringer deliberately copied the ideas or design of another; (2) whether the infringer, when he knew of the other's ***patent*** protection, investigated the scope of the ***patent*** and formed a good-faith belief that it was invalid or that it was not infringed; (3) the infringer's behavior as a party to the litigation; (4) defendant's size and financial condition; (5) closeness of the case; (6) duration of defendant's misconduct; (7) remedial action by defendant; (8) defendant's motivation for harm; and (9) whether defendant attempted to conceal its misconduct. *Read*, 970 F.2d at 827.

For *Read* factor one, MHL argues there is direct evidence of copying "from the fact that Waydoo's first iteration . . . was a carbon copy of the ***patented*** product's design." (D.I. 250 at 9). MHL, however, does not cite to anything to support its assertion that the products are so alike that they must have been copied. MHL contends there is circumstantial evidence of copying based on the timeline for Waydoo forming a company and bringing **[*22]** its eFoil to market. (D.I. 235 at 13). I do not think this factor weighs in favor of enhancing damages. MHL essentially argues that Waydoo must have copied because there can be no other explanation for how Waydoo developed a complete eFoil ready for the market in seven months when it took MHL and Dr. Langelaan years to

accomplish the same feat. (*Id.*). I do not think the record makes it more likely than not that Waydoo copied MHL's product.

For *Read* factor two, MHL argues that Waydoo did not have a good faith belief that the asserted ***patents*** were invalid or not infringed. MHL contends Waydoo's defenses are merely "litigation-inspired" defenses. (*Id.* at 14). MHL further cites to the jury's finding of willful infringement. Waydoo contends that it had a good faith belief that the asserted ***patents*** were invalid as anticipated by the Evolo Report. (D.I. 246 at 14 (citing D.I. 246-2, Ex. 4, at 74:24-75:23)).[8] In view of the willful infringement verdict, I find this factor weighs in favor of enhancing damages.

For *Read* factor three, MHL contends that Waydoo's litigation was not reasonable because they presented arguments that "could be considered weak at best and borderline frivolous at worst." (D.I. **[*23]** 235 at 14). I disagree.

I do not think Waydoo's arguments were unreasonable or particularly weak. I denied MHL's motions for summary judgment that Waydoo infringed the '044 ***patent*** and that the asserted ***patents*** were not invalid as anticipated. (D.I. 154). I found genuine issues of material fact for both. MHL takes issue with the fact that Waydoo relied primarily on expert testimony for many of its arguments regarding obviousness and enablement. (D.I. 235 at 15-16). I do not think that alone makes Waydoo's arguments frivolous or its actions misconduct. I note that it is the norm in ***patent*** litigation to rely primarily upon expert testimony for such arguments.

Overall, I do not think Waydoo's conduct was unreasonable. Indeed, I think many of these issues were closer than how MHL portrays them. Therefore, I find this factor weighs against enhancing damages.

For *Read* factor four, MHL argues that Waydoo will not be jeopardized by enhancing damages as Waydoo does millions of dollars in revenue each year. Waydoo contends that MHL cites Waydoo's revenues, not its profits, and that its profits over the relevant period were approximately $900,000. (D.I. 246 at 18; D.I. 85-1 at 1024-25 of 1039). Waydoo argues that **[*24]** enhancing damages would jeopardize its financial well-being as the jury award ($1,334,000) by itself exceeds its profits. (D.I. 246 at 18).

This Court has looked beyond just profits when considering the fourth factor. *See TruePosition Inc. v. Andrew Corp.*, 568 F. Supp. 2d 500, 528 (D. Del. 2008) (considering a party's revenues and research expenditures). Even when it is shown that the defendant has not turned a profit, this factor is considered neutral. *Bio-Rad Lab'ys Inc. v. 10X Genomics, Inc.*, 2019 U.S. Dist. LEXIS 122912, 2019 WL 3322322, at *10 (D. Del. July 24, 2019), *vacatedon other grounds*, 967 F.3d 1353 (Fed. Cir. 2020). Waydoo has not cited any evidence to indicate that it would be jeopardized by an enhanced damages award. Given that Waydoo generates millions of dollars of revenue, has turned a profit, and may continue to sell products globally, I do not think Waydoo would be jeopardized by enhancing damages. Therefore, I find this factor slightly favors enhancing damages.

For *Read* factor five, MHL argues this case was not close as it prevailed on every issue presented to the jury. While MHL is correct that it prevailed at trial, I do not think that means this case was not close. As discussed in *Read* factor three, I do not think Waydoo's case was particularly weak. Therefore, I find this factor weighs against enhancing damages.

For *Read* factor six, MHL argues that Waydoo has been infringing for four years, **[*25]** including throughout this litigation. Waydoo does not address this factor. Because infringement has been ongoing for so long, I find this factor weighs in favor of enhancing damages. *See Vectura Ltd. v. GlaxoSmithKline LLC*, 2019 U.S. Dist. LEXIS 155768, 2019 WL 4346502, at *4 (D. Del. Sept. 12, 2019) (finding infringement for "nearly three years, which includes a period of post-litigation infringement," favored enhancing damages).

For *Read* factor seven, MHL argues that Waydoo has not taken any remedial action. Waydoo does not address this factor. Therefore, I find this factor favors enhancement.

For *Read* factor eight, MHL concedes there is no motivation to harm. This factor is therefore neutral.

For *Read* factor nine, MHL argues Waydoo attempted to conceal its misconduct as Waydoo only produced one engineering report during discovery, despite Waydoo's head of research and development indicating that there were other reports. (D.I. 235 at 18). Waydoo argues that MHL is raising a discovery dispute for the first time and has not shown how it was harmed by it. (D.I. 246 at 19). Waydoo contends that it has been operating in the open

[8] There was no testimony at trial about Waydoo's beliefs.

(*id.*), which MHL does not dispute. Because Waydoo has been operating in the open, I find this factor weighs against enhanced damages. *See* Ventura, 2019 U.S. Dist. LEXIS 155769, 2019 WL 4346502, at *5 (finding *Read* factor nine weighed against enhancement **[*26]** when it was not in dispute that the defendant operated in the open).

I find that MHL is not entitled to enhanced damages. The *Read* factors, on balance, do not favor enhancing damages. I do not think MHL has demonstrated that Waydoo's conduct warrants enhancing damages. Therefore, MHL's motion for enhanced damages is denied.

G. ATTORNEYS' FEES

1. Legal Standard

The ***Patent*** Act provides, "The court in exceptional cases may award reasonable attorney fees to the prevailing party." 35 U.S.C. § 285. Under the statute there are two basic requirements: (1) that the case is "exceptional" and (2) that the party seeking fees is a "prevailing party." The Supreme Court defined an "exceptional" case as "simply one that stands out from others with respect to the substantive strength of a party's litigating position (considering both the governing law and the facts of the case) or the unreasonable manner in which the case was litigated." *Octane Fitness, LLC v. ICON Health & Fitness, Inc.*, 572 U.S. 545, 545, 134 S. Ct. 1749, 188 L. Ed. 2d 816 (2014). "District courts may determine whether a case is 'exceptional' in the case-by-case exercise of their discretion, considering the totality of the circumstances." *Id.* The Supreme Court has provided a non-exclusive list of factors for district courts to consider in deciding whether a case is exceptional, **[*27]** including frivolousness, deterrence, motivation, and objective unreasonableness in the factual and legal components of the suit. *Id.* at 554 n.6.

MHL refers to the same arguments it presented under the *Read* factors for enhanced damages. (D.I. 235 at 20 ("As discussed in connection with the enhanced damages argument, above, one could reasonably infer based on the result that this case was never close."); *id.* ("Finally, as to the last factor, which is the litigation behavior of [Waydoo], much of this analysis is presented above in connection with the enhanced damages request.")). As discussed above, I found this to be a close case. Waydoo did not engage in misconduct or unprofessional behavior. Therefore, MHL's motion for attorneys' fees is denied.

III. CONCLUSION

For the foregoing reasons, MHL's motion for pre- and post-judgment interest is GRANTED, MHL's motion for supplemental damages is GRANTED-IN-PART and DENIEDIN- PART, MHL's motion for ongoing royalties is DISMISSED without prejudice, MHL's motion for a permanent injunction is DENIED, MHL's motion for enhanced damages is DENIED, and MHL's motion for attorneys' fees is DENIED.

An appropriate order will issue.

ORDER

For the reasons stated in the accompanying **[*28]** opinion, IT IS HEREBY ORDERED that Plaintiff's Motion for Entry of a Permanent Injunction (D.I. 230) is DENIED; Plaintiff's Motion for Attorneys' Fees and Expenses (D.I. 231) is DENIED; Plaintiff's Motion for Enhanced Damages (D.I. 232) is DENIED; Plaintiff's Motion for Supplemental and/or Ongoing Damages, and for Pre-Judgment and Post-Judgment Interest (D.I. 233) is GRANTED-IN-PART and DENIED-IN PART. My order resolving Plaintiff's Motion for Supplemental and/or Ongoing Damages, and For Pre-Judgment and Post-Judgment Interest (D.I. 233) is as follows:

1. Plaintiff's motion for supplemental damages (D.I. 233) is GRANTED-IN-PART and DENIED-IN-PART. Plaintiff is entitled to supplemental damages from January 1, 2023 to April 12, 2023, the date of judgment.
2. Plaintiff's motion for pre-judgment and post-judgment interest (D.I. 233) is GRANTED.
3. Plaintiff's motion for ongoing damages (D.I. 233) is DISMISSED without prejudice. The Parties are instructed to see if they can reach an agreement on an ongoing royalty.

IT IS SO ORDERED this 7th day of September 2023.

/s/ Richard G. Andrews

United States District Judge

End of Document

Neutral
As of: April 11, 2024 10:31 AM Z

MHL Custom, Inc. v. Waydoo USA, Inc.

United States District Court for the District of Delaware

February 2, 2023, Decided; February 3, 2023, Filed

Civil Action No. 21-0091-RGA

Reporter
654 F. Supp. 3d 329 *; 2023 U.S. Dist. LEXIS 19476 **

MHL CUSTOM, INC., Plaintiff, v. WAYDOO USA, INC. and SHENZHEN WAYDOO INTELLIGENCE TECHNOLOGY CO., LTD., Defendants.

Prior History: MHL Custom, Inc. v. Waydoo USA, Inc., 2022 U.S. Dist. LEXIS 111958, 2022 WL 2290860 (D. Del. June 24, 2022)

Core Terms

stability, ***patent***, static, stable, watercraft, specification, preamble, hydrofoil, dynamic, invention, products, summary judgment, infringement, flotation, passive, invalid, surface, written description, argues, parties, discloses, recites, anticipated, skill, non-infringement, genuine issue of material fact, summary judgment motion, original condition, weight-shift, eigenvalue

Counsel: **[**1]** For Plaintiff: Blake A. Bennett, COOCH AND TAYLOR, P.A., Wilmington, DE; Dennis D. Murrell, Robert J. Theuerkauf (argued), Brian P. McGraw (argued), Megan E. Gibson, MIDDLETON REUTLINGER, Louisville, KY.

For Defendants: Kelly E. Farnan, Dorronda R. Bordley, RICHARDS, LAYTON & FINGER, P.A., Wilmington, DE; Edgar H. Haug, Robert E. Colletti (argued), Mark Basanta, Roman Khasidov, HAUG PARTNERS LLP, New York, NY.

Judges: Richard G. Andrews, United States strict Judge.

Opinion by: Richard G. Andrews

Opinion

[*333] MEMORANDUM OPINION

/s/ Richard G. Andrews

ANDREWS, UNITED STATES DISTRICT JUDGE:

Before me are Plaintiff MHL Custom's ("MHL") and Defendants Waydoo USA's and Shenzhen Waydoo Intelligence Technology's (collectively, "Waydoo") motions for partial summary judgment. The parties have fully briefed the motions. (D.I. 80, 83, 91, 93, 101, 106). I heard oral argument on January 4, 2023.

[*334] I. BACKGROUND

Plaintiff alleges that Defendants infringe two of Plaintiff's ***patents***. Those ***patents*** are U.S. ***Patent*** Nos. 9,359,044 (the, "'044 ***Patent***") and ***9,586,659*** (the, "'659 ***Patent***") (collectively, the "Asserted ***Patents***"). The Asserted ***Patents*** relate to a personal hydrofoil watercraft. The Asserted ***Patents*** share a common specification.

Plaintiff asserts that Defendants' products infringe all claims **[**2]** of the '044 ***Patent*** (claims 1-22) and '659 ***Patent*** (claims 1-20). Defendants counterclaimed. (D.I. 13). The parties agree claim 1 of the '044 ***Patent*** and claims 1 and 16 of the '659 ***Patent*** are representative of the other claims for purposes of the pending motions.[1]

Plaintiff has moved for summary judgment of (1) direct infringement of claim 1 of the '044 ***Patent***, (2) the '044 ***Patent*** and '659 ***Patent*** are not anticipated, and (3) Plaintiff has standing. (D.I. 77, 78, 79). Defendants have moved for summary judgment of (1) claims 16-20 of the '659 ***Patent*** are invalid for lack of written description, (2) non-infringement of the '044 ***Patent***, and (3) non-

[1] These three claims are the independent claims in the two ***patents***. For purposes of the pending motions, Parties agree that the other elements of the dependent claims are met and only dispute as to whether all the claim elements as listed in the three independent claims are infringed by Defendants' products.

infringement of claims 1-15 of the '659 ***Patent***. (D.I. 81).

II. LEGAL STANDARD

"The court shall grant summary judgment if the movant shows that there is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law." Fed. R. Civ. P. 56(a). Material facts are those "that could affect the outcome" of the proceeding. Lamont v. New Jersey, 637 F.3d 177, 181 (3d Cir. 2011) (quoting Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 248, 106 S. Ct. 2505, 91 L. Ed. 2d 202 (1986)). "[A] dispute about a material fact is 'genuine' if the evidence is sufficient to permit a reasonable jury to return a verdict for the nonmoving party." *Id.* The burden on the moving party may be discharged by pointing out to the district court that there is an absence of evidence supporting the non-moving party's case. **[**3]** Celotex Corp. v. Catrett, 477 U.S. 317, 323, 106 S. Ct. 2548, 91 L. Ed. 2d 265 (1986).

The burden then shifts to the non-movant to demonstrate the existence of a genuine issue for trial. Matsushita Elec. Indus. Co. v. Zenith Radio Corp., 475 U.S. 574, 586-87, 106 S. Ct. 1348, 89 L. Ed. 2d 538 (1986); Williams v. Borough of West Chester, 891 F.2d 458, 460-61 (3d Cir. 1989). A non-moving party asserting that a fact is genuinely disputed must support such an assertion by: "(A) citing to particular parts of materials in the record, including depositions, documents, electronically stored information, affidavits or declarations, stipulations . . . , admissions, interrogatory answers, or other materials; or (B) showing that the materials cited [by the opposing party] do not establish the absence . . . of a genuine dispute . . . ." Fed. R. Civ. P. 56(c)(1). The non-moving party's evidence "must amount to more than a scintilla, but may amount to less (in the evaluation of the court) than a preponderance." Williams, 891 F.2d at 460-61.

When determining whether a genuine issue of material fact exists, the court must view the evidence in the light most favorable to the non-moving party and draw all reasonable inferences in that party's favor. Scott v. Harris, 550 U.S. 372, 378, 127 S. Ct. 1769, 167 L. Ed. 2d 686 (2007); Wishkin v. Potter, 476 F.3d 180, 184 (3d Cir. 2007). If the non-moving party **[*335]** fails to make a sufficient showing on an essential element of its case with respect to which it has the burden of proof, the moving party is entitled to judgment as a matter of law. *See* Celotex, 477 U.S. at 322.

III. DISCUSSION

A. INFRINGEMENT OF CLAIMS 1-15 OF THE '659 *PATENT*

Defendants **[**4]** have moved for summary judgment on non-infringement of claims 1-15 of the '659 ***Patent*** (D.I. 80 at 20-26; D.I. 83 at 29-32). The dispute focuses on whether Defendants infringe claim 1 of the '659 ***Patent***. Claims 2-15 depend on claim 1. The claim reads as follows:

> 1. A passively stable, weight-shift controlled personal hydrofoil watercraft, comprising:
> a flotation device that has a fore-aft length greater than a lateral width, the flotation device having a top surface and a bottom surface, wherein a user can be disposed on the top surface of the flotation device in a prone, kneeling, or standing position, the flotation device having a forward section, a middle section, and a rear section;
> a strut having a upper end and a lower end, the upper end fixedly interconnected with the flotation device between the middle section and the rear section of the flotation device;
> a hydrofoil fixedly interconnected with the lower end of the strut, the hydrofoil having no movable surface;
> a propulsion system for propelling the watercraft in a body of water, wherein the propulsion system is connected to the hydrofoil; and
> the watercraft having no movable steering system.

('659 ***Patent***, cl. 1). The parties agree that the preamble of the '659 ***Patent***—A passively **[**5]** stable, weight-shift controlled personal hydrofoil watercraft—is limiting. (D.I. 83 at 30; D.I. 91 at 41). The parties dispute whether the "stable" aspect of the limitation is met. (D.I. 83 at 29-32; D.I. 91 at 43-45).

There are two issues to this dispute.

The first issue is whether "stable" includes both static stability — having an initial tendency to return to an original condition when disturbed — and dynamic stability — eventually returning to an original condition when disturbed. (D.I. 60-2, Ex. B at 602). Defendants argue both are included; Plaintiff, only static stability. I previously construed this term to have its plain and ordinary meaning but permitted the parties to readdress the issue at this stage of the case. (D.I. 66 at 9). Because there is a dispute over the scope of the claim

term, I must construe the term before addressing the question of infringement. *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1361 (Fed. Cir. 2008) ("A determination that a claim term 'needs no construction' or has the 'plain and ordinary meaning' may be inadequate . . . when reliance on a term's 'ordinary' meaning does not resolve the parties' dispute.").

The second issue is whether Defendants infringe the stability limitation as construed.

1. Claim Construction [6]**

"It is a bedrock principle of ***patent*** law that the claims of a ***patent*** define the invention to which the patentee is entitled the right to exclude." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (internal quotation marks omitted). "'[T]here is no magic formula or catechism for conducting claim construction.' Instead, the court is free to attach the appropriate weight to appropriate **[*336]** sources 'in light of the statutes and policies that inform ***patent*** law.'" *SoftView LLC v. Apple Inc.*, 2013 U.S. Dist. LEXIS 125893, 2013 WL 4759195, at *1 (D. Del. Sept. 4, 2013) (quoting *Phillips*, 415 F.3d at 1324) (alteration in original). When construing ***patent*** claims, a court considers the literal language of the claim, the ***patent*** specification, and the prosecution history. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 977-80 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370, 116 S. Ct. 1384, 134 L. Ed. 2d 577 (1996). Of these sources, "the specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term." *Phillips*, 415 F.3d at 1315 (internal quotation marks omitted).

"[T]he words of a claim are generally given their ordinary and customary meaning. . . . [Which is] the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the ***patent*** application." *Id.* at 1312-13 (citations and internal quotation marks omitted). "[T]he ordinary meaning **[**7]** of a claim term is its meaning to [an] ordinary artisan after reading the entire ***patent***." *Id.* at 1321 (internal quotation marks omitted). "In some cases, the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words." *Id.* at 1314.

When a court relies solely upon the intrinsic evidence—the ***patent*** claims, the specification, and the prosecution history—the court's construction is a determination of law. *See* *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 574 U.S. 318, 331, 135 S. Ct. 831, 190 L. Ed. 2d 719 (2015). The court may also make factual findings based upon consideration of extrinsic evidence, which "consists of all evidence external to the ***patent*** and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises." *Phillips*, 415 F.3d at 1317-19 (internal quotation marks omitted). Extrinsic evidence may assist the court in understanding the underlying technology, the meaning of terms to one skilled in the art, and how the invention works. *Id.* Extrinsic evidence, however, is less reliable and less useful in claim construction than the ***patent*** and its prosecution history. *Id.*

Defendants argue that "stable" **[**8]** should mean being statically stable and dynamically stable. Defendants cite to the ***patent*** specification and textbooks for support that a person of ordinary skill in the art ("POSA") would read "stable" to require static and dynamic stability. (D.I. 83 at 4-7).

Plaintiff argues that "stable" should be interchangeable with statically stable or having static stability, and therefore, does not require that the watercraft have dynamic stability. (D.I. 91 at 22). Plaintiff cites to their expert, Mr. Barry, for support that 'stable' and 'static stability' are 'commonly used interchangeably with respect to aircraft and hydrofoil stability.' (D.I. 91 at 18 (citing D.I. 80-31, ¶ 12)). Mr. Barry also expressed an opinion that the ***patent*** uses the terms interchangeably. (*Id.* at 19).

I agree with Defendants that "stable" should mean having both static stability and dynamic stability. I previously rejected Plaintiff's argument that "stable" and "static stability" could be used interchangeably. (D.I. 66 at 9). Plaintiff has not provided compelling intrinsic or extrinsic evidence to convince me to deviate from my initial view. Furthermore, the ***patent*** specification recites, "This trim condition is stable **[**9]** if a disturbance results in a restoring **[*337]** moment that returns the hydrofoil to its original condition." ('659 ***Patent***, col. 6:14-16). The hydrofoil returning to its original condition is a description of dynamic stability, not static stability. Therefore, the ***patent*** specification indicates that stable and statically stable (or static stability) are not interchangeable.

Therefore, I will construe "A passively stable, weight-

shift controlled personal hydrofoil watercraft" to mean "a weight-shift controlled personal watercraft having a hydrofoil that does not have any moveable components and which, when disturbed, (1) has an initial tendency to return to its original condition and (2) eventually returns to its original condition."[2]

2. Non-Infringement by the Accused Products

The remaining issue is whether the accused products have static stability and dynamic stability. Defendants argue that their products are dynamically unstable (or lack dynamic stability) and Plaintiff has provided no evidence to show the accused products are dynamically stable. Thus, Defendants argue there is no genuine issue of material fact that precludes summary judgment that the accused products do not infringe claims 1-15 of the **[**10]** '659 ***Patent***.

Defendants contend that the only evidence Plaintiff has that shows Defendants' products are dynamically stable are "eigenvalue" analyses of some of the accused products. (D.I. 83 at 31). The parties agree that this type of analysis can be used to assess whether a watercraft is dynamically stable. (D.I. 83 at 31; D.I. 91 at 43). "If an eigenvalue analysis reports a positive 'sigma value,' it indicates that [a watercraft] is unstable." (D.I. 83 at 3). Defendants assert, because "[a]ll of Mr. Barry's eigenvalue analyses for [Defendants'] products report positive sigma values," Plaintiff's own expert shows conclusively that Defendants' products do not have dynamic stability. (D.I. 83 at 32).

Plaintiff argues that Defendants are not entitled to summary judgment because there still exists a genuine issue of material fact as to whether Defendants' products are dynamically stable. Plaintiff cites to Mr. Barry's deposition where he testified that he did not believe his analyses showed the products were dynamically unstable. (D.I. 91 at 44). Plaintiff contends that: (1) while Mr. Barry's eigenvalue analysis showed the watercrafts to be dynamically unstable, the results were "close" to showing **[**11]** dynamic stability, and (2) when Mr. Barry viewed the accused products operating in the real world, he concluded that they were dynamically stable, notwithstanding the eigenvalue analysis. (*Id.; see* D.I. 85-1, Ex. 6, 402:8-403:23 (stating positive eigenvalues did not indicate dynamic instability in part because the software was "an approximation" and did not account for all effects)). Plaintiff, therefore, argues that the eigenvalue analysis is not conclusive when considering Mr. Barry's testimony and other analyses.

Plaintiff also relies on Mr. Barry's statements that the Athena Vortex Lattice (AVL) software he used to analyze the stability of the watercrafts understated the stability of the accused products.[3] Mr. Barry stated that the AVL software does not **[*338]** account for additional stabilizing factors that "exist once the effect of the water in which the hydrofoil is operating in is considered," such as "damping, free surface, added mass, and viscosity". (D.I. 91 at 44; *see, e.g.*, D.I. 80-33, Ex. 31, ¶¶ 23 (free surface), 55 (damping, added mass and viscosity effects)). Therefore, Plaintiff contends that Mr. Barry's testimony about his different analyses and his conclusions raises a genuine **[**12]** dispute as to whether the accused products are dynamically stable.

I agree with Plaintiff that there is a genuine dispute whether the accused products are dynamically stable. Defendants are correct that the eigenvalue analyses of the watercrafts show at least one positive sigma value for each product analyzed, which Plaintiff does not dispute, indicating dynamic instability. Those analyses, however, are not the only evidence in the record. The record also includes testimony by Mr. Barry, in which he concludes that the watercraft are dynamically stable based on analyzing the stability derivatives using the AVL software and observation of the watercraft in the real world. (D.I. 91 at 44; *see, e.g.*, D.I. 80-33, ¶¶ 26-28, 53-55). Taking the evidence in the light most favorable to Plaintiff, as I am required to do, I determine that a reasonable jury could conclude that the accused products have dynamic stability and therefore do infringe.

Therefore, I will deny summary judgment of infringement of claims 1-15 of the '659 ***Patent***.

B. INFRINGEMENT OF THE '044 *PATENT*

The parties have cross-moved for summary judgment on infringement of claims 1-22 of the '044 ***Patent*** (D.I. 80 at 20-26; D.I. 83 at 29-32). The parties agree **[**13]**

[2] I proposed this construction prior to oral argument. (D.I. 142).

[3] Mr. Barry used the AVL software to analyze the pitch stability derivative, directional stability derivative, and roll stability derivative to assess watercraft stability. Mr. Barry also used the AVL software to analyze the eigenvalues for his eigenvalue analysis. (*See, e.g.*, D.I. 85-1, Ex. 3, ¶¶ 95-96, 155-156)

that whether either side is entitled to summary judgment comes down to whether there is a genuine issue of material fact that Defendants infringe claim 1 of the '044 ***Patent***. The claim reads as follows:

> 1. A passively stable, weight-shift controlled personal hydrofoil watercraft, comprising:
> a flotation device that has a fore-aft length greater than a lateral width, the flotation device having a top surface and a bottom surface, wherein a user can be disposed on the top surface of the flotation device in a prone, kneeling, or standing position, the flotation device having a forward section, a middle section, and a rear section, and the flotation device being controlled via weight shift of the user;
> a strut having an upper end and a lower end, the upper end fixedly interconnected with the flotation device between the middle section and the rear section of the flotation device;
> a hydrofoil fixedly interconnected with the lower end of the strut, the hydrofoil having no movable surface and designed to provide passive static stability controlled solely by weight shift of the user;
>
> a propulsion system for propelling the watercraft in a body of water, wherein the propulsion system is connected to the hydrofoil; **[**14]** and
> the watercraft having no movable steering system.

('044 ***Patent***, cl. 1). There are two disputes at issue here. First, the parties dispute whether the preamble of claim 1 is limiting. Plaintiff argues it is not; Defendants, that it is. Second, the parties dispute whether Defendants' products satisfy the stability limitations of claim 1. Resolving the second issue necessarily depends on the outcome of the first issue.

1. Whether the Preamble of Claim 1 is Limiting

As an initial matter, it is proper for me to determine whether the **[*339]** preamble of claim 1 is limiting or not. Plaintiff argues that this is a determination to be left for the jury. (D.I. 91 at 41). Plaintiff is mistaken. Determining the effect of preamble language is a claim-construction issue. *See* Cochlear Bone Anchored Solutions AB v. Oticon Medical AB, 958 F.3d 1348, 1354 (Fed. Cir. 2020). Claim construction and resolving the scope of asserted claims are questions of law left to the court. *See* Every Penny Counts, Inc. v. American Express Co., 563 F.3d 1378, 1383 (citing O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co., 521 F.3d 1351, 1361-62 (Fed. Cir. 2008)). Therefore, I find it is necessary for me to make this determination now.[4]

"[A]s a general rule preamble language is not treated as limiting." Aspex Eyewear, Inc. v. Marchon Eyewear, Inc., 672 F.3d 1335, 1347 (Fed. Cir. 2012). "Whether to treat a preamble as a limitation is 'determined on the facts of each case in light of the overall form of the claim, and the invention as described in the specification and illuminated **[**15]** in the prosecution history.'" Deere & Co. v. Bush Hog, LLC, 703 F.3d 1349, 1357 (Fed. Cir. 2012) (quoting Applied Materials, Inc. v. Advanced Semiconductor Materials Am., Inc., 98 F.3d 1563, 1572-73 (Fed. Cir. 1996)). "In general, a preamble limits the invention if it recites essential structure or steps, or if it is necessary to give life, meaning, and vitality to the claim." Catalina Mktg. Int'l, Inc. v. Coolsavings.com, Inc., 289 F.3d 801, 808 (Fed. Cir. 2002) (citation and quotation marks omitted). "The preamble may be limiting to the extent it is 'necessary to provide antecedent basis for the body of the claim.'" Cochlear Bone, 958 F.3d at 1355 (quoting Symantec Corp. v. Computer Assoc. Int'l, Inc., 522 F.3d 1279, 1288 (Fed. Cir. 2008)). In addition, the preamble may be limiting when the preamble "is essential to understand limitations or terms in the claim body," recites "additional structure or steps underscored as important by the specification," or there was "clear reliance on the preamble during prosecution to distinguish the claimed invention from the prior art." Catalina, 289 F.3d at 808. In other words, there are numerous exceptions to the default rule that a preamble is not limiting.

Plaintiff contends that the preamble is not limiting because there is a presumption against reading a preamble as limiting and this case does not present one of the recognized exceptions to that presumption. Specifically, Plaintiff argues that the "preamble does not: (1) recite essential structure; (2) provide antecedent basis to the claim term at issue; and (3) is not essential to **[**16]** understand limitations or terms in the claim body." (D.I. 91 at 42).

Plaintiff further argues that there was no reliance on the preamble during prosecution. (*Id.* at 43). Plaintiff cites to the fact the preamble was present in the original claim as filed, and the static stability limitation was added to overcome prior art. (D.I. 146 at 2). Plaintiff contends that this shows that neither the inventor nor Examiner relied

[4] While I have construed identical preamble language in the context of claim 1 of the '659 ***Patent*** as limiting, both parties agreed the preamble was limiting in that ***patent***.

on the preamble during prosecution because the addition of the static stability limitation would be unnecessary if the preamble were limiting. (*Id.* at 2).

Defendants argue the preamble should be limiting because claim 1 of the '659 ***Patent***, which is part of the same ***patent*** family and has an identical specification, recites identical language and both parties agree the preamble is limiting in that context. Defendants contend that there is "no technical or legal justification for why identical preambles should be treated differently." (D.I. 83 at 30). Defendants further **[*340]** argue that the preamble "is limiting because it recites an 'essential' element not found in the body of the claim (i.e., dynamic stability)." (D.I. 106 at 15). To put it another way, Defendants argue that the ***patent*** specification **[**17]** "repeatedly defines the invention as an overall stable watercraft," and therefore the preamble should be limiting because only the preamble specifies that the invention is dynamically stable. (D.I. 145 at 3).

I agree with Plaintiff that the preamble is not limiting. As an initial matter, I am not aware of any case law that states a preamble must be limiting in one ***patent*** because the identically worded preamble is limiting in another ***patent*** belonging to the same ***patent*** family. Defendants have also not supplied any such case law, despite being given additional time to do so. (D.I. 145 at 1).

The proposed identically-worded-preamble rule is inconsistent with the case law.[5] The Federal Circuit has stated "[w]hether to treat a preamble as a limitation is determined on the facts of each case in light of the overall form of the claim[] and the invention as described in the specification and illuminated in the prosecution history." *Cochlear Bone*, 958 F.3d at 1354 (quoting *Deere & Co.*, 703 F.3d at 1357). I am thus required to analyze the form of claim 1 of the '044 ***Patent***, which has significant differences from the form of claim 1 of the '659 ***Patent***, when determining whether the preamble is limiting. Therefore, I do not believe that the presumption against reading a preamble **[**18]** as non-limiting is overcome just because the same preamble is limiting in claim 1 of the '659 ***Patent***.

I do not find that dynamic stability is an "essential" element that requires the preamble to be limiting. Nor do I think dynamic stability is "underscored as important by the specification." *Catalina*, 289 F.3d at 808. Nowhere in the '044 ***Patent*** is the term "dynamic stability" or "dynamically stable" used.

The '044 ***Patent*** specification does repeatedly describe the invention as being "stable" or having "passive stability," and dynamic stability is a component of those terms. *See* Section III.A.1 *supra*. "But not every preamble reference to additional structure is limiting, even when the structure is noted in the specification—even, indeed, when the structure is 'underscored as important by the specification.'" *Arctic Cat Inc. v. GEP Power Products, Inc.*, 919 F.3d 1320, 1329 (Fed. Cir. 2019) (quoting *Catalina*, 289 F.3d at 808 ("[W]hen reciting additional structure or steps underscored as important by the specification, the preamble may operate as a claim limitation."). Furthermore, even though the specification references the importance of stability, it similarly does so with respect to static stability. *See* '044 ***Patent*** 2:17-20 ("The prior art in powered hydrofoil surfboards have all relied on moveable surfaces for control, **[**19]** and have ignored the possibility of designing the hydrofoil for passive static stability."); 5:50-54 ("Note that other versions of the hydrofoil are possible: the key is designing the hydrofoil for passive static stability via planform design, airfoil design, and span-wise twist distribution."). Therefore, I read the specification as underscoring the importance that the watercraft have static stability.

[*341] The body of claim 1 of the '044 ***Patent*** addresses this essential, static stability element of the invention by reciting "a hydrofoil . . . designed to provide passive static stability." ('044 ***Patent***, cl. 1). Because having static stability is already an explicit limitation in the body of the claim, I do not read the preamble as supplying an essential element for claim 1 of the '044 ***Patent***.[6]

---

[5] Furthermore, I have not applied such a rule even when the claims sharing the identical preamble are part of the same ***patent***. *See Takeda Pharma. Co. v. Actavis Lab'ys FL, Inc.*, 2016 U.S. Dist. LEXIS 79121, 2016 WL 3193180, at *6 n.6, *7 n.7, *7-8 (D. Del. June 6, 2016) (independently analyzing whether identical preamble language is limiting in two separate claims of the same ***patent***), *aff'd in part, rev'd in part sub nom. Nalpropion Pharms., Inc. v. Actavis Lab'ys FL, Inc.*, 934 F.3d 1344 (Fed. Cir. 2019).

[6] It is this explicit recitation of static stability in the body of the claim 1 of the '044 ***Patent*** that differentiates the effect of the preamble in claim 1 of the '044 ***Patent*** from the effect of the preamble in claim 1 of the '659 ***Patent***. The body of claim 1 of the '659 ***Patent*** does not contain any limitations pertaining to stability. As already discussed, the shared ***patent*** specification underscores the importance of the watercraft having static stability. Therefore, the preamble is providing an essential

Accordingly, I conclude that the preamble of claim 1 of the '044 ***Patent*** is not limiting.

2. Non-Infringement of the '044 *Patent*

Defendants' motion for summary judgment of non-infringement of the '044 ***Patent*** is premised on the preamble of claim 1 of the '044 ***Patent*** being limiting and requiring the additional limitation of dynamic stability. (D.I. 83 at 29-31). Because I have determined that the preamble to claim 1 is not limiting, there is no dynamic stability limitation in the **[**20]** claims of the '044 ***Patent***. Therefore, Defendants' motion for summary judgment of non-infringement of the '044 ***Patent*** is denied.

3. Infringement of the '044 *Patent*

Plaintiff moves for summary judgment that Defendants infringe claim 1 of the '044 ***Patent***, and, by extension, all other claims of the '044 ***Patent***, on the ground that there is no genuine issue of fact that Defendants' accused products are statically stable.[7] Plaintiff argues that the testimony of its expert witness, Mr. Barry, and the analysis he conducted of the accused products, demonstrates that the accused products are passively statically stable. (D.I. 80 at 24-26). Plaintiff contends that because Defendants have not produced any affirmative evidence to dispute that the accused products are passively statically stable, there is no disputed fact in the record that prevents finding that the accused products infringe the '044 ***Patent***. (*Id.* at 25-26).

Defendants argue, "There is a genuine dispute as to whether [Plaintiff] has evidence sufficient to meet its burden for showing even static stability." (D.I. 93 at 25). Defendants contend that their expert witness, Dr. Triantafyllou, has "explained that in trying to show static stability of the Accused Products, Mr. Barry concocted his own stability **[**21]** standard rather than assess them according to the standard set out in the Asserted ***Patents***." (*Id.* at 26). Defendants further argue, "Without undisputed evidence that the Accused Products meet the standard set out in the Asserted ***Patents***—which [Plaintiff] does not have because Mr. Barry did not so opine—summary judgment of infringement is improper." (*Id.*). Defendants also argue that summary judgment is improper because Mr. Barry did not examine all of the accused products for infringement. (*Id.*).

I agree with Defendants that there exists a genuine issue of material fact. Plaintiff has provided evidence through Mr. Barry's testimony and analysis to show that Defendants' accused products are statically stable. Defendants' expert responded by noting that Mr. Barry's analysis deviates from that included in the asserted **[*342]** ***patents***, and the reason for doing so goes unexplained. (D.I. 85-1, Ex. 8, ¶ 17). A reasonable juror could weigh the testimony by the parties' experts and reach the conclusion that Plaintiff has not carried its burden to show that Defendants' products are statically stable.

Therefore, I will deny summary judgment as to infringement of the '044 ***Patent***.

C. WRITTEN DESCRIPTION OF CLAIMS 16-20 [22] OF THE '659 *PATENT***

Defendants move for summary judgment of invalidity for lack of written description for claims 16-20 of the '659 ***Patent***. Claim 16, which is representative of the other claims,[8] reads as follows:

16. A personal hydrofoil watercraft, comprising:
a surfboard-shaped flotation device that has a fore-aft length greater than a lateral width, the flotation device having a top surface and a bottom surface, wherein the top surface has a substantially horizontal supporting surface configured to support a user in a prone, kneeling, or standing position, the flotation device having a forward section, a middle section, and a rear section;
a hydrofoil interconnected with the surfboard-shaped flotation device, the hydrofoil having a strut and a first hydrofoil wing, an upper end of the strut being fixedly interconnected with the surfboard-shaped flotation device;
a propulsion system attached to the surfboard-shaped flotation device for propelling the watercraft in a body of water, the propulsion system

element in claim 1 of the '659 ***Patent*** by stating that the watercraft needs to be "stable." Since the preamble is limiting, the full scope of "stable" becomes a limitation.

[7] The parties agree that the only claim limitation in question is whether Defendants' products meet the stability limitation of claim 1. As discussed above, claim 1 of the '044 ***Patent*** only requires static stability because the preamble is not limiting.

[8] Claims 17-20 are dependent claims that depend on claim 16.

> comprising a battery, an electric motor, a motor speed controller, and a propulsor, wherein the propulsor is selected from a propeller, a ducted propeller, or a pump-jet, and the battery and motor speed controller **[**23]** are contained in a watertight compartment integrated into the flotation device;
> the watercraft having no movable steering system;
> a handheld controller having a throttle; and
> a throttle interface, wherein the throttle is adapted to send electronic signals to the throttle interface that cause an output of the propulsion system to change.

('659 ***Patent***, cl. 16). Defendants assert the claims are invalid for lack of written description because they do not contain a stability limitation (i.e., do not require the watercraft to be statically stable, dynamically stable, or both), but the specification of the Asserted ***Patents*** "clearly discloses the alleged invention as being a stable hydrofoil watercraft, and never suggests that the alleged invention can be anything other than stable." (D.I. 83 at 26). Defendants further contend that the file history of the '044 ***Patent*** shows the ***patent*** examiner "explicitly relied on the hydrofoil providing static stability in allowing the '044 [P]atent." (*Id.*). Defendants analogize the present case to *ICU Medical, Inc. v. Alaris Medical Sys., Inc.*, 558 F.3d 1368, 1377-79 (Fed. Cir. 2009).

Plaintiff does not dispute that neither static stability nor dynamic stability (or both together) are limitations of the claims 16-20 of the '659 ***Patent***. Plaintiff asserts the written description requirement **[**24]** is met because the ***patent*** specification does not limit the invention to a "stable" watercraft. Plaintiff analogizes the present case to *ScriptPro LLC v. Innovation Assoc., Inc.*, 833 F.3d 1336, 1340-42 (Fed. Cir. 2016). Plaintiff argues that a stable watercraft is just one purpose of the invention and claims 16-20 of the '659 ***Patent*** are written to address other purposes of the invention, **[*343]** such as not having a movable steering system, providing a "surfing feel," and being easy to transport and maintain. (D.I. 91 at 39).

The written description requirement contained in *35 U.S.C. § 112* requires that the specification "clearly allow persons of ordinary skill in the art to recognize that [the inventor] invented what is claimed." *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc) (alteration in original). "In other words, the test for sufficiency is whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date." *Id.* "When determining whether a specification contains adequate written description, one must make an 'objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art.'" *Bos. Sci. Corp. v. Johnson & Johnson*, 647 F.3d 1353, 1366 (Fed. Cir. 2011) (quoting *Ariad*, 598 F.3d at 1351).

The written description inquiry is a question of fact. *Ariad*, 598 F.3d at 1351. Although **[**25]** it is a question of fact, "[c]ompliance with the written description requirement . . . is amenable to summary judgment in cases where no reasonable fact finder could return a verdict for the non-moving party." *PowerOasis, Inc. v. T-Mobile USA, Inc.*, 522 F.3d 1299, 1307 (Fed. Cir. 2008). "A party must prove invalidity for lack of written description by clear and convincing evidence." *Vasudevan Software, Inc. v. MicroStrategy, Inc.*, 782 F.3d 671, 682 (Fed. Cir. 2015).

I find that Defendants are entitled to summary judgment that claims 16-20 of the '659 ***Patent*** are invalid for lack of written description. The ***patent*** specification does not disclose that the patentee possessed a personal hydrofoil watercraft that lacks both static and dynamic stability. There is no genuine disputed fact about this.

The specification of the '659 ***Patent*** only, and repeatedly, describes the invention as being a watercraft that is either stable or at least has static stability. For example, the abstract of the ***patent*** recites, "A passively stable personal hydrofoil watercraft . . . ." ('659 ***Patent*** at Abstract). The ***patent*** specification further recites, "The hydrofoil of the present invention has been designed to provide passive stability in the longitudinal direction, making traditional altitude control systems based on moveable surfaces unnecessary." (*Id.* at col. 2:8-12).

Static stability distinguishes **[**26]** the invention from the prior art. The specification recites, "The prior art in powered hydrofoil surfboards have all relied on moveable surfaces for control, and have ignored the possibility of designing the hydrofoil for passive static stability. . . . [T]he present invention is specifically designed to achieve desired levels of stability and controllability without the need for moveable surfaces." (*Id.* at col. 2:20-26). The ***patent*** specification further emphasizes that the hydrofoil should be designed to provide static stability to the watercraft, even for undisclosed embodiments. (*Id.* at col. 5:62-65 ("Note that other versions of the hydrofoil are possible: the key is designing the hydrofoil for passive static stability via

planform design, airfoil design, and span-wise twist distribution.")). The ***patent*** specification attributes the ability to be controlled by weight shift to the stability of the watercraft. The specification states, "This invention exploits passive stability to obviate the necessity for mechanisms or active control systems to provide stability. This passive stability allows the watercraft to be controlled by weight shift rather than by mechanical systems." (*Id.* **[**27]** at col. 6:7-11). There is nothing in the ***patent*** specification to suggest that a watercraft **[*344]** that is both statically and dynamically unstable is part of the disclosure. *See* LizardTech, Inc. v. Earth Resource Mapping, Inc., 424 F.3d 1336, 1346 (Fed. Cir. 2005).

I agree with Defendants that the present case is similar to ICU Medical. In ICU Medical, the ***patent*** at issue claimed medical valves with spikes and without spikes (i.e., valves without the spike limitation). The specification of the ***patent***, however, only described "medical valves with spikes." Id. at 1378. The Federal Circuit upheld the district court's grant of summary judgment that the "spikeless" claims were invalid for lack of written description because a POSA would not have understood the patentee to have invented a "spikeless" medical valve. Id. at 1378-79.

Similarly, in the present case, the '659 ***Patent*** only discusses a watercraft that is at least statically stable. There is nothing in the specification that would signal to a POSA that the patentee invented a watercraft that is statically unstable. Furthermore, at oral argument, Plaintiff failed to point to any disclosure in the ***patent*** specification of a description or embodiment of a watercraft that was not at least statically stable. (D.I. 147 at 73:9-23). *See* ICU Medical, 558 F.3d at 1379.

While Plaintiff argues that this case is more analogous **[**28]** to ScriptPro, LLC v. Innovation Assocs., Inc., 833 F.3d 1336 (Fed. Cir. 2016), I disagree. In *ScriptPro*, the Federal Circuit reversed the district court's ruling that claims without a limitation of employing a "sorting and storage scheme based on patient-identifying information" were invalid for lack of written description. Id. at 1341. The Federal Circuit noted that while the ***patent*** specification "focuses on embodiments employing a sorting and storage scheme based on patient-identifying information," it is not a limitation of the invention because the invention is used to solve many problems, not all of which involve using a scheme based on patient-identifying information. *Id.* Specifically, the Federal Circuit cautioned that "a specification's focus on one particular embodiment or purpose cannot limit the described invention where the specification expressly contemplates other embodiments or purposes." Id. at 1341.

Plaintiff's arguments that watercraft stability is just one solution the invention addresses, like the scheme in *ScriptPro*, misses the mark. First, in *ScriptPro*, the Federal Circuit stated that the "***patent***'s express disclosure that sorting and storing can be done in a number of ways distinguishes this case from . . . *ICU Medical.*" *Id.* Specifically, the Federal Circuit **[**29]** found that the invention was not limited to using a patient-identifying information sorting scheme because the ***patent*** specification disclosed that "any predetermined storage scheme will do." *Id.* Unlike in *ScriptPro*, there is no such express disclosure in the '659 ***Patent*** specification that the watercraft can be statically and dynamically unstable. Nor is there anything that could reasonably be interpreted as an implied disclosure.

Second, the Federal Circuit noted that the ***patent*** in *ScriptPro* was aimed at addressing multiple problems and that the different claims were directed at "covering these different aspects of the invention." Id. at 1342. In this case, however, the ***patent*** specification clearly describes static stability as a limitation of the invention as a whole, not an aspect of some embodiments or one purpose. *See* p.19 *supra*. The ***patent*** specification is not just describing some embodiments as stable or having static stability. (*See, e.g.*, '659 ***Patent***, col. 2:9-12; 2:23-25, 5:62-65). Nor is the specification describing stability as just one purpose of the invention. The ***patent*** specification, instead, is emphasizing that it is the stability of the watercraft — or at the least static stability provided by the **[**30]** **[*345]** hydrofoil — that permits the invention to achieve the full scope of its purposes such as not having a moveable steering system. (*See id.* at col. 6:7-11).

Therefore, I find that Defendants are entitled to summary judgment that claims 16-20 of the '659 ***Patent*** are invalid for lack of written description.

D. ANTICIPATION OF THE '044 *PATENT* AND '659 *PATENT*

Plaintiff moves for summary judgment on Defendants' counterclaims that the Asserted ***Patents*** are invalid as anticipated by Plaintiff's products. (DI. 80 at 26-37; *see also* D.I. 13 at 13-14). Defendants concede that they are not arguing that Plaintiff's own products invalidate the Asserted ***Patents***. (D.I. 93 at 27 ("Waydoo is not

asserting that the Asserted ***Patents*** are invalid over MHL's own products.")). Therefore, this issue is moot and Plaintiff's motion is dismissed.

Plaintiff also moves for summary judgment on Defendants' counterclaims that the Asserted ***Patents*** are invalid as anticipated by the Evolo Report. The Evolo Report is a 554 page report from "a graduate-level student project that was completed in 2009 by naval architecture students at the Royal Institute of Technology in Stockholm, Sweden." (D.I. 80 at 26-37). [9]

There are two issues to this dispute.

The first issue **[**31]** is whether the Evolo Report discloses the static stability limitation of the claims 1-22 of the '044 ***Patent*** and claims 1-15 of the '659 ***Patent***.[10] Plaintiff argues it does not; Defendants argue it does.

The second issue is whether the Evolo Report is a printed publication. Plaintiff argues the Evolo Report is not because it was not publicly accessible before the priority date of the Asserted ***Patents***. Defendants argue there is a genuine issue of material fact as to whether the Evolo Report was publicly accessible.

I address each issue in turn.

1. Does the Evolo Report Disclose the Static Stability Limitation?

"To show that a ***patent*** claim is invalid as anticipated, the accused infringer must show by clear and convincing evidence that a single prior art reference discloses each and every element of a claimed invention." *Silicon Graphics, Inc. v. ATI Techs., Inc., 607 F.3d 784, 796 (Fed. Cir. 2010)*. "[E]very element of the claimed invention [must be described], either expressly or inherently, such that a person of ordinary skill in the art could practice the invention without undue experimentation." *Callaway Golf Co. v. Acushnet Co., 576 F.3d 1331, 1346 (Fed. Cir. 2009)*. As with infringement, the court construes the claims and compares them against the prior art. *See Enzo Biochem, Inc. v. Applera Corp., 599 F.3d 1325, 1332 (Fed. Cir. 2010)*. "While anticipation is a question of fact, it may be decided on summary judgment if **[**32]** the record reveals no genuine dispute of material fact." *Encyclopaedia Britannica, Inc. v. Alpine Elecs. of Am., Inc., 609 F.3d 1345, 1349 (Fed. Cir. 2010)*.

Plaintiff argues that the Evolo Report does not disclose a statically stable watercraft. **[*346]** Specifically, Plaintiff argues that Defendants cannot meet their burden because Dr. Triantafyllou did not mathematically assess the stability of the watercraft disclosed in the Evolo Report. (D.I. 80 at 34-35). Plaintiff also cites to Mr. Barry's expert report to show that the Evolo Report discloses a statically unstable watercraft (*Id.* at 35-36).

Defendants argue that there is a material issue of fact as to whether the Evolo Report discloses a statically stable watercraft because Dr. Triantafyllou concluded that the Evolo Report discloses a statically stable watercraft. (D.I. 93 at 32 (citing D.I. 85-1, Ex. 7, ¶¶ 220-241)). Defendants contend that Dr. Triantafyllou responded to the arguments raised by Plaintiff's expert, Mr. Barry. (D.I. 93 at 32 (citing D.I. 85-1, Ex. 9, ¶¶ 71-77)).

I find there are genuine issues of material fact as to whether the Evolo Report discloses a statically stable watercraft. Both parties rely on the testimony of their expert witnesses to establish their positions. A reasonable juror could weigh the testimony by **[**33]** the parties' experts and reach the conclusion that Defendants have shown that the Evolo Report discloses a statically stable watercraft.

2. Is the Evolo Report a Printed Publication?

"Whether a reference qualifies as a "printed publication" under *§ 102(b)* is a legal conclusion based on underlying factual findings." *Jazz Pharm., Inc. v. Amneal Pharm., LLC, 895 F.3d 1347, 1356 (Fed. Cir. 2018)*. "A reference is considered publicly accessible if it was disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, can locate it." *Acceleration Bay, LLC v. Activision Blizzard Inc., 908 F.3d 765, 772 (Fed. Cir. 2018)* (citation and internal quotation marks omitted). "The test

---

[9] Plaintiff argue that Defendants improperly combine multiple Evolo-related references into one anticipation analysis. Defendants argue in their briefing that the Evolo Report itself is the single prior art reference that anticipates the Asserted ***Patents***. (D.I. 93 at 30). Therefore, for purposes of this motion, I focus only on the Evolo Report.

[10] Plaintiff also argues that claims 16-20 of the '659 ***Patent*** are not invalidated by anticipation because the Evolo Report does not disclose a motor speed controller, but this issue is moot as I have found claims 16-20 of the '659 ***Patent*** to be invalid for lack of written description. *See* Section III.C *supra*.

for public accessibility is not 'has the reference been indexed?'" *Id. at 774*. Instead, "the ultimate question is whether the reference was 'available to the extent that persons interested and ordinarily skilled in the subject matter or art[,] exercising reasonable diligence, can locate it.'" *Voter Verified, Inc. v. Premier Election Sols., Inc., 698 F.3d 1374, 1380 (Fed. Cir. 2012)* (quoting *SRI Int'l, Inc. v. Internet Sec. Sys., Inc., 511 F.3d 1186, 1194 (Fed. Cir. 2008)*).

Plaintiff argues the Evolo Report was not publicly accessible before the priority date of the Asserted ***Patents***. (D.I. 80 at 30-32). Plaintiff specifically contends that there is no evidence that the Evolo website, which contained a link to the Evolo Report, was indexed by Google, would turn up on **[**34]** a Google search in 2013, or was otherwise accessible to a POSA before the Asserted ***Patents***' priority date. (D.I. 32).

Defendants argue that Plaintiff is not entitled to summary judgment because there is evidence that the Evolo Report was publicly accessible before the Asserted ***Patents***' priority date. Therefore, there is a disputed material of fact, making summary judgment inappropriate. Defendants argue that the record contains evidence that the Evolo Report was downloaded in the United States before the priority date of the Asserted ***Patents***; that their expert Mr. Lanterman concluded that the Evolo website was likely indexed by Google and had regular activity, and that an article published in the Swedish magazine Batnytt ("Boat News") in August 2009 detailed the Evolo project and contained a link to the Evolo website. (D.I. 93 at 28-30).

I find there is a genuine issue of material fact as to whether the Evolo Report was publicly accessible to a POSA prior to October 2013. Plaintiff concedes that there was at least one user in the United States (or at least outside of Sweden and Switzerland) **[*347]** who downloaded the Evolo Report. (D.I. 80 at 16, n.7). Further, the article in Batnytt may also **[**35]** have served as a publicly accessible "research aid" that would have led a POSA to the Evolo website, which contained the Evolo Report. *See, e.g., Blue Calypso, LLC v. Groupon, Inc., 815 F.3d 1331, 1350 (Fed. Cir. 2016); Bruckelmyer v. Ground Heaters, Inc., 445 F.3d 1374, 1379 (Fed. Cir. 2006)*. For these reasons, I find a reasonable jury could determine that the Evolo Report was publicly accessible before the Asserted ***Patents***' priority date.

Therefore, I find Plaintiff is not entitled to summary judgment on Defendants' counterclaims that the Asserted ***Patents*** are anticipated by the Evolo Report.

E. PLAINTIFF'S STANDING

Plaintiff moved for summary judgment on Defendants' affirmative defense that Plaintiff lacks standing. (D.I. 79). After oral argument, Defendants stated they are not challenging standing. (D.I. 145).

Therefore, I will dismiss Plaintiff's motion for summary judgment on standing as moot.

IV. CONCLUSION

For the reasons stated above, I deny Plaintiff's motion for summary judgment for infringement of the '044 ***Patent***, deny Plaintiff's motion for summary judgment for the Asserted ***Patents*** not being invalid as anticipated by the Evolo Report, and dismiss Plaintiff's motion for summary judgment on Defendants' lack of standing argument.

I deny Defendants' motion for summary judgment for non-infringement of the '044 ***Patent*** and '659 ***Patent*** and grant Defendants' motion **[**36]** for summary judgment of invalidity for lack of written description for claims 16-20 of the '659 ***Patent***.

An appropriate order will issue.

ORDER

For the reasons stated in the accompanying memorandum opinion, IT IS HEREBY ORDERED that Plaintiff's Motion for Partial Summary Judgment is resolved as follows: summary judgment of infringement of the '044 ***Patent*** (D.I. 78) is DENIED; summary judgment for the '044 ***Patent*** and '659 ***Patent*** not being invalid as anticipated by the Evolo Report (D.I. 77) is DENIED; summary judgment for the '044 ***Patent*** and '659 ***Patent*** not being invalid as anticipated by MHL Custom's own products (D.I. 77) is DISMISSED as moot; summary judgment for Defendants' lack of standing argument (D.I. 79) is DISMISSED as moot.

Defendants' Motion for Partial Summary Judgment is resolved as follows: summary judgment for non-infringement of the '044 ***Patent*** and '659 ***Patent*** (D.I. 81) is DENIED; summary judgment for claims 16-20 of the '659 ***Patent*** being invalid for lack of written description (D.I. 81) is GRANTED.

As used in the asserted claims of the '659 ***Patent***, the term "A passively stable, weight-shift controlled personal hydrofoil watercraft" is construed to mean "a weight-shift controlled personal watercraft having a hydrofoil that does not have any moveable components and which, when disturbed, **[**37]** (1) has an initial tendency to return to its original condition and (2) eventually returns to its original condition."

As used in the preamble of the asserted claims of the '044 ***Patent***, the term "A passively stable, weight-shift controlled personal hydrofoil watercraft" is construed not to be limiting.

IT IS SO ORDERED this 2nd day of February 2023.

/s/ Richard G. Andrews

United States strict Judge

End of Document

Neutral
As of: April 11, 2024 10:31 AM Z

MHL Custom, Inc. v. Waydoo USA, Inc.

United States District Court for the District of Delaware

June 24, 2022, Decided; June 24, 2022, Filed

Civil Action No. 21-91-RGA

Reporter
2022 U.S. Dist. LEXIS 111958 *; 2022 U.S.P.Q.2D (BNA) 586; 2022 WL 2290860

MHL CUSTOM, INC., Plaintiff; v. WAYDOO USA, INC, and SHENZHEN WAYDOO INTELLIGENCE TECHNOLOGY CO., LTD, Defendants.

Subsequent History: ***Patent*** interpreted by, Summary judgment denied by, Summary judgment dismissed by, As moot, Summary judgment granted by *MHL Custom, Inc. v. Waydoo USA, Inc., 2023 U.S. Dist. LEXIS 19476 (D. Del. Feb. 2, 2023)*

Motion granted by, in part, Motion denied by, in part *MHL Custom, Inc. v. Waydoo USA, Inc., 2023 U.S. Dist. LEXIS 46138, 2023 WL 2572285 (D. Del. Mar. 20, 2023)*

Motion denied by, Motion for new trial denied by *MHL Custom, Inc. v. Waydoo USA, Inc., 2023 U.S. Dist. LEXIS 157220 (D. Del. Sept. 6, 2023)*

Injunction denied by, Judgment entered by, Motion granted by, in part, Motion denied by, in part, Motion dismissed by, Without prejudice, Costs and fees proceeding at *MHL Custom, Inc. v. Waydoo USA, Inc., 2023 U.S. Dist. LEXIS 156243 (D. Del. Sept. 7, 2023)*

Core Terms

hydrofoil, flotation, surface, stability, user, proposed construction, watercraft, ***patent***, top, kneeling, static, prone, passive, standing position, ordinary meaning, specification, propulsion, positions, interconnected, stable, strut, upper end, weight-shift, propelling, disturbed, tailoring, disposed, throttle, fixedly, movable

Counsel: **[*1]** For Plaintiff: Blake A. Bennett, COOCH AND TAYLOR, P.A., Wilmington, DE; Dennis D. Murrell, Robert J. Theuerkauf (argued), Daniel W. Redding, MIDDLETON REUTLINGER, Louisville, Kentucky.

For Defendants: Kelly E. Farnan, Dorronda R. Bordley, RICHARDS, LAYTON & FINGER, P.A., Wilmington, DE; Edgar H. Haug, Robert E. Colletti (argued), Roman Khasidov, Mark Basanta, HAUG PARTNERS LLP, New York, New York.

Judges: Richard G. Andrews, UNITED STATES DISTRICT JUDGE.

Opinion by: Richard G. Andrews

Opinion

MEMORANDUM OPINION

June 24, 2022

/s/ Richard G. Andrews

ANDREWS, UNITED STATES DISTRICT JUDGE:

Before me is the issue of claim construction of multiple terms in U.S. ***Patent*** Nos. 9,359,044 ("the '044 ***Patent***") and ***9,586,659*** ("the '659 ***Patent***"). I held a claim construction hearing on May 3, 2022 and requested supplemental briefing on several questions. I have considered the parties' joint and supplemental briefing. (D.I. 46, 59, 60, 62).

I. LEGAL STANDARD

"It is a bedrock principle of ***patent*** law that the claims of a ***patent*** define the invention to which the patentee is entitled the right to exclude." *Phillips v. AWH Corp., 415 F.3d 1303, 1312 (Fed. Cir. 2005)* (en banc) (cleaned up). "'[T]here is no magic formula or catechism for conducting claim construction.' Instead, the court is free to attach the appropriate weight to appropriate sources 'in light of the statutes **[*2]** and policies that inform ***patent*** law.'" *SoftView LLC v. Apple Inc., 2013 U.S. Dist. LEXIS 125893, 2013 WL 4758196, at *1 (D. Del. Sept. 4, 2013)* (quoting *Phillips, 415 F.3d at 1324*) (alteration

in original). When construing ***patent*** claims, a court considers the literal language of the claim, the ***patent*** specification, and the prosecution history. *Markman v. Westview Instruments, Inc., 52 F.3d 967, 977-80 (Fed. Cir. 1995)* (en banc), *aff'd*, *517 U.S. 370, 116 S. Ct. 1384, 134 L. Ed. 2d 577 (1996)*. Of these sources, "the specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term." *Phillips, 415 F.3d at 1315* (cleaned up).

"[T]he words of a claim are generally given their ordinary and customary meaning.... [Which is] the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the ***patent*** application." *Id. at 1312-13* (citations and internal quotation marks omitted). "[T]he ordinary meaning of a claim term is its meaning to [an] ordinary artisan after reading the entire ***patent***." *Id. at 1321* (internal quotation marks omitted). "In some cases, the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood **[*3]** words." *Id. at 1314*.

When a court relies solely upon the intrinsic evidence—the ***patent*** claims, the specification, and the prosecution history—the court's construction is a determination of law. *See Teva Pharms. USA, Inc. v. Sandoz, Inc., 574 U.S. 318, 331, 135 S. Ct. 831, 190 L. Ed. 2d 719 (2015)*. The court may also make factual findings based upon consideration of extrinsic evidence, which "consists of all evidence external to the ***patent*** and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises." *Phillips, 415 F.3d at 1317-19* (cleaned up). Extrinsic evidence may assist the court in understanding the underlying technology, the meaning of terms to one skilled in the art, and how the invention works. *Id.* Extrinsic evidence, however, is less reliable and less useful in claim construction than the ***patent*** and its prosecution history. *Id.*

II. BACKGROUND

The ***patents*** claim a "personal hydrofoil"—a surfboard-like device that achieves a hovering effect by using a fin that glides under the surface of the water. This fin—the hydrofoil—"enable[s] higher speeds and to lift the surfboard above the choppy, turbulent surface of the water, thus enabling surfing on larger waves." '044 ***Patent***, 1:26-28.

The '044 ***patent*** application was filed October 8, 2014. The '659 ***patent*** application was filed March 8, 2016 and is a continuation of **[*4]** the '044 ***patent***. The '044 and '659 ***patents*** share a specification. The parties agree that the following claims are representative for their respective ***patents***. The disputed claim language is italicized.

'044 ***Patent***, Claim 1:

> A passively stable, weight-shift controlled personal hydrofoil watercraft, comprising:
>
> a flotation device that has a fore-aft length greater than a lateral width, the flotation device having a top surface and a bottom surface, *wherein a user can be disposed on the top surface of the flotation device in a prone, kneeling, or standing position*, the flotation device having a forward section, a middle section, and a rear section, and the flotation device being controlled via weight shift of the user;
> a strut having an upper end and a lower end, the upper end fixedly interconnected with the flotation device between the middle section and the rear section of the flotation device;
>
> a hydrofoil fixedly interconnected with the lower end of the strut, the hydrofoil having no movable surface and *designed to provide passive static stability* controlled solely by weight shift of the user;
>
> a propulsion system for propelling the watercraft in a body of water, wherein the propulsion system is connected to the hydrofoil; and **[*5]**
> the watercraft having no movable steering system.

'044 ***Patent***, Claim 5:

> A watercraft in accordance with claim 1, wherein *the design for providing the passive static stability is achieved through a combination of airfoil design, planform design and tailoring of span-wise twist distribution.*

'659 ***Patent***, Claim 1:

> *A passively stable, weight-shift controlled personal hydrofoil watercraft*, comprising:
>
> a flotation device that has a fore-aft length greater than a lateral width, the flotation device having a top surface and a bottom surface, *wherein a user can be disposed on the top surface of the flotation device in a prone, kneeling, or standing position*,

the flotation device having a forward section, a middle section, and a rear section;
a strut having a upper end and a lower end, the upper end fixedly interconnected with the flotation device between the middle section and the rear section of the flotation device;
a hydrofoil fixedly interconnected with the lower end of the strut, the hydrofoil having no movable surface;
a propulsion system for propelling the watercraft in a body of water, wherein the propulsion system is connected to the hydrofoil; and
the watercraft having no movable steering system.

'659 ***Patent***, Claim 16:

A personal **[*6]** hydrofoil watercraft, comprising:

a surfboard-shaped flotation device that has a fore-aft length greater than a lateral width, the flotation device having a top surface and a bottom surface, *wherein the top surface has a substantially horizontal supporting surface configured to support a user in a prone, kneeling, or standing position*, the flotation device having a forward section, a middle section, and a rear section;
a hydrofoil interconnected with the surfboard-shaped flotation device, the hydrofoil having a strut and a first hydrofoil wing, an upper end of the strut being fixedly interconnected with the surfboard-shaped flotation device;
a propulsion system attached to the surfboard-shaped flotation device for propelling the watercraft in a body of water, the propulsion system comprising a battery, an electric motor, a motor speed controller, and a propulsor, wherein the propulsor is selected from a propeller, a ducted propeller, or a pump jet, and the battery and motor speed controller are contained in a watertight compartment integrated into the flotation device;
the watercraft having no movable steering system;
a handheld controller having a throttle; and

a throttle interface, wherein **[*7]** the throttle is adapted to send electronic signals to the throttle interface that cause an output of the propulsion system to change.

III. CONSTRUCTION OF DISPUTED TERMS

A. Term 1: "wherein a user can be disposed on the top surface of the flotation device in a prone, kneeling, or standing position" ('044 ***Patent***, Cl. 1; '659 ***Patent***, Cl. 1)

1. *Plaintiff's proposed construction:* "Wherein a user can be disposed on the top surface of the flotation device in each of the following positions: lying chest down; kneeling; or standing."

2. *Defendants' proposed construction:* Plain and ordinary meaning.

3. *Court's construction:* "'Prone, kneeling, or standing' are alternatives. Only one of them is required."

Plaintiff argues that the top surface of the board must allow the user to use the device in each listed position (prone, kneeling, and standing). Defendants disagree, arguing that the use of the word "or" in the claim limitation means that the board must allow a user to "be in any (or all) of the three positions." (D.I. 62 at 4).

"Or" usually designates alternatives. *See* *Kustom Signals, Inc. v. Applied Concepts, Inc.*, 264 F.3d 1326, 1331 (Fed. Cir. 2001). To deviate from the usual interpretation, a party must show that the deviation is "clearly explained in the ***patent*** documents." *Id.* Here, I do not think **[*8]** that the ***patent*** documents show that "or" has anything other than its common usage.

The claim describes "a flotation device ... wherein a user can be disposed on the top surface of the flotation device in a prone, kneeling, or standing position ...." '044 ***Patent***, Cl. 1. Plaintiff argues, "The conjunction 'or' is necessary because a user cannot be in all three positions at once ...." (D.I. 46 at 14). I do not think that "or" was "necessary"—the patentee could have drafted the claim with more clarity to claim a board that must support all three positions. The claim language, as drafted, claims a top surface that supports a user in a prone position, a kneeling position, or a standing position.

The specification does not clearly explain that "or" ought to be given anything other than its usual meaning. Plaintiff cites an embodiment in support of its proposed construction. (D.I. 46 at 12-14). The embodiment describes a "flotation board ... similar to those used in surfing or sailboarding." '044 ***Patent***, 3:7-8. Figure 1 shows the flotation board to be "substantially flat." (D.I. 46 at 12). The specification further describes, "To operate the watercraft 100, a user initially lies prone on the flotation board 101. **[*9]** The throttle is engaged, causing the craft to accelerate. As the craft gains speed

the user may move to a kneeling or standing position." '044 ***Patent***, 4:33-36.

Defendants argue that Plaintiff seeks to import limitations from embodiments into the claims. (D.I. 46 at 18). I agree. As Defendants argue, "claim 1 (of both ***patents***) and claim 16 (of the '659 ***patent***) are each directed to a 'personal hydrofoil watercraft,' of which a surfboard is just one example." (D.I. 46 at 19). The Figure 1 embodiment, far from clearly explaining that the top surface of the claimed device must support a user in all three positions, suggests that a "flat upper surface to allow an adult human to lie prone, sit, kneel or stand" is merely "preferential[.]" ('044 ***patent***, 3:13-17).

Thus, I reject Plaintiff's proposed construction. I will give "or" its customary meaning of designating alternatives. The claimed top surface must support a user in at least one of the three listed positions, but it need not support a user in more than one of the three.

B. Term 2: "wherein the top surface has a substantially horizontal supporting surface configured to support a user in a prone, kneeling, or standing position" ('659 *Patent*, Cl. 16)

1. *Plaintiff's proposed construction:* ***[*10]*** "Wherein the top surface has a substantially horizontal supporting surface configured to support a user in each of the following positions: lying chest down; kneeling; or standing."

2. *Defendants' proposed construction:* Plain and ordinary meaning.

3. *Court's construction:* 'Prone, kneeling, or standing' are alternatives. Only one of them is required."

For the reasons stated in Section III.A, I reject Plaintiff's proposed construction.

C. Term 3: "designed to provide passive static stability" ('044 *Patent*, Cl. 1)

1. *Plaintiff's proposed construction:* "Designed such that the hydrofoil has an initial tendency to return to its original condition when disturbed without the hydrofoil having any moveable components."

2. *Defendants' proposed construction:* Indefinite or, in the alternative, "designed to provide stability without mechanisms or active control systems."

3. *Court's construction:* "Designed such that the hydrofoil has an initial tendency to return to its original condition when disturbed without the hydrofoil having any moveable components."

Defendants argue this term is indefinite. (D.I. 46 at 38). This is because, according to Defendants, the specification treats stability as simply a "personal preference" **[*11]** and a person of skill in the art ("POSA") would be unable to determine whether "any particular personal hydrofoil watercraft falls inside or outside the scope of the claims." (*Id.* at 39.). Plaintiff responds that there are criteria listed in the specification for determining stability and point to the expert opinion of Mr. Barry. (*Id.* at 46-50). I agree with Plaintiff. The concept of stability appears to be well-known in the art. (*See* D.I. 59, 60). Plaintiffs expert, who considers himself a POSA, has explained how the ***patents*** use the term. (D.I. 39-1, Ex. A ¶¶ 71, 77-79). Thus, I reject Defendants' argument that the term is indefinite.

Defendants also dispute Plaintiff's proposed construction. The dispute is over the role of "static" in the term "passive static stability." Defendants argue for the construction, "designed to provide stability without mechanisms or active control systems" while Plaintiff has proposed the construction "Designed such that the hydrofoil has an initial tendency to return to its original condition when disturbed without the hydrofoil having any moveable components." I requested supplemental letters providing definitions of "stability" from sources such as **[*12]** textbooks. The letters were helpful. Stability in the field of aerodynamics has two categories: static and dynamic. Static stability "deals with the *initial* tendency of a vehicle to return to equilibrium ... after being disturbed. It says nothing about whether it ever reaches its equilibrium position or how it gets there. Such matters are the realm of dynamic stability." (D.I. 60-2, Ex. B at 602).

Defendants' proposed construction does not account for the fact that static stability is a sub-category of stability. Plaintiff's proposed construction, on the other hand, captures the concept of static stability. Thus, I will adopt Plaintiff's proposed construction.

D. Term 4: "A passively stable, weight-shift controlled personal hydrofoil watercraft" ('659 *Patent*, Cl. 1)

1. *Plaintiff's proposed construction:* "A watercraft having a hydrofoil, the hydrofoil having an initial tendency to return to its original condition when disturbed without the hydrofoil having any moveable components and that is controlled by weight-shift of the user."

2. *Defendants' proposed construction:* Indefinite or, in the alternative, "A weight-shift controlled personal hydrofoil watercraft that is stable without mechanisms or active **[*13]** control systems."

3. *Court's construction:* Plain and ordinary meaning.

Unlike the last claim term, this term does not specify "static" stability. As discussed *supra*, stability incorporates both static and dynamic stability. Plaintiff asserts that a person of skill in the art would find "passively stable" and "passive static stability" to be interchangeable. (D.I. 46 at 36). I doubt that. Thus, I reject Plaintiff's proposition that the term here ought to have substantially the same construction as the last term. Defendants' proposed construction, however, does not construe "stable" at all. For now, I will construe the term to have its plain and ordinary meaning. The parties may readdress this issue, if it is important, in case dispositive motions.

E. Term 5: "wherein the design for providing the passive static stability is achieved through a combination of airfoil design, planform design and tailoring of span-wise twist distribution" ('044 *Patent*, Cl. 5)

1. *Plaintiff's proposed construction:* "The design for providing the passive static stability is achieved through a combination of:

- a geometry of a cross-section of the hydrofoil;
- a shape of the hydrofoil as viewed from above; and
- a measure of rotation **[*14]** of a hydrofoil section along the span of the hydrofoil."

2. *Defendants' proposed construction:* "This claim term is not limiting or, in the alternative, no construction is needed at this time."

3. *Court's construction:* Plain and ordinary meaning.

Plaintiff's position is that airfoil design, planform design, and tailoring of span-wise twist distribution are "structural characteristics." (D.I. 46 at 53). Defendants argue that they are methods of design, not structure. (*Id.* at 58). The parties dispute, for instance, whether "tailoring" describes an act or a structure.

"Tailoring" and "design" could be a structure, as Plaintiff argues. At this point, however, I am not convinced that the term means anything other than its plain and ordinary meaning. In support of their proposed construction, Plaintiff largely cites to its expert's declaration, but I give that no weight. (D.I. 46 at 53-57). Neither party has made a strong claim construction argument based on the intrinsic record. The parties are free to address the construction of this term again, if it is important, in case dispositive motions.

IV. CONCLUSION

Within five days the parties shall submit a proposed order consistent with this Memorandum **[*15]** Opinion suitable for submission to the jury.

End of Document

US Patent Issued on March 7 for "Powered hydrofoil board" (Pennsylvania Inventor)

US Fed News

March 10, 2017 Friday 11:38 AM EST

Copyright 2017 HT Media Ltd. All Rights Reserved

Length: 226 words

Dateline: ALEXANDRIA, Va.

Body

ALEXANDRIA, Va., March 10 -- United States ***Patent*** no. ***9,586,659***, issued on March 7.

"Powered hydrofoil board" was invented by Jacob Willem Langelaan (State College, Pa.). According to the abstract* released by the U.S. ***Patent*** & Trademark Office: "A passively stable personal hydrofoil watercraft that has a flotation device, wherein a user can ride in a prone, kneeling, or standing position. The watercraft includes a strut having an upper end interconnected with the flotation device and lower end connected with a hydrofoil. The hydrofoil greatly reduces the power required to travel at higher speed. The watercraft also includes a propulsion system connected to the hydrofoil. Both longitudinal and directional control of the watercraft is via weight shift, eliminating the need of any movable surfaces. The flotation device, strut, and hydrofoil may be permanently interconnected or may be detachable." The ***patent*** was filed on March 8, 2016, under Application No. 15/064,521. *For further information, including images, charts and tables, please visit:

http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&p=1&u=%2Fnetahtml%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&co1=AND&d=PTXT&s1=9586659&OS=9586659&RS=9586659 For any query with respect to this article or any other content requirement, please contact Editor at hlsyndication@hindustantimes.com

Load-Date: March 10, 2017

End of Document

Langelaan Jacob Willem Secures Patent on Powered Hydrofoil Board

Global IP News. Shipping and Marine Patent News

March 8, 2017 Wednesday

Copyright 2017 ProQuest Information and Learning
All Rights Reserved
Copyright 2017 Globalipnews.com

Length: 295 words

Dateline: New Delhi

Body

FULL TEXT

Publication Name: Shipping and Marine ***Patent*** News***Patent*** **Application Number:** 15/064,521***Patent*** **Publication Number:** ***9,586,659*****International** ***Patent*** **Classification Codes:** B63B 35/79 (20130101), B63B 1/248 (20130101), B63B 35/7926 (20130101), B63B 35/7943 (20130101), B63H 1/16 (20130101), B63H 5/14 (20130101), B63H 11/04 (20130101), B63H 21/17 (20130101), B63H 21/21 (20130101)***Patent*** **Status:** Granted

Alexandria, March 8 -- Langelaan Jacob Willem has secured a ***patent*** on powered hydrofoil board. The ***patent*** application number is 15/064,521. The International ***Patent*** Classification codes are B63B 35/79 (20060101), B63H 5/14 (20060101), B63H 21/21 (20060101), B63H 21/17 (20060101), B63H 11/04 (20060101), B63H 1/16 (20060101) and B63B 1/24 (20060101). Cooperative ***Patent*** Classification codes are B63B 35/79 (20130101), B63B 1/248 (20130101), B63B 35/7926 (20130101), B63B 35/7943 (20130101), B63H 1/16 (20130101), B63H 5/14 (20130101), B63H 11/04 (20130101), B63H 21/17 (20130101) and B63H 21/21 (20130101).

The abstract released by U.S. ***Patent*** and Trademark Office states, "A passively stable personal hydrofoil watercraft that has a flotation device, wherein a user can ride in a prone, kneeling, or standing position. The watercraft includes a strut having an upper end interconnected with the flotation device and lower end connected with a hydrofoil. The hydrofoil greatly reduces the power required to travel at higher speed. The watercraft also includes a propulsion system connected to the hydrofoil. Both longitudinal and directional control of the watercraft is via weight shift, eliminating the need of any movable surfaces. The flotation device, strut, and hydrofoil may be permanently interconnected or may be detachable."

Copyright© 2017, Globalipnews.com

Load-Date: March 9, 2017

End of Document

United States Courts Opinion: United States District Court District of Delaware: 21-091 - MHL Custom, Inc. v. Waydoo USA, Inc. et al

Impact News Service

February 6, 2023 Monday

Copyright 2023 Impact Media Limited All Rights Reserved

Length: 8588 words

Body

Washington: United States District Court District of Delaware has issued the following opinion:

IN THE UNITED STATES DISTRICT COURTFOR THE DISTRICT OF DELAWAREMHL CUSTOM, INC.,Plaintiff,V.WA YDOO USA, INC. and SHENZHENWA YDOO INTELLIGENCETECHNOLOGY CO., LTD.,Defendants.Civil Action No. 21-0091-RGAMEMORANDUM OPINIONBlake A. Bennett, COOCH AND TAYLOR, P.A , Wilmington, DE; Dennis D. Murrell, RobertJ. Theuerkauf (argued), Brian P. McGraw (argued), Megan E. Gibson, MIDDLETONREUTLINGER, Louisville, KY.Attorneys for Plaintiff.Kelly E. Farnan, Dorronda R. Bordley, RICHARDS, LAYTON & FINGER, P.A , Wilmington,DE; Edgar H. Haug, Robert E. Colletti (argued), Mark Basanta, Roman Khasidov, HAUGPARTNERS LLP, New York, NY.Attorneys for Defendants.February 2, 20231Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 1 of 26 PageID #:<pageID>ANBefore me are Plaintiff MHL Custom's ('MHL') and Defendants Waydoo USA's andShenzhen Waydoo Intelligence Technology's (collectively, 'Waydoo') motions for partialsummary judgment. The parties have fully briefed the motions. (D.I 80, 83, 91 , 93, 101 , 106). Iheard oral argument on January 4, 2023.I. BACKGROUNDPlaintiff alleges that Defendants infringe two of Plaintiff's ***patents***. Those ***patents*** are U.S ***Patent*** Nos. 9,359,044 (the, "044 ***Patent***') and ***9,586,659*** (the, "659 ***Patent***') (collectively, the'Asserted ***Patents***'). The Asserted ***Patents*** relate to a personal hydrofoil watercraft. The AssertedPatents share a common specification.Plaintiff asserts that Defendants' products infringe all claims of the '044 ***Patent*** (claims 1-22) and '659 ***Patent*** (claims 1-20). Defendants counterclaimed. (D.I 13). The parties agree claim1 of the '044 ***Patent*** and claims 1 and 16 of the '659 ***Patent*** are representative of the other claimsfor purposes of the pending motions. 1Plaintiff has moved for summary judgment of (1) direct infringement of claim 1 of the '044Patent, (2) the '044 ***Patent*** and '659 ***Patent*** are not anticipated, and (3) Plaintiff has standing. (D.I 77, 78, 79). Defendants have moved for summary judgment of (1) claims 16-20 of the '659 Patentare invalid for lack of written description, (2) non-infringement of the '044 ***Patent***, and (3) noninfringementof claims 1-15 ofthe '659 ***Patent***. (D.I 81).1 These three claims are the independent claims in the two ***patents***. For purposes of the pendingmotions, Parties agree that the other elements of the dependent claims are met and only disputeas to whether all the claim elements as listed in the three independent claims are infringed byDefendants' products.2Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 2 of 26 PageID #:<pageID>II. LEGAL STANDARD'The court shall grant summary judgment if the movant shows that there is no genuinedispute as to any material fact and the movant is entitled to judgment as a matter of law.' FED. R.CIV. P. 56(a). Material facts are those 'that could affect the outcome' of the proceeding. Lamontv. New Jersey, 637 F.3d 177, 181 (3d Cir. 2011) (quoting Anderson v. Liberty Lobby, Inc., 477U.S 242, 248 (1986)). '[A] dispute about a material fact is 'genuine' if the evidence is sufficientto permit a reasonable jury to return a verdict for the nonmoving party.' Id. The burden on themoving party may be discharged by pointing out to the district court that there is an absence ofevidence supporting the non-moving party's case. Celotex Corp. v. Catrett, 477 U.S 317, 323(1986).The burden then shifts to the non-movant to demonstrate the existence of a genuine issuefor trial. Matsushita Elec. Indus. Co. v. Zenith Radio Corp., 475 U.S 574, 586-87 (1986); Williamsv. Borough of West Chester, 891 F.2d 458, 460-61 (3d Cir. 1989). A non-moving party assertingthat a fact is genuinely disputed must support such an assertion by: '(A) citing to particular partsof materials in

the record, including depositions, documents, electronically stored information,affidavits or declarations, stipulations ... , admissions, interrogatory answers, or other materials;or (B) showing that the materials cited [by the opposing party] do not establish the absence . . . ofa genuine dispute . . .. ' FED. R. CIV. P. 56(c)(l). The non-moving party's evidence 'must amountto more than a scintilla, but may amount to less (in the evaluation of the court) than apreponderance.' Williams, 891 F.2d at 460-61.When determining whether a genuine issue of material fact exists, the court must view theevidence in the light most favorable to the non-moving party and draw all reasonable inferencesin that party's favor. Scott v. Harris, 550 U.S 372, 378 (2007); Wishkin v. Potter, 476 F.3d 180,3Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 3 of 26 PageID #:<pageID>184 (3d Cir. 2007). If the non-moving party fails to make a sufficient showing on an essentialelement of its case with respect to which it has the burden of proof, the moving party is entitled tojudgment as a matter of law. See Celotex, 477 U.S at 322.III. DISCUSSIONA. INFRINGEMENT OF CLAIMS 1-15 OF THE '659 PATENTDefendants have moved for summary judgment on non-infringement of claims 1-15 of the'659 ***Patent*** (D.I 80 at 20-26; D.I 83 at 29-32). The dispute focuses on whether Defendantsinfringe claim 1 of the '659 ***Patent***. Claims 2-15 depend on claim 1. The claim reads as follows:1. A passively stable, weight-shift controlled personal hydrofoil watercraft,compnsmg:a flotation device that has a fore-aft length greater than a lateral width, the flotationdevice having a top surface and a bottom surface, wherein a user can be disposedon the top surface of the flotation device in a prone, kneeling, or standing position,the flotation device having a forward section, a middle section, and a rear section;a strut having a upper end and a lower end, the upper end fixedly interconnectedwith the flotation device between the middle section and the rear section of theflotation device;a hydrofoil fixedly interconnected with the lower end of the strut, the hydrofoilhaving no movable surface;a propulsion system for propelling the watercraft in a body of water, wherein thepropulsion system is connected to the hydrofoil; andthe watercraft having no movable steering system.('659 ***Patent***, cl. 1). The parties agree that the preamble of the '659 ***Patent***-A passively stable,weight-shift controlled personal hydrofoil watercraft-is limiting. (D.I 83 at 30; D.I 91 at 41). Theparties dispute whether the 'stable' aspect of the limitation is met. (D.I 83 at 29-32; D.I 91 at 43-45).There are two issues to this dispute.4Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 4 of 26 PageID #:<pageID>The first issue is whether 'stable' includes both static stability-having an initial tendencyto return to an original condition when disturbed - and dynamic stability - eventually returning toan original condition when disturbed. (D.I 60-2, Ex. B at 602). Defendants argue both areincluded; Plaintiff, only static stability. I previously construed this term to have its plain andordinary meaning but permitted the parties to readdress the issue at this stage of the case. (D.I 66at 9). Because there is a dispute over the scope of the claim term, I must construe the term beforeaddressing the question of infringement. 0 2 Micro Int '! Ltd. v. Beyond Innovation Tech. Co., 521F.3d 1351 , 1361 (Fed. Cir. 2008) ('A determination that a claim term 'needs no construction' orhas the 'plain and ordinary meaning' may be inadequate . .. when reliance on a term's ' ordinary'meaning does not resolve the parties' dispute.').The second issue is whether Defendants infringe the stability limitation as construed.1. Claim Construction'It is a bedrock principle of ***patent*** law that the claims of a ***patent*** define the invention towhich the patentee is entitled the right to exclude.' Phillips v. AWH Corp. , 415 F.3d 1303, 1312(Fed. Cir. 2005) (en bane) (internal quotation marks omitted). " [T]here is no magic formula orcatechism for conducting claim construction. ' Instead, the court is free to attach the appropriateweight to appropriate sources 'in light of the statutes and policies that inform ***patent*** law."SoftView LLC v. Apple Inc., 2013 WL 4758195, at *1 (D. Del. Sept. 4, 2013) (quoting Phillips,415 F.3d at 1324) (alteration in original). When construing ***patent*** claims, a court considers theliteral language of the claim, the ***patent*** specification, and the prosecution history. Markman v.Westview Instruments, Inc. , 52 F.3d 967, 977- 80 (Fed. Cir. 1995) (en bane), aff'd, 517 U.S 370(1996). Of these sources, 'the specification is always highly relevant to the claim construction5Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 5 of 26 PageID #:<pageID>analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.'Phillips, 415 F.3d at 1315 (internal quotation marks omitted).'[T]he words of a claim are generally given their ordinary and customary meaning ....[Which is] the meaning that the term would have to a person of ordinary skill in the art in questionat the time of the invention, i.e , as of the effective filing date of the ***patent*** application.' Id. at1312- 13 (citations and internal quotation marks omitted). '[T]he ordinary meaning of a claim termis its meaning to [an] ordinary artisan after reading the entire ***patent***.' Id. at 13 21 (internal quotationmarks omitted). 'In some cases, the ordinary meaning of claim language as understood by a personof

skill in the art may be readily apparent even to lay judges, and claim construction in such casesinvolves little more than the application of the widely accepted meaning of commonly understoodwords.' Id. at 1314.When a court relies solely upon the intrinsic evidence- the ***patent*** claims, the specification,and the prosecution history-the court's construction is a determination oflaw. See Teva Pharm.USA, Inc. v. Sandoz, Inc., 574 U.S 318, 331 (2015). The court may also make factual findingsbased upon consideration of extrinsic evidence, which 'consists of all evidence external to thepatent and prosecution history, including expert and inventor testimony, dictionaries, and learnedtreatises.' Phillips, 415 F.3d at 1317- 19 (internal quotation marks omitted). Extrinsic evidencemay assist the court in understanding the underlying technology, the meaning of terms to oneskilled in the art, and how the invention works. Id. Extrinsic evidence, however, is less reliableand less useful in claim construction than the ***patent*** and its prosecution history. Id.Defendants argue that 'stable' should mean being statically stable and dynamically stable.Defendants cite to the ***patent*** specification and textbooks for support that a person of ordinary skillin the art ('POSA') would read 'stable' to require static and dynamic stability. (D.I 83 at 4-7).6Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 6 of 26 PageID #:<pageID>Plaintiff argues that 'stable' should be interchangeable with statically stable or havingstatic stability, and therefore, does not require that the watercraft have dynamic stability. (D.I 91at 22). Plaintiff cites to their expert, Mr. Barry, for support that " stable' and ' static stability' are'commonly used interchangeably with respect to aircraft and hydrofoil stability." (D .I 91 at 18(citing D.I 80-31 , ,r 12)). Mr. Barry also expressed an opinion that the ***patent*** uses the termsinterchangeably. (Id. at 19).I agree with Defendants that 'stable' should mean having both static stability and dynamicstability. I previously rejected Plaintiffs argument that 'stable' and 'static stability' could be usedinterchangeably. (D.I 66 at 9). Plaintiff has not provided compelling intrinsic or extrinsic evidenceto convince me to deviate from my initial view. Furthermore, the ***patent*** specification recites, 'Thistrim condition is stable if a disturbance results in a restoring moment that returns the hydrofoil toits original condition.' (' 659 ***Patent***, col. 6: 14-16). The hydrofoil returning to its original conditionis a description of dynamic stability, not static stability. Therefore, the ***patent*** specificationindicates that stable and statically stable (or static stability) are not interchangeable.Therefore, I will construe 'A passively stable, weight-shift controlled personal hydrofoilwatercraft' to mean 'a weight-shift controlled personal watercraft having a hydrofoil that does nothave any moveable components and which, when disturbed, (1) has an initial tendency to returnto its original condition and (2) eventually returns to its original condition.'22. Non-Infringement by the Accused ProductsThe remaining issue is whether the accused products have static stability and dynamicstability. Defendants argue that their products are dynamically unstable (or lack dynamic stability)and Plaintiff has provided no evidence to show the accused products are dynamically stable. Thus,2 I proposed this construction prior to oral argument. (D.I 142).7Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 7 of 26 PageID #:<pageID>Defendants argue there is no genuine issue of material fact that precludes summary judgment thatthe accused products do not infringe claims 1-15 of the '65 9 ***Patent***.Defendants contend that the only evidence Plaintiff has that shows Defendants' productsare dynamically stable are 'eigenvalue' analyses of some of the accused products. (D .I 83 at 31).The parties agree that this type of analysis can be used to assess whether a watercraft isdynamically stable. (D.I 83 at 31 ; D.I 91 at 43). 'If an eigenvalue analysis reports a positive'sigma value,' it indicates that [a watercraft] is unstable.' (DJ. 83 at 3). Defendants assert, because' [a]ll of Mr. Barry's eigenvalue analyses for [Defendants'] products report positive sigma values,'Plaintiffs own expert shows conclusively that Defendants' products do not have dynamic stability.(D.I 83 at 32).Plaintiff argues that Defendants are not entitled to summary judgment because there stillexists a genuine issue of material fact as to whether Defendants' products are dynamically stable.Plaintiff cites to Mr. Barry's deposition where he testified that he did not believe his analysesshowed the products were dynamically unstable. (D.I 91 at 44). Plaintiff contends that: (1) whileMr. Barry's eigenvalue analysis showed the watercrafts to be dynamically unstable, the resultswere 'close' to showing dynamic stability, and (2) when Mr. Barry viewed the accused productsoperating in the real world, he concluded that they were dynamically stable, notwithstanding theeigenvalue analysis. (Id; see D.I 85-1 , Ex. 6, 402:8-403 :23 (stating positive eigenvalues did notindicate dynamic instability in part because the software was 'an approximation' and did notaccount for all effects)). Plaintiff, therefore, argues that the eigenvalue analysis is not conclusivewhen considering Mr. Barry's testimony and other analyses.Plaintiff also relies on Mr. Barry's statements that the Athena Vortex Lattice (A VL)software he used to analyze the stability of the

watercrafts understated the stability of the accused8Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 8 of 26 PageID #:<pageID>products.3 Mr. Barry stated that the A VL software does not account for additional stabilizingfactors that 'exist once the effect of the water in which the hydrofoil is operating in is considered,'such as 'damping, free surface, added mass, and viscosity'. (D.I 91 at 44; see, e.g , D.I 80-33,Ex. 31, ,r,r 23 (free surface), 55 (damping, added mass and viscosity effects)). Therefore, Plaintiffcontends that Mr. Barry's testimony about his different analyses and his conclusions raises agenuine dispute as to whether the accused products are dynamically stable.I agree with Plaintiff that there is a genuine dispute whether the accused products aredynamically stable. Defendants are correct that the eigenvalue analyses of the watercrafts show atleast one positive sigma value for each product analyzed, which Plaintiff does not dispute,indicating dynamic instability. Those analyses, however, are not the only evidence in the record.The record also includes testimony by Mr. Barry, in which he concludes that the watercraft aredynamically stable based on analyzing the stability derivatives using the A VL software andobservation of the watercraft in the real world. (D.I 91 at 44; see, e.g , D.I 80-33, ,r,r 26-28, 53-55). Taking the evidence in the light most favorable to Plaintiff, as I am required to do, I determinethat a reasonable jury could conclude that the accused products have dynamic stability andtherefore do infringe.Therefore, I will deny summary judgment of infringement of claims 1-15 of the '659Patent.3 Mr. Barry used the A VL software to analyze the pitch stability derivative, directional stabilityderivative, and roll stability derivative to assess watercraft stability. Mr. Barry also used theAVL software to analyze the eigenvalues for his eigenvalue analysis. (See, e.g , D.I 85-1 , Ex. 3,,r,r 95-96, 155-156)9Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 9 of 26 PageID #:<pageID>B. INFRINGEMENT OF THE '044 PA TENTThe parties have cross-moved for summary judgment on infringement of claims 1-22 ofthe '044 ***Patent*** (D.I 80 at 20-26; D.I 83 at 29-32). The parties agree that whether either side isentitled to summary judgment comes down to whether there is a genuine issue of material fact thatDefendants infringe claim 1 of the '044 ***Patent***. The claim reads as follows:1. A passively stable, weight-shift controlled personal hydrofoil watercraft,compnsmg:a flotation device that has a fore-aft length greater than a lateral width, the flotationdevice having a top surface and a bottom surface, wherein a user can be disposedon the top surface of the flotation device in a prone, kneeling, or standing position,the flotation device having a forward section, a middle section, and a rear section,and the flotation device being controlled via weight shift of the user;a strut having an upper end and a lower end, the upper end fixedly interconnectedwith the flotation device between the middle section and the rear section of theflotation device;a hydrofoil fixedly interconnected with the lower end of the strut, the hydrofoilhaving no movable surface and designed to provide passive static stabilitycontrolled solely by weight shift of the user;a propulsion system for propelling the watercraft in a body of water, wherein thepropulsion system is connected to the hydrofoil; andthe watercraft having no movable steering system.('044 ***Patent***, cl. 1). There are two disputes at issue here. First, the parties dispute whether thepreamble of claim 1 is limiting. Plaintiff argues it is not; Defendants, that it is. Second, the partiesdispute whether Defendants' products satisfy the stability limitations of claim 1. Resolving thesecond issue necessarily depends on the outcome of the first issue.1. Whether the Preamble of Claim 1 is LimitingAs an initial matter, it is proper for me to determine whether the preamble of claim 1 islimiting or not. Plaintiff argues that this is a determination to be left for the jury. (D.I 91 at 41).Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 10 of 26 PageID #:<pageID>Plaintiff is mistaken. Determining the effect of preamble language is a claim-construction issue.See Cochlear Bone Anchored Solutions AB v. Oticon Medical AB, 958 F.3d 1348, 1354 (Fed. Cir.2020). Claim construction and resolving the scope of asserted claims are questions of law left tothe court. See Every Penny Counts, Inc. v. American Express Co., 563 F.3d 1378, 1383 (citing 02Micro Int'! Ltd. v. Beyond Innovation Tech. Co. , 521 F.3d 1351 , 1361-62 (Fed. Cir. 2008)).Therefore, I find it is necessary for me to make this determination now.4'[A]s a general rule preamble language is not treated as limiting.' Aspex Eyewear, Inc. v.Marchan Eyewear, Inc. , 672 F.3d 1335, 1347 (Fed. Cir. 2012). 'Whether to treat a preamble as alimitation is 'determined on the facts of each case in light of the overall form of the claim, and theinvention as described in the specification and illuminated in the prosecution history." Deere &Co. v. Bush Hog, LLC, 703 F.3d 1349, 1357 (Fed. Cir. 2012) (quoting Applied Materials, Inc. v.Advanced Semiconductor Materials Am., Inc., 98 F.3d 1563, 1572-73 (Fed. Cir. 1996)). 'Ingeneral, a preamble limits the invention if it recites essential structure or steps, or if it is necessaryto give life, meaning, and vitality to the claim.' Catalina Mktg. Int'!, Inc. v. Coo/savings.com, Inc. ,289 F.3d 801, 808 (Fed. Cir.

2002) (citation and quotation marks omitted). 'The preamble may belimiting to the extent it is 'necessary to provide antecedent basis for the body of the claim."Cochlear Bone, 958 F.3d at 1355 (quoting Symantec Corp. v. Computer Assoc. Int '!, Inc. , 522 F.3d1279, 1288 (Fed. Cir. 2008)). In addition, the preamble may be limiting when the preamble 'isessential to understand limitations or terms in the claim body,' recites 'additional structure or stepsunderscored as important by the specification,' or there was 'clear reliance on the preamble during4 While I have construed identical preamble language in the context of claim 1 of the '659 Patentas limiting, both parties agreed the preamble was limiting in that ***patent***.11Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 11 of 26 PageID #:<pageID>prosecution to distinguish the claimed invention from the prior art.' Catalina, 289 F.3d at 808. Inother words, there are numerous exceptions to the default rule that a preamble is not limiting.Plaintiff contends that the preamble is not limiting because there is a presumption againstreading a preamble as limiting and this case does not present one of the recognized exceptions tothat presumption. Specifically, Plaintiff argues that the 'preamble does not: (1) recite essentialstructure; (2) provide antecedent basis to the claim term at issue; and (3) is not essential tounderstand limitations or terms in the claim body.' (D.I 91 at 42).Plaintiff further argues that there was no reliance on the preamble during prosecution. (Id.at 43). Plaintiff cites to the fact the preamble was present in the original claim as filed, and thestatic stability limitation was added to overcome prior art. (D.I 146 at 2). Plaintiff contends thatthis shows that neither the inventor nor Examiner relied on the preamble during prosecutionbecause the addition of the static stability limitation would be unnecessary if the preamble werelimiting. (Id. at 2).Defendants argue the preamble should be limiting because claim 1 of the '659 ***Patent***,which is part of the same ***patent*** family and has an identical specification, recites identical languageand both parties agree the preamble is limiting in that context. Defendants contend that there is'no technical or legal justification for why identical preambles should be treated differently.' (D.I 83 at 30). Defendants further argue that the preamble 'is limiting because it recites an ' essential'element not found in the body of the claim (i.e , dynamic stability).' (D.I 106 at 15). To put itanother way, Defendants argue that the ***patent*** specification 'repeatedly defines the invention asan overall stable watercraft,' and therefore the preamble should be limiting because only thepreamble specifies that the invention is dynamically stable. (D.I 145 at 3).12Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 12 of 26 PageID #:<pageID>I agree with Plaintiff that the preamble is not limiting. As an initial matter, I am not awareof any case law that states a preamble must be limiting in one ***patent*** because the identically wordedpreamble is limiting in another ***patent*** belonging to the same ***patent*** family. Defendants have alsonot supplied any such case law, despite being given additional time to do so. (D.I 145 at 1).The proposed identically-worded-preamble rule is inconsistent with the case law.5 TheFederal Circuit has stated '[w]hether to treat a preamble as a limitation is determined on the factsof each case in light of the overall form of the claim[] and the invention as described in thespecification and illuminated in the prosecution history.' Cochlear Bone, 958 F.3d at 1354(quoting Deere & Co. , 703 F.3d at 1357). I am thus required to analyze the form of claim 1 of the'044 ***Patent***, which has significant differences from the form of claim 1 of the '659 ***Patent***, whendetermining whether the preamble is limiting. Therefore, I do not believe that the presumptionagainst reading a preamble as non-limiting is overcome just because the same preamble is limitingin claim 1 of the '659 ***Patent***.I do not find that dynamic stability is an 'essential' element that requires the preamble tobe limiting. Nor do I think dynamic stability is 'underscored as important by the specification.'Catalina, 289 F.3d at 808. Nowhere in the '044 ***Patent*** is the term 'dynamic stability' or'dynamically stable' used.The '044 ***Patent*** specification does repeatedly describe the invention as being 'stable' orhaving 'passive stability,' and dynamic stability is a component of those terms. See Section III.A I5 Furthermore, I have not applied such a rule even when the claims sharing the identicalpreamble are part of the same ***patent***. See Takeda Pharma. Co. v. Actavis Lab 'ys FL, Inc., 2016WL 3193188, at *6 n.6, *7 n.7, *7-8 (D. Del. June 6, 2016) (independently analyzing whetheridentical preamble language is limiting in two separate claims of the same ***patent***), aff din part,rev 'din part sub nom. Nalproprion Pharms., Inc. v. Actavis Lab 'ys FL, Inc., 934 F.3d 1344 (Fed.Cir. 2019).13Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 13 of 26 PageID #:<pageID>supra. 'But not every preamble reference to additional structure is limiting, even when thestructure is noted in the specification--even, indeed, when the structure is 'underscored asimportant by the specification." Arctic Cat Inc. v. GEP Power Products, Inc., 919 F.3d 1320,1329 (Fed. Cir. 2019) (quoting Catalina, 289 F.3d at 808 ('[W]hen reciting additional structure orsteps underscored as important by the specification, the preamble may

operate as a claimlimitation.')). Furthermore, even though the specification references the importance of stability, itsimilarly does so with respect to static stability. See '044 ***Patent*** 2: 17-20 ('The prior art in poweredhydrofoil surfboards have all relied on moveable surfaces for control, and have ignored thepossibility of designing the hydrofoil for passive static stability.'); 5:50-54 ('Note that otherversions of the hydrofoil are possible: the key is designing the hydrofoil for passive static stabilityvia planform design, airfoil design, and span-wise twist distribution.'). Therefore, I read thespecification as underscoring the importance that the watercraft have static stability.The body of claim 1 of the '044 ***Patent*** addresses this essential, static stability element ofthe invention by reciting 'a hydrofoil ... designed to provide passive static stability.' ('044 ***Patent***,cl. 1). Because having static stability is already an explicit limitation in the body of the claim, I donot read the preamble as supplying an essential element for claim 1 of the '044 ***Patent***. 6Accordingly, I conclude that the preamble of claim 1 of the '044 ***Patent*** is not limiting.6 It is this explicit recitation of static stability in the body of the claim 1 of the '044 ***Patent*** thatdifferentiates the effect of the preamble in claim 1 of the '044 ***Patent*** from the effect of thepreamble in claim 1 of the '659 ***Patent***. The body of claim 1 of the '659 ***Patent*** does not containany limitations pertaining to stability. As already discussed, the shared ***patent*** specificationunderscores the importance of the watercraft having static stability. Therefore, the preamble isproviding an essential element in claim 1 of the '659 ***Patent*** by stating that the watercraft needsto be 'stable.' Since the preamble is limiting, the full scope of 'stable' becomes a limitation.14Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 14 of 26 PageID #:<pageID>2. Non-Infringement of the '044 PatentDefendants' motion for summary judgment of non-infringement of the '044 ***Patent*** ispremised on the preamble of claim 1 of the '044 ***Patent*** being limiting and requiring the additionallimitation of dynamic stability. (D.I 83 at 29-31). Because I have determined that the preamble toclaim 1 is not limiting, there is no dynamic stability limitation in the claims of the '044 ***Patent***.Therefore, Defendants' motion for summary judgment of non-infringement of the '044 ***Patent*** isdenied.3. Infringement of the '044 PatentPlaintiff moves for summary judgment that Defendants infringe claim 1 of the '044 ***Patent***,and, by extension, all other claims of the '044 ***Patent***, on the ground that there is no genuine issueof fact that Defendants' accused products are statically stable. 7 Plaintiff argues that the testimonyof its expert witness, Mr. Barry, and the analysis he conducted of the accused products,demonstrates that the accused products are passively statically stable. (D.I 80 at 24-26). Plaintiffcontends that because Defendants have not produced any affirmative evidence to dispute that theaccused products are passively statically stable, there is no disputed fact in the record that preventsfinding that the accused products infringe the '044 ***Patent***. (Id. at 25-26).Defendants argue, 'There is a genuine dispute as to whether [Plaintiff] has evidencesufficient to meet its burden for showing even static stability.' (D.I 93 at 25). Defendants contendthat their expert witness, Dr. Triantafyllou, has 'explained that in trying to show static stability ofthe Accused Products, Mr. Barry concocted his own stability standard rather than assess themaccording to the standard set out in the Asserted ***Patents***.' (Id. at 26). Defendants further argue,7 The parties agree that the only claim limitation in question is whether Defendants' productsmeet the stability limitation of claim 1. As discussed above, claim 1 of the '044 ***Patent*** onlyrequires static stability because the preamble is not limiting.15Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 15 of 26 PageID #:<pageID>'Without undisputed evidence that the Accused Products meet the standard set out in the AssertedPatents-which [Plaintiff] does not have because Mr. Barry did not so opine-summary judgmentof infringement is improper.' (Id.). Defendants also argue that summary judgment is improperbecause Mr. Barry did not examine all of the accused products for infringement. (Id.).I agree with Defendants that there exists a genuine issue of material fact. Plaintiff hasprovided evidence through Mr. Barry's testimony and analysis to show that Defendants' accusedproducts are statically stable. Defendants' expert responded by noting that Mr. Barry's analysisdeviates from that included in the asserted ***patents***, and the reason for doing so goes unexplained.(D.I 85-1, Ex. 8, 1 17). A reasonable juror could weigh the testimony by the parties' experts andreach the conclusion that Plaintiff has not carried its burden to show that Defendants' products arestatically stable.Therefore, I will deny summary judgment as to infringement of the '044 ***Patent***.C. WRITTEN DESCRIPTION OF CLAIMS 16-20 OF THE '659 PATENTDefendants move for summary judgment of invalidity for lack of written description forclaims 16-20 of the '659 ***Patent***. Claim 16, which is representative of the other claims,8 reads asfollows:16. A personal hydrofoil watercraft, comprising:a surfboard-shaped flotation device that has a fore-aft length greater than a lateralwidth, the flotation device having a top

surface and a bottom surface, wherein thetop surface has a substantially horizontal supporting surface configured to supporta user in a prone, kneeling, or standing position, the flotation device having aforward section, a middle section, and a rear section;a hydrofoil interconnected with the surfboard-shaped flotation device, the hydrofoilhaving a strut and a first hydrofoil wing, an upper end of the strut being fixedlyinterconnected with the surfboard-shaped flotation device;8 Claims 17-20 are dependent claims that depend on claim 16.16Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 16 of 26 PageID #:<pageID>a propulsion system attached to the surfboard-shaped flotation device forpropelling the watercraft in a body of water, the propulsion system comprising abattery, an electric motor, a motor speed controller, and a propulsor, wherein thepropulsor is selected from a propeller, a ducted propeller, or a pump-jet, and thebattery and motor speed controller are contained in a watertight compartmentintegrated into the flotation device;the watercraft having no movable steering system;a handheld controller having a throttle; anda throttle interface, wherein the throttle is adapted to send electronic signals to thethrottle interface that cause an output of the propulsion system to change.('659 ***Patent***, cl. 16). Defendants assert the claims are invalid for lack of written descriptionbecause they do not contain a stability limitation (i.e , do not require the watercraft to be staticallystable, dynamically stable, or both), but the specification of the Asserted ***Patents*** 'clearly disclosesthe alleged invention as being a stable hydrofoil watercraft, and never suggests that the allegedinvention can be anything other than stable.' (D.I 83 at 26). Defendants further contend that thefile history of the '044 ***Patent*** shows the ***patent*** examiner 'explicitly relied on the hydrofoilproviding static stability in allowing the '044 [P]atent.' (Id.). Defendants analogize the presentcase to ICU Medical, Inc. v. Alaris Medical Sys., Inc., 558 F.3d 1368, 1377-79 (Fed. Cir. 2009).Plaintiff does not dispute that neither static stability nor dynamic stability (or both together)are limitations of the claims 16-20 of the '659 ***Patent***. Plaintiff asserts the written descriptionrequirement is met because the ***patent*** specification does not limit the invention to a 'stable'watercraft. Plaintiff analogizes the present case to ScriptPro LLC v. Innovation Assoc., Inc., 833F.3d 1336, 1340-42 (Fed. Cir. 2016). Plaintiff argues that a stable watercraft is just one purpose ofthe invention and claims 16-20 of the '659 ***Patent*** are written to address other purposes of theinvention, such as not having a movable steering system, providing a 'surfing feel,' and beingeasy to transport and maintain. (D.I 91 at 39).17Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 17 of 26 PageID #:<pageID>The written description requirement contained in 35 U.S.C § 112 requires that thespecification 'clearly allow persons of ordinary skill in the art to recognize that [the inventor]invented what is claimed.' Ariad Pharms., Inc. v. Eli Lilly & Co. , 598 F.3d 1336, 1351 (Fed. Cir.2010) (en bane) (alteration in original). 'In other words, the test for sufficiency is whether thedisclosure of the application relied upon reasonably conveys to those skilled in the art that theinventor had possession of the claimed subject matter as of the filing date.' Id. 'When determiningwhether a specification contains adequate written description, one must make an ' objective inquiryinto the four corners of the specification from the perspective of a person of ordinary skill in theart." Bos. Sci. Corp. v. Johnson & Johnson, 64 7 F .3d 1353, 1366 (Fed. Cir. 2011) (quoting Ariad,598 F.3d at 1351).The written description inquiry is a question of fact. Ariad, 598 F.3d at 1351. Although itis a question of fact, '[c]ompliance with the written description requirement ... is amenable tosummary judgment in cases where no reasonable fact finder could return a verdict for the nonmovingparty.' PowerOasis, Inc. v. T-Mobile USA, Inc., 522 F.3d 1299, 1307 (Fed. Cir. 2008). 'Aparty must prove invalidity for lack of written description by clear and convincing evidence.'Vasudevan S9ftware, Inc. v. MicroStrategy, Inc., 782 F.3d 671 , 682 (Fed. Cir. 2015).I find that Defendants are entitled to summary judgment that claims 16-20 of the '659Patent are invalid for lack of written description. The ***patent*** specification does not disclose thatthe patentee possessed a personal hydrofoil watercraft that lacks both static and dynamic stability.There is no genuine disputed fact about this.The specification of the '659 ***Patent*** only, and repeatedly, describes the invention as beinga watercraft that is either stable or at least has static stability. For example, the abstract of the patentrecites, 'A passively stable personal hydrofoil watercraft . ... ' ('659 ***Patent*** at Abstract). The18Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 18 of 26 PageID #:<pageID>***patent*** specification further recites, 'The hydrofoil of the present invention has been designed toprovide passive stability in the longitudinal direction, making traditional altitude control systemsbased on moveable surfaces unnecessary.' (Id. at col. 2: 8-1 2).Static stability distinguishes the invention from the prior art. The specification recites, 'Theprior art in powered hydrofoil surfboards have all relied on moveable surfaces for control, andhave ignored the possibility of designing the hydrofoil for passive static stability ... . [T]he presentinvention is specifically

designed to achieve desired levels of stability and controllability withoutthe need for moveable surfaces.' (Id. at col. 2:20-26). The ***patent*** specification further emphasizesthat the hydrofoil should be designed to provide static stability to the watercraft, even forundisclosed embodiments. (Id. at col. 5 :62-65 ('Note that other versions of the hydrofoil arepossible: the key is designing the hydrofoil for passive static stability via planform design, airfoildesign, and span-wise twist distribution.')). The ***patent*** specification attributes the ability to becontrolled by weight shift to the stability of the watercraft. The specification states, 'This inventionexploits passive stability to obviate the necessity for mechanisms or active control systems toprovide stability. This passive stability allows the watercraft to be controlled by weight shift ratherthan by mechanical systems.' (Id. at col. 6:7-11). There is nothing in the ***patent*** specification tosuggest that a watercraft that is both statically and dynamically unstable is part of the disclosure.See LizardTech, Inc. v. Earth Resource Mapping, Inc., 424 F.3d 1336, 1346 (Fed. Cir. 2005).I agree with Defendants that the present case is similar to ICU Medical. In ICU Medical,the ***patent*** at issue claimed medical valves with spikes and without spikes (i.e , valves without thespike limitation). The specification of the ***patent***, however, only described 'medical valves withspikes.' Id. at 1378. The Federal Circuit upheld the district court's grant of summary judgment19Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 19 of 26 PageID #:<pageID>that the 'spikeless' claims were invalid for lack of written description because a POSA would nothave understood the patentee to have invented a 'spikeless' medical valve. Id. at 13 78-79.Similarly, in the present case, the '659 ***Patent*** only discusses a watercraft that is at leaststatically stable. There is nothing in the specification that would signal to a POSA that the patenteeinvented a watercraft that is statically unstable. Furthermore, at oral argument, Plaintiff failed topoint to any disclosure in the ***patent*** specification of a description or embodiment of a watercraftthat was not at least statically stable. (D.I 147 at 73:9-23). See ICU Medical, 558 F.3d at 1379.While Plaintiff argues that this case is more analogous to ScriptPro LLC v. InnovationAssoc., Inc. , 833 F.3d 1336 (Fed. Cir. 2016), I disagree. In ScriptPro, the Federal Circuit reversedthe district court's ruling that claims without a limitation of employing a 'sorting and storagescheme based on patient-identifying information' were invalid for lack of written description. Id.at 1341.The Federal Circuit noted that while the ***patent*** specification 'focuses on embodimentsemploying a sorting and storage scheme based on patient-identifying information,' it is not alimitation of the invention because the invention is used to solve many problems, not all of whichinvolve using a scheme based on patient-identifying information. Id. Specifically, the FederalCircuit cautioned that 'a specification's focus on one particular embodiment or purpose cannotlimit the described invention where the specification expressly contemplates other embodimentsor purposes.' Id. at 1341.Plaintiffs arguments that watercraft stability is just one solution the invention addresses,like the scheme in ScriptPro, misses the mark. First, in ScriptPro, the Federal Circuit stated thatthe '***patent***'s express disclosure that sorting and storing can be done in a number of waysdistinguishes this case from ... ICU Medical.' Id. Specifically, the Federal Circuit found that theinvention was not limited to using a patient-identifying information sorting scheme because the20Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 20 of 26 PageID #:<pageID>***patent*** specification disclosed that 'any predetermined storage scheme will do.' Id. Unlike inScriptPro, there is no such express disclosure in the '659 ***Patent*** specification that the watercraftcan be statically and dynamically unstable. Nor is there anything that could reasonably beinterpreted as an implied disclosure.Second, the Federal Circuit noted that the ***patent*** in ScriptPro was aimed at addressingmultiple problems and that the different claims were directed at 'covering these different aspectsof the invention.' Id. at 1342. In this case, however, the ***patent*** specification clearly describes staticstability as a limitation of the invention as a whole, not an aspect of some embodiments or onepurpose. See p.19 supra. The ***patent*** specification is not just describing some embodiments asstable or having static stability. (See, e.g , '659 ***Patent***, col. 2:9-12; 2:23-25, 5:62-65). Nor is thespecification describing stability as just one purpose of the invention. The ***patent*** specification,instead, is emphasizing that it is the stability of the watercraft - or at the least static stabilityprovided by the hydrofoil - that permits the invention to achieve the full scope of its purposes suchas not having a moveable steering system. (See id. at col. 6:7-11).Therefore, I find that Defendants are entitled to summary judgment that claims 16-20 ofthe '659 ***Patent*** are invalid for lack of written description.D. ANTICIPATION OF THE '044 ***PATENT*** AND '659 PATENTPlaintiff moves for summary judgment on Defendants' counterclaims that the AssertedPatents are invalid as anticipated by Plaintiff's products. (D.I 80 at 26-37; see also D.I 13 at 13-14). Defendants concede that they are not arguing that Plaintiff's own products

invalidate theAsserted ***Patents***. (D.I 93 at 27 ('Waydoo is not asserting that the Asserted ***Patents*** are invalidover MHL's own products.')). Therefore, this issue is moot and Plaintiff's motion is dismissed.21Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 21 of 26 PageID #:<pageID>Plaintiff also moves for summary judgment on Defendants' counterclaims that the AssertedPatents are invalid as anticipated by the Evolo Report. The Evolo Report is a 554 page report from'a graduate-level student project that was completed in 2009 by naval architecture students at theRoyal Institute of Technology in Stockholm, Sweden.' (D.I 80 at 26-37). 9There are two issues to this dispute.The first issue is whether the Evolo Report discloses the static stability limitation of theclaims 1-22 of the '044 ***Patent*** and claims 1-15 of the '659 ***Patent***. 10 Plaintiff argues it does not;Defendants argue it does.The second issue is whether the Evolo Report is a printed publication. Plaintiff argues theEvolo Report is not because it was not publicly accessible before the priority date of the AssertedPatents. Defendants argue there is a genuine issue of material fact as to whether the Evolo Reportwas publicly accessible.I address each issue in turn.1. Does the Evolo Report Disclose the Static Stability Limitation?'To show that a ***patent*** claim is invalid as anticipated, the accused infringer must show byclear and convincing evidence that a single prior art reference discloses each and every element ofa claimed invention.' Silicon Graphics, Inc. v. AT! Tech., Inc. , 607 F.3d 784, 796 (Fed. Cir. 2010).'[E]very element of the claimed invention [must be described], either expressly or inherently, such9 Plaintiff argue that Defendants improperly combine multiple Evolo-related references into oneanticipation analysis. Defendants argue in their briefing that the Evolo Report itself is the singleprior art reference that anticipates the Asserted ***Patents***. (D.I 93 at 30). Therefore, for purposesof this motion, I focus only on the Evolo Report.10 Plaintiff also argues that claims 16-20 of the '659 ***Patent*** are not invalidated by anticipationbecause the Evolo Report does not disclose a motor speed controller, but this issue is moot as Ihave found claims 16-20 of the '659 ***Patent*** to be invalid for lack of written description. SeeSection III.C supra.22Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 22 of 26 PageID #:<pageID>that a person of ordinary skill in the art could practice the invention without undueexperimentation.' Callaway Golf Co. v. Acushnet Co., 576 F.3d 1331, 1346 (Fed. Cir. 2009). Aswith infringement, the court construes the claims and compares them against the prior art. SeeEnzo Biochem, Inc. v. Applera Corp., 599 F.3d 1325, 1332 (Fed. Cir. 2010). 'While anticipationis a question of fact, it may be decided on summary judgment if the record reveals no genuinedispute of material fact.' Encyclopaedia Britannica, Inc. v. Alpine Elecs. of Am., Inc., 609 F.3d1345, 1349 (Fed. Cir. 2010).Plaintiff argues that the Evolo Report does not disclose a statically stable watercraft.Specifically, Plaintiff argues that Defendants cannot meet their burden because Dr. Triantafylloudid not mathematically assess the stability of the watercraft disclosed in the Evolo Report. (D.I 80at 34-35). Plaintiff also cites to Mr. Barry's expert report to show that the Evolo Report disclosesa statically unstable watercraft (Id. at 35-36).Defendants argue that there is a material issue of fact as to whether the Evolo Reportdiscloses a statically stable watercraft because Dr. Triantafyllou concluded that the Evolo Reportdiscloses a statically stable watercraft. (D.I 93 at 32 (citing D.I 85-1 , Ex. 7, ,r,r 220-241)).Defendants contend that Dr. Triantafyllou responded to the arguments raised by Plaintiffs expert,Mr. Barry. (D.I 93 at 32 (citing D.I 85-1 , Ex. 9, ,r,r 71-77)).I find there are genuine issues of material fact as to whether the Evolo Report discloses astatically stable watercraft. Both parties rely on the testimony of their expert witnesses to establishtheir positions. A reasonable juror could weigh the testimony by the parties' experts and reach theconclusion that Defendants have shown that the Evolo Report discloses a statically stablewatercraft.23Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 23 of 26 PageID #:<pageID>2. Is the Evolo Report a Printed Publication?'Whether a reference qualifies as a 'printed publication' under § 102(b) is a legalconclusion based on underlying factual findings. ' Jazz Pharm. , Inc. v. Amneal Pharm., LLC, 895F.3d 1347, 1356 (Fed. Cir. 2018). 'A reference is considered publicly accessible if it wasdisseminated or otherwise made available to the extent that persons interested and ordinarilyskilled in the subject matter or art, exercising reasonable diligence, can locate it.' AccelerationBay, LLC v. Activision Blizzard Inc., 908 F.3d 765, 772 (Fed. Cir. 2018) (citation and internalquotation marks omitted). 'The test for public accessibility is not 'has the reference beenindexed?" Id. at 774. Instead, 'the ultimate question is whether the reference was ' available to theextent that persons interested and ordinarily skilled in the subject matter or art[,] exercisingreasonable diligence, can locate it." Voter Verified, Inc. v. Premier Election Sols., Inc., 698 F.3d1374, 1380 (Fed. Cir. 201 2) (quoting SRI Int'l, Inc. v. Internet Sec. Sys., Inc., 511 F.3d 1186, 1194(Fed. Cir. 2008)).Plaintiff argues the Evolo Report was not publicly accessible before the priority date of theAsserted ***Patents***. (D.I 80 at 30-32). Plaintiff

specifically contends that there is no evidence thatthe Evolo website, which contained a link to the Evolo Report, was indexed by Google, would tumup on a Google search in 2013, or was otherwise accessible to a POSA before the Asserted ***Patents***'priority date. (D.I 32).Defendants argue that Plaintiff is not entitled to summary judgment because there isevidence that the Evolo Report was publicly accessible before the Asserted ***Patents***' priority date.Therefore, there is a disputed material of fact, making summary judgment inappropriate.Defendants argue that the record contains evidence that the Evolo Report was downloaded in theUnited States before the priority date of the Asserted ***Patents***; that their expert Mr. Lanterman24Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 24 of 26 PageID #:<pageID>concluded that the Evolo website was likely indexed by Google and had regular activity, and thatan article published in the Swedish magazine Batnytt ('Boat News') in August 2009 detailed theEvolo project and contained a link to the Evolo website. (D.I 93 at 28-30).I find there is a genuine issue of material fact as to whether the Evolo Report was publiclyaccessible to a POSA prior to October 2013 . Plaintiff concedes that there was at least one user inthe United States (or at least outside of Sweden and Switzerland) who downloaded the EvoloReport. (D.I 80 at 16, n.7). Further, the article in Batnytt may also have served as a publiclyaccessible 'research aid' that would have led a POSA to the Evolo website, which contained theEvolo Report. See, e. g. , Blue Calypso, LLCv. Groupon, Inc., 815 F.3d 1331 , 1350 (Fed. Cir. 2016);Bruckelmyer v. Ground Heaters, Inc., 445 F.3d 1374, 1379 (Fed. Cir. 2006). For these reasons, Ifind a reasonable jury could determine that the Evolo Report was publicly accessible before theAsserted ***Patents***' priority date.Therefore, I find Plaintiff 1s not entitled to summary judgment on Defendants'counterclaims that the Asserted ***Patents*** are anticipated by the Evolo Report.E. PLAINTIFF'S STANDINGPlaintiff moved for summary judgment on Defendants' affirmative defense that Plaintifflacks standing. (D.I 79). After oral argument, Defendants stated they are not challenging standing.(DJ. 145).Therefore, I will dismiss Plaintiffs motion for summary judgment on standing as moot.IV. CONCLUSIONFor the reasons stated above, I deny Plaintiffs motion for summary judgment forinfringement of the '044 ***Patent***, deny Plaintiffs motion for summary judgment for the Asserted25Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 25 of 26 PageID #:<pageID>***Patents*** not being invalid as anticipated by the Evolo Report, and dismiss Plaintiff's motion forsummary judgment on Defendants' lack of standing argument.I deny Defendants' motion for summary judgment for non-infringement of the '044 Patentand '659 ***Patent*** and grant Defendants' motion for summary judgment of invalidity for lack ofwritten description for claims 16-20 of the '659 ***Patent***.An appropriate order will issue.26Case 1:21-cv-00091-RGA-MPT Document 153 Filed 02/03/23 Page 26 of 26 PageID #:<pageID>

Load-Date: February 7, 2023

End of Document

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
90/015,269	**03/04/2024 04:39:05 PM Z ET**	**GBWHCC001-EPR**

Title of Invention

POWERED HYDROFOIL BOARD

Application Information

APPLICATION TYPE	Utility / ex parte reexam	PATENT #	9586659
CONFIRMATION #	5917	FILED BY	Sharon McGee
PATENT CENTER #	64542646	FILING DATE	08/09/2023
CUSTOMER #	530	FIRST NAMED INVENTOR	- 9586659
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Kevin Kocun

Documents

TOTAL DOCUMENTS: 8

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
Amendment LD-447.pdf	20	Applicant Arguments/Remarks Made in an Amendment	250 KB
Declaration of Jacob Langelaan signed.pdf	25	Miscellaneous Incoming Letter	4121 KB
Warning: The attached file contains comments or annotations. Comments are not recommended and may cause processing problems with the document.			
Exhibits to Langelaan Dec.pdf	33	Miscellaneous Incoming Letter	7522 KB
Declaration of Nick Leason 79847931 96 copy.pdf	9	Miscellaneous Incoming Letter	517 KB
Warning: The attached file contains comments or annotations. Comments are not recommended and may cause processing problems with the document.			
Exhibits A - M to Leason	142	Miscellaneous Incoming Letter	17384 KB

Dec.pdf			
Exhibits N - Y to Leason Dec.pdf	115	Miscellaneous Incoming Letter	15715 KB
Amendment Transmittal.pdf	1	Miscellaneous Incoming Letter	21 KB
Patent Owner Interview Summary.pdf	4	Applicant summary of interview with examiner	38 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
Amendment LD-447.pdf	3FC1436764B9FCE595540B0F840804BEB603B3343B7713605D B2268D80581130AD40FFDE600B8821A9508E6FBAB3A7B372C 0AD48AB6529EF997A3C70D70C1F9E
Declaration of Jacob Langelaan signed.pdf	0226A784DF7BC5BBAC70DCC269919608FBDDE7675A0A9F0D 6E72AC79384DB0EDB65887CB727FBDC8FDBB3E07861E90DF 839F1EACA1ED985D30277BAFED782450
Exhibits to Langelaan Dec.pdf	8775F1A17E32E2CE1BD00B5B8C2C3EDDBFF72A6927300538 96BDC69C24EC4E71BCA7BD9018E79A89C0177D7DB837648F E3E122C9EAD95C66D5B19EE8934C8CA0
Declaration of Nick Leason 79847931 96 copy.pdf	EEE1F30F375944CEC7398301CA527B4B68AAE9372A846E0AF 6DF6AE416ECEC8EF57B6CF60782391390BDB4DE057151B03 80989C17826A8524719C2246C494BD1
Exhibits A - M to Leason Dec.pdf	2CC7B7AF6A988A7273036A49D000648DA2ED0FCD851E44296 6C4BC3995DC9E77F9A36301897F646A550A3113EBCA14F775 2939A71447495EE2E2C743C6BE6449
Exhibits N - Y to Leason Dec.pdf	1BE6473E96E76B791F4CF1CBBAC911BE7A77A3ACCEC37842 9D45DA903EF39AF9EDB0184DB7980DD5D912DB711FCCE448 43C7B5E3178D2B0CC6526B6050DF233A
Amendment Transmittal.pdf	23F678B1ACFA0D4CE395617D0AB726E2AD3E04916CFC1EDF C5EF9EB1C4403EFE5E1C2DD153A91FF4215C50F8550AA7BB 2FC8406276F920CB744E6505EE36CA93
Patent Owner Interview Summary.pdf	985315F7E39ED384B9700603303062BA5FB31AC66063D58DA B1F24B1BB8C9CD857288147B7BD7A23A201759109832ECA06 F34732ED7943B2570605765C5375BC

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d)

and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
90/015,269	**03/04/2024 04:39:05 PM Z ET**	**GBWHCC001-EPR**

Title of Invention

POWERED HYDROFOIL BOARD

Application Information

APPLICATION TYPE	Utility / ex parte reexam	PATENT #	9586659
CONFIRMATION #	5917	FILED BY	Sharon McGee
PATENT CENTER #	64542646	AUTHORIZED BY	Kevin Kocun
CUSTOMER #	530	FILING DATE	08/09/2023
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	- 9586659

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 1060	E202434G39406664	Sharon McGee

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
2822	EACH REEXAMINATION CLAIM IN EXCESS OF 20 AND ALSO IN EXCESS OF THE NUMBER OF CLAIMS IN THE PATENT UNDER EXAMINATION	40.00	8	320.00
			TOTAL AMOUNT:	**$320.00**

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

AMENDMENT TRANSMITTAL LETTER

Docket No. MHLCUS 3.5-002 CON			
Application No. 90/015,269-Conf. #5917	Filing Date August 9, 2023	Examiner G. Spahn	Art Unit 3993

Applicant(s): Nicholas Leason

Invention: Powered Hydrofoil Board

TO THE COMMISSIONER FOR PATENTS

Transmitted herewith is an amendment in the above-identified application.

The fee has been calculated and is transmitted as shown below.

CLAIMS AS AMENDED

	Claims Remaining After Amendment	Highest Number Previously Paid	Number Extra Claims Present	Rate	
Total Claims	28	- 20 =	8	x 40.00	320.00
Independent Claims	2	- 3 =	0	x	
Multiple Dependent Claims (check if applicable)	☐				
Other fee (please specify):					
TOTAL ADDITIONAL FEE FOR THIS AMENDMENT:					320.00

☐ Large Entity ☒ Small Entity

☐ No additional fee is required for this amendment.

☐ Please charge Deposit Account No. 12-1095 in the amount of $ _____ .

☐ A check in the amount of $ _____ to cover the filing fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☒ The Director is hereby authorized to charge and credit Deposit Account No. 12-1095 as described below. A duplicate copy of this sheet is enclosed.

- ☒ Credit any overpayment.
- ☒ Charge any additional filing or application processing fees required under 37 C.F.R. § 1.16 and 1.17.

/Michael C. Bossner/ Dated: March 4, 2024

Michael C. Bossner (Atty/Agent Reg. No.: 79,441)
LERNER DAVID LLP
20 Commerce Dr.
Cranford, New Jersey 07016
(908) 654-5000

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being transmitted via the Office electronic filing system in accordance with 37 C.F.R. § 1.6(a)(4).

Dated: March 4, 2024 Electronic Signature for Michael C. Bossner: /Michael C. Bossner/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Reexamination Application of:
Nicholas Leason

Application No.: 90/015,269 | Confirmation No.: 5917

Filed: August 9, 2023 | Art Unit: 3993

For: Powered Hydrofoil Board | Examiner: G. Spahn

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION OF NICK LEASON
UNDER 37 C.F.R. § 1.132

I, Nick Leason, hereby declare as follows:

1. I am a co-founder and CEO of MHL Custom, Inc., the assignee of U.S. Patent No. 9,586,659 ("the '659 Patent"), which is the subject of the present *ex parte* reexamination. As a co-founder and CEO, I am intimately familiar with the history of development of hydrofoil products covered by the claims of the '659 Patent, the difficulties and unexpected successes experienced during this development, the creation of a market for these products, the great success we have achieved, and the value of the '659 Patent, in terms of licensing third parties and pursuing unlicensed infringers, and the underlying products themselves.

2. I have been involved in the preparation of Patent Owner's response to the pending Office Action, and in doing so I have reviewed and am familiar with the Office Action and cited prior art, namely: U.S. Patent Application Publication No. 2011/0111650 to Braden *et al.* ("*Braden*"); U.S. Patent No. 5,544,607 to Rorabaugh *et al.* ("*Rorabaugh*"); and U.S. Patent Application Publication No. 2005/0255764 to Woolley ("*Woolley*"). I have also reviewed the specification and claims of the '659 Patent that is the subject of the present reexamination.

NEXUS BETWEEN PRODUCT AND CLAIM ELEMENTS

3. I understand that, in order for evidence of secondary considerations to be applicable to rebutting an obviousness challenge, the evidence must have a so-called "nexus" to the claim elements. In my opinion, this nexus is readily achieved through the various evidence included and discussed below. I know Jacob Langelaan, the sole inventor of the '659 Patent, has also provided a written declaration ("Langelaan Declaration"), accompanying my declaration, and I have reviewed his declaration. I understand he compared the claims of the '659 Patent to the features of an exemplary product, Lift3 and Lift4. I agree completely with his assessment that these products are fully encompassed by the claims. It is also my opinion that the predecessor products, Lift1 and Lift2, also include each and every element of independent claim 1. (also see Exhibits C, D.) All exhibits relating to our products that I discuss with this declaration are based on one of these "Lift" products notes above.

COMMERCIAL SUCCESS

4. We have achieved great commercial success with our hydrofoil products. As we created the market for these so-called e-foils (electric, hydrofoil boards), we command a majority of the sales and revenue in the market, and our revenue has grown year-over-year, again due to the success of our product. For instance, in 2023 our sales were about $36 million, up from revenues of under $10 million when we first started sales of the products in 2018. On an individual basis, our products cost about $12,000 each.

5. Furthermore, the '659 Patent itself has proven to be quite valuable in the market. First, when we first learned of the '659 Patent, we negotiated an exclusive license to the patent, and later we, MHL Custom, Inc., purchased the patent outright, and are now the recorded assignee of the '659 Patent. These agreements are withheld as they are confidential, but in any event, I do not believe the details of the agreements would be pertinent for the present purposes. If you wish to review them, please let us know.

6. Since obtaining our license to the '659 Patent, and completing the subsequent acquisition of it, we have licensed the patent to a few third parties. License royalties on the '659 Patent, and its related parent patent, U.S. 9,359,044, total in the many millions of dollars (again, these agreements are confidential, not just to us, but to our licensees as well). As I stated previously, the '659 Patent covers the efoil products in the market we created, and into which others have ventured. The direct correlation between the claims of the '659 Patent to the products themselves is central to

the value and success of the '659 Patent. Our ability to have the original, and in my opinion best, product in the market we created, and to have the product be directly protected by the claims of the '659 Patent, is testament to our commercial success.

7. We also estimate our market share based on a combination of our sales, the sales reported by our licensees, and then our general knowledge of other competitors in the market, including, for instance, Waydoo, who we successfully sued for patent infringement of the '659 Patent. Based on our estimates, we currently have a market share of about 50%, while our licensees have about 25-30%. In other words, 75-80% of the products in the market are covered by and sold under the '659 Patent. Waydoo made up part of the remaining 20-25%, and they were also found to be covered by the claims of the '659 Patent. As such, based on our estimates, the claims of the '659 Patent cover nearly 100% of the efoil market, and our individual market share remains at about 50%, despite the entry of these various other competitors.

8. Indeed, in my opinion, as demonstrated by my extensive experience speaking with and teaching customers and users of our products, the ability for our products to be passively stable, with no movable steering systems or surfaces, makes the product so appealing to people of all skill levels. Typically, I can have the average person riding on the hydrofoil board within about 15 or 20 minutes. In fact, I have experienced firsthand people ranging from small children to late-age adults being able to ride our products with little to no experience with such products – something I take great pride in seeing. (see Exhibits A, B, also see e.g., Exh. W.) The ability for people of all skill levels to be able to ride our products makes for a large market, and therefore, in my opinion the large sales volume (as well as the entry of other products into the market as I discuss below) is directly attributable to the passively stable and simple riding experience which we created in our products. By creating a product that is passively stable and free of any moveable or steerable surfaces, we were able to make this product approachable for people of all levels of ability.

COPYING BY OTHERS0

9. Of course, in 2018, when we first launched our product, we had 100% market share. But following our launch, we quickly saw competitors jump into the market we created. In my opinion, these third parties were able to get into the market by studying our product and making copycat products. Upon review of our product, they were able to understand that our product remained stable in the water even without any movable surfaces or steering components – they saw

that, by practicing the claimed inventions of the '659 Patent, a passively stable hydrofoil board was possible.

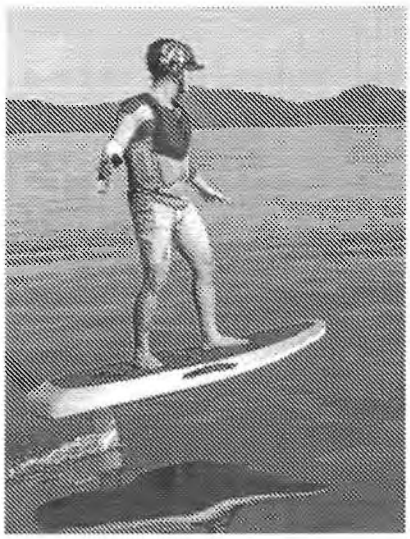
10. Initial prototypes of our product, and early marketing videos, launched around 2016, so competitors would have been able to start studying our product around that time. In particular, a marketing video we distributed on Facebook in 2017, as a teaser for our product launch, obtained 140,000 hits almost immediately. We had people interested in our product almost immediately, and people in the industry noticed that we had that sort of web activity and buzz in such a short amount of time. Within a couple weeks of this video and another teaser marketing video, we had over a hundred million views across many social media channels. It was a huge public reaction.

11. Following these initial marketing videos, we started displaying our product publicly, and started disseminating information through sales channels – we were not shy about expounding on all the great details of our product. (e.g., see Exhs. H, N, O, V.) Our first public sale was in May 2018.

12. As discussed herein, these competitors have also understood the value of the '659 Patent, as they recognize that these products, in order to be as commercially successful as ours have been, must practice the claims of the '659 Patent. As a result, we have licensed many of the follow-on competitors, or have asserted our patent to protect our rights. These patent assertions have been successful and include the aforementioned infringement verdict against Waydoo and have also led to settlements by other competitors to agree to exit the U.S. market.

13. The Waydoo product serves as a good comparison of a copycat product, as it has similar dimensions, components, and functionality as our products:





And, just like ours, it meets the claims of the '659 Patent, including the fact that it is passively stable and does not include any movable surfaces on the hydrofoil or a movable steering system – this was established by the aforementioned favorable finding of infringement of at least claim 1 of the '659 Patent.

14. Indeed, I have seen efoil "review" articles that mention, one way or another, that "most efoils have very similar characteristics – about 28 to 35 kg weight, around 1.5 hours of riding time, 2.5 hours to charge…," and as a result most of the competitor products have similar features as ours. (Exh. E at 2; also see e.g., Exhs. N, O, X.) In order to compete with our products, they have had to design their products to be nearly identical to ours, which not only makes them look similar and operate in a similar fashion, but also include the elements set forth in the claims of the '659 Patent. In other words, these competitor products have a nexus to the claims of the '659 Patent, just as our own products do.

LONG-FELT BUT UNRESOLVED NEED

15. When I first started developing our efoil product, I was looking at the current arc of watercraft – jet skis, paddleboards, surfboards, powerboats, etc. – and I wanted to challenge all of them. (see e.g., Exh. G.) A hydrofoil allows you to use less power and provide a unique experience that cannot be found with any of these other watercraft. The use of hydrofoils has been generally known for a very long time, including hydrofoil boards that could be propelled by the force of a wave or by an outside force such as from a kite, jet ski or powerboat – the *Woolley* prior art reference involved in this Office Action is one such example. (see Exhs. J, M.) But no one had as yet figured

out how to incorporate a hydrofoil and propulsor in combination and yet keep it a simple, stable, and easy to use design. As I evaluated the use of a powered hydrofoil board, I came across the patent application that eventually became the '659 Patent, and I knew someone had already been thinking about this. Though again, there was no product and no market for such a product yet.

16. The teachings of the '659 Patent provided additional insight we needed to achieve a working prototype, as it taught the fundamental elements to create a passively stable hydrofoil board that, importantly, did *not* use movable surfaces or steering components. Anyone trying to combine a hydrofoil with a board and a propulsor would, again, determine that movable elements would be needed to control the watercraft. But the inventor of the '659 Patent discovered that a simpler design, without the need for these movable features, was possible.

17. Indeed, this simpler design opened the door to a larger market of potential users, as evidenced by the large amount of sales realized by us and by other licensed and/or copycat designs, and by the differences between our products and those in the prior art These differences include, for instance, the ability to use an electric battery to power our products, the ability of our product to provide an exhilarating yet stable experience, and the ability for this experience to be available to people of all ages and abilities. All of these differences, not found in prior products but demonstrably longed-for in the market, are attributable to the features of the product which are also found in the claims of the '659 Patent – namely, a passively stable, weight-shift controlled personal hydrofoil board that has a hydrofoil and a propulsor but does *not* have movable surfaces or a movable steering system which would render the watercraft overly complex and more difficult to operate.

FAILURE OF OTHERS

18. I am aware that the Examiner is combining multiple references from the prior art in order to show that a person of ordinary skill in the art would recognize that a hydrofoil could simply be added to a powered surfboard to arrive at the claimed invention of the '659 Patent. In my experience with these types of products, I respectfully disagree with this assertion. Indeed, as noted above, I am not aware of anybody else that had previously attempted or was able to make the device recited in the claims of the '659 Patent.

19. In fact, my own efforts to build this product spanned many years. I worked day-in and day-out, 7 days a week, 12-14 hours a day, for six years developing and experimenting with hydrofoils and other watercraft products. But everything we were making was either underpowered (e.g., a

stand-up paddleboard) or was difficult to ride (e.g., a hydrofoil kite board). But one day, I started thinking about how to actually power a hydrofoil board without the need for an external power source, like a kite, a jet ski, a wave, or the like. I looked all over in conducting research on such a device, just to get a frame of reference to see if it was even possible. I came up empty – I couldn't find any information on such a device, how it might operate, etc.

20. Eventually, my own efforts were to the point where I was starting to build prototypes and really try to manifest my ideas into a physical representation. But I was not yet having much luck. I was having trouble getting these ideas to work in the real world. I was having many more failures than successes.

21. At this time, I also considered filing a patent application. I consulted with a patent attorney, who advised me to conduct a patent search before going through the process of preparing and filing a patent application. We started our search, and eventually discovered the patent application that, through a continuation application, eventually became the '659 Patent. As I noted above, upon learning of this patent application, I contacted the inventor and eventually negotiated an exclusive license.

22. The '659 Patent held the "secret sauce" that advanced my ideas and rough prototypes into a working product, which eventually became the wildly successful product it is today. The inventor of the '659 Patent was far ahead of where I was, and his teachings and expertise allowed me to make giant leaps and avoid many more failures.

23. Without the teachings of the '659 Patent, I would not have had enough information or teachings to build the hydrofoil boards covered by the claims of the '659 Patent. I would have made further failures, and probably end up where others had in this industry – i.e., requiring an outside force to propel the hydrofoil (like *Woolley*) or include a complex control system to help stabilize the hydrofoil (like U.S. Pat. No. 7,047,901 to Chen, which is discussed in column 1 lines 50-56 of the Background of the '659 Patent).

UNEXPECTED RESULTS

24. I reviewed the Langelaan Declaration, which accompanies my present Declaration and other documents in response to the Office Action in this reexamination proceeding. In particular, I like his analogy of positioning the tow rope either around a user's waist or around their ankles, and the drastically different results upon the application of a pulling force. In my opinion, this illustrates

the unexpected results we experienced as we developed this product based on the teachings of the '659 Patent. Specifically, by positioning the propulsor on the mast near the hydrofoil, the result should be a strong and immediate "nose-up" pitching moment of the board. This would result in an unusable product. The natural solution for counteracting this force would be to include movable surfaces that would provide opposing forces that could vary depending on the amount of thrust applied by the propulsion source.

25. As I mention numerous times herein, including such movable surfaces would over-complicate the product and likely render it very difficult to use for a majority of people. Thus, both the inventor and I believed that a hydrofoil with no movable surfaces would need to be used.

26. While the inventor's declaration focused this analysis on why a person of ordinary skill in the art would not combine the prior art references, the analysis is in my opinion equally applicable to show the unexpected success we had in realizing that the claimed invention was also successful in real life.

INDUSTRY PRAISE

27. It goes without saying based on the above demonstrated financial success and the evidence of many new entrants into the market after the launch of my company's product, but I have received a mountain of industry praise from competitors, customers, distributors, everyone. The product was something entirely new and never seen before – we created the market from nothing. The praise was generally around how simple it is to get people of all ages and abilities to ride on the efoil products with relative ease.

28. In fact, many of my sales are to resorts and watercraft rental companies that cater to tourists and, generally, first-timers. (e.g., see Exh. B.) Of course, if these resorts and rental companies are charging money to let people experience these products, it is important for the customer to enjoy the experience, and that means being able to stand up on the board and use the hydrofoil to fly above the water, all within a relatively short amount of time. As I mentioned above, I rarely have somebody that cannot use the board in this manner during their first time using the product. Again, the ability for users to enjoy the experience so quickly, even if it is their first time, is due to the passive stability of the watercraft and the lack of additional control surfaces and steering mechanisms, which would only complicate the experience and make it much more difficult to use (if it could even be used at all).

29. Of course, what better industry praise is there than when copycats try and copy your idea and put their own products on the market? As I noted above, we have had plenty of these situations. Some of these are now sanctioned competitive products, licensed under the '659 Patent, while we have had to assert patent infringement actions against others in order to force them to stop infringing on the product that resulted from countless hours of effort and monetary investment. Our success in licensing and patent infringement activities leave no doubt, in my opinion, of the importance of the claimed elements of the '659 Patent relative to both our products and those of our competitors. That is, without passive stability and the absence of movable surfaces and steering components, the product would be neither usable nor commercially viable.

30. Attached hereto are examples of the overwhelming industry praise our product has received since the days we first introduced the device to the world. I provide only a sampling here for illustrative purposes, but I can provide many more examples upon request. (see e.g., Exhs. A-G, I-M, P-U, W, Y.)

I declare under penalty of perjury that the foregoing is true and correct. I further state that I have been warned that willful false statements and the like so made are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code and such willful false statements may jeopardize the validity of the application or any patent resulting therefrom. I state that all statements made of my own knowledge are true and all statements made on information and belief are believed to be true.

Dated: **March 4, 2024**

/Nick Leason/
NICK LEASON

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being transmitted via the Office electronic filing system in accordance with 37 C.F.R. § 1.6(a)(4).

Dated: March 4, 2024
Electronic Signature for Michael C. Bossner: /Michael C. Bossner/

Docket No.: MHLCUS 3.5-002 CON (PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Reexamination Application of:
Nicholas Leason

Application No.: 90/015,269 | Confirmation No.: 5917

Filed: August 9, 2023 | Art Unit: N/A

For: Powered Hydrofoil Board | Examiner: Spahn, Gay

PATENT OWNER'S STATEMENT PURSUANT TO MPEP §2281
OF THE SUBSTANCE OF THE INTERVIEW OF JANUARY 30, 2024

Mail Stop Petition
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

The Patent Owner, MHL Custom, Inc., and its representatives attending the interview of January 30, 2024, express their appreciation to the panel of reexamination examiners for their courtesies, patience, and cooperation during the course of the interview. Attending the interview for the Patent Owner ("PO") were Brian Tomkins, Gregory Reilly, and Mike Bossner, attorneys of the undersigned's law firm; Jack Langelaan, Professor at Penn State University College of Engineering; and Nick Leason, CEO of MHL Custom, Inc. Both Jack Langelaan and Nick Leason are authors of declarations submitted with the reply to the Office Action filed concurrently herewith.

Patent Owner's Detailed Summary of Substance of the Interview

1. The interview began with a discussion of the outstanding rejection of independent claim 1 under 35 U.S.C. § 103 as being obvious over U.S. Pat. Pub. No. 2011/0111650 ("*Braden*") in view of U.S. Pat. No. 5,544,607 ("*Rorabaugh*").

2. The PO presented arguments that a *prima facie* case of obviousness was not established because *Rorabaugh* is primarily directed to movable sponsons for a hydrofoil watercraft to increase stability. Further, when hydrofoils are discussed in *Rorabaugh*, they are explicitly noted to have adjustable control surfaces, which are steered by *Rorabaugh's* movable steering gear 25.

3. Jack Langelaan presented an airplane design textbook intended for teaching aeronautical engineering at the undergraduate level. Specifically, Dr. Langelaan pointed to drawings in the textbook illustrating what control surfaces on traditional airplane and hydrofoil wings look like. Such drawings were argued to further support the assertion that a person having ordinary skill in the art would understand from *Rorabaugh*'s drawings that its hydrofoils have adjustable control surfaces.

4. Based on such teachings, the PO submitted that any combination of *Braden* and *Rorabaugh* would not result in a passively stable, weight-shift controlled personal hydrofoil watercraft having no movable steering system and no movable control surfaces, contrary to claim 1 of the '659 Patent. The examiners appeared to agree that the asserted combination of *Braden* in view of *Rorabaugh* would involve movable control surfaces and/or movable steering systems.

5. After the discussion of the outstanding rejection based on *Braden* in view of *Rorabaugh*, the discussion turned to the outstanding rejection of independent claim 1 under 35 U.S.C. § 103 as being obvious over *Braden* in view of U.S. Pat. Pub. No. 2005/0255764 ("*Woolley*").

6. The PO presented arguments that a *prima facie* case of obviousness is not established. First, the PO submitted that the Office Action failed to provide any justification for why the hydrofoil of *Woolley* would be connected to *Braden*'s propulsion system specifically, as opposed to some other component of *Braden*'s surfboard.

7. The PO then addressed the assertion in the Office Action that a rationale for combining *Braden* with *Woolley* is to increase stability of the watercraft. Specifically, the PO argued that the purpose of the foils of *Woolley* is not to increase stability, but rather to provide a

flying experience by elevating the rider and board above the surface of the water. If such a combination were to occur, the motor mount 13 of *Braden* would have to be significantly lengthened, so that it could continue to provide thrust while *Braden's* surfboard body 10 is elevated above the water. However, as explained by Dr. Langelaan, shifting the location of the thrust away from the center of gravity in that manner would destabilize the watercraft of *Braden* by imparting a large nose-up pitching moment on the watercraft. There is no suggestion in any of the applied art as to how to counteract that destabilizing torque. Indeed, *Woolley* does not address that problem, as the propulsion in *Woolley* is via a tow rope connected to a separate powerboat, and thus the rope itself provides an additional source of stabilization that would not exist if the propulsion were instead connected to a hydrofoil below the board. Thus, the PO and Dr. Langelaan submitted that, at best, a person having ordinary skill in the art would consider resorting to movable steering systems and/or movable control surfaces in order to impart stability to the watercraft.

8. Dr. Langelaan then listed several benefits of the claimed invention. Specifically, providing a hydrofoil interconnected with the flotation device via a strut reduces drag of the watercraft through the water by reducing the surface area of the flotation device in contact with the water, which allows for a longer battery life by decreasing the required power. Additionally, Dr. Langelaan explained that the difficulty in creating a passively stable hydrofoil watercraft with no movable control surfaces and no movable steering systems is that, by positioning the motor beneath the center of gravity of the rider-and-board combination, a destabilizing nose-up pitching moment is inherently induced. To illustrate that point, Dr. Langelaan compared pulling someone on rollerblades via a rope tied around the person's waist versus a rope tied around that person's ankles. He then proceeded to explain the concept of "pendulum stability" by reference to a hang glider, in contrast to the instability of an inverted pendulum such as a broomstick being balanced above a person's hand. Thus, to counteract the previously-noted destabilizing pitching moment on the powered hydrofoil watercraft, Dr. Langelaan explained that the hydrofoil itself would need to be designed to impart stability to the watercraft. However, in view of the lack of reasonable expectation of success in achieving such a design, it was argued that a person having ordinary skill in the art would instead implement either a movable control surface or a movable steering system, such as the steering system of U.S. Pat. No. 7,047,901 (which was applied during the original

examination of the application that matured as the '659 Patent), in order to provide stability to the watercraft.

9. At the conclusion of the interview, the examiners recommended that PO file its Interview Summary as a separate document (like the present communication), rather than incorporating it into the remarks to the response to the Office Action.

For the foregoing reasons and in view of the concurrent submissions by the Patent Owner, it is believed that all claims under reexamination are patentable and that the outstanding obviousness rejections should be withdrawn.

Dated: March 4, 2024

Respectfully submitted,

Electronic signature: /Michael C. Bossner/
Michael C. Bossner
Registration No.: 79,441
LERNER DAVID LLP
20 Commerce Dr.
Cranford, New Jersey 07016
(908) 654-5000
Attorney for Patent Owner

Docket No. MHLCUS 3.5-002 CON
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Reexamination Application of:
Nicholas Leason

Application No.: 90/015,269 | Confirmation No.: 5917

Filed: August 9, 2023 | Art Unit: 3993

For: Powered Hydrofoil Board | Examiner: G. Spahn

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION OF DR. JACOB LANGELAAN
UNDER 37 C.F.R. § 1.132

I, Jacob Langelaan, hereby declare as follows:

1. I am the named inventor on U.S. Patent No. 9,586,659 ("the '659 Patent"), which is the subject of the present *ex parte* reexamination. Although I am the sole inventor of the '659 Patent, I do not have any current financial interest in that patent or in MHL Custom, Inc., which is the current assignee. I am being compensated for the time that I have devoted to assisting with this reexamination, including preparation of this Declaration, at my normal legal consulting rate, and I do not have any financial stake in the outcome of this reexamination.

2. My education and experience are set forth in the curriculum vitae attached hereto as Exhibit A. In summary, I have a Bachelor of Applied Science degree in Engineering Physics from Queen's University in Kingston, Ontario, Canada in 1992; I have a Master of Science degree in Aeronautics and Astronautics from the University of Washington in Seattle, Washington in 1994, where my research was in structural analysis of aircraft fuselage structures; and I have a PhD in Aeronautics and Astronautics from Stanford University in Stanford, California in 2006, where my dissertation was on state estimation for autonomous flight in cluttered environments. Between earning my Master's degree and my PhD, I was an engineer for de Havilland Inc. (now Bombardier Aerospace) for almost 5 years, where I worked in structures research and development, primarily on

advanced materials and damage tolerance analysis of reinforced structures, and also on cabin noise reduction in the acoustics and vibration group. Since earning my PhD, I have been a professor at Penn State University for almost 18 years. Specifically, I am a professor of aerospace engineering and director of the graduate program. My research areas are related to autonomous flight and unmanned aerial vehicles (UAVs), as well as vehicle dynamics and controls and design of flight vehicles. With my students I have authored 26 refereed archival journal papers and 67 refereed conference papers related to flight control, flight planning, data fusion, and other subjects connected to autonomous aircraft systems (commonly referred to as drones). I have also presented as a speaker at numerous conferences relating to autonomous and robotic aircraft. My teaching responsibilities at Penn State have included: aircraft stability and control; control of aerospace systems; aircraft design; aeronautics; estimation theory; global navigation satellite systems (GPS); and advanced air mobility.

3. In preparing this Declaration, I have reviewed the Office Action issued December 5, 2023 in the present reexamination, as well as the references applied therein, namely: U.S. Patent Application Publication No. 2011/0111650 to Braden *et al.* ("*Braden*"); U.S. Patent No. 5,544,607 to Rorabaugh *et al.* ("*Rorabaugh*"); and U.S. Patent Application Publication No. 2005/0255764 to Woolley ("*Woolley*"). I have also reviewed the specification and claims of the '659 Patent that is the subject of the present reexamination.

4. I understand that the Office Action rejected independent claims 1 and 16 and the associated dependent claims of the '659 Patent under 35 U.S.C. § 103 as being obvious. In particular, claims 1-20 were rejected as obvious over *Braden* in view of *Rorabaugh*, and claims 1-2, 4-6, 8-11, 13-16, and 18-20 were rejected as obvious over *Braden* in view of *Woolley*. In both rejections, the Office Action relied on the powered surfboard of *Braden* as the primary reference in connection with the invention recited in claim 1, while acknowledging that *Braden* does not disclose "a hydrofoil having no movable surface interconnected with the lower end of the strut and connected to the propulsion system." For those purported teachings, the Office Action pointed to: (1) the contended "hydrofoil wings" of *Rorabaugh* identified in the annotations on the rear hydrofoil assembly 11 of *Rorabaugh*'s FIG. 1 reproduced on page 4 of the Office Action; and (2) the front blade 40 and rear blade 42 of the planing blade 38 of *Woolley*'s flying ski. The Office Action alleged that it would have been obvious to add the contended hydrofoils of *Rorabaugh* or *Woolley* to *Braden*'s motor 12 to provide "increased stability" to *Braden*'s watercraft. As discussed in more detail below, however, I

respectfully disagree that a person having ordinary skill in the art would have found it obvious to combine the identified disclosures in the manner asserted in the Office Action so as to meet all of the features of the claimed invention. Before discussing these references, I first want to discuss some of the underlying physics surrounding the use of a "hydrofoil," particularly one as recited in the claimed invention, to establish why a person having ordinary skill in the art would not arrive at the claimed invention simply by considering this prior art.

5. In connection with the discussions herein, I have assumed that a person having ordinary skill in the relevant art would have either: (1) a bachelor of science degree in aerospace engineering (or related discipline) plus five years of experience; or (2) a master of science degree in aerospace engineering (or related discipline) plus three years of experience.

HYDROFOIL ANALYSIS

6. Initially, I note that the term "hydrofoil" is a term of art that would be well understood to a person having ordinary skill in the art. In that regard, a hydrofoil is normally considered to consist of one or more fully submerged hydrodynamic surfaces capable of producing lift (*i.e.*, a force in the vertical direction). Typically, but not always, one of the hydrodynamic surfaces is larger than the other, and the hydrofoil is designed so that this largest surface provides the bulk of the lifting force. Smaller hydrodynamic surfaces may be designed to counteract hydrodynamic moments. This is functionally identical to the wing and horizontal stabilizer (sometimes called a horizontal tail) on an aircraft. Under certain conditions, an aircraft may be a "flying wing" with no tail, in which case the wing itself is designed to both provide lift and counteract moments. A hydrofoil can thus be thought of as an airplane that "flies" underwater. Note that objects whose main hydrodynamic function is to provide buoyancy (*e.g.*, pontoons, sponsons, outriggers, and submerged buoyant volumes) are not considered "hydrofoils." Similarly, an object whose main function is to provide drag (*e.g.*, a sea anchor) is not a hydrofoil, and neither is a propulsor (such as a propeller or pump jet). Further, an object whose main function is to counteract a hydrodynamic side force (*e.g.*, a dagger board or keel on a sailboat) is not a hydrofoil. Thus, for the remainder of this Declaration, and consistent with the understanding of a person having ordinary skill in the art, I will use the word "hydrofoil" to denote the system of wings and stabilizers that together provide lift force and counter hydrodynamic

moments. Moreover, "wing" will be used to refer to the main lifting surface(s) of the hydrofoil, and "stabilizer" will refer to surfaces whose main function is to counteract moments.

7. Collectively, the wings and stabilizers that comprise a hydrofoil generate a lift force, a drag force, a lateral force (commonly called a "side force"), a rolling moment, a pitching moment, and a yawing moment. To simplify matters, the following discussion will be restricted to the longitudinal (forward/back and up/down) degrees of freedom. The discussion of lateral/directional motion is similar. Note that a person having ordinary skill in the art would normally separate these degrees of freedom for the purpose of analysis. The longitudinal degrees of freedom include motion in the fore/aft direction, the up/down direction, and pitch rotation (*i.e.*, nose up/down rotation). The net hydrodynamic force and moment produced by a hydrofoil is the sum of the forces and moments produced by the wing(s) and stabilizer(s). Normally one computes moment about the center of gravity of the vehicle. The "net hydrodynamic force" is separated into lift and drag. Note that thrust from the propulsion system is treated independently.

8. The magnitude of the lift force produced by the hydrofoil is commonly written:

$$L = \frac{1}{2}\rho v^2 S C_L \qquad \text{[Equation 1]}$$

Where L is the magnitude of the lift force, ρ is the density of the fluid (water in the case of a hydrofoil, air in the case of an airplane wing), v is the speed, S is a reference area (normally this is the area of the wing), and C_L is the lift coefficient. The lift coefficient, in turn, is provided by the following equation, which is dependent on the angle of attack α (*i.e.*, the angle between the incoming flow and the wing) and the pitch rate q (*i.e.*, the rate of change of the pitch angle of the vehicle).

$$C_L = C_{L_0} + C_{L_\alpha}\alpha + C_{L_q} q \qquad \text{[Equation 2]}$$

The parameters C_{L_0}, C_{L_α}, and C_{L_q} are dependent on the design of the hydrofoil (*i.e.*, the design of the wing(s) and stabilizer(s), as well as their locations with respect to one another). Thus, the lift force is dependent on fluid density, flow condition (speed and angle of attack), and design of the hydrofoil.

9. In addition to lift force, a hydrofoil will generate a drag force D and a pitching moment M. The magnitude of the drag force and the magnitude of the pitching moment can be quantified as:

$$D = \frac{1}{2}\rho v^2 S C_D \qquad \text{[Equation 3]}$$

$$M = \frac{1}{2}\rho v^2 S\bar{c}C_M \qquad \text{[Equation 4]}$$

The drag coefficient C_D and the pitching moment coefficient C_M are given by the following equations, and, like the lift coefficient C_L, they are similarly dependent on angle of attack. However, note that a person having ordinary skill in the art typically expresses the drag coefficient as a function of the lift coefficient.

$$C_D = C_{D_0} + kC_L^2 \qquad \text{[Equation 5]}$$

$$C_M = C_{M_0} + C_{M_\alpha}\alpha + C_{M_q}q \qquad \text{[Equation 6]}$$

Above, the parameter C_{D_0} is the drag coefficient at zero lift, and k is a constant that is dependent on wing design and the particular airfoil chosen or designed for the application at hand. The parameter $C_{M_0}$is the pitching moment coefficient at zero angle of attack and zero pitch rate, the parameter C_{M_α} (commonly known as "pitch stiffness") is the derivative of pitching moment coefficient with respect to angle of attack, and the parameter C_{M_q} (commonly known as "pitch damping") is the derivative of pitching moment coefficient with respect to pitch rate. The parameters C_{M_0}, C_{M_α}, and C_{M_q} are all dependent on the design of the wing(s) and stabilizer(s), the relative arrangement of the wing(s) and stabilizers(s), and on the location of the center of gravity with respect to the neutral point. Note that a hydrofoil (or airplane) with moveable control surfaces has additional terms in the equations for C_M, C_L, and C_D, which additional terms define the contributions of control surface movement to the total pitching moment coefficient, lift coefficient, and drag coefficient of the hydrofoil (or airplane).

10. When a system is in equilibrium, all forces and moments sum to zero. In the case of a hydrofoil, that means that:

$$L = W$$

$$T = D$$

$$M = 0$$

That is, lift force L equals weight W, thrust T equals drag D, and pitch moment M equals zero. A person having ordinary skill in the art often refers to equilibrium as "trim."

11. A particular equilibrium may be stable. If an equilibrium is stable, there is a restoring force that seeks to return the system back to its equilibrium after a disturbance. Stability is commonly described in terms of static stability (*i.e.*, the initial tendency to return to equilibrium after a disturbance) and dynamic stability (*i.e.*, the effects of a disturbance decay to zero over time). A system that is statically stable may (but not necessarily) be dynamically stable. However, a system that is dynamically stable must also be statically stable. Stable systems tend to be easier for humans to operate. As an example, consider the difference between balancing a broomstick upright on the palm of your hand [an unstable arrangement] versus allowing it to hang downwards as you grip the top end between your thumb and fingers [a stable arrangement]. That is, you may be able to find an equilibrium as you balance the broomstick upright on the palm of your hand, but any small disturbance (*e.g.*, a gust of air) will cause the broomstick to tip over. However, a system may be too stable, in which case it will be very difficult or impossible for the human steering inputs to be able to overcome the system's inherent stability.

12. Independent claim 1 of the '659 Patent recites a "passively stable, weight-shift controlled personal hydrofoil watercraft." In view of that patent, a person having ordinary skill in the art would understand that "passively stable" means that stability is achieved without the need for active control systems or mechanisms. Moreover, "weight-shift controlled" would be understood to mean that steering is achieved by shifting the weight of the rider, resulting in a change of direction or speed (or both).

13. Passive stability is achieved by satisfying certain conditions in the equations that govern the dynamics of a system. In the case of a hydrofoil, the conditions governing longitudinal stability can be summarized as:

$$C_{M_\alpha} < 0$$

$$C_{M_q} < 0$$

In addition, the existence of a stable *equilibrium* further requires that:

$$C_{M_0} > 0$$

Thus, mathematically:

$$C_{M_\alpha} = -C_{L_\alpha}(h_{NP} - h) \qquad \text{[Equation 7]}$$

where h is the location of the center of gravity and h_{NP} is the neutral point. The neutral point is defined as the location of the center of gravity location the hydrofoil becomes unstable. If the center of gravity is forward of the neutral point, then the hydrofoil will be stable, whereas, if the center of gravity is aft of the neutral point, then the hydrofoil will be unstable.

14. One might conclude that stability is therefore achieved solely by placing the center of gravity ahead of the neutral point. However, for passively stable, weight-shift controlled personal hydrofoil watercraft to be functional, it is important to provide a range of stable equilibria so that the rider can choose (and change in real time) the riding condition, while maintaining stability. Consider a desired equilibrium at some nominal speed v_0. If we assume that this desired equilibrium is at a constant pitch angle, the pitch rate q will equal 0. Therefore, mathematically, we must first satisfy the following (see Equations 1 and 2, as well as the equilibrium conditions noted in paragraph 12 above):

$$W = \frac{1}{2}\rho v_0^2 S C_L = \frac{1}{2}\rho v_0^2 S\left(C_{L_0} + C_{L_\alpha}\alpha\right) \qquad \text{[Equation 8]}$$

A desired speed v_0 thus results in a desired angle of attack α_0. At that desired angle of attack, we must also satisfy $M = 0$ (from the conditions in paragraph 12 above). Hence:

$$0 = C_{M_0} + C_{M_\alpha}\alpha_0 \qquad \text{[Equation 9]}$$

Because the weight-shift controlled personal hydrofoil watercraft as recited in claim 1 does not have moveable control surfaces, we can only satisfy the above Equation 9 by adjusting C_{M_α} by changing the location of the center of gravity with respect to the neutral point. Substituting for C_{M_α} (from Equation 7), we get the following equation, which is rearranged in the subsequent lines below to yield Equation 10. That equation solves for h_0, which is the location of the center of gravity that results in an equilibrium at a desired angle of attack α_0 (and thus a desired speed v_0):

$$0 = C_{M_0} - C_{L_\alpha}(h_{NP} - h)\alpha_0$$

$$(h_{NP} - h_0) = \frac{C_{M_0}}{C_{L_\alpha}\alpha_0}$$

$$h_0 = h_{NP} - \frac{C_{M_0}}{C_{L_\alpha}\alpha_0} \qquad \text{[Equation 10]}$$

Thus, the rider can change h_0 to change the desired speed, and a small adjustment in thrust then counteracts any change in drag. As noted previously, C_{M_0} and C_{L_α} are dependent on design of the hydrofoil, and the location of the neutral point h_{NP} is similarly dependent on design of the hydrofoil. To be functional, the hydrofoil must be designed so that it is passively stable over a wide range of operating speeds, so that the user has sufficient control over the craft.

15. In addition to the above complexity in ensuring that the center of gravity is appropriately positioned with respect to the neutral point, there are further complications involved in achieving a functional, personal hydrofoil watercraft that is stable, all without the use of active control surfaces. Specifically, an additional complication results from the rider being positioned above the board ("flotation device" in the claims), as that results in the center of gravity being far above the hydrofoil that supports the weight of the vehicle, since the hydrofoil is submerged below the board and interconnected with the recited "strut." That positioning thus results in the system as a whole being dynamically equivalent to an inverted pendulum, which is unstable (as with the broomstick being balanced on the palm of your hand, as discussed above). That is in contrast to a hang glider, for example, which is another type of weight-shift controlled personal "craft" (specifically an aircraft), since a hang glider positions the center of gravity below the wing, which results in what is known as "pendulum stability."

16. A further complication arises from the fact that the thrust line (from the submerged "propulsor") is also spaced far below the center of gravity. That results in a strong nose-up pitching moment. Note that thrust contributes to positive C_{M_0}, which contribution varies with the amount of thrust, which in turn varies with drag, which varies with lift, which varies with speed and angle of attack. The resulting effect is that strong disturbances are imposed on the vehicle, since what was a helpful condition (*i.e.*, contribution to positive C_{M_0}) has become destabilizing because its magnitude is large and varies with thrust.

17. Thus, the hydrofoil must be designed to be stable in the presence of the strong inverted pendulum instability, as well as the strong disturbances that result from having the thrust line so far from the center of gravity. In addition, the hydrofoil must be designed so that changes in the location of the center of gravity (resulting from the weight shift of the rider) result in changes in operating condition, such as speed and/or turn rate. Even further, the hydrofoil must be designed so that it

remains stable over a wide range of locations of the center of gravity, so that that the watercraft is stable for all desired operating conditions.

18. A significant constraint on designing a hydrofoil that is stable over a wide range of locations of the center of gravity, despite the presence of the different instabilities noted above, is the fact that the claimed invention is "passively stable" and "weight-shift controlled," with the hydrofoil having "no movable surface" and the watercraft having "no movable steering system." Such passive stability with no movable control surfaces imposes a significant design constraint on the developer that conflicts with other constraints: mathematically, there would be "missing terms" in the equations that describe the system dynamics. At the time of the invention, therefore, a person having ordinary skill in the art would have concluded that no feasible design exists, given the constraints. The functioning watercraft of the present invention thus achieves results what would have been unexpected to a person having ordinary skill in the art at the time of the invention. Moreover, even if such a person were to try to achieve the invention as claimed, it would have involved undue experimentation to achieve a functioning watercraft without outside guidance. As discussed below, such guidance is lacking in the references applied in the Office Action. Thus, it would only have been through hindsight knowledge gleaned from the Patentee's own patent disclosure that such an ordinarily skilled person would have been able to achieve a functioning watercraft within the scope of the claims of the '659 Patent.

19. The primary function of a hydrofoil is to improve vehicle performance, not stability. In particular, by creating lift that raises the main body of the watercraft above the surface of the water, the drag through the water that would have otherwise resulted from moving that body through the water is reduced. As relevant here, that reduces the power required to operate the watercraft at meaningful speeds, so that range and endurance are improved. For the hydrofoil to be useful, it must also be stable and controllable. As described above, achieving stability and controllability in a hydrofoil without moveable control surfaces and without an active control system is difficult and would not have been obvious to a person having ordinary skill in the art.

DISCUSSION OF THE CITED PRIOR ART AND OFFICE ACTION

20. Thus, contrary to the assertions in the Office Action, a person having ordinary skill in the art would not utilize a hydrofoil for the purpose of improving the stability of a watercraft. In fact,

a hydrofoil might actually reduce stability if it is not designed and implemented in such a way as to specifically target and correct particular known instabilities. Therefore, a person having ordinary skill in the art would not have any expectation of success in incorporating a hydrofoil into a powered surfboard such as that in *Braden*, particularly with the goal asserted in the Office Action of "increas[ing] stability."

21. In that regard, *Rorabaugh* does not provide any assistance in combination with *Braden*. Firstly, *Rorabaugh* does not suggest that its hydrofoils increase stability. Rather, there is very little discussion in *Rorabaugh* about the details of its hydrofoil assemblies 10, 11 because the disclosure of *Rorabaugh* is primarily directed to movable sponsons (*e.g.*, sponsons 26, 27 in FIG. 4) that are used to increase the stability of its hydrofoil watercraft. As disclosed in *Rorabaugh*, such sponsons can be moved between an inboard position shown in FIG. 3, outboard positions shown in FIGS. 4 and 5, and a downwards position shown in FIG. 6 (*see Rorabaugh* col.12 ll.58-65). As noted in, for example, *Rorabaugh*'s Abstract, the outboard positions (of FIGS. 4 and 5) "stabilize the hull while the HFWC is stopped or moving slowly." Indeed, the language from column 1, lines 16-20 of *Rorabaugh*, which was quoted on page 4 of the Office Action as support for the concept of adding *Rorabaugh*'s hydrofoils to *Braden*'s surfboard for the purpose of "provid[ing] increased stability," is not actually discussing stability provided by hydrofoils, but rather one discussing stability provided by *Rorabaugh*'s sponsons. That is, the full sentence from *Rorabaugh* quoted in the Office Action is:

> [t]he present invention particularly concerns extended performance hydrofoil watercraft (E-P HFWC) that, nonetheless to having hydrofoils that are positionally fixed in extension from the hull, are safe and stable to operate in shallow water, and also in heavy seas when not on hydrofoil plane or when progressing to hydrofoil plane.

(*Rorabaugh*, col.1 ll.16-21 (emphasis added).) Thus, that passage is discussing how *Rorabaugh*'s "present invention" (which involves incorporating movable sponsons into hydrofoil watercraft) is "safe and stable to operate" despite having hydrofoils (*i.e.*, "nonetheless to having hydrofoils").

22. Secondly and more importantly, however, *Rorabaugh* does not teach or suggest a "watercraft having no movable steering system" or a "hydrofoil having no movable surface," as recited in the claims of the '659 Patent. Indeed, despite the fact that it is the sponsons and not the hydrofoils that are the focus of *Rorabaugh*'s disclosure, when *Rorabaugh* does discuss the hydrofoils, they are explicitly noted to have adjustable control surfaces (*see, e.g.*, col.8 ll.41-44, col.9 ll.14-26, col.13 ll.10-13, col.15 ll.36-37, and col.16 ll.5-6) that are steered by *Rorabaugh*'s movable steering

gear 25. Those statements are entirely consistent with *Rorabaugh*'s figures, which depict control surfaces on its hydrofoils, although without identifying those control surfaces with associated reference numerals. For example, FIG. 1 of *Rorabaugh* has been reproduced below with annotations identifying those adjustable controls surfaces.

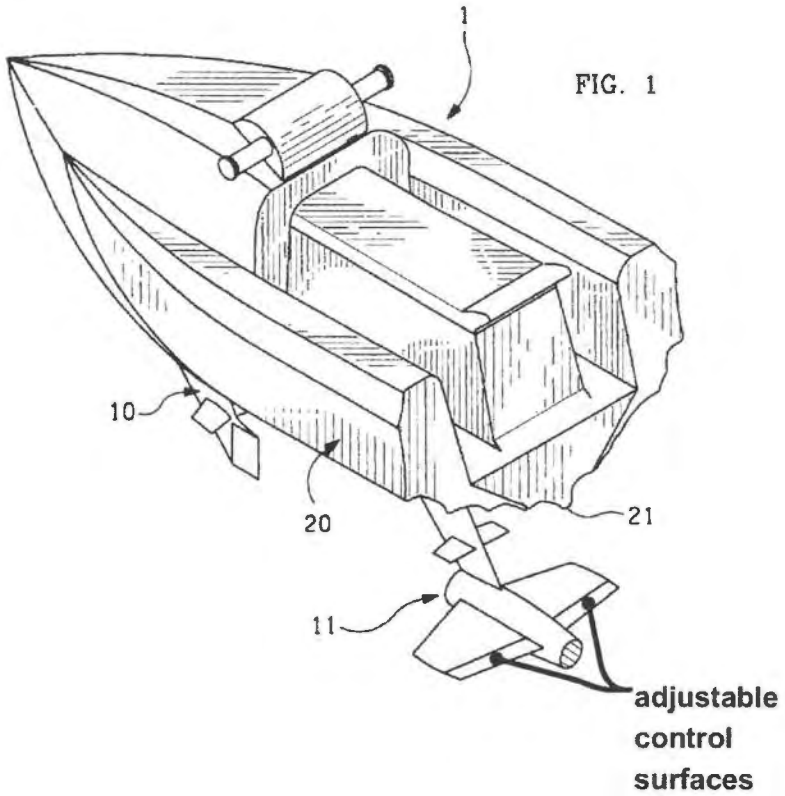


FIG. 1

The fact that those control surfaces are not identified with a reference numeral in *Rorabaugh* is not entirely surprising, since, as discussed above, the hydrofoils themselves are not a focus of *Rorabaugh*'s disclosure. Nevertheless, a person having ordinary skill in the art would immediately recognize that the items identified with the annotations in the above figure are the adjustable control surfaces mentioned in the above-identified passages of *Rorabaugh*. Indeed, a person having ordinary skill in the art would recognize that those control surfaces look like and are analogous to adjustable control surfaces of airplane wings known as "ailerons" or the control surfaces of an airplane's horizontal stabilizer known as "elevators." For reference, excerpts from Thomas, *Fundamentals of Sailplane Design*, tr. Judah Milgram, College Park Press 1999, which show such common control surfaces on airplane wings, are attached hereto in Exhibit B. For additional reference, Exhibit B also

contains the slide packet for Lecture 1 of my course "AERSP 306 – Introduction to Aeronautics" that I am currently teaching. This slide packet describes the jargon, function, and positioning of aircraft components and subassemblies such as the control surfaces. Thus, contrary to the assertion at the top of page 4 of the Office Action, *Rorabaugh*'s jet ski-like watercraft is not "weight-shift controlled," but rather it is controlled by movable planes of the hydrofoils that are controlled by an input device such as an "aircraft joystick," as stated in column 8, lines 40-45 of *Rorabaugh*.

23. Turning to the other secondary reference in the Office Action, *i.e.*, *Woolley*, that reference also does not help in reaching the claimed invention in combination with *Braden*. *Woolley* discloses a "flying ski" that is pulled behind a motorboat by a tow rope, similar to a water ski, except that it "flies" above the surface of the water by means of a planing blade 38. Consistent with the general function of a hydrofoil, *Woolley*'s planing blade 38 is primarily used in that reference for elevating the rider and board above the surface of the water to provide a flying experience (*see* paragraphs [0005]-[0006] of *Wooley*, which refer to earlier disclosures of the flying ski by the same inventor, and which are improved upon in *Woolley*). However, modification of stability characteristics is only a secondary aspect that is designed into *Woolley*'s planing blade 38, once a planing blade is implemented as a component of the watercraft for the primary "lifting" purpose noted above. That is, paragraphs [0191]-[0214] of *Woolley* discuss how the planing blade 38 of the flying ski can be "adapted" for beginning and intermediate riders so as to provide a stable, steady ride that is relatively unresponsive to rider actions. On the other hand, for more advanced or professional riders, the planing blade 38 can be modified to make the flying ski extremely responsive to rider actions so as to provide an "action-packed" experience that is capable of performing maneuvers such as jumps and somersaults.

24. As noted above, the function of a hydrofoil is to lift the main body of the watercraft above the surface of the water to reduce drag, and, once that objective is achieved, then the hydrofoil can be designed to provide desired stability characteristics to the lifted watercraft in operation. Therefore, in view of *Woolley*, a person having ordinary skill in the art would not incorporate a hydrofoil into a watercraft such as *Braden*'s powered surfboard purely for the purpose of improving stability. In fact, if a person having ordinary skill in the art were to consider adding a hydrofoil to *Braden*'s powered surfboard to lift the body of the surfboard out of the water during operation, it would result in a tremendous instability (due to a strong nose-up pitching moment caused by the

propulsion system, as discussed below), and neither *Braden* nor *Woolley* would suggest how that instability could be overcome. In viewing these references, the only conclusion based on the combined teachings would be to use a tow rope from a boat for propulsion rather than an integrated propulsion system or to use some other mechanism that would counteract the destabilizing moment induced by the integrated propulsion system, which I discuss further below. Alternatively, one of ordinary skill in the art would have to resort to movable steering systems and/or movable control surfaces, which would be contrary to the explicit requirements of the claims of the '659 Patent. In fact, this is exactly what persons having ordinary skill in the art have done in the past: hydrofoils have traditionally incorporated moveable surfaces to provide stability (through active control) and for control of direction and height of the hull above water (*i.e.*, steering).

25. Specifically, *Woolley* is different from the claimed invention in at least three important respects. First, the propulsion in *Woolley* is provided by a tow rope held by the rider at one end and connected to a motorboat at the other end. Second, in addition to being a source of the propulsion, the tow rope is used to aid in control. That is, the rider can move the tow handle up, down, left, and right in order to provide steering and control moments. Third, the propulsive force provided by the tow rope goes roughly through the center of gravity of the vehicle (*i.e.*, the rider plus board), and therefore it does not contribute to destabilizing the system in a way that a propulsor would if it were located relatively far below the center of gravity (such that it would remain submerged when the body of the board is raised above the surface of the water). In that regard, consider the difference between pulling someone on roller skates by a rope tied around their waist versus a rope tied around their ankles. In the former case, the rope would be roughly aligned with the center of gravity of the person, and therefore pulling the person would not induce a destabilizing moment that could cause them to fall. In contrast, in the latter case, pulling the person by their ankles (far below the center of gravity) is most likely to result in pulling the person's feet out from under them and causing them to fall over.

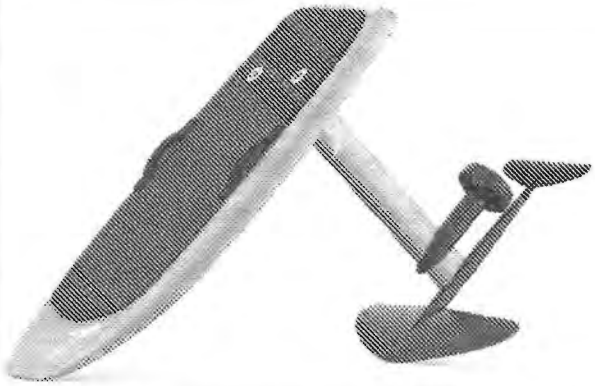
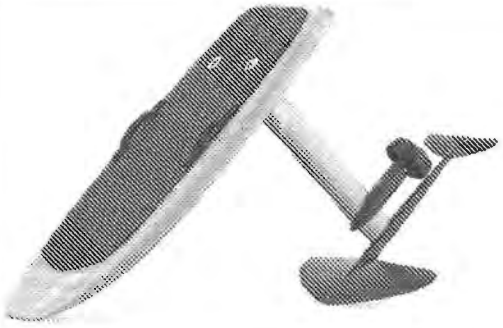
26. Due to the above differences between *Woolley* and the claimed invention, significant instabilities would be induced by simply adding a hydrofoil to *Braden*'s powered surfboard, as was asserted in the Office Action. That is, in attempting to use a hydrofoil like that in *Woolley* to lift *Braden*'s surfboard body 10 above the water during operation, *Braden*'s motor mount 13 would have to be lengthened so that it could continue to provide thrust while the surfboard body is above the water. However, as noted above, shifting the location of the thrust away from the center of gravity in

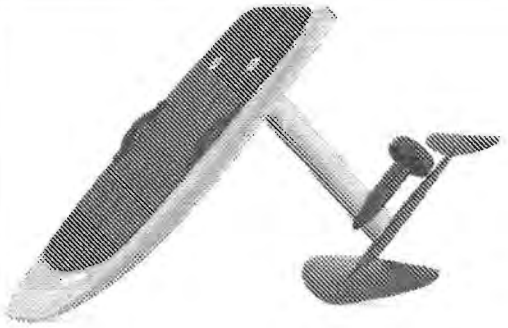
that manner would destabilize the watercraft of *Braden* by imparting a large nose-up pitching moment on the watercraft. *Woolley* does not suggest how one would counteract such a destabilizing torque because, as discussed above, *Woolley*'s propulsion is aligned with the center of gravity via the tow rope, and therefore *Woolley* does not experience anything like the torque that would result from making that modification. Moreover, *Woolley* certainly does not suggest how to achieve stability in such a modified watercraft without the stabilizing presence of the tow rope.

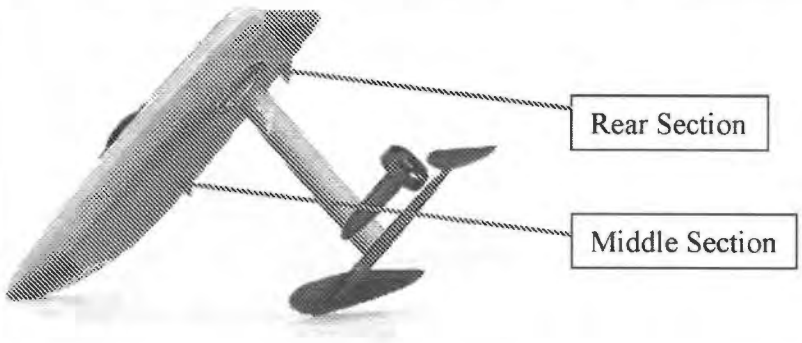
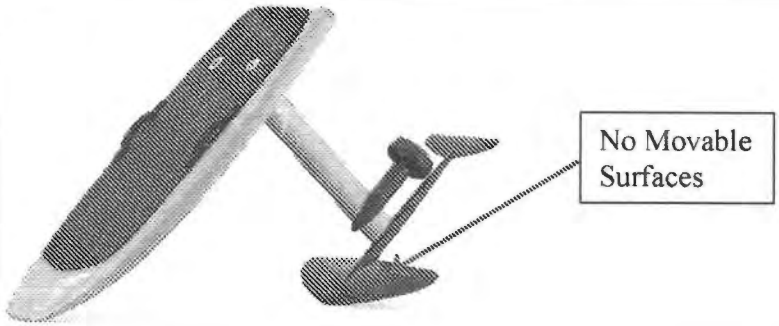
27. In view of all of the above, a person having ordinary skill in the art considering *Braden* and *Woolley* (or any other combination of a powered surfboard with a hydrofoil) at the time of the invention would have concluded that the destabilizing effect of a propulsor spaced away from the center of gravity would have required the use of an active stabilization system including movable steering systems and/or movable control surfaces, such as was disclosed in U.S. Patent No. 7,047,901 to Chen. Or perhaps such an ordinarily skilled person would have sought to implement alternative propulsion that is not spaced below the center of gravity, such as reverting to an external force such as a tow rope, kite, or the like already known in the art. In any event, such alternative implementations would not have fallen within the scope of the claimed invention, which is directed to a "passively stable" and "weight-shift controlled" hydrofoil watercraft having "no movable steering system," and in which the hydrofoil has "no movable surface."

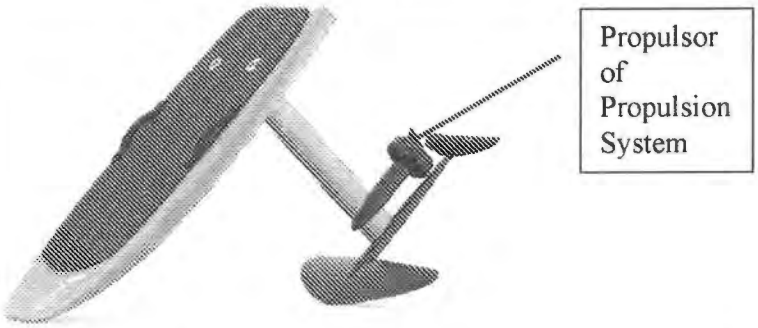
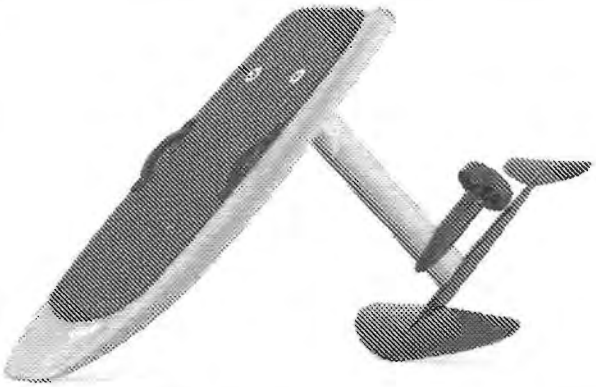
DISCUSSION RELATING TO SECONDARY CONSIDERATIONS

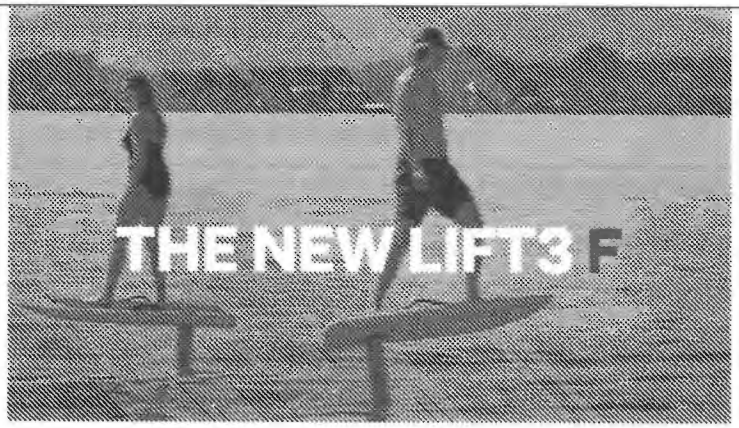
28. A sufficient nexus exists between the Patent Owner's products and the claims of the '659 Patent. As set forth in the following table, each element of the independent claims is found in the LIFT3 eFoil product. While I demonstrate the LIFT3 below, the other generations of this product likewise embody the claims of the '659 Patent.

US 9,586,659 Claim Elements	LIFT3 F Product
1. A passively stable, weight-shift controlled personal hydrofoil watercraft, comprising:	  The LIFT3 F is a passively stable, weight-shift controlled personal hydrofoil watercraft. Users can maneuver the passively stable watercraft solely by weight-shift.
a flotation device that has a fore-aft length greater than a lateral width,	

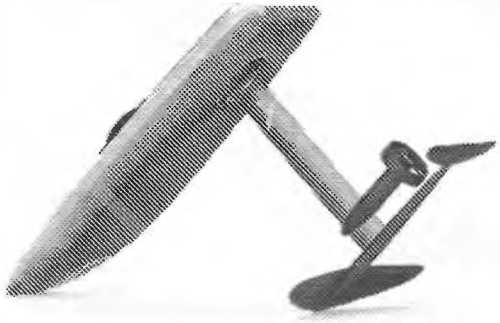
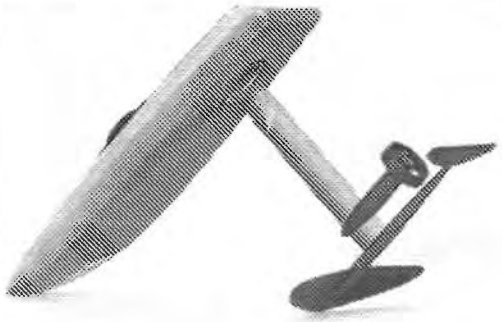
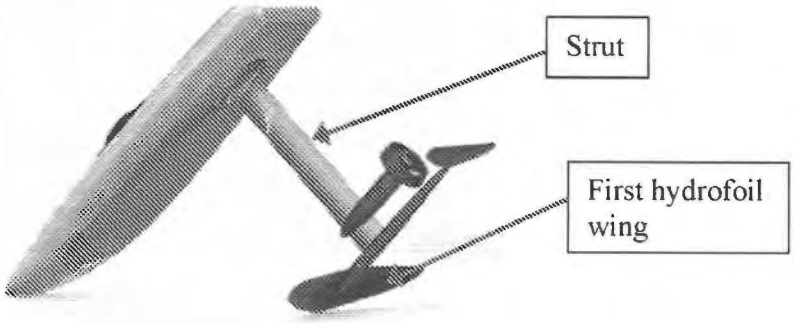
	The fore-aft length of the flotation device is seen to be greater than a lateral width of the flotation device.
the flotation device having a top surface and a bottom surface,	  The flotation device is seen as having a top surface and a bottom surface.
wherein a user can be disposed on the top surface of the flotation device in a prone, kneeling, or standing position	 The top surface of the flotation device is configured to support a user in a prone, kneeling, or standing position.

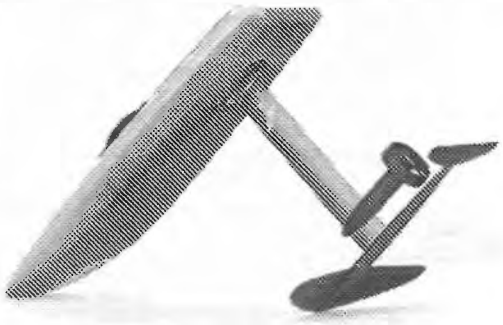
the flotation device having a forward section, a middle section, and a rear section;	 The flotation device can be divided into a forward section, a middle section, and a rear section.
a strut having a upper end and a lower end, the upper end fixedly interconnected with the flotation device between the middle section and the rear section of the flotation device;	 The strut extends between an upper end that is fixedly interconnected with the flotation device and a lower end. Further, the strut is seen to be interconnected between a middle section of the flotation device and a rear section of the flotation device.
a hydrofoil fixedly interconnected with the lower end of the strut, the hydrofoil having no movable surface;	

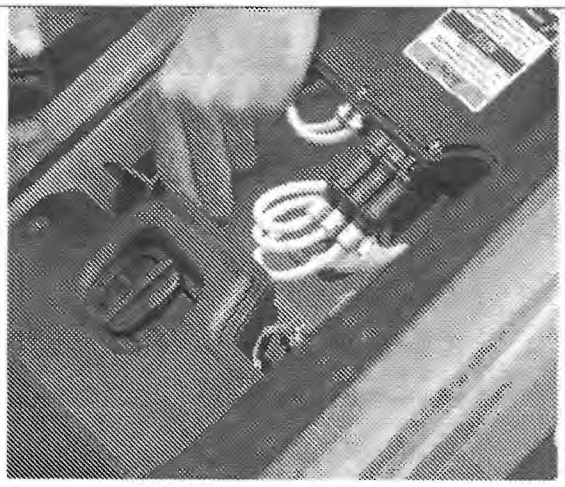
	A hydrofoil is connected to the lower end of the strut via a fuselage. The hydrofoil is also seen to include a unitary wing with no movable surfaces such as ailerons, elevators, rudders, etc.
a propulsion system for propelling the watercraft in a body of water, wherein the propulsion system is connected to the hydrofoil; and	 A propulsor of a propulsion system is connected to the hydrofoil via the strut and is configured to propel the watercraft in a body of water.
the watercraft having no movable steering system.	 The watercraft has no movable steering system, such as rudders.
16. A passively stable, weight-shift controlled personal hydrofoil watercraft, comprising:	

	 The LIFT3 F is a passively stable, weight-shift controlled personal hydrofoil watercraft. Users can maneuver the passively stable watercraft solely by weight-shift.
a surfboard-shaped flotation device that has a fore-aft length greater than a lateral width	 The flotation device is surfboard-shaped and has a fore-aft length greater than a lateral width.

the flotation device having a top surface and a bottom surface,	  The flotation device is seen as having a top surface and a bottom surface.
wherein the top surface has a substantially horizontal supporting surface configured to support a user in a prone, kneeling, or standing position,	 The top surface of the flotation device is seen to be substantially horizontal relative to the strut. The top surface is configured to support a user in a prone, kneeling, or standing position.

the flotation device having a forward section, a middle section, and a rear section;	 The flotation device can be divided into a forward section, a middle section, and a rear section.
a hydrofoil interconnected with the surfboard-shaped flotation device	 The hydrofoil is seen to be connected to a strut, which is connected to the surfboard-shaped flotation device.
the hydrofoil having a strut and a first hydrofoil wing	 The hydrofoil includes a strut and a first hydrofoil wing.

an upper end of the strut being fixedly interconnected with the surfboard-shaped flotation device	 The upper end of the strut is seen to be fixedly interconnected with the bottom surface of the surfboard-shaped flotation device.
the hydrofoil having no movable surface	 The hydrofoil is seen to include a unitary wing with no movable surfaces such as ailerons, elevators, rudders, etc.
a propulsion system attached to the surfboard-shaped flotation device for propelling the watercraft in a body of water,	 A propulsion system, specifically a propulsor of the system, is connected to the hydrofoil via the strut and is configured to propel the watercraft in a body of water.

the propulsion system comprising a battery, an electric motor, a motor speed controller, and a propulsor, wherein the propulsor is selected from a propeller, a ducted propeller, or a pump-jet	  It is seen that the propulsion system comprises a battery, an electric motor, a motor speed controller, and a propulsor in the form of a propeller.
and the battery and motor speed controller are contained in a watertight compartment integrated into the flotation device;	

	It is seen that the battery and motor speed controller are contained within a watertight compartment integrated into the flotation device.
the watercraft having no movable steering system;	 The watercraft has no movable steering system, such as rudders.
a handheld controller having a throttle	 A user is seen to be operating the watercraft with a handheld controller having a throttle.
a throttle interface, wherein the throttle is adapted to send electronic signals to the throttle interface that cause an output of the propulsion system to change.	 A user is capable of adjusting the throttle to send electronic signals to the throttle interface that changes the output of the propulsion system and speed of the watercraft.

I declare under penalty of perjury that the foregoing is true and correct. I further state that I have been warned that willful false statements and the like so made are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code and such willful false statements may jeopardize the validity of the application or any patent resulting therefrom. I state that all statements made of my own knowledge are true and all statements made on information and belief are believed to be true.

Dated: **March 02, 2024**

/Jacob W. Langelaan/
JACOB W. LANGELAAN

EXHIBIT A

Jack W. Langelaan PH.D.
Professor and Director of Graduate Studies, Aerospace Engineering
The Pennsylvania State University ***t: (814) 863-6817***
www.aero.psu.edu/jack ***jlangelaan@psu.edu***

Education

Stanford University, Stanford, CA
Ph.D., Department of Aeronautics and Astronautics, March 2006.
Dissertation title: State Estimation for Autonomous Flight in Cluttered Environments
Advisor: Professor Stephen Rock, Department of Aeronautics and Astronautics

University of Washington, Seattle, Washington
Master of Science in Aeronautics and Astronautics, December 1994.
Thesis title: Design Oriented Structural Analysis for Shape Optimization of Isotropic and Composite Fuselage Structures
Advisor: Professor Eli Livne, Department of Aeronautics and Astronautics

Queen's University, Kingston, Ontario.
Bachelor of Science, Engineering Physics (Mechanical Option), with Honors, May 1992.

Research and Professional Experience

2020–present: Professor, Aerospace Engineering, The Pennsylvania State University, University Park, Pennsylvania. Director of Graduate Program, 2017–present.

2012–2020: Associate Professor, Aerospace Engineering, The Pennsylvania State University, University Park, Pennsylvania. Director of Graduate Program, 2017–present.

2006–2012: Assistant Professor, Aerospace Engineering, The Pennsylvania State University, University Park, Pennsylvania.

2000–2006: Research Assistant, Aerospace Robotics Laboratory, Department of Aeronautics and Astronautics, Stanford University, Stanford, California.

1995–2000: Engineer, Bombardier Aerospace (formerly de Havilland Inc.), Downsview, Ontario Canada.

1994–1995: Research Assistant, Department of Aeronautics and Astronautics, University of Washington, Seattle, Washington.

Professional Memberships and Service

Professional Engineer, Association of Professional Engineers of Ontario since 1996.

Associate Fellow (2011), American Institute of Aeronautics and Astronautics. Member of Guidance, Navigation and Control Technical Committee (2005-2014 and 2018-present). Chair of Education sub-committee, 2007-2010.

Member, Vertical Flight Society. Member of Unmanned Vertical Flight Technical Committee, (2014-present) and eVTOL Provisional Technical Committee (2019-present)

Member, Institute for Electrical and Electronics Engineers. Session organizer and co-chair (Autonomous Vehicles), 2006 and 2007 IEEE Aerospace Conference, Big Sky, MT.

Associate Editor, Journal of Guidance, Control and Dynamics (2017-present).

Reviewer: AIAA Journal of Guidance, Control and Dynamics; International Journal of Robotics Research; IEEE Transactions on Control System Technology; IEEE Transactions on Robotics; Journal of Intelligent Robots and Systems; IEEE Conference on Decision and Control; AIAA Guidance, Navigation and Control Conference; IEEE/RSJ International Conference on Intelligent Robots and Systems; IEEE Conference on Robotics and Automation; IEEE Multi-Conference on Systems and Control; American Control Conference.

Grant Proposal Peer Review: National Science Foundation Robust Intelligence Cluster "small proposals" panel, 2009, 2008, 2007; Army Research Office, 2009, Office of Naval Research, 2010.

Conference Organization: Technical Area co-chair, 2008 AIAA Guidance, Navigation and Control Conference; Technical Area Chair, 2009, 2010, 2011, 2020 AIAA Guidance, Navigation and Control Conference; Technical co-Chair, 2012 AIAA Guidance, Navigation and Control Conference; Organizing Committee, 2010 National Academy of Engineering United States Frontiers of Engineering (USFOE) Conference.

Honors and Awards

2014: Winner of OSTIV Diploma for best paper presented at the XXXI OSTIV Congress and published in the Journal of Technical Soaring, vol. 37, no. 3, July 2013. (OSTIV is the Organization Scientifique et Technique International du Vol à Voile).

2011: Winner of a NASA Centennial Challenge. Team Leader of Pipistrel-USA.com, winner of the Green Flight Challenge. Our four seat, electric powered aircraft flew 403 passenger miles per gallon over a 195 mile course at 107 miles per hour. The prize of $1.35Million is the largest ever awarded for an achievement in aviation.

2011: Associate Fellow, American Institute of Aeronautics and Astronautics.

2010: PSEAS Outstanding Teaching Award (awarded by the Penn State Engineering Alumni Society).

2008: National Science Foundation Faculty Early Career Development Program (CAREER) award.

2006-2008: Dorothy Quiggle Professor in Engineering, The Pennsylvania State University.

2001-2004: Alyce B. and Henry J. Ramey Jr. Fellow, Stanford University.

2000: Department Fellowship, Department of Aeronautics and Astronautics, Stanford University.

Teaching

AERSP 306 (Introduction to Aeronautics): Spring 2024, Spring 2018, Spring 2012, Spring 2010.

AERSP 397 (Aerospace Design Studio): Spring 2018

AERSP 402A (Aircraft Design, Preliminary): Fall 2020-2016, 2012-2014.

AERSP 402B (Aircraft Design, Detailed): Spring 2021-2017, 2012-2015.

AERSP 413 (Aircraft Stability and Control): Fall 2023, 2022, 2008.

AERSP 460 (Control of Aerospace Systems): Fall 2021-2018, 2012, 2010, 2009, 2007, 2006.

AERSP 497D/597D (AUV Design): Fall 2013, Spring 2014, Fall 2014

AERSP 518 (Dynamics and Control of Aerospace Vehicles): Spring 2021

AERSP 597 (Advanced Air Mobility): Spring 2022-Spring 2024

AERSP 597E (Estimation Theory): Spring 2013, Spring 2011, Spring 2008.

AERSP 597G (Theory and Application of Global Navigation Satellite Systems): Fall 2011, Spring 2009, Spring 2007.

Patents

Names in **BOLD SMALL CAPS** denote students supervised by Langelaan.

[P3] Stroman, Richard, Daniel J. Edwards, Daniel S. Newton, **JOHN J. BIRD**, Jack W. Langelaan, Vladimir Dobrokhodov, *Method for identifying optimal vehicle paths when energy is a key metric or constraint*, US Patent Application Publication 2019/0107408 A1, April 11, 2019.

[P2] Langelaan, Jacob Willem, *Powered hydrofoil board*, US Patent 9,586,659 B2, March 7, 2017.

[P1] Langelaan, Jacob Willem, *Weight-shift controlled personal hydrofoil watercraft*, US Patent 9,359,044 B2, June 7, 2016.

Invited Publications

[1] Langelaan, Jack W. and Nicholas Roy, "Enabling New Missions for Robotic Aircraft," *Science*, vol. 326, no. 5960, December 18, 2009, pp. 1642-1644, DOI: 10.1126/science.1182497

Refereed Journal Publications

Names in **BOLD SMALL CAPS** denote students supervised by Langelaan.

[J26] Hendrick, Christopher M.; **JAQUES, EMMA R.**; Horn, Joseph F.; Langelaan, Jack W.; Sydney, Anish J. "Model-Scale Evaluation of Autonomous Ship Landing Guidance and Control Modes," Journal of the American Helicopter Society, available on-line January 2024

[J25] **OPAZO, TOMAS I.,** Raja Akif Raja Zahirudin, Jose Palacios, Sven Schmitz, and Jack W. Langelaan, "Analytical and Experimental Power Minimization for Fixed-Pitch Coaxial Rotors in Hover," *Journal of Aircraft*, vol. 60, no. 2, December 2022. DOI: 10.2514/1.C036807

[J24] **GENG, JUNYI,** Puneet Singla, & Jack W. Langelaan. "Load-Distribution-Based Trajectory Planning and Control for a Multilift System," *Journal of Aerospace Information Systems*, January 2022. DOI: 10.2514/1.I011067

[J23] **GENG, JUNYI** and Jack W. Langelaan, "Mass and Center of Mass Location Estimation for a Multi-lift Slung Load," *AIAA Journal of Guidance, Control, and Dynamics*, November 2020. DOI: 10.2514/6.2020-2067

[J22] Yan, Sihong, **TOMAS I. OPAZO**, Jack W. Langelaan, and Jose L. Palacios, "Experimental Evaluation and Flight Simulation of Coaxial-rotor Vehicles in Icing Clouds," *Journal of the American Helicopter Society*, 65(2), April 2020. DOI: 10.4050/JAHS.65.022011

[J21] **GENG, JUNYI** and Jack W. Langelaan, "Cooperative transport of a slung load using load-leading control," *AIAA Journal of Guidance, Control, and Dynamics*, 43(7), March 2020. DOI: 10.2514/1.G004680

[J20] **BIRD, JOHN J.** and Jack W. Langelaan, "Optimal Speed Scheduling with Arrival Time Constraints for Solar Augmented Aircraft," *AIAA Journal of Guidance, Control, and Dynamics*, 43(7), May 2020. DOI: 10.2514/1.G004430

[J19] **BIRD, JOHN J.,** Scott J. Richardson, and Jack W. Langelaan, "Estimating the Vertical Structure of Weather-Induced Mission Costs for Small UAS," *Sensors* 2019, 19, 2770; DOI:10.3390/s19122770

[J18] **DEPENBUSCH, NATHAN T., JOHN J. BIRD** and Jack W. Langelaan, "The AutoSOAR Autonomous Soaring Aircraft Part 1: Autonomy Algorithms," *Journal of Field Robotics,* available online March 2018. DOI: 10.1002/rob.21782

[J17] Enciu, J., Joseph F. Horn and Jacob W. Langelaan, "Formation control of a rotorcraft multilift system," *Journal of the American Helicopter Society*, vol. 62, No. 4, October 2017.

[J16] **DEPENBUSCH, NATHAN T., JOHN J. BIRD** and Jack W. Langelaan, "The AutoSOAR Autonomous Soaring Aircraft Part 2: Hardware Implementation and Flight Results," *Journal of Field Robotics*, online October 3, 2017. DOI: 10.1002/rob.21747

[J15] **YOMCHINDA, THANAN**, Jack W. Langelaan and Joseph F. Horn, "Modified Dubins Parameterization for Aircraft Emergency Trajectory Planning," *Proceedings of the Institution of Mechanical Engineers Part G: Journal of Aerospace Engineering* 03/2016. DOI:10.1177/0954410016638869

[J14] **GRANDE, NICHOLAS, SHANE TIERNEY**, Joseph F. Horn and Jack W. Langelaan, "Safe Autorotation through Wind Shear via Backwards Reachable Sets," *Journal of the American Helicopter Society*, vol. 61, no. 2, April 2016.

[J13] Mandell, Jason G., Jack W. Langelaan, Andrew G. Webb, and Steven J. Schiff, "Volumetric brain analysis in neurosurgery: Part I. Particle filter segmentation of brain and cerebrospinal fluid growth dynamics from MRI and CT images," *Journal of Neurosurgery: Pediatrics,* vol. 15, no. 2, February 2015, pp 113-124. DOI: 10.3171/2014.9.PEDS12426

[J12] **BIRD, JOHN J.** and Jack W. Langelaan, "Spline Mapping to Maximize Energy Exploitation of Non-Uniform Thermals," *Journal of Technical Soaring*, vol. 37, no. 3, July-September 2013. Winner of 2014 OSTIV Diploma.

[J11] Langelaan, Jack W., **ANJAN CHAKRABARTY**, Aijun Deng, Kirk Miles, Vid Plevnik, Jure Tomazic, Tine Tomazic, Gregor Veble, "Green Flight Challenge: Aircraft Design and Flight Planning for Extreme Fuel Efficiency," *Journal of Aircraft*, vol. 50, no. 3, May 2013, pp 832-846. DOI: 10.2514/1.C032022

[J10] Tomažič, Tine, Vid Plevnik, Gregor Veble, Jure Tomažič, Franc Popit, Sašo Kolar, Radivoj Kikelj, Jacob W Langelaan, Kirk Miles, "Pipistrel Taurus G4: on Creation and Evolution of the Winning Aeroplane of NASA Green Flight Challenge 2011," *Strojniški vestnik-Journal of Mechanical Engineering*, vol. 57, no. 12, 2012, pp 869-878.

[J9] **CHAKRABARTY, ANJAN** and Jack W. Langelaan, "Energy-based Long-Range Path Planning for Soaring-capable UAVs," *Journal of Guidance, Control and Dynamics*, vol. 34, no. 4, 2011, pp 1002-1015.

[J8] Langelaan, Jack W., Nicholas J. Alley, and James Neidhoefer, "Wind Field Estimation for Mini- and Micro-Unmanned Aerial Vehicles," *Journal of Guidance, Control and Dynamics*, vol. 34, no. 4, 2011, pp 1016-1030.

[J7] Langelaan, Jack W., "A Gust Soaring Controller for Small Gliders," *Journal of Technical Soaring*, vol. 35, no. 2, 2011.

[J6] **MARLOW, SEAN Q.** and Jack W. Langelaan, "Local Terrain Mapping for Obstacle Avoidance using Monocular Vision," *Journal of the American Helicopter Society*, vol. 56, no. 2, April 2011.

[J5] **CORBETS, JEFFREY B.** and Jack W. Langelaan, "Real Time Trajectory Generation for Target Localization using Micro Air Vehicles," *Journal of Aerospace Computing, Information and Communications*, vol. 7, August 2010, pp 223-240. DOI: 10.2514/1.47834.

[J4] Langelaan, Jack W., "Gust Energy Extraction for Small- and Micro- Uninhabited Aerial Vehicles," *Journal of Guidance, Control and Dynamics*, vol. 32, no. 2, 2009, pp 464-473.

[J3] Langelaan, Jack W., "State Estimation for Autonomous Flight in Cluttered Environments," *Journal of Guidance, Control and Dynamics*, vol. 30, no. 5, 2007.

[J2] Langelaan, Jack, ed.: "Special Issue on Aircraft Design and Development," *Canadian Aeronautics and Space Journal* vol. 46, no. 2 June 2000.

[J1] Langelaan, Jack W. and E. Livne: "Analytic Sensitivities and Design Oriented Structural Analysis for Airplane Fuselage Shape Synthesis," *Computers and Structures*, vol. 62, no. 3, pp. 505–519, 1997.

Book Chapters

[B1] Langelaan, Jack W., "Power Generation and Energy Management," in *Encyclopedia of Aerospace Engineering: UAS*, online June 13, 2016. DOI: 10.1002/9780470686652.eae1113

Conference Publications

Names in **BOLD SMALL CAPS** denote Langelaan's students.

[C67] **YUAN, KAIL J.**, Damaris R. Zachos, Jack W. Langelaan, Eric Greenwood and Kenneth Brentner, "Flight Path Planning for Minimization of Total Noise Exposure in Urban Air Mobility Operations," *AIAA SciTech Forum*, January 2024. https://doi.org/10.2514/6.2024-2881

[C66] **KIMMEL, NATHAN K** and Jack W. Langelaan, "UAS Data retrieval in large-scale sensor networks," *AIAA SciTech Forum*, January 2024. https://doi.org/10.2514/6.2024-2891

[C65] Habas, Bryan, Jack W. Langelaan, and Bo Cheng, "Inverted Landing in a Small Aerial Robot via Deep Reinforcement Learning for Triggering and Control of Rotational Maneuvers," *IEEE International Conference on Robotics and Automation*, May 2023.

[C64] Hendrick, Christopher M., **EMMA R. JAQUES**, Joseph F. Horn, and Jack W. Langelaan, "Evaluation of Autonomous Ship Landing Systems at the Maneuvering and Seakeeping Basin," *Vertical Flight Society 79th Annual Forum*, West Palm Beach, FL, May 2023

[C63] **GONZALEZ, BIANCA**, Muhammad J. H. Zahed, Alan R. Wagner, and Jack W. Langelaan, "Scalable Collision Avoidance in High-density Airspaces," *Vertical Flight Society 79th Annual Forum*, West Palm Beach, FL, May 2023

[C62] Hendrick, C., **NICHOLSON, D., JACQUES, E.**, Horn, J. F., Langelaan, J., & Sydney, A. "Scaled Experiments in Flight Control Design for Autonomous Landing in High Sea States," *AIAA Aviation Conference*, June 2022.

[C61] **NICHOLSON, D.**, Hendrick, C., **JACQUES, E.**, Horn, J. F., Langelaan, J., & Sydney, A. "Scaled Experiments in Vision-Based Approach and Landing in High Sea States," *AIAA Aviation Conference*, June 2022.

[C60] Habas, B., Al Attar, B., Davis, B., Langelaan, J., & Cheng, B. "Optimal Inverted Landing in a Small Aerial Robot with Varied Approach Velocities and Landing Gear Designs," *IEEE International Conference on Robotics and Automation*, May 2022.

[C59] Langelaan, J., Schmitz, S., Adams, D. S., & Lorenz, R. D. (2021). Conceptual design of the Dragonfly lander. Vertical Flight Society 77th Annual Forum.

[C58] **GENG, JUNYI**, Puneet Singla and Jack W. Langelaan, "Trajectory Planning and Control for a Multilift System Based on Load Distribution," *Proceedings of the 2021 AIAA SciTech Forum*, virtual event, January 11-15 and 19-21, 2021. DOI: 10.2514/6.2021-0980

[C57] **GENG, JUNYI** and Jack W. Langelaan, "Mass and Center of Mass Location Estimation for a Multi-lift Slung Load," *Proceedings of the 2020 AIAA SciTech Forum*, Orlando, Florida, January 7-11, 2020. DOI: 10.2514/6.2020-2067

[C56] **BIRD, JOHN J.** and Jack W. Langelaan, "A Multi-Armed Bandit Approach to Atmospherically Aware Altitude Optimization," *Proceedings of the 2020 AIAA SciTech Forum*, Orlando, Florida, January 7-11, 2020. DOI: 10.2514/6.2020-1089

[C55] **LI, ZHENDA** and Jack W. Langelaan, "Parameterized Trajectory Planning for Dynamic Soaring," *Proceedings of the 2020 AIAA SciTech Forum*, Orlando, Florida, January 7-11, 2020. DOI: 10.2514/6.2020-0856

[C54] **OPAZO, TOMAS I.** and Jack W. Langelaan, "Longitudinal control of transition to powered flight for a parachute-dropped multirotor," *Proceedings of the 2020 AIAA SciTech Forum*, Orlando, Florida, January 7-11, 2020. DOI: 10.2514/6.2020-2072

[C53] Kinzel, Michael P., Jason K. Cornelius, Sven Schmitz, Jose L. Palacios, Jack W. Langelaan, Douglas Adams, and Ralph Lorenz, "An Investigation of the Behavior of a Coaxial Rotor in Descent and Ground Effect," *Proceedings of the 2019 AIAA SciTech Forum*, San Diego, California, January 7-11, 2019. doi: 10.2514/6.2019-1098

[C52] Yan, Sihong, David Getz, Jose L. Palacios, Michael P. Kinzel, Sven Schmitz and Jack W. Langelaan, "Design, Fabrication and Preliminary Testing of an Experimental Measurement Rig for Co-Axial Rotors," *Proceedings of the 2019 AIAA SciTech Forum*, San Diego, California, January 7-11, 2019. doi: 10.2514/6.2019-1096

[C51] **GENG, JUNYI** and Jack W. Langelaan, "Implementation and Demonstration Of Coordinated Transport Of A Slung Load By A Team Of Rotorcraft," *Proceedings of the 2019 AIAA SciTech Forum*, San Diego, California, January 7-11, 2019. doi: 10.2514/6.2019-0913

[C50] **BIRD, JOHN J.** and Jack W. Langelaan, "Optimal Speed Scheduling for Hybrid Solar Aircraft with Arrival Time Condition," *Proceedings of the 2019 AIAA SciTech Forum*, San Diego, California, January 7-11, 2019. doi: 10.2514/6.2019-1421

[C49] Yan, Sihong, **TOMAS OPAZO**, Jose Palacios, Jack W. Langelaan and Louis-David Germain, "Experimental evaluation of multi-rotor UAV operation under icing conditions," *Proceedings of the American Helicopter Society 74th Annual Forum*, Phoenix, Arizona, May 2018.

[C48] Lakhmani, Sagar, Jack W. Langelaan, and Alan Wagner, "Human-intuitable collision avoidance for autonomous and semi-autonomous aerial vehicles," *Proceedings of the American Helicopter Society 74th Annual Forum*, Phoenix, Arizona, May 2018.

[C47] McGee, Timothy G., Douglas S. Adams, Kenneth E. Hibbard, Elizabeth P. Turtle, Ralph D. Lorenz, Farzin Amzajerdian, and Jack W. Langelaan, "Guidance, Navigation, and Control for Exploration of Titan with the Dragonfly Rotorcraft Lander," *AIAA Guidance, Navigation, and Control Conference*, Kissimee, Florida, January 8-12, 2018.

[C46] **BIRD, JOHN J.** and Jack W. Langelaan, "Design Space Exploration for Hybrid Solar/Soaring Aircraft," *Proceedings of the AIAA Aviation Technology, Integration, and Operations Conference*, Denver, Colorado, June 5-7, 2017.

[C45] Langelaan, Jack W., Sven Schmitz, Jose Palacios and Ralph D. Lorenz, "Energetics of rotary-wing exploration of Titan," *IEEE Aerospace Conference*, Big Sky, Montana, March 6-10, 2017.

[C44] **GENG, JUNYI** and Jack W. Langelaan, "A Quasi Polar Local Occupancy Grid Approach for Vision-based Obstacle Avoidance," *Proceedings of the AIAA Guidance, Navigation and Control Conference*, Grapevine, Texas, January 9-13, 2017.

[C43] **HOLMES, W. K.** and Jack W. Langelaan, "Autonomous Ship-board Landing using Monocular Vision," *Proceedings of the American Helicopter Society 72nd Annual Forum*, West Palm Beach, Florida, May 2016.

[C43] Jerath, Kshitij and Jack W. Langelaan, "Simulation framework for incorporating sensor systems in UAS conceptual design," *Proceedings of the AIAA Modeling and Simulation Technologies Conference*, San Diego, California, January 4-8, 2016.

[C42] Enciu, Jacob, Joseph F. Horn, and Jack W. Langelaan, "Formation control of a rotorcraft multi-lift system," *41st European Rotorcraft Forum*, September 1-4, 2015.

[C41] **DEPENBUSCH, NATHAN T.,** Constantino Lagoa, and Jack W Langelaan, "Random Geometric Graphs as a Model for Bounding the Endurance of Soaring Aircraft," *IEEE Conference on Decision and Control*, Los Angeles, California, December 2014.

[C40] **CHENG, KWOK** and Jack W. Langelaan, "Guided Exploration for Coordinated Autonomous Soaring Flight," *Proceedings of the AIAA Guidance, Navigation and Control Conference*, National Harbor, Maryland, January 13-17, 2014.

[C39] **LI, ZUQUN,** Jack W. Langelaan and Joseph F. Horn, "Coordinated Transport of a Slung Load by a Team of Autonomous Rotorcraft," *Proceedings of the AIAA Guidance, Navigation and Control Conference*, National Harbor, Maryland, January 13-17, 2014.

[C38] **MAKOVKIN, DMITRIY** and Jack W. Langelaan, "Optimal Persistent Surveillance using Coordinated Soaring," *Proceedings of the AIAA Guidance, Navigation and Control Conference*, National Harbor, Maryland, January 13-17, 2014.

[C37] **BIRD, JOHN J.,** Jack W. Langelaan, Corey Montella, John Spletzer, Joachim Grenestedt, "Closing the Loop in Dynamic Soaring," *Proceedings of the AIAA Guidance, Navigation and Control Conference*, National Harbor, Maryland, January 13-17, 2014.

[C36] **DAUGHERTY, SHAWN** and Jack W. Langelaan, "Improving Autonomous Soaring via Energy State Estimation and Extremum Seeking Control," *Proceedings of the AIAA Guidance, Navigation and Control Conference*, National Harbor, Maryland, January 13-17, 2014.

[C35] **DEPENBUSCH, NATHAN T.** and Jack W. Langelaan, "Minimum Risk Planning for Teams of Unmanned Air Vehicles," *Proceedings of the 2013 Infotech@Aerospace Conference*, Boston, Massachusetts, August 19-22, 2013. (invited paper).

[C34] **CHAKRABARTY, ANJAN** and Jack W. Langelaan, "UAV Flight Path Planning in Time Varying Complex Wind Fields," *American Control Conference*, Washington, DC, June 2013.

[C33] **GRANDE, NICHOLAS** and Jack W. Langelaan, "Safe Autonomous Flare and Landing during Autorotation through Wind Shear," *Proceedings of the AHS 69th Annual Forum*, Phoenix, Arizona, May 21-23, 2013.

[C32] **TRUSKIN, BENJAMIN** and Jack W. Langelaan, "Vision-based Deck State Estimation for Autonomous Ship-board Landing," *Proceedings of the AHS 69th Annual Forum*, Phoenix, Arizona, May 21-23, 2013.

[C31] Song, Y., Joseph F. Horn, **ZUQUN LI,** and Jack W. Langelaan, "Modeling, Simulation, and Non-linear Control of a Rotorcraft Multi-Lift System," *Proceedings of the AHS 69th Annual Forum*, Phoenix, Arizona, May 21-23, 2013.

[C30] **QUINDLEN, JOHN F.** and Jack W. Langelaan, "Flush Air Data Sensing for Soaring-capable UAVs," *51st AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition*, January 7-10, 2013. DOI: 10.2514/6.2013-1153.

[C29] **BIRD, JOHN J.** and Jack W. Langelaan, "Spline Mapping to Maximize Energy Exploitation of Non-uniform Thermals," *Proceedings of the XXXI OSTIV Congress*, Uvalde, Texas, August 8-13, 2012.

[C28] Langelaan, Jack W., J. Spletzer, C. Montella and J. Grenestedt, "Wind field estimation for autonomous dynamic soaring," *2012 IEEE International Conference on Robotics and Automation*, St. Paul, Minnesota, May 14-18, 2012.

[C26] **YOMCHINDA, THANAN,** Joseph F. Horn and Jack W. Langelaan, "Autonomous Control and Path Planning for Autorotation of Unmanned Helicopters," *American Helicopter Society 68th Annual Forum*, Fort Worth, Texas. May 1-3, 2012.

[C26] **MARLOW, SEAN Q.** and Jack W. Langelaan, "Population of a Range Bearing Map for Local Obstacle Avoidance Using Monocular Vision," *American Astronautical Society Guidance and Control Conference*, Breckenridge, Colorado, 2012.

[C25] **YOMCHINDA, THANAN**, Joseph F. Horn and Jack W. Langelaan, "Flight Path Planning for Descent-phase Helicopter Autorotation," *AIAA Guidance, Navigation and Controls Conference*, Portland, Oregon, August 7-11, 2011.

[C24] **NATHAN T. DEPENBUSCH** and Jack W. Langelaan, "Coordinated Mapping and Exploration for Autonomous Soaring," *AIAA Infotech@Aerospace Conference*, St. Louis, Missouri, March 29-31, 2011.

[C23] Jack W. Langelaan, Nicholas Alley and James Niedhoefer, "Wind Field Estimation for Small Unmanned Aerial Vehicles," *AIAA Guidance, Navigation and Controls Conference*, Toronto, Canada, August 2-5, 2010.

[C22] **DEPENBUSCH, NATHAN T.** and Jack W. Langelaan, "Receding Horizon Control for Atmospheric Energy Harvesting by Small UAVs," *AIAA Guidance, Navigation and Controls Conference*, Toronto, Canada, August 2-5, 2010.

[C21] **CHAKRABARTY, ANJAN** and Jack W. Langelaan, "Flight Path Planning for UAV Atmospheric Energy Harvesting Using Heuristic Search," *AIAA Guidance, Navigation and Controls Conference*, Toronto, Canada, August 2-5, 2010.

[C20] **MARLOW, SEAN Q.** and Jack W. Langelaan, "Dynamically Sized Occupancy Grids for Obstacle Avoidance," *AIAA Guidance, Navigation and Controls Conference*, Toronto, Canada, August 2-5, 2010.

[C19] Dean, Adam J., Jack W. Langelaan, and Sean N. Brennan, "Improvements in Terrain-Based Road Vehicle Localization by Initializing an Unscented Kalman Filter Using Particle Filters." *2010 American Control Conference*, Baltimore, Maryland, June 30-July 2, 2010.

[C18] **TIERNEY, SHANE** and Jack W. Langelaan, "Autorotation Path Planning Using Backwards Reachable Sets and Optimal Control," *American Helicopter Society 66th Annual Forum*, Phoenix, Arizona, May 2010.

[C17] Jemmott, Colin W., Lee J. Culver, and Jack W. Langelaan, "Comparison of Particle Filter and Histogram Filter for Passive Sonar Localization," *Proceedings of Meetings on Acoustics*, vol. 8, issue 1, December 22, 2009. http://dx.doi.org/10.1121/1.3292596

[C16] Dean, Adam J., Jack W. Langelaan, and Sean N. Brennan, "Initializing an Unscented Kalman Filter using a Particle Filter," Dynamic Systems and Control Conference, Hollywood, California, October 2009.

[C15] **CHAKRABARTY, ANJAN** and Jack W. Langelaan, "Energy Maps for Long Range Path Planning for Small- and Micro- UAVs," *AIAA Guidance, Navigation and Controls Conference*, Chicago, Illinois, August, 2009.

[C14] **MARLOW, SEAN Q.** and Jack W. Langelaan, "Local Terrain Mapping for Obstacle Avoidance using Monocular Vision," *AHS International Specialist's Meeting on Unmanned Rotorcraft*, Scottsdale, Arizona, January 2009.

[C13] **SARFRAZ, SANA** and Jack W. Langelaan, "Autonomous Ground-Based Tracking of Migrating Raptors using Vision," *AIAA Guidance, Navigation and Controls Conference (invited paper)*, Honolulu, Hawaii, August 18-21, 2008.

[C12] Jack W. Langelaan, "Biologically Inspired Flight Techniques for Small and Micro Unmanned Aerial Vehicles," *AIAA Guidance, Navigation and Controls Conference*, Honolulu, Hawaii, August 18-21, 2008.

[C11] Jack W. Langelaan, "Tree-based Trajectory Planning to Exploit Atmospheric Energy," *American Control Conference,* Seattle, Washington, June 11-13, 2008.

[C10] **JEFFREY B. CORBETS** and Jack W. Langelaan, "Parameterized Trajectories for Target Localization using Small- and Micro- Unmanned Aerial Vehicles," *American Control Conference,* Seattle, Washington, June 11-13, 2008.

[C9] Jack W. Langelaan and Goetz Bramesfeld, "Gust Energy Extraction for Small and Micro Uninhabited Aerial Vehicles," *46th AIAA Aerospace Sciences Meeting*, Reno, Nevada, January 7-10, 2008.

[C8] Jack W. Langelaan, "Long Distance/Duration Trajectory Optimization for Small UAVs," *AIAA Guidance, Navigation and Controls Conference*, Hilton Head, South Carolina, August 20-23, 2007.

[C7] Eric W. Frew, Jack Langelaan, Maciej Stachura, "Adaptive Planning Horizon Based on Information Velocity for Vision-Based Navigation and Active Sensing," *invited to AIAA Guidance, Navigation and Controls Conference*, Hilton Head, South Carolina, August 20-23, 2007.

[C6] **JEFFREY B. CORBETS** and Jack W. Langelaan, "Parameterized Optimal Trajectory Generation for Target Localization," *invited to AIAA Guidance, Navigation and Controls Conference*, Hilton Head, South Carolina, August 20-23, 2007.

[C5] Eric Frew, Jack Langelaan and Sungmoon Joo, "Adaptive Receding Horizon Control for Vision-Based Navigation of Small Unmanned Aircraft," *invited to American Controls Conference*, Minneapolis, Minnesota, June 14-16, 2006.

[C4] Jack Langelaan and Steve Rock, "Towards Autonomous UAV Flight in Forests," *AIAA Guidance, Navigation and Control Conference*, San Francisco, California, August 15-18, 2005.

[C3] Jack Langelaan and Steve Rock, "Passive GPS-Free Navigation for Small UAVs," *IEEE Aerospace Conference*, Big Sky, Montana 2005.

[C2] Jack Langelaan and Steve Rock, "Navigation of Small UAVs Operating in Forests," *AIAA Guidance, Navigation and Control Conference*, Providence, Rhode Island, August 16-19, 2004.

[C1] Jack W. Langelaan and Leo J. J. Kok: "Damage Tolerance Modelling of Fibre/Metal Laminate Fuselage Structures," AIAA Paper 97-1400, *38th Structures, Structural Dynamics and Materials Conference*, Kissimmee, Florida, April 7-10, 1997.

Funded research

August 15, 2023 – July 31, 2026, "Collaborative Research: Omnidirectional Perching on Dynamic Surfaces: Emergence of Robust Behaviors from Joint Learning of Embodied and Motor Control," National Science Foundation. Total requested: $700,021, co-PI (50%).

May 1, 2022 – April 30, 2025, "Design, characterization, and control of compound CAT-HR unmanned aircraft (or: Vindicator only slightly Defiant)," Office of Naval Research. Total requested: $905,163, co-PI (50%)

April 15, 2022 – March 31, 2027, "IUCRC Phase I Pennsylvania State University: Center for Autonomous Air Mobility and Sensing (CAAMS)," National Science Foundation. Total requested: $503,438, PI (100%)

October 1, 2021 – September 30, 2026, "Penn State Vertical Lift Research Center of Excellence (VLRCOE)," U.S. Army Contracting Command, Total requested: $7,172,443, co-I (12%)

December 1, 2019 – August 31, 2022, "Characterization and scaling of coaxial unmanned rotorcraft," Office of Naval Research, Federal Agencies. Total requested: $90,095.00, PI (100%)

December 1, 2019 – May 31, 2023, "Experimental Analysis of Advanced Control and Estimation Systems for Autonomous Ship Landing," Office of Naval Research, Federal Agencies. Total requested: $577,616.00, co-PI (50%)

February 3, 2021–April 30, 2026, "Dragonfly: PSU Phase C and D," Johns Hopkins University Applied Physics Lab, under negotiation, expected $2,000,000, PI (20%). (Pending)

September 1, 2019–February 2, 2021, "Dragonfly: PSU Bridge Phase and Phase B," Johns Hopkins University Applied Physics Lab, $751,000, PI (20%). (Pending)

June 1, 2018–May 31, 2020, "Sensor networks on Greenland Glaciers (Phase 1)," Heising-Simons Foundation, $489,327, co-PI (20%).

May 1, 2018–April 30, 2019, "Dragonfly: PSU Phase A," Johns Hopkins University Applied Physics Lab, $294,766, PI (34%).

February 28, 2017–December 31, 2019, "Energy Management and Adaptation to the Changing Atmosphere for Hybrid Soaring/Solar/Fuel Cell Aircraft," Naval Research Laboratory, $349,318, PI (100%).

November 30, 2016–October 30, 2021, "High-speed carriage of external loads," U.S. Army Combat Capabilities Development Command (CCDC) through the Vertical Lift Research Center of Excellence. Total requested: $611,032 (plus $636,454 cost share). Total awarded: $611,032 (plus $636,454 cost share), co-PI (29%).

November 30, 2016–October 30, 2021, "Slung load state and parameter estimation for autonomous multi-lift systems," U.S. Army Combat Capabilities Development Command (CCDC) through the Vertical Lift Research Center of Excellence. Total requested: $588,881 (plus $366,454 cost share). Total awarded: $588,881 (plus $366,454 cost share), PI (67%).

September 1, 2016–September 30, 2017, "Energy management and flight planning for hybrid soaring/solar/fuel cell aircraft," Naval research Laboratory, $24,713, PI (100%).

August 1, 2015–July 31, 2017, "Efficient Reconfigurable Cockpit Design and Fleet Operations using Software Intensive, Networked and Wireless Enabled Architecture (ECON)," National Aeronautics and Space Administration, $21,000, PI (100%).

June 1, 2015–December 31, 2015, "Competitive and cooperative autonomous soaring flight demonstrations," Naval Research Laboratory, $21,968, PI (100%).

March 23, 2015–March 22, 2017, "Product Architectures, Design, and Manufacturing for Operational Responsiveness," Naval Sea Systems Command, $1,237,264, co-PI (10%).

March 1, 2012–November 30, 2012, "Reactive Controller for Harvesting Gust Energy (RECHARGE)," Office of Naval Research STTR Phase 2 Option 1, $82,500, PI (100%)

December 1, 2012–November 30, 2013, "Reactive Controller for Harvesting Gust Energy (RECHARGE)," Office of Naval Research STTR Phase 2 Option 2, $225,000, PI (100%)

September 1, 2011–August 31, 2016, "Autonomous shipboard take-off and landing," U.S. Army Combat Capabilities Development Command (CCDC) through the Vertical Lift Research Center of Excellence. Total requested: $370,804 (plus $327,140 cost share). Total awarded: $370,804 (plus $327,140 cost share). PI (100%).

September 1, 2011–August 31, 2016, "Autonomous multi-lift systems," U.S. Army Combat Capabilities Development Command (CCDC) through the Vertical Lift Research Center of Excellence. Total requested: $370,804 (plus $327,140 cost share). Total awarded: $438,335 (plus $371,551 cost share). co-PI (50%).

April 1, 2011–March 21, 2014, "Low Altitude Persistence via Bio-inspired Flight: Cooperative Autonomous Soaring for sUAS," Office of Naval Research award number N00014-11-1-0656, $506,312, PI (100%).

March 1, 2011–February 28, 2014, "Collaborative Research: RI: Medium: Towards Perpetual Flight of a Gliding Unmanned Aerial Vehicle in the Jet Stream," National Science Foundation, $242,365, PI, (100%). This is a collaborative research submission done in conjunction with Lehigh University, Langelaan is a co-PI on full proposal with total budget $1,038,584

August 1, 2010–February 29, 2012, "Reactive Controller for Harvesting Gust Energy (RECHARGE)," Office of Naval Research STTR Phase 2 Base Award, $165,000, PI (100%)

May 15, 2010–December 31, 2012, "Aided/Automated Flare and Landing during Autorotation (AutoFLARE)", Vertical Lift Consortium, $350,000, Co-PI (50%)

April 30, 2010–August 30, 2010, "Robust Autonomous Maneuvering of Unmanned Air Systems in Challenging Environmental/Weather Conditions for Safety, Mission Effectiveness, and Endurance," Office of Naval Research STTR N09A-025-0019 in conjunction with Area-I, Inc, $15,000, PI (100%) (Phase 1 option complete).

July 1, 2009–April 30, 2010, "Robust Autonomous Maneuvering of Unmanned Air Systems in Challenging Environmental/Weather Conditions for Safety, Mission Effectiveness, and Endurance," Office of Naval Research STTR N09A-025-0019 in conjunction with Area-I, Inc, $50,000, PI (100%) (Phase 1 complete).

May 15, 2009–May 14, 2010, "REU: Development of a Small Autopilot Module for Mini- and Micro-Uninhabited Aerial Vehicles," National Science Foundation supplement to IIS-0746655, $6000, PI (100%).

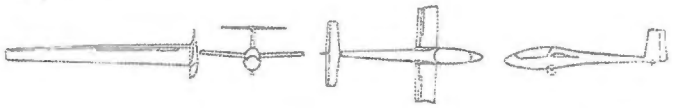
January 1, 2008–May 15, 2012, "Local Terrain Mapping for Obstacle Avoidance using Monocular Vision," Applied Research Lab Exploratory and Foundational Research Program, $204,875, PI (100%)

June 15, 2008–May 31, 2013, "CAREER: Theory and Practice of Autonomous Soaring for Aerial Robots," National Science Foundation award number IIS-0746655, $439,750, PI (100%).

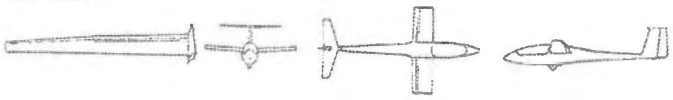
EXHIBIT B

Fred Thomas, Fundamentals of Sailplane Design
tr. Judah Milgram
College Park Press 1999
ISBN 0-9669553-0-7

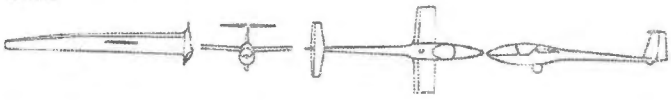
Mosquito



Mini-Nimbus



DG 200



ASW 20



Speed Astir



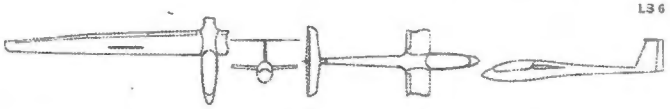
Ventus B



DG 400



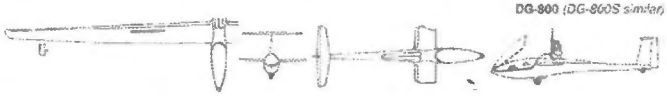
LS 6



DG-600M *(DG-600 similar)*



DG-800 *(DG-860S similar)*



ASW 27





PennState
College of Engineering

AEROSPACE
ENGINEERING

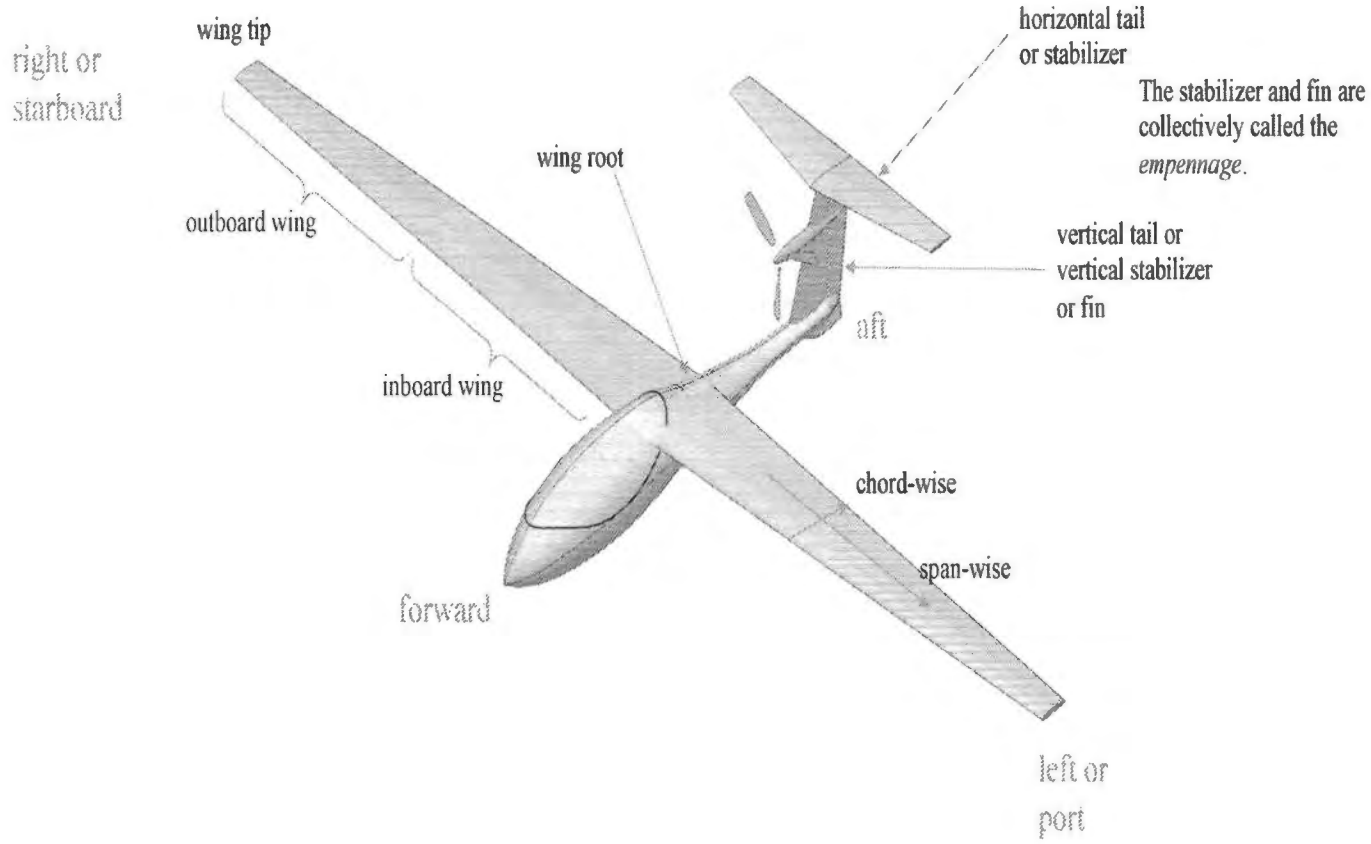
AERSP 306

Lecture 01: Terminology

Jack W. Langelaan

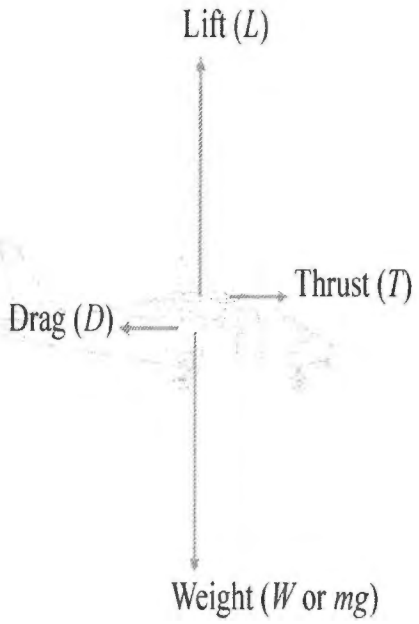
Lecture 1 of my course notes for AERSP 306 "Introduction to Aeronautics."
This notes packet defines some of the terms of art (jargon) used by Aerospace Engineers, and shows the main components of an aircraft.

General terminology



2

Forces acting upon an aircraft in flight



Four forces act upon (most) aircraft: thrust, drag, lift, and weight.

In equilibrium all forces and all moments sum to zero.

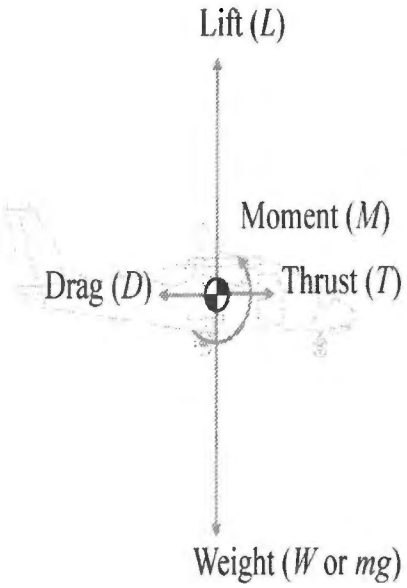
Aircraft is said to be in *trim*.

An aircraft can be in equilibrium in a steady turn… in that case the acceleration is not zero, but speed will be constant and angular acceleration is zero.

A more specific case of trim is when the aircraft is not turning. In that case acceleration is zero.

Note: gliders have zero thrust.

Forces and moments acting upon an aircraft in flight



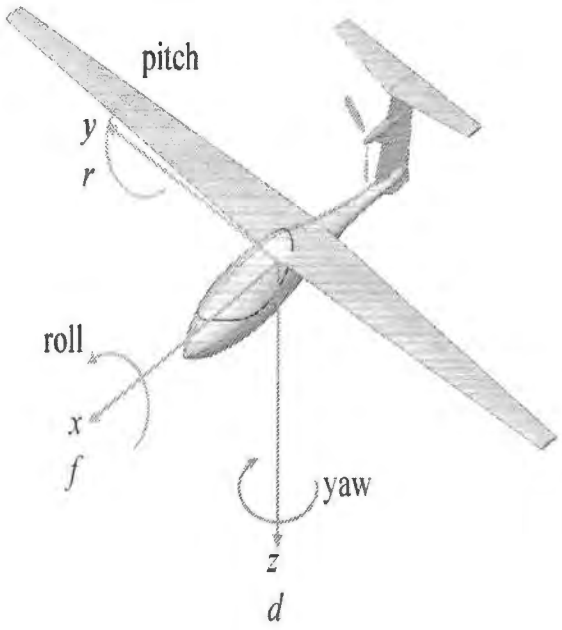
We generally resolve all forces and moments so they act through the center of gravity (CG) of the aircraft.

The pilot (or flight control system) controls thrust and moment.

These in turn affect lift and drag, so the pilot controls the speed and rate of climb (or descent) of the aircraft.

The pilot can also control the direction of flight by banking the aircraft.

Aircraft axes



We often talk about aircraft body axes.

- *x* or *f* : forward out the nose
- *y* or *r*: out the right wing
- *z* or *d*: down

This is sometimes called an *frd* coordinate frame.

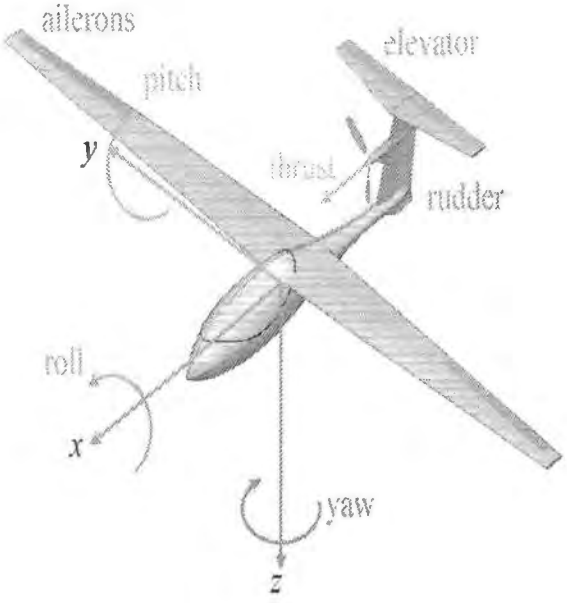
The aircraft has three rotational degrees of freedom:

- *roll*: around body *x* axis, positive to the right
- *pitch*: around body *y* axis, positive nose up
- *yaw*: around body *z* axis, positive nose right

The rotational degrees of freedom are positive by right hand rule around each respective axis.

5

Flight controls



Most aircraft have 4 controls: roll, pitch, yaw, and thrust

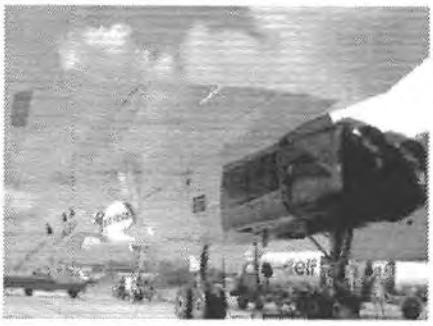
In a fixed-wing aircraft:

- roll: controlled by ailerons
- pitch: controlled by elevator
- yaw: controlled by rudder
- thrust: controlled via propulsion system (propeller or jet)

An aircraft may have additional control surfaces such as flaps or spoilers. Flaps control lift, and usually actuate slowly. Spoilers affect lift and drag and are usually only used for landing.

More control surfaces

Aerospace control engineers invent their own terms: spell check will not recognize these words that describe non-standard control surfaces.



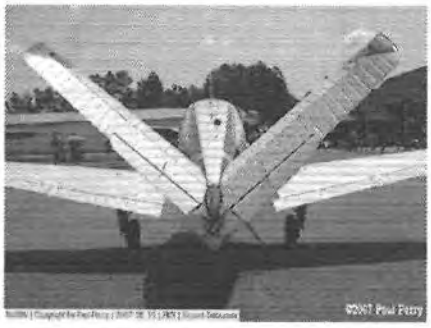
Elevator + Aileron = Elevon
(e.g. Concorde SST and other delta wing aircraft)



Stabilizer + Elevator = Stabilator
(as used on F-16 and other aircraft that have an all moving stabilizer surface for pitch control)



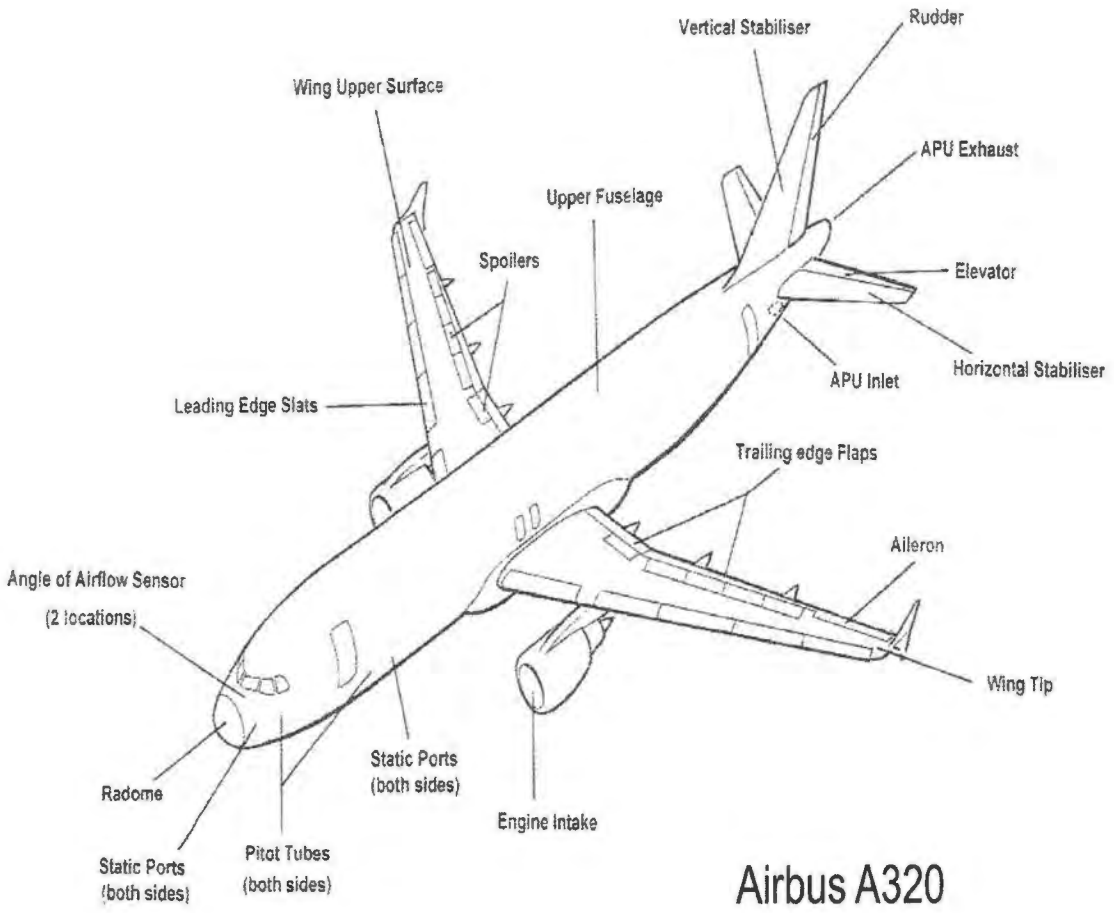
Flap + Aileron = Flaperon
(e.g. V-22 and other aircraft that combine a high lift flap with roll control)



Rudder + Elevator = Ruddervator
(e.g. Beechcraft Bonanza Model 35 "V-tail" aircraft)

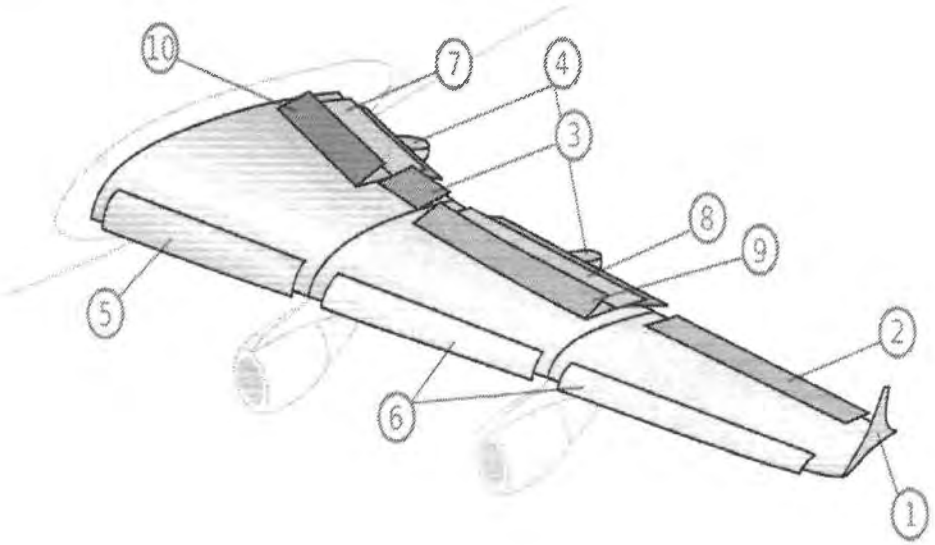
7

transport aircraft configuration



8

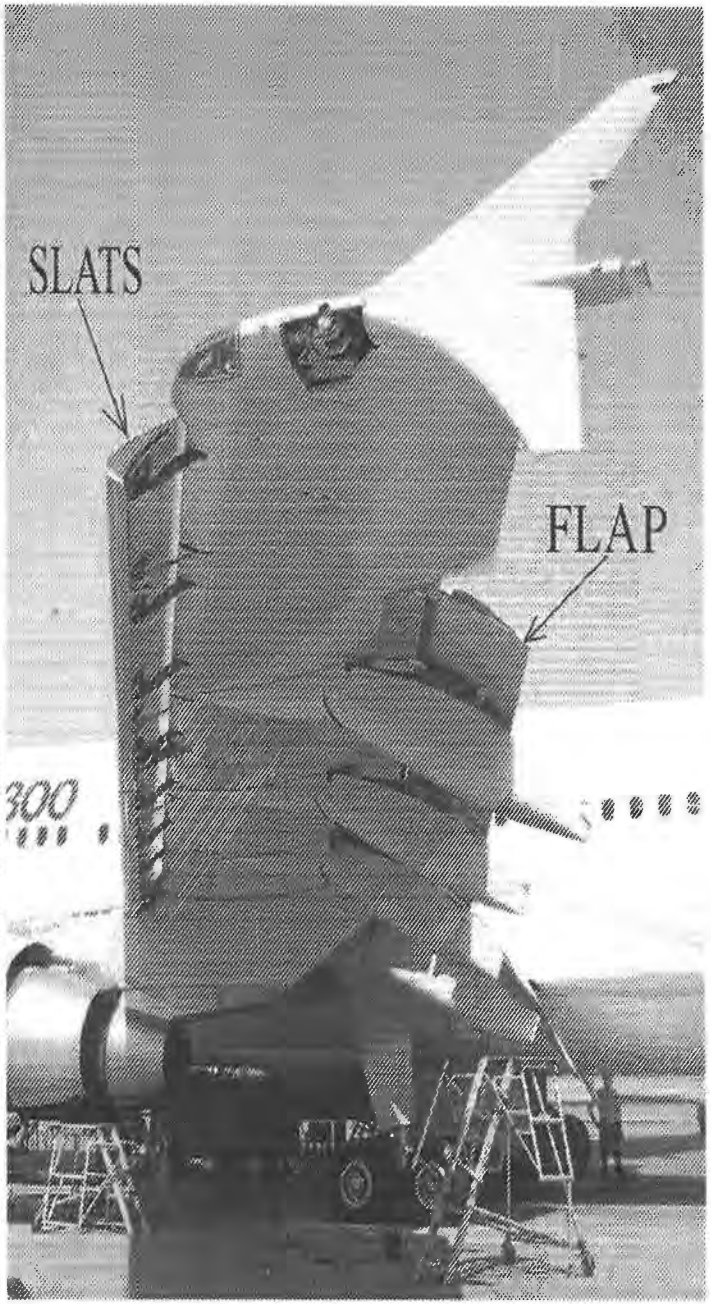
wing surfaces



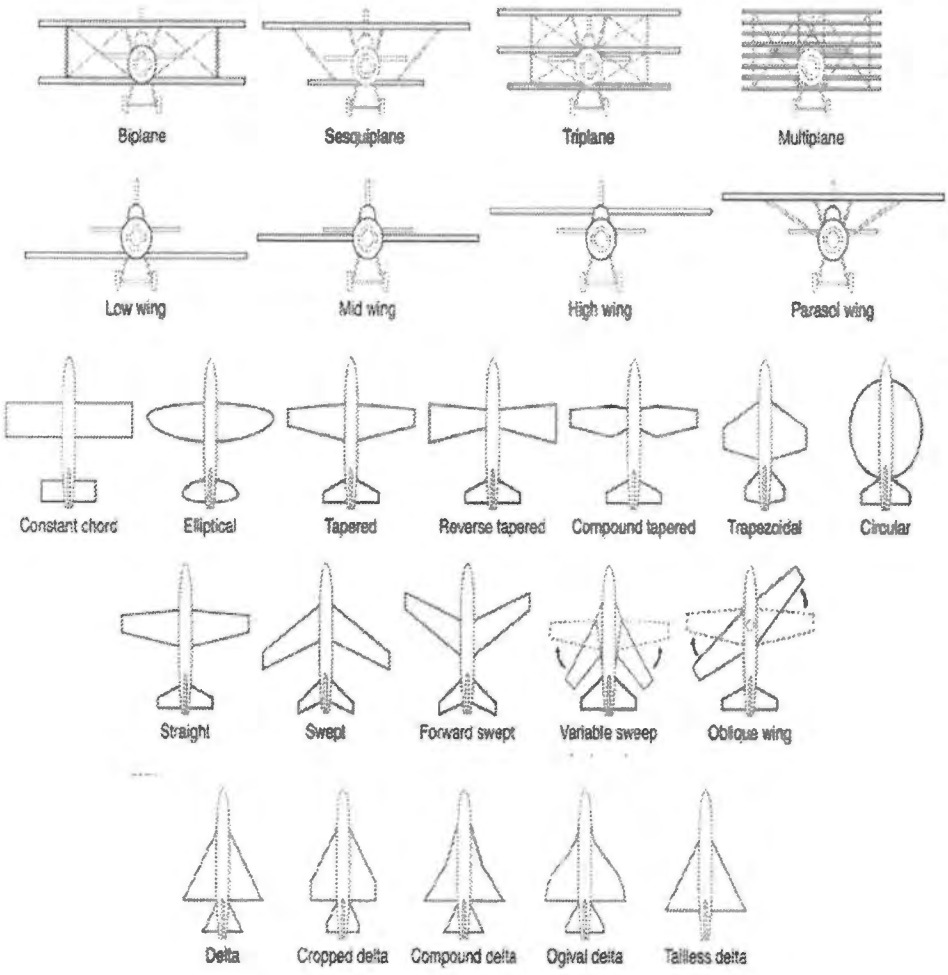
1. winglet
2. low speed aileron
3. high speed aileron
4. flap track fairing
5. Krueger flaps
6. slats
7-8. slotted flaps
9. spoiler
10. spoiler/air brake

Some pictures of high lift devices





wing configurations



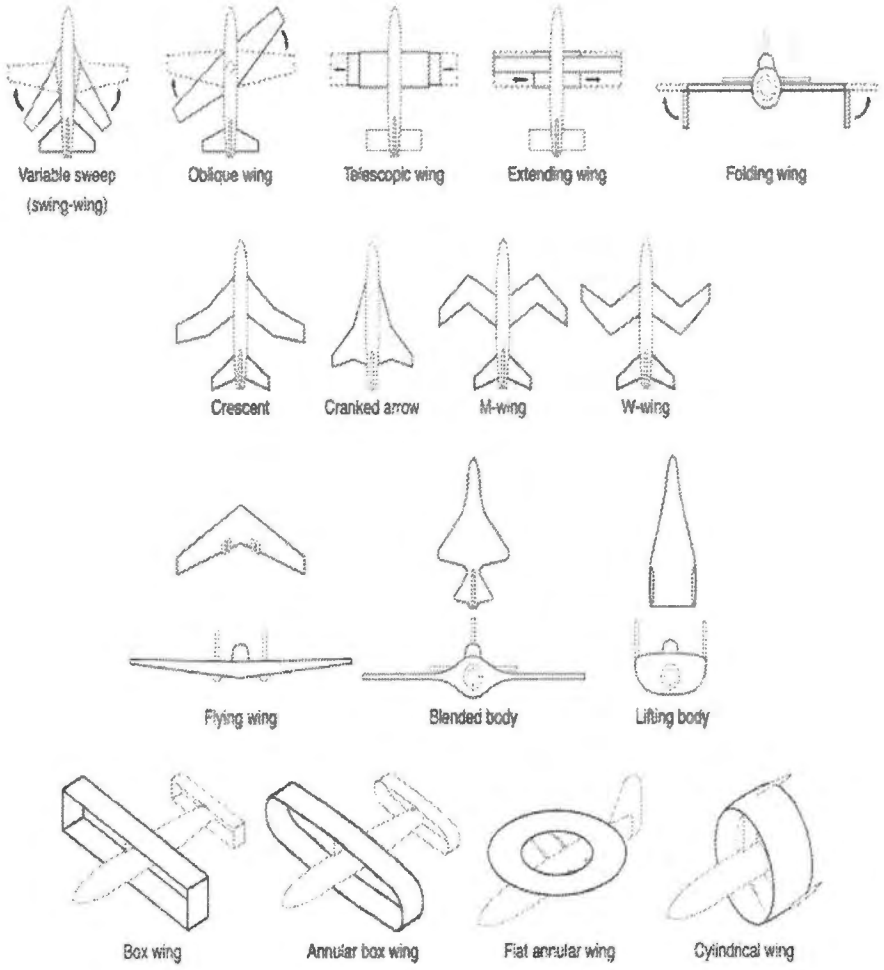
Aeronautical engineers have tried many wing configurations and designs.

Some have advantages and disadvantages.

Some mostly have disadvantages.

11

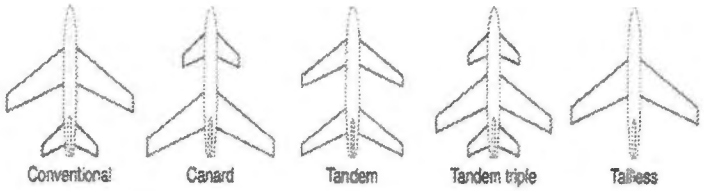
more wing configurations

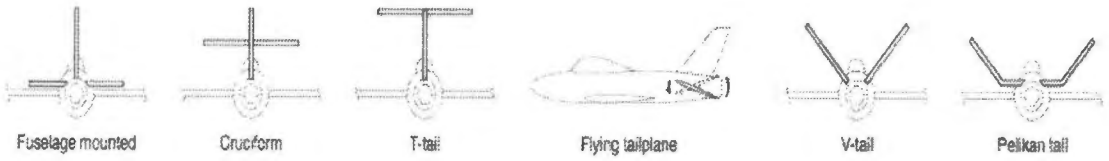


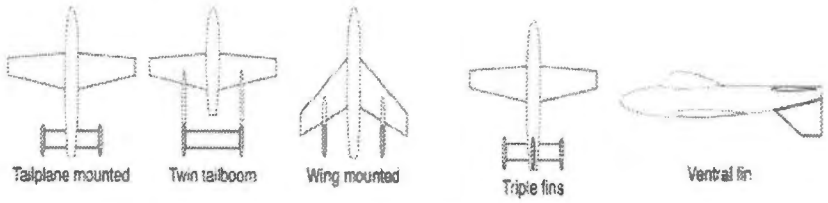
12

empennage configurations

We have also tried many empennage configurations.

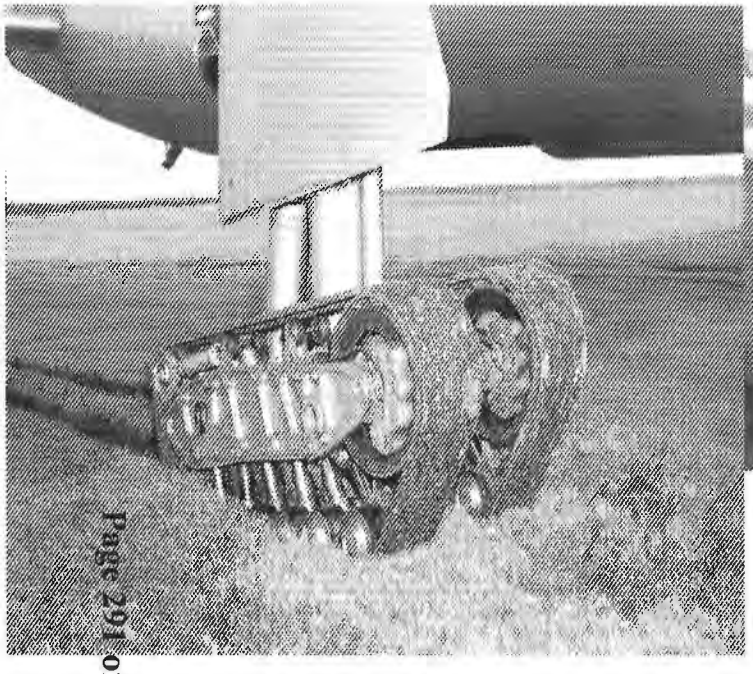






13

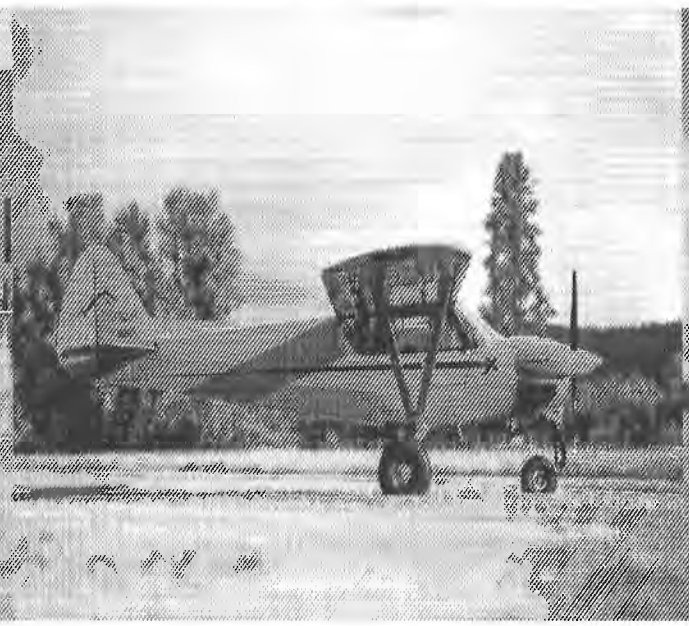
landing gear

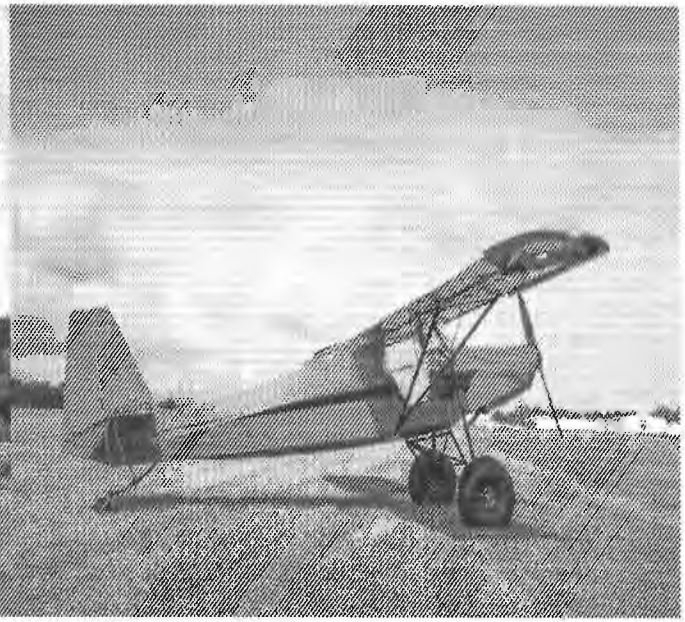






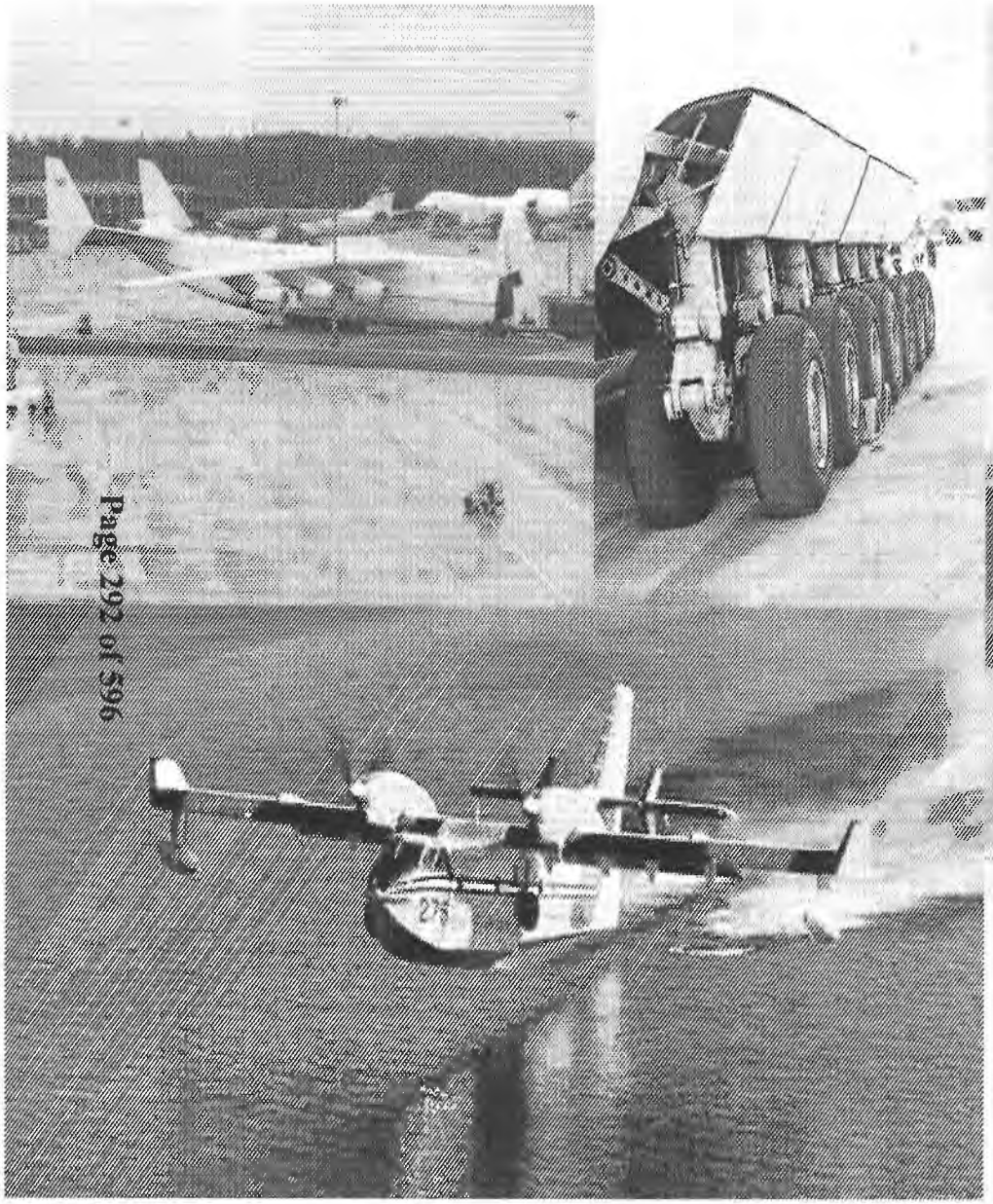


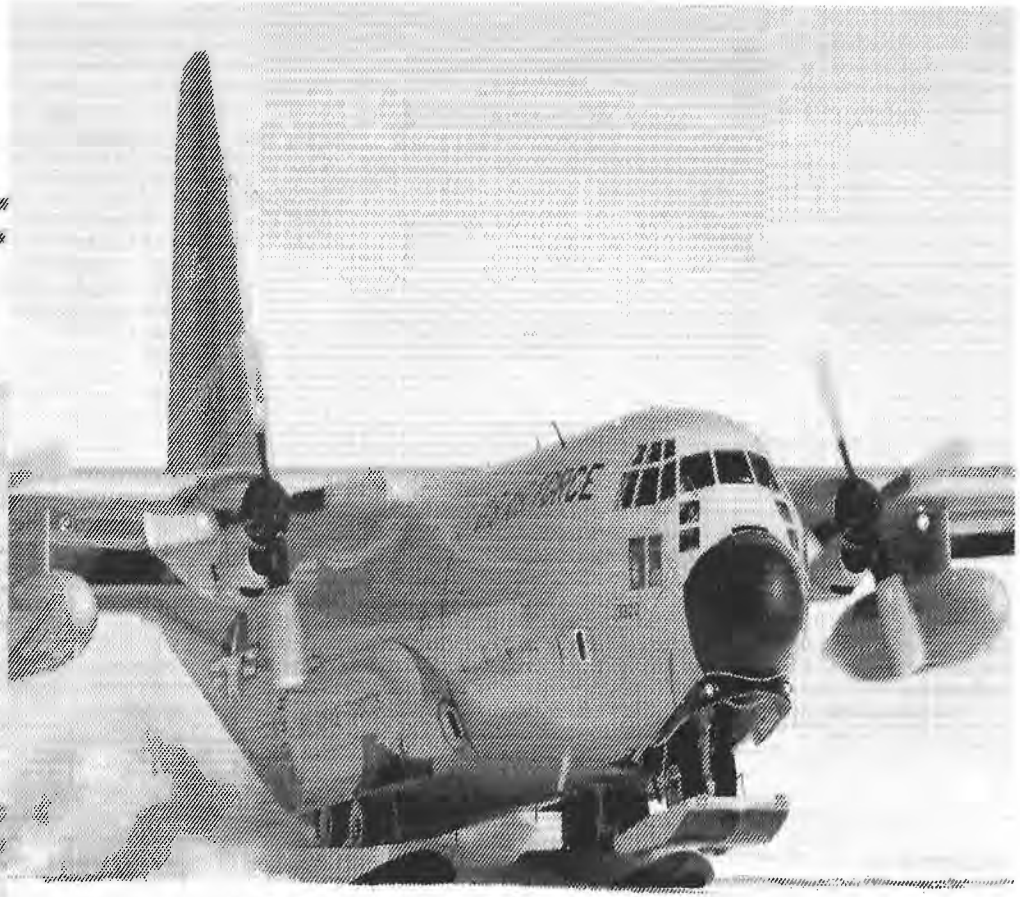




Page 291 of 596

landing gear





Page 292 of 596

Propulsion



de Havilland Comet: root-embedded engines



Gulfstream G6[illegible] fuselage mounted podded engines



F-16: engine buried in fuselage

More propulsion



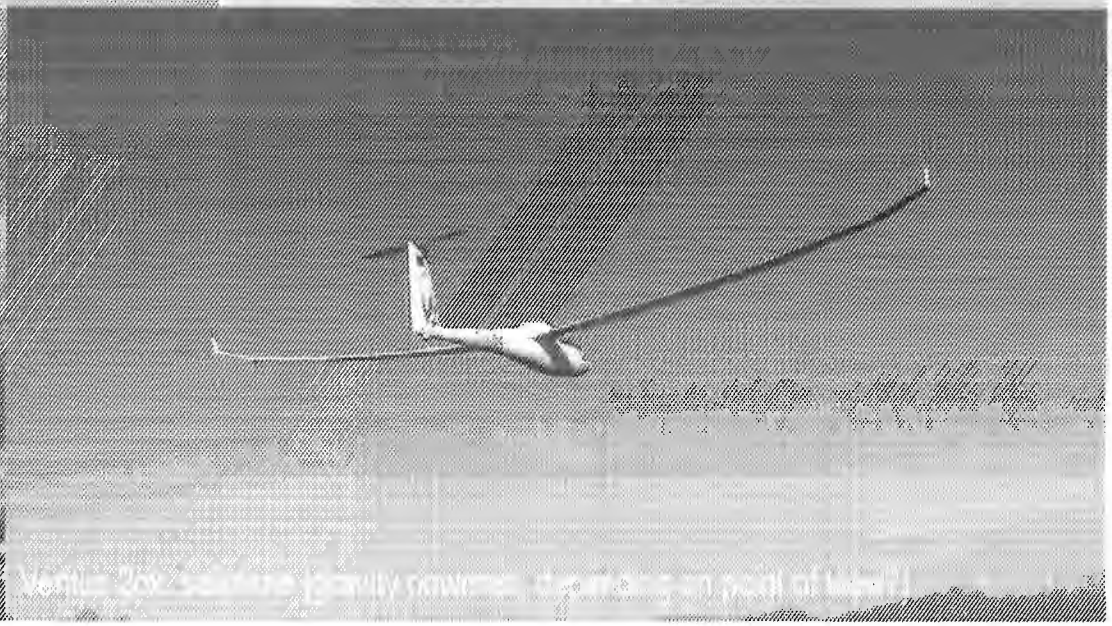
DHC 8-400: turboprop



Cessna 152: piston engine

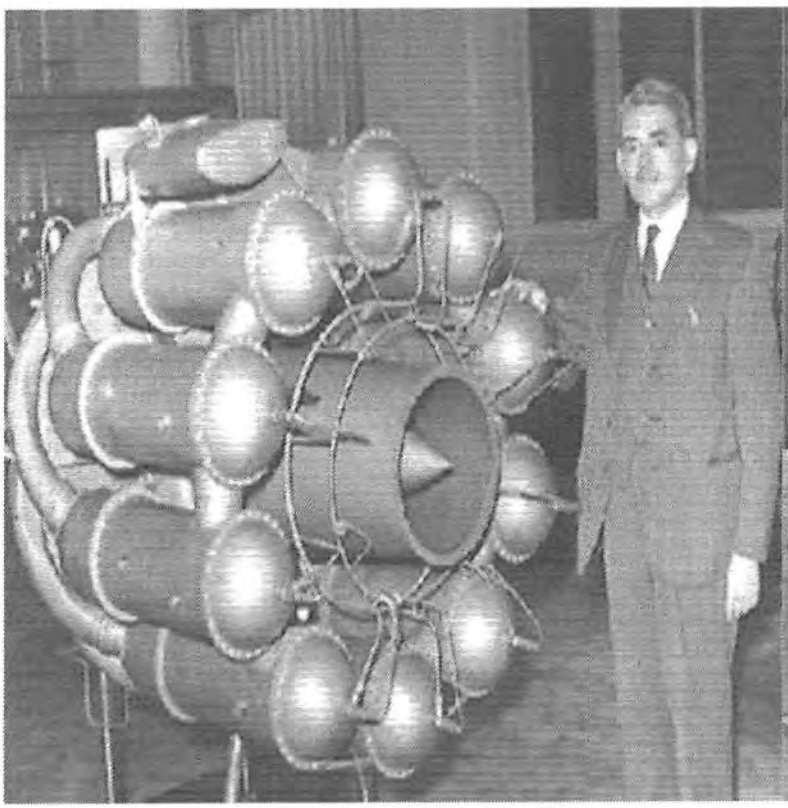


Pipistrel Velis: battery electric

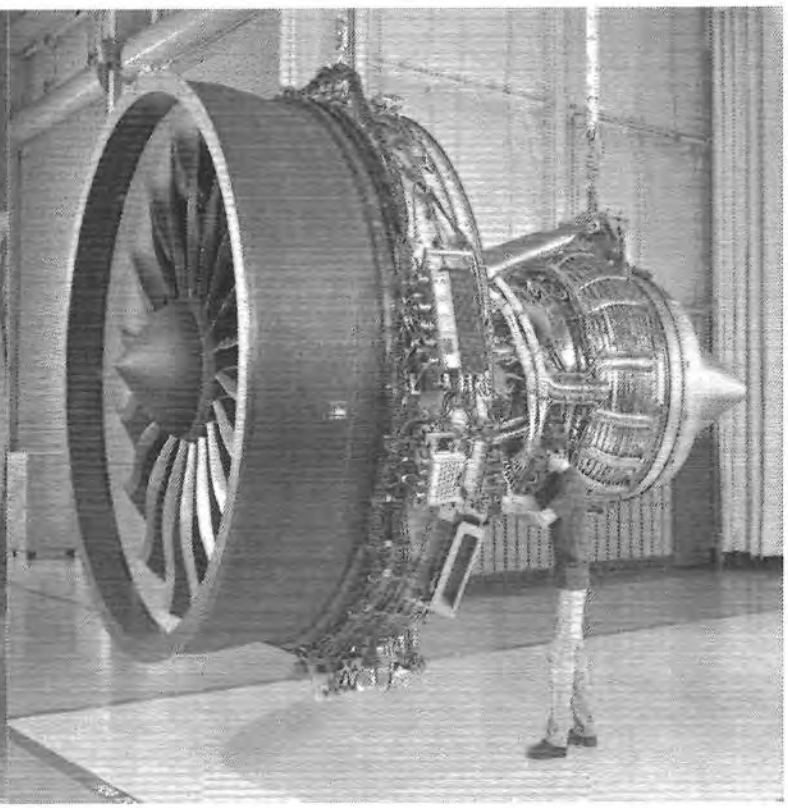


Vertilite: Rev 3 solar electric concept, shown with pilot of 1.8m (6ft)

propulsion



Sir Frank Whittle (inventor of jet engine at roughly the same time as Hans Von Ohain) with the W.1X engine. This engine flew in 1941.



Genx-1B engine (used on Boeing 787 and 747-8)

Aircraft you'll see operating out of State College Airport



Bombardier CRJ-700



Embraer ERJ-145



Bombardier CRJ-200



Cessna Caravan

If you want to sound like a professional...

N.A.C.A. (the precursor to NASA) is pronounced N.A.C.A., not "NACA."

A plane is a flat surface defined by three points or a line and a point or by two intersecting lines. An airplane is a fixed-wing aircraft.

An aircraft is any mechanical device that flies (i.e. a balloon, a blimp, a glider, and a helicopter are all aircraft). An airplane is a kind of aircraft. A glider is an airplane (but a balloon is not, and neither is a helicopter).

The plural of aircraft is aircraft (i.e. you don't add the "s").

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being transmitted via the Office electronic filing system in accordance with 37 C.F.R. § 1.6(a)(4).

Dated: March 4, 2024
Electronic Signature for Michael C. Bossner: /Michael C. Bossner/

Docket No. MHLCUS 3.5-002 CON
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Reexamination Application of:
Nicholas Leason

Application No.: 90/015,269 | Confirmation No.: 5917

Filed: August 9, 2023 | Art Unit: 3993

For: Powered Hydrofoil Board | Examiner: G. Spahn

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT

Dear Commissioner:

In response to the Office Action mailed December 5, 2023, Patent Owner submits the following amendments and remarks.

IN THE CLAIMS

Please amend the claims as follows:

1. (original) A passively stable, weight-shift controlled personal hydrofoil watercraft, comprising:

a flotation device that has a fore-aft length greater than a lateral width, the flotation device having a top surface and a bottom surface, wherein a user can be disposed on the top surface of the flotation device in a prone, kneeling, or standing position, the flotation device having a forward section, a middle section, and a rear section;

a strut having a upper end and a lower end, the upper end fixedly interconnected with the flotation device between the middle section and the rear section of the flotation device;

a hydrofoil fixedly interconnected with the lower end of the strut, the hydrofoil having no movable surface;

a propulsion system for propelling the watercraft in a body of water, wherein the propulsion system is connected to the hydrofoil; and

the watercraft having no movable steering system.

2. (original) A watercraft in accordance with claim 1, wherein the propulsion system comprises a battery, an electric motor, a motor speed controller, and a propulsor, the propulsor selected from a propeller, a ducted propeller, or a pump-jet.

3. (original) A watercraft in accordance with claim 2, wherein the propulsor is disposed below the hydrofoil.

4. (original) A watercraft in accordance with claim 1, wherein the hydrofoil is indirectly connected to the strut.

5. (original) A watercraft in accordance with claim 4, wherein the strut is directly connected to the propulsion system.

6. (original) A watercraft in accordance with claim 5, wherein a first hydrofoil wing of the hydrofoil is indirectly connected to the strut through the propulsion system.

7. (original) A watercraft in accordance with claim 4, wherein the hydrofoil comprises a plurality of wings that are interconnected by way of a strut.

8. (original) A watercraft in accordance with claim 2, wherein the battery and motor speed controller are contained in a watertight compartment integrated into the flotation device.

9. (original) A watercraft in accordance with claim 2, wherein the electric motor is integrated into a waterproof, streamlined pod and the watercraft comprises a cooling system for cooling the electric motor.

10. (original) A watercraft in accordance with claim 9, wherein the waterproof, streamlined pod is removably interconnected with the hydrofoil through a fitting.

11. (original) A watercraft in accordance with claim 8, further comprising a wireless handheld controller having a transmitter, and a throttle interface having a receiver, wherein the transmitter is adapted to send wireless signals to the receiver that cause an output of the propulsion system to change.

12. (original) A watercraft in accordance with claim 1, wherein a first hydrofoil wing of the hydrofoil is directly connected to the strut.

13. (original) A watercraft in accordance with claim 8, wherein the strut has an internal passage and electrical wires extend from the electric motor to the watertight compartment inside the strut through the internal passage for controlling the electric motor.

14. (original) A watercraft in accordance with claim 13, wherein the flotation device has a detector adapted to detect a user's presence on the flotation device and cease operation of the electric motor if the detector detects that the user is not on the flotation device.

15. (original) A watercraft in accordance with claim 1, wherein the propulsion system is directly or indirectly connected to the hydrofoil.

16. (amended) A passively stable, weight-shift controlled personal hydrofoil watercraft, comprising:

a surfboard-shaped flotation device that has a fore-aft length greater than a lateral width, the flotation device having a top surface and a bottom surface, wherein the top surface has a substantially horizontal supporting surface configured to support a user in a prone, kneeling, or standing position, the flotation device having a forward section, a middle section, and a rear section;

a hydrofoil interconnected with the surfboard-shaped flotation device, the hydrofoil having a strut and a first hydrofoil wing, an upper end of the strut being fixedly interconnected with the surfboard-shaped flotation device, the hydrofoil having no movable surface;

a propulsion system attached to the surfboard-shaped flotation device for propelling the watercraft in a body of water, the propulsion system comprising a battery, an electric motor, a motor speed controller, and a propulsor, wherein the propulsor is selected from a propeller, a ducted propeller, or a pump-jet, and the battery and motor speed controller are contained in a watertight compartment integrated into the flotation device;

the watercraft having no movable steering system;

a handheld controller having a throttle; and

a throttle interface, wherein the throttle is adapted to send electronic signals to the throttle interface that cause an output of the propulsion system to change.

17. (original) A watercraft in accordance with claim 16, wherein the hydrofoil comprises a plurality of hydrofoil wings including the first hydrofoil wing and a second hydrofoil wing, the first and second hydrofoil wings being connected by way of a strut.

18. (original) A watercraft in accordance with claim 16, wherein the watercraft comprises a cooling system for cooling the electric motor.

19. (original) A watercraft in accordance with claim 16, wherein the strut has an internal passage and electrical wires extend from the electric motor to the watertight compartment inside the strut through the internal passage for controlling electric motor.

20. (original) A watercraft in accordance with claim 16, wherein the handheld controller comprises a wireless transmitter operatively coupled to the throttle and the throttle interface includes a receiver, the transmitter being adapted to send wireless signals to the receiver in response to actuation of the throttle that cause an output of the propulsion system to change.

21. (new) A watercraft in accordance with claim 1, wherein the upper end of the strut is fixedly interconnected with the flotation device via a detachable fitting.

22. (new) A watercraft in accordance with claim 21, wherein the detachable fitting is configured to fit into a complementary opening in the flotation device.

23. (new) A watercraft in accordance with claim 22, wherein the fitting is configured to be secured within the complementary opening by at least one of a bolt, a pin, and a latch.

24. (new) A watercraft in accordance with claim 1, wherein the propulsion system includes a battery positioned in the strut.

25. (new) A watercraft in accordance with claim 24, further comprising a wired connection between the battery and a motor of the propulsion system.

26. (new) A watercraft in accordance with claim 1, further comprising a safety device for monitoring the presence of a user on the flotation board.

27. (new) A watercraft in accordance with claim 1, wherein the strut is the only strut connected with the flotation device.

28. (new) A watercraft in accordance with claim 1, wherein the propulsion system includes a motor speed controller contained in a watertight compartment integrated into the flotation device.

STATUS OF CLAIMS AND SUPPORT FOR CLAIM CHANGES

Pursuant to 37 C.F.R. § 1.173(c), upon entry of the present Amendment, the status of the claims will be as follows: **claims 1-28 pending**.

By way of the present amendment, claim 16 has been amended, and new claims 21-28 have been added. In particular:

- The preamble of independent claim 16 has been amended to recite a "passively stable, weight-shift controlled" personal hydrofoil watercraft. Support for such amendments can be found, for example, in col.2 ll.8-18 and col.6 ll.7-11 of U.S. Pat. No. 9,586,659 ("the '659 Patent") subject to the present *ex parte* reexamination. In addition, the claim has been further amended by defining the "hydrofoil" as "having no movable surface." Support for that amendment can be found, for example, in col.5 l.66-col.6 l.2 and col.7 l.50 of the '659 Patent.
- New dependent claim 21 depends from claim 1 and recites that "the upper end of the strut is fixedly interconnected with the flotation device via a detachable fitting." Support for such new claim be found, for example, in col.5 ll.7-12 of the '659 Patent.
- New dependent claim 22 depends from claim 21 and recites that "the detachable fitting is configured to fit into a complementary opening in the flotation device." Support for such new claim be found, for example, in col.5 ll.7-12 of the '659 Patent.
- New dependent claim 23 depends from claim 22 and recites that "the fitting is configured to be secured within the complementary opening by at least one of a bolt, a pin, and a latch." Support for such new claim can be found, for example, in col.5 ll.11-12 of the '659 Patent.
- New dependent claim 24 depends from claim 1 and recites that "the propulsion system includes a battery positioned in the strut." Support for such new claim can be found, for example, in col.3 ll.46-47 of the '659 Patent.
- New dependent claim 25 depends from claim 24 and recites "a wired connection between the battery and a motor of the propulsion system." Support for such new claim can be found, for example, in col.3 ll.51-52 of the '659 Patent.

- New dependent claim 26 depends from claim 1 and recites "a safety device for monitoring the presence of a user on the flotation board." Support for such new claim can be found, for example, in col.4 ll.52-56 of the '659 Patent.
- New dependent claim 27 depends from claim 1 and recites that "the strut is the only strut connected with the flotation device." Support for such new claim can be found, for example, in FIGS. 1-7 and col.3 ll.63-64 of the '659 Patent.
- New dependent claim 28 depends from claim 1 and recites that "the propulsion system includes a motor speed controller contained in a watertight compartment integrated into the flotation device." Support for such new claim can be found, for example, in col.3 ll.27-32 and col.8 ll.4-6 of the '659 Patent.

REMARKS

The present communication is in response to the Office Action mailed December 5, 2023 ("the Action"). By way of the present amendment, claim 16 has been amended and claims 21-28 are newly presented. No new matter is presented by any of the amendments to the claims. The following sets forth Patent Owner's remarks pertaining to the currently pending claims and the Action.

INTERVIEW SUMMARY

Patent Owner thanks the Examiner for conducting a video conference interview with Patent Owner's counsel on January 30, 2024. A complete summary of the interview has been filed concurrently with the present communication.

CLAIM REJECTIONS UNDER 35 U.S.C. § 103

Claims 1-20 were rejected under 35 U.S.C. § 103 as being obvious over U.S. Pat. Pub. No. 2011/0111650 ("*Braden*") in view of U.S. Pat. No. 5,544,607 ("*Rorabaugh*"). Additionally, claims 1-2, 4-6, 8-11, 13-16, and 18-20 were rejected under 35 U.S.C. § 103 as being obvious over *Braden* in view of U.S. Pat. Pub. No. 2005/0255764 ("*Woolley*"). Those rejections are respectfully traversed for those reasons discussed below. In the following discussion, reference is made to the enclosed Declaration Of Dr. Jacob Langelaan Under 37 C.F.R. § 1.132 ("Langelaan Declaration").

A. Obviousness Rejections over *Braden* in view of *Rorabaugh*

Independent claim 1 is directed to a passively stable, weight-shift controlled personal hydrofoil watercraft. The watercraft comprises a flotation device having a fore-aft length greater than a lateral width. The flotation device has a top surface and a bottom surface. A user can be disposed on the top surface in a prone, kneeling, or standing position. The flotation device has a forward section, a middle section, and a rear section. The watercraft further comprises a strut having an upper end and a lower end. The upper end is fixedly interconnected with the flotation device between the middle section and the rear section of the flotation device. The watercraft further comprises a hydrofoil fixedly interconnected with the lower end of the strut. The hydrofoil has no movable surface. The watercraft further comprises a propulsion system for propelling the watercraft in a body

of water. The propulsion system is connected to the hydrofoil. The watercraft has no movable steering system.

Independent claim 16, as amended, is directed to a passively stable, weight-shift controlled personal hydrofoil watercraft. The watercraft comprises a surfboard-shaped flotation device having a fore-aft length greater than a lateral width. The flotation device has a top surface and a bottom surface. The top surface has a substantially horizontal supporting surface configured to support a user in a prone, kneeling, or standing position. The flotation device has a forward section, a middle section, and a rear section. A hydrofoil is interconnected with the surfboard-shaped flotation device, and the hydrofoil has a strut and a first hydrofoil wing and no movable surface. An upper end of the strut is fixedly interconnected with the surfboard-shaped flotation device. A propulsion system is attached to the surfboard-shaped flotation device and is configured to propel the watercraft in a body of water. The propulsion system comprises a battery, an electric motor, a motor speed controller, and a propulsor. The propulsor is selected from a propeller, a ducted propeller, or a pump-jet. A battery and motor speed controller are contained in a watertight compartment integrated into the flotation device. The watercraft has no movable steering system. The watercraft comprises a handheld controller having a throttle. The watercraft comprises a throttle interface, wherein the throttle is adapted to send electronic signals to the throttle interface that cause an output of the propulsion system to change.

Braden is directed to a surfboard having a surfboard body, an electric motor, and a propeller. (*See Braden*, Abstract.) Specifically, a propeller 11 powered by an electric motor 12 is attached to the bottom of the body 10 of the surfboard via a motor mount 13 near the tail of the body 10. (*See id.* at ¶ [0024] and FIG. 1, reproduced below.)

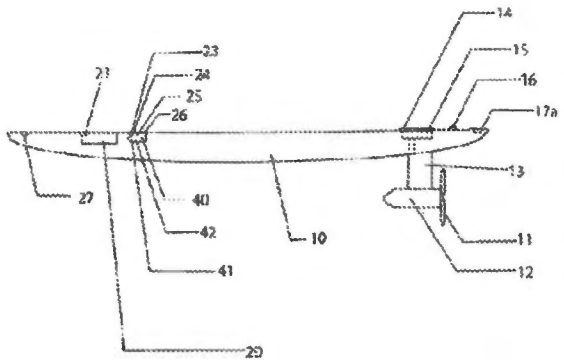


FIG 1

In rejecting the claims as obvious over *Braden* in view of *Rorabaugh*, the Action alleged that *Braden* discloses all of the features recited in independent claims 1 and 16 except for those relating to the hydrofoil. For those missing teachings, the Action turned to *Rorabaugh*, which the Action characterized as "a weight-shift controlled personal watercraft" (Action, p.4), and the Action pointed to the "hydrofoil wings" labeled on the annotated version of FIG. 1 of *Rorabaugh* reproduced on page 4 of the Action. The Action then asserted that it would have been obvious to add such "hydrofoil wings" of *Rorabaugh* to the strut 13 and motor 12 of *Braden* in order to "provide increased stability to the *Braden* watercraft given the hydrofoils are 'positionally fixed in extension from the hull, are safe and stable to operate in shallow water and also in heavy seas when not on hydrofoil plane.'" (Action, p.4 (*quoting Rorabaugh*, col.1 ll.16-20).) However, Patent Owner respectfully traverses that rejection and submits that no proper combination of *Braden* and *Rorabaugh* teaches or suggests all of the features recited in independent claims 1 and 16, as discussed below.

Rorabaugh is primarily directed to movable sponsons (*see, e.g.,* sponsons 26, 27 in FIG. 4, reproduced below) intended to increase the stability of a hydrofoil watercraft. (Langelaan Dec., ¶ 21; *see also Rorabaugh*, Abstract, col.1 ll.38-51, col.4 ll.57-61.) There is very little discussion in *Rorabaugh* regarding the details of its hydrofoil assemblies 10, 11, but, when they are discussed, they are explicitly taught to have adjustable control surfaces that are steered by *Rorabaugh's* movable steering gear 25. (Langelaan Dec., ¶¶ 21-22; *see also Rorabaugh*, col.8 ll.41-44, col.9 ll.14-26, col.13 ll.10-13, col.15 ll.36-37, col.16 ll.5-6.) The steering gear 25 is moveable both fore and aft, and from