

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Shenzhen Waydoo Intelligence Technology Co., Ltd.,
Petitioner

v.

MHL Custom Inc.
Patent Owner

Case IPR2024-00998

**PETITION FOR *INTER PARTES* REVIEW OF
U.S. PATENT NO. 9,359,044
CHALLENGING CLAIMS 1, 2, 5-8, 10-15, 17-18, AND 20-21**

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Shenzhen Waydoo Intelligence Technology Co., Ltd. (“Waydoo” or “Petitioner”) respectfully requests *inter partes* review (“IPR”) of claims 1, 2, 5-8, 10-15, 17-18, and 20-21 of USP 9,359,044 (“’044 patent”) (Ex. 1001).

I. INTRODUCTION

The ’044 patent is directed to a personal hydrofoil watercraft that is controlled by the weight shift of a user. Ex-1001-USP044, 1:13-15. The purported invention claimed by the ’044 Patent was to remove the use of control surfaces of powered hydrofoil surfboards and design the hydrofoil used by the invention to provide for passive static stability. Ex-1001-USP044, 2:17-20. The providing of passive static stability by the hydrofoil was purportedly achieved by “a combination of airfoil design, planform design, and tailoring the span-wise twist distribution to achieve desired outcomes.” Ex-1001-USP044, 2:22-25.

For example, Figure 1, reproduced below, depicts a representative embodiment of a weight-shift controlled personal hydrofoil watercraft.

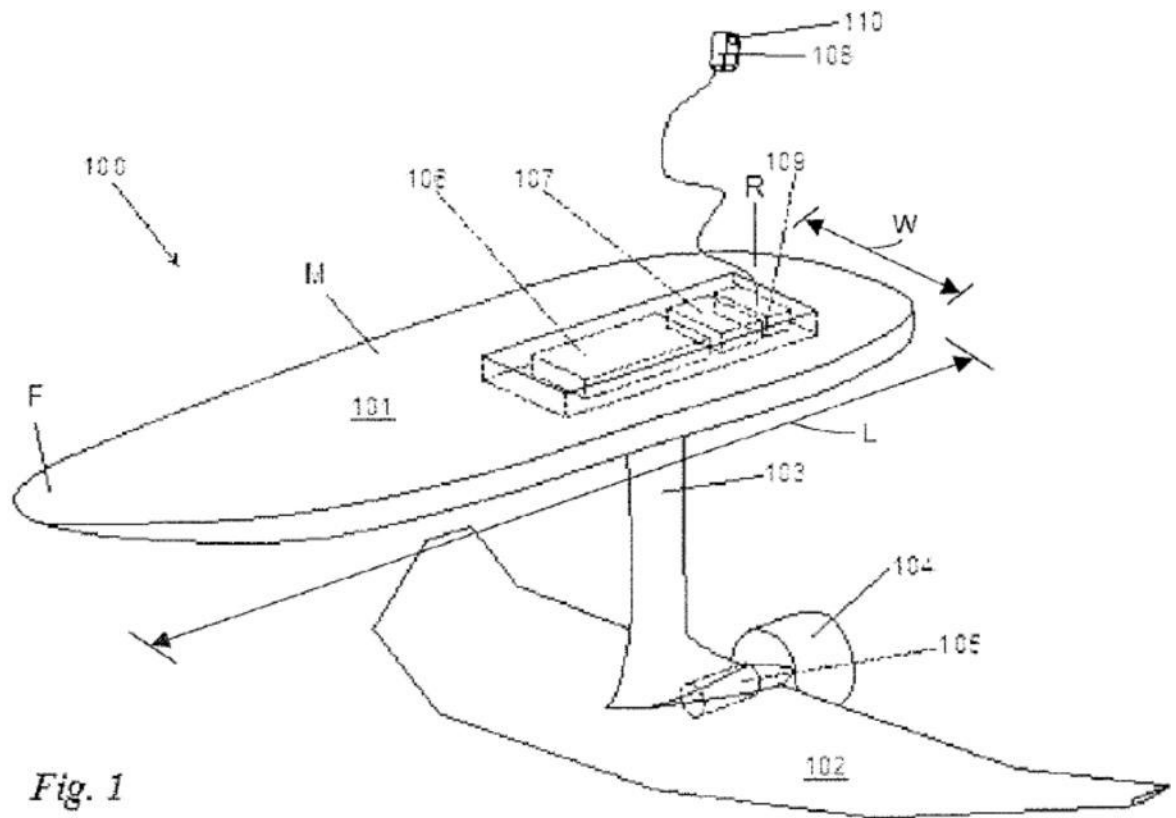
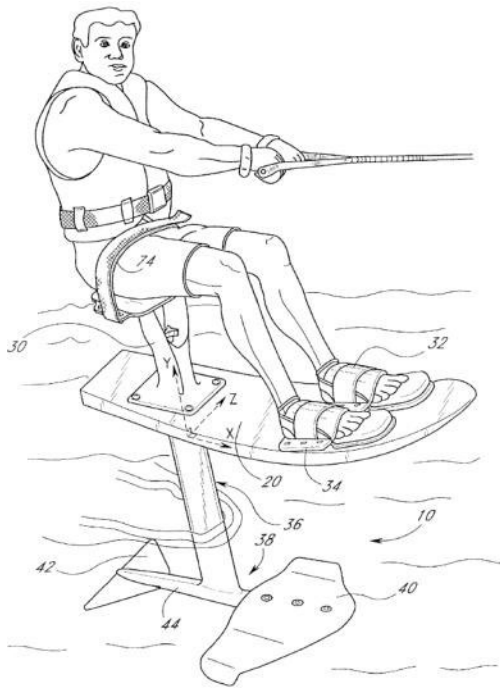


Fig. 1

Id., Fig. 1. The watercraft comprises four primary elements: a floatation device 101 for the user, a fixed strut 103 connected to the floatation device, a hydrofoil 102 with no moveable surfaces connected to the lower end of the strut 103, and a propulsion system 104 that is connected to the hydrofoil 102. The combination of these four elements, along with a negative limitation disclaiming the use of a moveable steering system, form primary elements of Claim 1 of the '044 patent – its only independent claim.

However, the concept of a personal watercraft that utilized a hydrofoil providing passive static stability was already well known at the time. For example,

Woolley, a US patent entitled “Flying Ski”, disclosed a waterski of almost identical configuration to the claimed invention of the ‘044 patent.



Ex-1011-Woolley, Fig.1. Furthermore, unlike the ‘044 patent, Woolley provided significant disclosures relating to how to configure its hydrofoil to provide passive static stability. *See e.g.* Ex-1011-Woolley, Figs 6-11, 10:32-14:39.

In addition to prior patents, a Master’s Level course on Marine Design/Lightweight Design taught at Kungliga Tekniska högskolan (“KTH”) in Stockholm, Sweden developed and published information about a prototype product called Evolo. As part of the class’s efforts on the Evolo Project, they published a

report online of more than 500 pages detailing their efforts to make a self-propelled personal watercraft. *See e.g.* Ex-1003-EvoloReport. This report received significant press in the boating industry when a popular Swedish boating magazine with a circulation of over 125,000 readers published an article in its August 2009 issue about the Evolo project. *See e.g.* Ex-1019-Båtnytt. The instructor of the class that developed the Evolo Project also publicly uploaded videos regarding Evolo to YouTube that showed the Evolo watercraft, its capabilities, and some of the process used to create the watercraft.



See e.g. Ex-1006-EvoloVideos-PrototypeRun at 0:09.

The challenged claims of the '044 patent are unpatentable over these and other references as set forth below.

II. MANDATORY NOTICES

A. Real Party-in-Interest

Petitioner Shenzhen Waydoo Intelligence Technology Co., Ltd. and Waydoo USA, Inc. are the only real parties-in-interest. However, Waydoo USA, Inc. has been dissolved and is being listed out of an abundance of caution because it was a co-defendant to Petitioner in the Waydoo case and co-appellant to Petitioner in the Waydoo appeal mentioned below.

B. Related Matters

According to USPTO records, the '044 patent is owned by MHL Custom Inc. ("Patent Owner" or "PO"). U.S. Patent No. 9,586,659 (the "'659 patent") is a continuation patent of the '044 patent, which is owned by Patent Owner. Petitioner is challenging the '659 patent in concurrently-filed IPR2024-00999.

PO asserted the '044 and '659 patents against Petitioner and Waydoo USA, Inc. in *MHL Custom Inc. v. Waydoo USA, Inc. et al.* (D.Del 1:21-CV-00091) ("Waydoo case"), where infringement was found as to certain claims of the '044 and '659 patents. Petitioner and Waydoo USA, Inc. appealed in *MHL Custom, Inc. v. Waydoo USA, Inc.* (Fed. Cir. 24-1036) ("Waydoo appeal"), which has been dismissed.

In addition, PO alleges that Foil Boarding Co. Inc. ("Foil") infringes the '044 Patent and the '659 Patent in *MHL Custom Inc. v Foil Boarding Co. Inc.* (NDFL

3:22-CV-21258). Foil filed IPR2024-00086 challenging the '044 Patent, which has been instituted by the Board on May 28, 2024.

C. Counsel

Lead Counsel: Alexander Stein (Reg. No. 71,397);

Back-up Counsel: Yalei Sun (Reg. No. 57,765).

D. Service Information

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Post and hand delivery: Morgan, Lewis & Bockius LLP, 1301 Second Ave., Suite 2800, Seattle, WA 98101 (Telephone: 206.274.6400; Fax: 206.274.6401).

Petitioner consents to service via email at the email addresses above.

III. CERTIFICATION AND FEES

Petitioners certify pursuant to Rule 42.104(a) that the patent for which review is sought is available for IPR and that Petitioners are not barred or estopped from requesting IPR challenging the claims on the grounds identified in this Petition.

Any additional fees for this IPR may be charged to Deposit Account No. 50-0310 (Order No. 137710-0003).

IV. THE BOARD SHOULD NOT DENY INSTITUTION

A. § 314(a) Discretion Does Not Apply

1. *General Plastic*

The '044 patent has not been challenged in any prior IPR other than the Foil IPR, which this Petition seeks to join. There is no “significant relationship” between Petitioner and Foil. *See Cisco Systems, Inc. v. Centripetal Networks, Inc.*, IPR2022-01151, Paper 12, 47 (PTAB Jan. 4, 2023) (“present[ing] substantively identical challenges... does not create a ‘significant relationship’...”). Because Petitioner presents substantively identical challenges to claims 1, 2, 5-8, 10-15, 17-18, 20-21 of the '044 patent based on the same prior art and the same unpatentability theories as Foil presents in the Foil IPR, there exist no road-mapping concerns, especially when the Foil IPR has already been instituted. *Id.* at 49.

Joining Petitioner to the Foil IPR will not adversely impact the Board’s resources or the requirement to issue a final written decision within a year of institution. The Board will decide substantively identical challenges to the same claims in the '044 patent based on the same prior art and the same unpatentability theories as Foil presents in the Foil IPR. *See Cisco Systems*, Paper 12, 52-54. Joinder will require little, if any, additional Board effort. *Id.*

Considering the above, the Board should not exercise discretion to deny institution under *General Plastic*.

2. No *Fintiv* denial

There is no overlap between this proceeding and the issues that were tried in the Waydoo case because the jury in the Waydoo case only deliberate on validity of a small subset (*i.e.*, claims 1-2 and 5-6) of the Challenged Claims and did not make any determination as to whether claims 1-2 and 5-6 are anticipated by the EvoloReport. Waydoo Case, Dkt. No. 220 (Jury Verdict, finding no clear and convincing evidence that the Evolo Report was publicly accessible before October 10, 2013, and therefore making no determination as to whether certain claims of the '044 patent are anticipated by the Evolo Report). Neither was the jury presented with the unpatentability grounds (e.g., EvoloReport-Woolley combination and the EvoloVideos-Woolley combination) raised in the present proceeding.

Here, the Waydoo case “did not resolve issues presented by this proceeding, so there is no chance of an inconsistent outcome.” *Intel Corporation v. VLSI Technology LLC*, IPR2022-00366, Paper 14, 7 (PTAB Jun. 8, 2022). Therefore, even if PO argues that the litigation parties and the District Court invested “enormous effort,” institution review here would not mean redoing the work of another tribunal. *Id.*

Given that Petitioner is seeking to join the already instituted Foil IPR, Petitioner has presented compelling evidence of unpatentability, which, when

considered in conjunction with the remaining *Fintiv* factors, weighs further against a discretionary denial under *Fintiv*.

V. OVERVIEW OF CHALLENGE AND RELIEF REQUESTED

Petitioners challenge claims 1, 2, 5-8, 10-15, 17-18, 20-21 of the '044 patent.

A. Prior Art

The '044 patent claims the benefit of a provisional application filed on Oct 10, 2013. Ex-1001-USP044, p. 2.¹ Petitioner relies upon the documents in the Table of Exhibits, including:

1. Evolo Final Report ² (“Evoloreport”) (Ex-1003), published April 23, 2009, as § 102(a)(1) prior art;

¹ Petitioner relies on prior art that predates the claimed provisional date. Accordingly, Petitioner assumes for purposes of this Petition, without taking a position, that the '044 patent is entitled to the benefit of the claimed provisional date, but reserves the right to argue in later proceedings that the claimed subject matter is unsupported by the provisional filing.

² Evoloreport was originally written and published in Swedish under the title “Slutrapport Evolo.” All references and citations to Evoloreport are referencing a

2. Evolo prototype run (“Evolovideos-PrototypeRun”) (Ex-1006), published May 5, 2009 at <https://www.youtube.com/watch?v=a-OCN50aWo>, as § 102(a)(1) prior art;
3. Evolo movie (“Evolovideos-Evolomovie”) (Ex-1008), published June 11, 2009 at <https://www.youtube.com/watch?v=zL9fO8tF118>, as § 102(a)(1) prior art;
4. Test run – the new Torqeedo 4.0 R installed on Evolo!!! (“Evolovideos-Torqeedo” and collectively with Evolovideos-PrototypeRun and Evolovideos-Evolomovie as “Evolovideos”) (Ex-1010), published April 29, 2009 at <https://www.youtube.com/watch?v=fKOQ0JwQnjc>, as § 102(a)(1) prior art
5. U.S. Patent 6,234,856 (“Woolley”) (Ex-1011), filed September 23, 1999, issued May 22, 2001, as § 102(a)(1) and (2) prior art;
6. U.S. Patent 4,020,782 (“Gleason”) (Ex-1012), filed January 26, 1976, issued May 3, 1977, as § 102(a)(1) and (2) prior art;

certified translation of EvoloReport into English. The original Swedish language version of EvoloReport is filed as Ex-1005.

7. U.S. Patent 8,290,636 (“Manning”) (Ex-1013), filed April 20, 2008, issued October 16, 2012, as § 102(a)(1) and (2) prior art;
8. Operating Manual Cruise 2.0 (“TorqeedoManual”) (Ex-1014),
9. published February 2007, as § 102(a)(1) prior art.

B. Grounds for Challenge

The challenged claims are unpatentable under §§ 103 as follows:

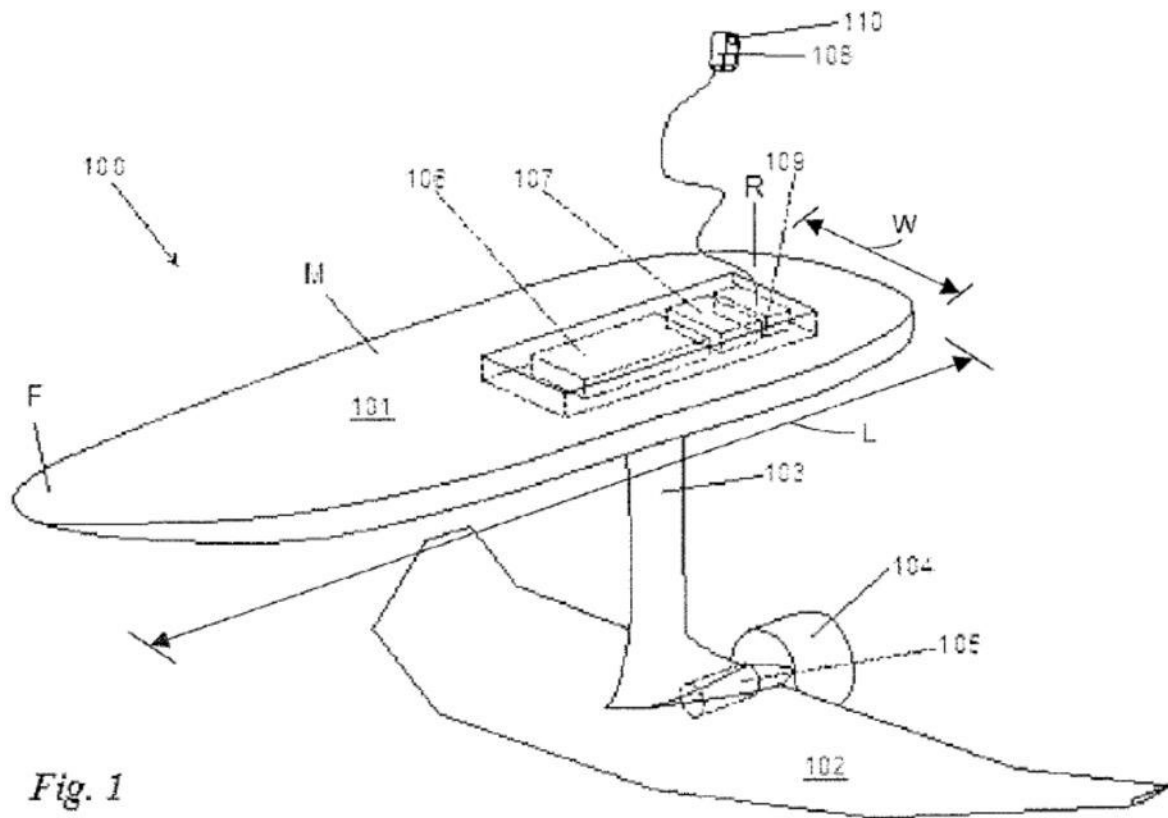
Ground	Claims	Reference(s)
1	1, 2, 5-8, 10-15, 17-18,20-21	Evoloreport and Woolley
2	1, 5-8, 10, 17, 21	Evolovideos and Woolley
3	2, 12-14, 20	Evolovideos, Woolley, and TorqeedoManual
4	11	Evolovideos, Woolley, TorqeedoManual, and Gleason
5	15, 18	Evolovideos, Woolley, TorqeedoManual, Gleason, and Manning

This Petition, supported by the declaration of Dr. Brizzolara (“Ex-1002-Brizzolara-Decl.”), demonstrates that each challenged claim is unpatentable.

VI. BACKGROUND TECHNOLOGY AND '044 PATENT OVERVIEW

A. The Alleged Invention

The '044 patent describes an improvement upon the powered hydrofoil surfboard by providing a personal watercraft that includes a hydrofoil that provides passive stability without the use of moveable surfaces. Ex-1001-USP044, 2:17-26. Specifically, referring to Figure 1 below, the patent explains that the watercraft consists of four major components: a floatation device 101 for the user to occupy, a fixed strut 103 connected to the floatation device, a hydrofoil 102 with no moveable surfaces connected to the lower end of the strut 103, and a propulsion system 104 that is connected to the hydrofoil 102. Ex-1001-USP044, Fig 1, 3:7-4:7. Ex-1002-Brizzolara-Decl. at ¶20.



In addition to the four main structural elements, the watercraft can include a battery 106, motor speed controller 107, and handheld throttle system 108. Ex-1001-USP044, Fig 1, 3:1-6. Ex-1002-Brizzolara-Decl. at ¶21.

The hydrofoil of the watercraft of the '044 patent is designed to provide passive stability to obviate the need for active control systems. Ex-1001-USP044, 6:63-65. Ex-1002-Brizzolara-Decl. at ¶22. The '044 patent discloses multiple design choices that can be made with the hydrofoil to affect its ability to provide passive static stability. Ex-1001-USP044, Fig 8, 5:36-54 (disclosing the use of fixed canards, winglets, horizontal tails, and vertical tails). Ex-1002-Brizzolara-Decl. at ¶24. The

‘044 patent notes that the degree of passive static stability provided by the hydrofoil can vary, because greater stability impacts the ability for the watercraft to maneuver. Ex-1001-USP044, 7:11-18. Ex-1002-Brizzolara-Decl. at ¶24.

VII. CLAIM CONSTRUCTION

A claim is construed “using the same claim construction standard that would be used to construe the claim in a civil action...” 37 C.F.R. § 42.100(b). Petitioner submits that no terms need to be construed to resolve the issues raised in this Petition because the prior art discloses all limitations under any plausible construction.

To the extent that any of the claim terms of the ‘044 Patent require construction, the Board may be advised by a Memorandum Order by the Court in *MHL Custom Inc. v. Waydoo USA, Inc. et al.* (D.Del 1:21-CV-00091)(Ex-1023) issuing the following claim constructions:

A. Claim 1

Term 1: “wherein a user can be disposed on the top surface of the flotation device in a prone, kneeling, or standing position”

Construction of Term 1: “‘Prone, kneeling, or standing’ are alternatives. Only one of them is required.”

Term 2: “Designed to provide passive static stability” Construction of Term 2: “Designed such that the hydrofoil has an initial tendency to return to its

original condition when disturbed without the hydrofoil having any moveable components.”

Claim 5

Term: “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.”

Construction: Plain and ordinary meaning.

VIII. OVERVIEW OF THE PRIOR ART

A. EvoloReport

EvoloReport is a design document describing the work conducted by a Master’s Level course on Marine Design/Lightweight Design taught at Kungliga Tekniska högskolan (“KTH”) in Stockholm, Sweden. EvoloReport was authored by the instructors and students in the class and describes their work in designing a battery-powered electric-motor-driven hydrofoil watercraft. *See generally*, Ex-1003-EvoloReport.

EvoloReport was uploaded to http://flygmac7.flyg.kth.se/cdio/old_projects/evolo as of 2009. Declaration of Jakob Kutteneuler at ¶18 (“KutteneulerDecl”) (Ex.1018). (“In 2009, shortly after receiving the final report, I published a PDF of it on the website for the Marine Design

and Lightweight Design courses. The final report is available at this web address:
http://flygmac7.flyg.kth.se/cdio/old_projects/evolo/Evolo_slutrapport.pdf.”).

EvoloReport was further published when a popular Swedish boating magazine, *Båtnytt*, published an article in its August 2009 issue, which described the watercraft disclosed in EvoloReport, including several photographs of the watercraft. Ex.1018-KuttenkeulerDecl. ¶¶ 29-30. The *Båtnytt* article shows the entire Evolo watercraft and describes its various features, including the hydrofoil and electric motor. Ex-1019- *Båtnytt* p.9 (“Evolo is **powered by an electric motor** located at the bottom of the “keel,” where there are also **delta-type hydrofoils**.”) As shown below, the *Båtnytt* article shows each of the main features of the Evolo watercraft; those main features being a flotation device and a strut linking the flotation device to both a propulsion system and a hydrofoil.



Further, the Båtnytt article included direct links to where interested persons could find more information about the Evolo watercraft, specifically including a link that took readers to EvoloReport. Ex1019- Båtnytt p.12. (“Read more about Evolo at www.evolo.se, www.msy.se, http://flygmac7.flyg.kth.se/cdio/old_projects/evolo/”).



At the time, *Båtnytt* had an audience of approximately 125,000 readers per issue and published 12 issues each year. Ex1020- *Båtnytt* -Readership (“**125,000 readers per issue** according to Orvesto 2009:1”). Jakob Kutteneuler also testified that he saw the August 2009 issue of *Båtnytt*, the issue containing the Evolo watercraft, for sale at public newsstands. Ex-1018-Kutteneuler-Dec p.5,31 (“In the fall and winter of 2009, **I saw the August 2009 issue of Batnytt available for sale in Stockholm at public newsstands.**”). The *Båtnytt* Magazine is the type of publication that a POSITA would review in order to learn about and remain up-to-date on developments in the current state of the art. Ex-1002-Brizzolara-Decl. at ¶31.

The article in *Båtnytt* would have served as a publicly available “research aid that would have led a POSITA 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).

The significant distribution of the Båtnytt article combined with it being the type of article that a POSITA would use to keep up to date on developments in the industry illustrate that is the type of research aid contemplated by the Federal Circuit to find otherwise publicly available publications. Ex-1002-Brizzolara-Decl. at ¶31.

B. EvoloVideos

In addition to publishing the above report, throughout 2008 and 2009, both the instructor of the class, Jakob Kutenkeuler, and project members published a number of videos on YouTube related to the watercraft disclosed in Evolo-Report. Ex1018-Kutenkeuler-Dec p.5 (“I know that my Evolo students also uploaded videos to YouTube in 2008 and 2009. The videos are of the 2008 and 2009 prototype testing sessions, certain aspects of building the Evolo prototypes, and interviews with team members.”); Ex1006-EvoloVideos-PrototypeRun; Ex1008-EvoloVideos-EvoloMovie; Ex1010-EvoloVideos-Torqueedo.

Specifically, Jakob Kutenkeuler uploaded, on or about June 11, 2009, a video of the final Evolo prototype showing the testing sessions that took place during 2009. Ex1018-KutenkeulerDecl p.4 (“On or about June 11, 2009, I uploaded to [YouTube.com](https://www.youtube.com) a video of the final Evolo prototype, taken by me and some of my students during the testing sessions in 2009.”); Ex1008-EvoloVideos-EvoloMovie; Ex1009-EvoloVideos-EvoloMovieYouTubePage. The video has been publicly

accessible since it was uploaded. Ex1018-KuttenkeulerDecl p.5 (“When uploading it, I permitted the video to be viewed publicly.”)

In EvoloVideos-EvoloMovie, the Evolo watercraft is shown in various different operating conditions, including while hydrofoiling and being completely removed from the water such that the hydrofoil and motor are visible. Ex1008-EvoloVideos-EvoloMovie, 1:17 (showing the craft in a hydrofoiling condition), 1:42 (showing the craft removed from the water with hydrofoil and motor visible).





YouTube and Twitter are both mainstream Internet-based platforms that are used to disseminate information about projects and updates in the state of the art (e.g., a new type of recreational/sporting watercraft) to interested members of the public, including POSITAs. These platforms are well-known, public (e.g., no access restrictions), searchable, and intended to reach a wide audience. To date, the three EvoloVideos have received over 17,000, 72,000, and 12,000 views. Ex-1007-EvoloVideos-PrototypeRunYouTube; Ex-1009-EvoloVideos-EvoloMovieYouTube; Ex-1022-EvoloVideos-TorqueedoYouTube.

YouTube videos can constitute printed publications in inter partes review proceedings under §311. *See Medtronic, Inc. v. Barry*, 891 F.3d 1368, 1379-83 (Fed. Cir. 2018) (vacating the Board’s finding that a video was not sufficiently accessible to constitute a printed publication); *London Luxury LLC v. E&E Co., Ltd.*, PGR2021-

00083, Paper 10 at * 18-19 (PTAB Nov. 15, 2021)(finding prior art YouTube video to be publicly accessible and a printed publication).

The description page of EvoloVideos-EvoloMovieYouTube further contains description of the Evolo watercraft being an “electrically propelled hydrofoil water-toy” and a link to additional information, containing a link to the Evolo-Report. Ex.1009-EvoloVideos-EvoloMovieYouTube, description (“More material is available at <http://flygmac7.flyg.kth.se/cdio.>”) As such, a POSITA could have discovered the publicly accessible EvoloVideos-EvoloMovie and followed the link provided on EvoloMovieYouTube to find the EvoloReport.

IX. LEVEL OF ORDINARY SKILL IN THE ART

A person of ordinary skill in the art (“POSITA”) at the time of the alleged invention would have had a masters’s degree in Aerospace or Naval Engineering, or equivalent experience, and one to two years of experience in the field of watercraft design and construction. Ex-1002-Brizzolara-Decl. at ¶18.

X. SPECIFIC GROUNDS OF UNPATENTABILITY

A. Ground 1

EvoloReport in combination with Woolley renders claims 1, 2, 5-8, 10-15, 17-18, 20-21 obvious over the combined teachings of EvoloReport and Woolley and the knowledge of POSITA. Ex-1002-Brizzolara-Decl., ¶35.

1. Claim 1

- (a) [1Preamble] A passively stable, weight-shift controlled personal hydrofoil watercraft, comprising:

To the extent that the preamble of Claim 1 is limiting, EvoloReport discloses a weight-shift controlled personal hydrofoil watercraft. As noted by the EvoloReport “Evolos is a new type of watercraft that travels on a hydrofoil and is intended for one person. It is powered by an electric motor and is controlled only by means of center of gravity movement.” Ex-1003-EvoloReport at 546. Ex-1002-Brizzolara-Decl., ¶¶36-37. As discussed supra at IX.A.1(f), to the extent that the EvoloReport does not sufficiently disclose a watercraft that is passively stable, it would have been obvious to someone skilled in the art to modify the EvoloReport using the skill in the art of a POSITA or combine it with Woolley to make it passively stable. Ex-1002-Brizzolara-Decl., ¶37.

- (b) [1A1] a floatation device that has a fore-aft length greater than a lateral width, the floatation device having a top surface and a bottom surface,;

EvoloReport discloses a floatation device that has a fore-aft length greater than a lateral width, with the floatation device having a top surface and a bottom surface. Ex-1003-EvoloReport, p.546-550; Ex-1002-Brizzolara-Decl., ¶38.

EvoloReport discloses the use of a floatation device described as a “floating body” as the portion of the disclosed watercraft. Ex-1003-EvoloReport, p.550.

Evoloreport notes that the floating flotation device “has sufficient volume to stay afloat the drive.” Ex-1003-Evoloreport, p.550.

Evoloreport discloses a flotation device having an overall length (bow to stern) of C1, which is given as a length of 2313 millimeters. Ex-1003-Evoloreport at 546-547. Evoloreport discloses that its flotation device has an overall breadth (port to starboard) of A3, measuring 701 millimeters. Ex-1003-Evoloreport at 546-547. This lateral width A3 is less than the overall length of C1. Ex-1002-Brizzolara-Decl., ¶41.

Evoloreport also discloses that the flotation device has a top-surface upon which a rider is disposed and a bottom-surface that is normally in the water in non-flying conditions. Ex-1003-Evoloreport at 550. Ex-1002-Brizzolara-Decl., ¶42.

(c) [1A2] wherein a user can be disposed on the top surface of the flotation device in a prone, kneeling, or standing position,;

Evoloreport discloses a watercraft that is designed for use with a “kneeling driver’s position” holding the handles on the top surface of the flotation device. Ex-1003-Evoloreport at 551. Ex-1002-Brizzolara-Decl., ¶43.

- (d) [1A3] the floatation device having a forward section, a middle section, and a rear section;

The claim terms “a forward section, a middle section and a rear section” are referenced in the ‘044 patent as labels of the fore, middle, and aft sections of the floatation device. Ex-1001-USP044, 3:27-31, Fig. 1; Ex-1002-Brizzolara-Decl., ¶44. To the extent that the floatation device claimed in the ‘044 Patent “may be said to have” a forward section, middle section, and a rear section, EvoloReport discloses a floatation device showing such sections. Ex-1003-EvoloReport at 546; Ex-1002-Brizzolara-Decl., ¶45.

- (e) [1B] a strut having an upper end and a lower end, the upper end fixedly interconnected with the floatation device between the middle section and the rear section of the floatation device.

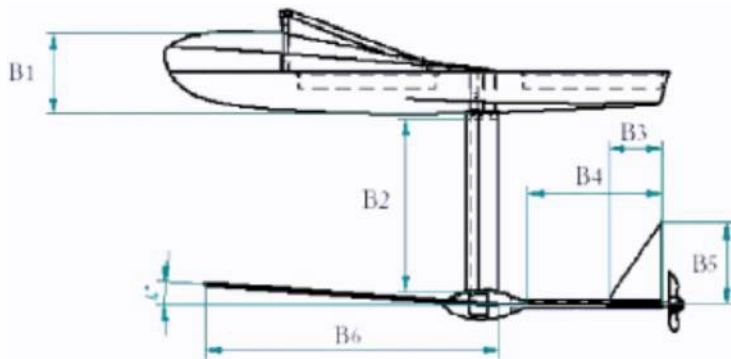
EvoloReport discloses the use of a strut having an upper end and a lower end. Ex-1003-EvoloReport at 549-550. Ex-1002-Brizzolara-Decl., ¶¶46-47.



Figure. 10. Illustration of Evolo's strut

Ex-1003-EvoloReport at 549. The upper end of the disclosed strut in EvoloReport is fixedly interconnected with the floatation device. Ex-1003-

Evoloreport at 211215. Ex-1002-Brizzolara-Decl., ¶48. Evoloreport discloses the interconnection between the strut and the floatation device occurs aft of the midpoint of the floatation device.



Ex-1003-Evoloreport at 546, Ex-1002-Brizzolara-Decl., ¶48.

- (f) [1C] a hydrofoil fixedly interconnected with the lower end of the strut, the hydrofoil having no moveable surface and designed to provide passive static stability controlled solely by weight shift of the user

Evoloreport discloses a hydrofoil fixedly interconnected with the lower end of the strut. Ex-1003-Evoloreport at 546, 549, Ex-1002-Brizzolara-Decl., ¶49.



Figure. 9. Illustration of Evolo's underwater body

Evoloreport further discloses that the hydrofoil has no moveable surface. Evoloreport at 546, 549, Ex-1002-Brizzolara-Decl., ¶49.

Evoloreport discloses that its vehicle was designed to be “controlled by means of a center of gravity shift.” Ex-1003-Evoloreport at 29, Ex-1002-Brizzolara-Decl., ¶50. The limitation “controlled solely by weight shift of the user” refers to the control of the entire personal watercraft, rather than the control of the hydrofoil separately from the personal watercraft. Ex-1002-Brizzolara-Decl., ¶51. The ‘044 patent notes that “both longitudinal and directional control of the board is via weight shift.” Ex-1001-USP044 at 2:9-11. The purported passive stability of the claimed hydrofoil allows “the watercraft to be controlled by weight shift rather than by mechanical system.” Ex-1001-USP044 at 5:65-66; Ex-1002-Brizzolara-Decl., ¶51. Because Evoloreport does not disclose any other moveable objects that would change the force of gravity on the disclosed watercraft, the weight shift of the user of the disclosed watercraft is the gravity shift disclosed in Evoloreport. Ex-1003-Evoloreport at 29, Ex-1002-Brizzolara-Decl., ¶52.

Evoloreport discloses that both pitch stability and rolling stability are factors in the design of the disclosed Evoloreport hydrofoil. Ex-1003-Evoloreport at 58 – 62 (“The purpose of this analysis is to establish a configuration of the hydrofoil so that it is stable in pitch.”); 88-98; Ex-1002-Brizzolara-Decl., ¶53. The term “stable” as used by the Evoloreport was being used to mean passive static stability as

contemplated by the '044 patent (“By stable is meant that if Evolo is exposed to a disturbance, it will return to its initial position.”).

A POSITA would have been motivated to combine EvoloReport with Woolley to provide for a passively stable hydrofoil. Ex-1002-Brizzolara-Decl., ¶55. Woolley a hydrofoil fixedly interconnected with the lower end of a strut, the hydrofoil having no moveable surface and designed to provide passive static stability controlled solely by weight shift of the user. Ex-1002-Brizzolara-Decl., ¶55. Like EvoloReport, the primary embodiment disclosed in Woolley discloses a hydrofoil – or planing blade – comprising a front blade and rear blade interconnected by a fuselage. Ex-1011-Woolley at 6:16-18. Ex-1002-Brizzolara-Decl., ¶55. Woolley notes that the purpose of the planing blade is to provide a combination of “stability, lift, and responsiveness.” Ex-1011-Woolley at 10:22-27. Ex-1002-Brizzolara-Decl., ¶55. The ability to interchange different size front and rear planing blades in Woolley allows for providing “different stability, lift and responsiveness characteristics.” Ex-1011-Woolley at 10:30-33. Ex-1002-Brizzolara-Decl., ¶55. In addition, Woolley discloses the ability to adjust the planform and angle of attack of the rear planing blade, based upon the level stability desired between a beginner through professional rider. Ex-1011-Woolley at 16:39-19:60. Ex-1002-Brizzolara-Decl., ¶55.

Woolley discloses a front planing blade containing a chorded upper surface that tapers towards the rear so that the upper surface has a larger surface area than

the lower surface, which causes an upward lifting force on the forward blade. Ex-1011-Woolley at 11:22-30. Ex-1002-Brizzolara-Decl., ¶56. In addition, Woolley discloses the use of the rear blade with a negative angle of attack, so that the rear blade creates a downward force on the rear blade. Ex-1011-Woolley at 16:6217:11. Ex-1002-Brizzolara-Decl., ¶57. The use of counteracting forces between the upward force caused by the forward blade of the hydrofoil and the downward force caused by the rear blade of hydrofoil is a well-known method for increasing pitch stability. Ex-1002-Brizzolara-Decl., ¶57.

In addition to disclosing a hydrofoil that is stable in the longitudinal (pitch) plane, Woolley discloses a hydrofoil designed to be passively stable in the yaw and roll (lateral plane). Ex-1002-Brizzolara-Decl., ¶58. As noted by the ‘044 Patent, yaw and roll stability are generally linked in hydrofoils. Ex-1001-USP044, 6:367:6. The ‘044 Patent notes that yaw and roll stability can be achieved through “a combination of sweep and dihedral and can also be influenced with the addition of winglets or a fin.” Ex-1001-USP044 at 6:63-65. Woolley discloses the use of each of the features in its hydrofoil, along with the desire to achieve stability in yaw and roll. Ex-1002-Brizzolara-Decl., ¶58. The front and rear blades disclosed by Woolley are swept on at least their leading edge and on both edges in some embodiments. Ex-1011-Woolley at Fig. 6A, 6B, 7A, 7B, 17:3-4. Ex-1002-Brizzolara-Decl., ¶58. Woolley discloses a dihedral rear blade. Ex-1011-Woolley at Fig 11A; Ex-1002-Brizzolara-

Decl., ¶58. Finally, both the forward blades and rear blades disclosed within Woolley show the use of winglets or fins at their ends. Ex-1011-Woolley at Fig. 6A, 9A, 10A, 11A. Ex-1002-Brizzolara-Decl., ¶59. Woolley discusses how these features are used to provide roll and yaw stability. Ex-1011-Woolley at 11:6-15 (“[t]he relatively large distance of the edge of the blade from the plane of symmetry A increases the moment created by water acting on the surface of the blade”); Ex-1002-Brizzolara-Decl., ¶59.

Woolley’s disclosure of both pitch stability along with roll and yaw stability through the use of the hydrofoil discloses a hydrofoil designed to provide passive static stability. Ex-1011-Woolley, 4:16-25 (“When the generally planar surface of the rear blade operates together with the elliptical planing surface of the front blade, these surfaces battle and counteract each other providing the desired stability characteristics. Specifically, these surfaces resist the turning of the ski from side-to-side or up and down, which is very desirable for beginners.”) Ex- 1002-Brizzolara-Decl., ¶60. Woolley’s description of how it provides passive static stability far exceeds any disclosure within the ‘044 Patent regarding how to design a hydrofoil wing that is passively statically stable. Ex-1002-Brizzolara-Decl., ¶61. The ‘044 Patent does not disclose how to design a hydrofoil wing that is passively statically stable, it simply enunciates well known aerodynamic conditions to mathematically satisfy stability and provides numerous examples of generic design choices that may provide passive stability. *See e.g.* Ex-1001-USP044, 2:30-35 (“A fixed canard or

horizontal tail surface can also be added to further improve passive longitudinal stability A fixed vertical tail can be added to improve lateral stability); Ex-1002-Brizzolara-Decl., ¶61. To the extent that the disclosed hydrofoil in Woolley could be found to not be designed to provide passive static stability, a POSITA would have sufficient knowledge to modify the disclosed hydrofoil in Woolley such that it was designed to provide passive static stability. Ex-1002-Brizzolara-Decl., ¶62.

- (g) [1D] a propulsion system for propelling the watercraft in a body of water, wherein the propulsion system is connected to the hydrofoil; and

Evoloreport discloses a propulsion system for propelling the watercraft in a body of water, wherein the propulsion system is connected to the hydrofoil. Ex-1002-Brizzolara-Decl., ¶63. Evoloreport discloses the use of an electric motor coupled with batteries and a propeller to provide a propulsion system for propelling the watercraft in a body of water. Ex-1003-Evoloreport at 551-552. Ex-1002-Brizzolara-Decl., ¶63. The propulsion system in Evoloreport is directly connected to the hydrofoil. Ex-1003-Evoloreport at 549. Ex-1002-Brizzolara-Decl., ¶63.

- (h) [1E] the watercraft having no movable steering system.

The watercraft disclosed by Evoloreport has no movable steering system. Ex-1002-Brizzolara-Decl., ¶64. Evoloreport discloses the use of a fixed, unmovable

handle for the rider to hold onto the watercraft and apply weight shifting. Ex-1003-EvoloReport at 551. Ex-1002-Brizzolara-Decl., ¶64.

2. Claim 2: 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.

EvoloReport discloses a watercraft having a propulsion system comprising 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. Ex-1003-EvoloReport at 9 (“...in order to power the chosen *electric motor, new batteries were purchased for the project*”); *Id.* (“In order to have an advantageous propulsion system for Evolo ... a standard propeller [can be] used or a propeller... is manufactured”); Ex-1003-EvoloReport at 498 (“The motor is controlled by varying the frequency of the input voltage by varying a control voltage to a control system ... indicates what speed or torque is desired...”). Ex-1002-Brizzolara-Decl., ¶65.

The final design in EvoloReport uses the Torqeedo 4.0 R, an electric motor, to rotate a propeller to propel the watercraft through the water. Ex-1003-EvoloReport at 498 (“an asynchronous motor that is now being investigated in the project, Torqeedo Cruise 2.0.”). Ex-1002-Brizzolara-Decl., ¶66. Evolo-Report discloses using the Torqeedo 2.0 R and the Torqeedo 4.0 R at different design stages due to the availability of the 4.0 R motor; however, both Torqeedo motors

are electric motors. Ex-1003-EvoloReport at 498 (“Since most of the industrial and marine motors on the market, eg Torqeedo, are asynchronous motors...”). Ex-1002-Brizzolara-Decl., ¶67. The watercraft further includes a motor speed controller (e.g., either an inverter or pulse modeler) that controls the speed of the motor. Ex-1003-EvoloReport at 498 (“The motor is **controlled by varying the frequency of the input voltage by varying a control voltage to a control system, known as an inverter or pulse modeler...**”). Ex-1002-Brizzolara-Decl., ¶67.

EvoloReport discloses that the electric motor is powered by batteries. Ex-1003-EvoloReport at 9 (“In order to be able to use the selected electric motor, **new batteries** were purchased for the project.”). Ex-1002-Brizzolara-Decl., ¶68. The electric motor provides rotation to a propeller that drives the watercraft through the water. Ex-1003-EvoloReport at 9 (“The **finished propeller** is shown in Figure 9.”).



Figure 9 Propeller manufactured for Evolo

3. 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.

The hydrofoil disclosed by Woolley provides passive static stability through a combination of airfoil design, planform design and tailoring of span-wise twist distribution. Ex-1002-Brizzolara-Decl., ¶¶69-76. Woolley discloses multiple ways that the hydrofoil can be designed to achieve greater stability. *See discussion above at IX.A.1(f).* Ex-1002-Brizzolara-Decl., ¶¶69-76.

The plain and ordinary meaning of “design for providing the passive static stability is achieved through a combination of airfoil design, planform design and tailoring of span-wise twist distribution” means that the design of the hydrofoil utilizes some combination of these three design choices to contribute towards passive static stability. Ex-1002-Brizzolara-Decl., ¶¶69. In the ‘044 Patent, no specific lower bound of any of these three elements is provided. Ex-1002-Brizzolara-Decl., ¶¶70. The specification notes that “the exact ratios of wing sweep and twist are dependent on the degree of stability desired.” Ex-1001-USP044, 6:17-19.

Woolley discloses the use of airfoil design to provide passive static stability. Ex-1002-Brizzolara-Decl., ¶¶71. Airfoil design is generally understood to mean the design of the cross-section of the hydrofoil, aligned with the prevalent direction of inflow (or air or water). Ex-1002-Brizzolara-Decl., ¶¶71. Woolley discloses the use

of a forward blade with a larger top surface area than the bottom surface area that creates lift on the forward blade. Ex-1011-Woolley at Fig. 9C, 11:37-40. The corresponding rear blade of the hydrofoil has a larger surface area on the lower surface compared to the upper surface. Ex-1011-Woolley at 13:23-27. This airfoil design of the forward and rear blades of the hydrofoil of Woolley causes counteracting forces to occur between the two portions of the hydrofoil that contribute to the passive static stability of the hydrofoil. Ex-1011-Woolley at 13:47-53. Ex-1002-Brizzolara-Decl., ¶72.

In addition, Woolley discloses the use of planform design to contribute to passive static stability. Ex-1002-Brizzolara-Decl., ¶73. Planform design is generally understood to be the shape of the hydrofoil as viewed from above. Ex-1002-Brizzolara-Decl., ¶73. Woolley discloses the use of swept hydrofoils to provide for greater yaw and roll passive stability. Ex-1011-Woolley at Fig. 6A, 7A, 7B; Ex-1002-Brizzolara-Decl., ¶73.

The use of both airfoil design and planform design to provide passive static stability is sufficient to disclose “design for providing the passive static stability is achieved through a combination of airfoil design, planform design and tailoring of span-wise twist distribution” even if combined with an unknown span-wise twist distribution. Ex-1002-Brizzolara-Decl., ¶74. To the extent that it is determined that this claim term is construed to require the use of a span-wise twist distribution on

the hydrofoil, a POSITA would have found it obvious based on their own knowledge to add a span-wise twist distribution to the hydrofoil of Woolley to increase its passive stability. Ex-1002-Brizzolara-Decl., ¶75. Because Woolley is discussing the need to provide varying levels of stability in its hydrofoil, a POSITA would have been motivated to combine their knowledge of flight dynamics and stability with Woolley to implement the well-known technique of adding a span-wise twist to increase passive static stability. Ex-1002-Brizzolara-Decl., ¶75.

4. **Claim 6: A watercraft in accordance with claim 1, wherein the hydrofoil is wing shaped with a front edge and a rear edge that both curved rearwardly.**

Woolley further discloses a hydrofoil in which the front and rear edges are curved rearwardly. Ex-1011-Woolley at Fig. 7B.

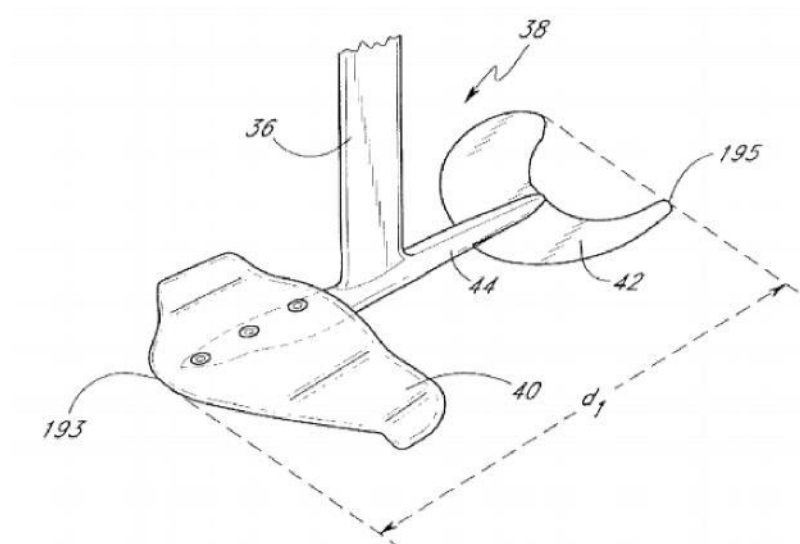


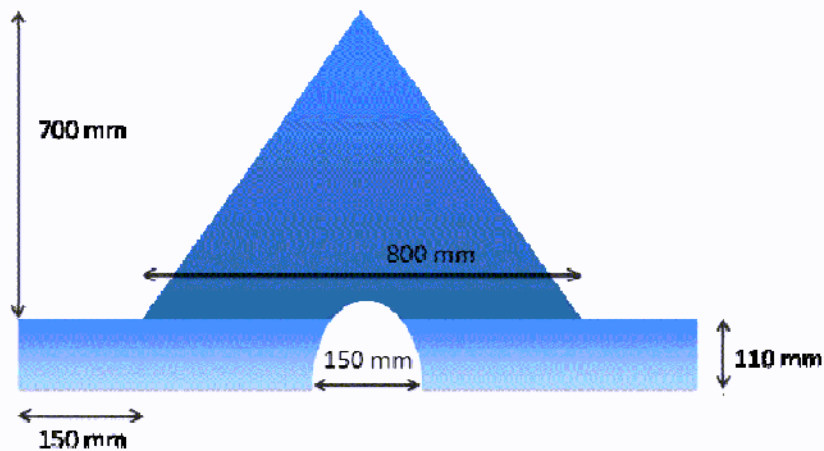
FIG. 7B

Ex-1011-Woolley, 4:63-64 (“FIG. 7B is an assembled perspective view of the planing blade for the ski of FIG. 7A;”). Woolley discloses a hydrofoil containing two blades, 40 and 42 that operate together to provide lift and stability to the rider. Ex-1011-Woolley, 13:54-57 (“illustrated in FIGS. 7 and 11, the rear blade 42 defines a curved hydrodynamically efficient member designed to provide lift and responsiveness characteristics to the ski 10. Significantly, elliptical planing surface of the curved rear blade 42 cooperates with the elliptical planing surface of the front blade 40 greatly enhancing responsiveness.”). Ex-1002-Brizzolara-Decl., ¶77.

5. Claim 7: A watercraft in accordance with claim 1, wherein the hydrofoil is indirectly connected to the strut.

Evoloreport discloses a watercraft having a hydrofoil that is indirectly connected to the **strut**. Ex-1002-Brizzolara-Decl., ¶78. The below figure from Evoloreport shows dimensions of the front hydrofoil wing formed by molding a wing shape with a central cutaway for a **motor pod**.

Front hydrofoil



Ex-1003-EvoloReport at 322. The hydrofoil is then inserted around the **motor pod** and attached to a **flange** of the **motor pod** by bolts. Ex-1003-EvoloReport at 271

(“The mounting of the front hydrofoil and the strut with the motor is done by **bolting the hydrofoil against the flange located on the motor pod.**”) Figure 1 shows the internal connection between the **motor pod**, the hydrofoil **flange**, and the **strut**. Ex-1003-EvoloReport at 371. Ex-1002-Brizzolara-Decl., ¶79.

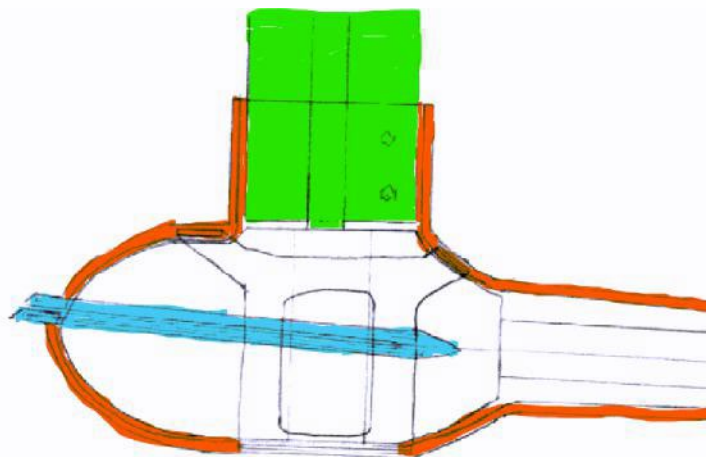


Figure 1. Drawing of "Easter egg solution" in profile. The flange visible in the center should be straight to facilitate manufacturing. The aluminum reinforcement drawn according to the hydrofoil and stay report does not need to be used.

As shown above, the top and bottom **motor pods** are molded around the motor to secure the attached hydrofoil in place. Ex-1003-EvoloReport at 256-267 (“These parts are then enclosed around the motor so that the hydrofoil is prevented from shifting in all degrees of freedom.”); Ex-1002-Brizzolara-Decl., ¶79. The top section of the **motor pod** includes a hole to allow the **motor pod** to be secured to the **strut**. Ex-1003-EvoloReport at 295 (“Mounting number 3, between the strut and the motor bulb, is the most complicated of the 4. It involves attaching the strut to an egg-like engine compartment shell which in turn is assembled with the front delta wing, *see Figure 4*”). EvoloReport shows the results from a test to manufacture the top section of the **motor pod**, in which the **flange** is visible protruding around the bottom edge of the **motor pod** and having bolt holes for attaching the hydrofoil.



Figure 3. Results of test lamination.

Ex-1003-EvoloReport at 370 - 373 (“A submarine shaped plug with approximate dimensions as it will be on the real hydrofoil mount was hand laid with carbon fiber and matrix. Image of the construction after lamination is shown in Figure 3.”) Ex-1002-Brizzolara-Decl., ¶¶80-81.

As the hydrofoil is only attached to the **flange** of the **motor pod**, the hydrofoil is indirectly connected to the **strut** by way of the **flange** on the **motor pod**. Ex-1002-Brizzolara-Decl., ¶82.

6. Claim 8: A watercraft in accordance with claim 7, wherein the strut is directly connected to the propulsion system.

Evoloreport discloses a watercraft wherein the strut is directly connected to the propulsion system. Ex-1002-Brizzolara-Decl., ¶83. Evoloreport discloses that

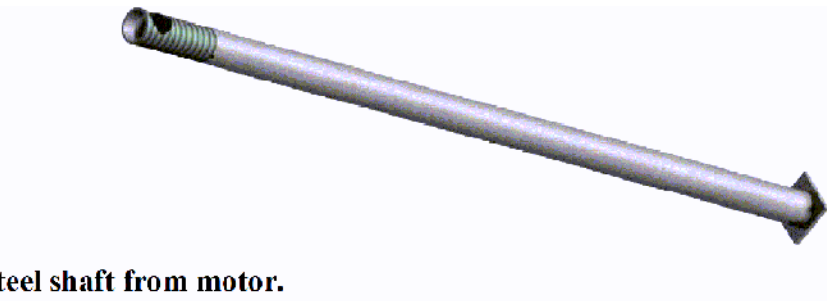
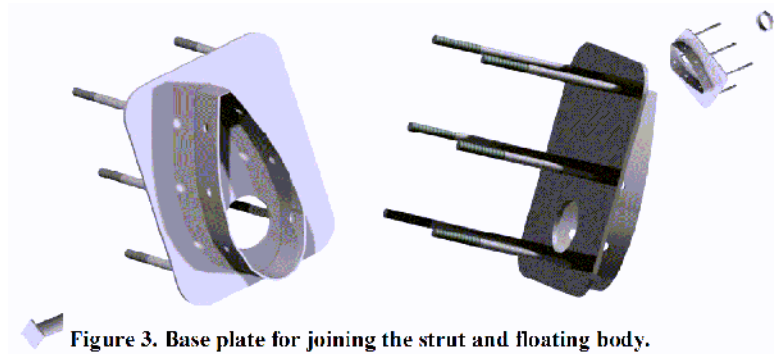


Figure 2. Steel shaft from motor.

the watercraft's propulsion system, specifically the steel **rod** that extends from the **motor** to the motor controls and shown below in Figure 2, forms the core of the strut that links the floatation device to the **motor** and hydrofoil. Ex-1003-Evoloreport at 14 ("The metal bar **is part of the original engine structure** and is retained as it provides a guaranteed watertight link down to the engine bulb."); Ex-1003-Evoloreport at 276 ("As **the motor cannot be detached from the shaft**, the profile and any other parts must be put on the shaft from above."); *Id.* ("In this figure, **the motor represents the square plate.**") (referring to Figure 2, below).

Evoloreport teaches that the steel rod provided from the Torqeedo motor does not provide the required strength and rigidity to handle the loads transmitted by the hydrofoil. *Id.* (“the existing shaft is not enough to give the desired strength and



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rigidity.”) To provide additional strength, a wing shaped structure is added around the existing shaft to form the strut. Ex-1003-Evoloreport at 276 (“To solve this problem, the profile is used as a load-bearing structure together with the steel shaft.”). The strut, formed by the wing shaped profile and the steel shaft, is connected to the floatation device by a base plate. Ex-1003-Evoloreport at 277 (“The function of the base plate is to transmit the forces and torques absorbed by both the shaft and the profile to the floating body.”) Ex-1002-Brizzolara-Decl., ¶84.

The connection between the strut, the steel rod from the motor, and the motor pod is shown below (to avoid confusion, it should be noted that this drawing was previously used to display the indirect connection between the strut and hydrofoil

and there referred to the steel rod and the wing shaped profile together as the strut, here the distinction is made to differentiate the two parts forming the strut). Ex-1003-EvoloReport at 371.

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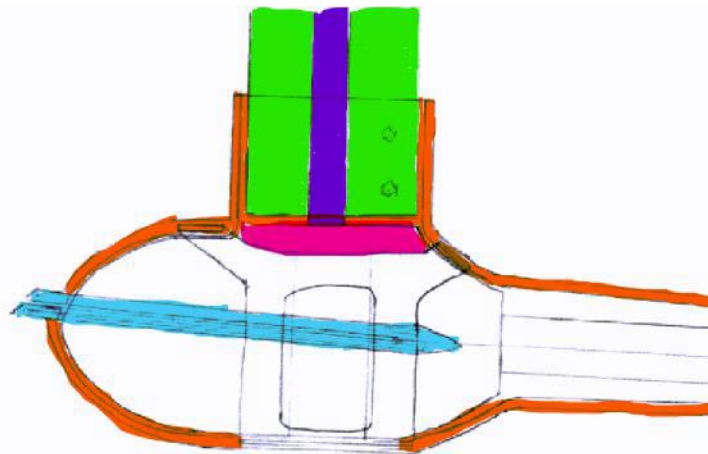


Figure 1. Drawing of "Easter egg solution" in profile. The flange visible in the center should be straight to facilitate manufacturing. The aluminum reinforcement drawn according to the hydrofoil and stay report does not need to be used.

Therefore, EvoloReport discloses a watercraft having a strut that is directly connected to the propulsion system (electric motor) by way of the steel rod extending from the motor. Ex-1002-Brizzolara-Decl., ¶85.

7. Claim 10: A watercraft in accordance with Claim 7, wherein the hydrofoil comprises a plurality of wings that are interconnected by way of a strut.

EvoloReport discloses a watercraft having a hydrofoil comprising a plurality of wings that are interconnected by way of a strut. Ex-1002-Brizzolara-Decl., ¶86. Specifically, EvoloReport discloses a watercraft having a front hydrofoil and a rear

(“aft”) hydrofoil that are connected by way of a carbon fiber strut (e.g., the stay). Ex-1003-EvoloReport at 7 (“As can be seen in Figure 6 below, it was chosen to integrate the motor in **the front hydrofoil** and that the propeller is placed **behind the aft hydrofoil**. The propeller shaft runs from the motor to the propeller **inside a carbon fiber stay.**”).

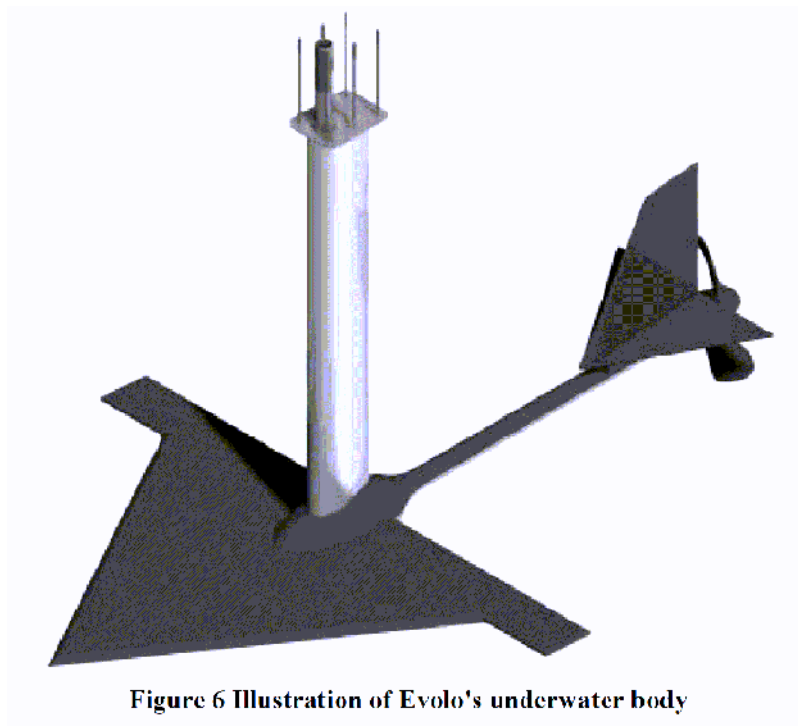


Figure 6 Illustration of Evolo's underwater body

As the front hydrofoil and the rear hydrofoil are connected via the motor pod and the rear strut, the front hydrofoil is interconnected to the rear hydrofoil by way of a strut. Ex-1002-Brizzolara-Decl., ¶86.

Furthermore, Woolley discloses a hydrofoil comprised of two wings – its front blade and rear blade – interconnected by way of a strut. Ex-1002-Brizzolara-Decl., ¶87.

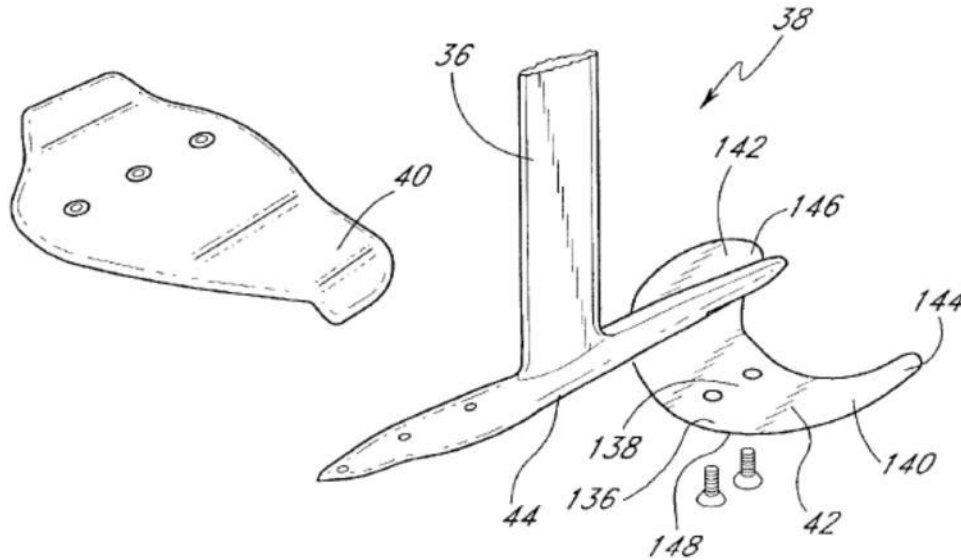
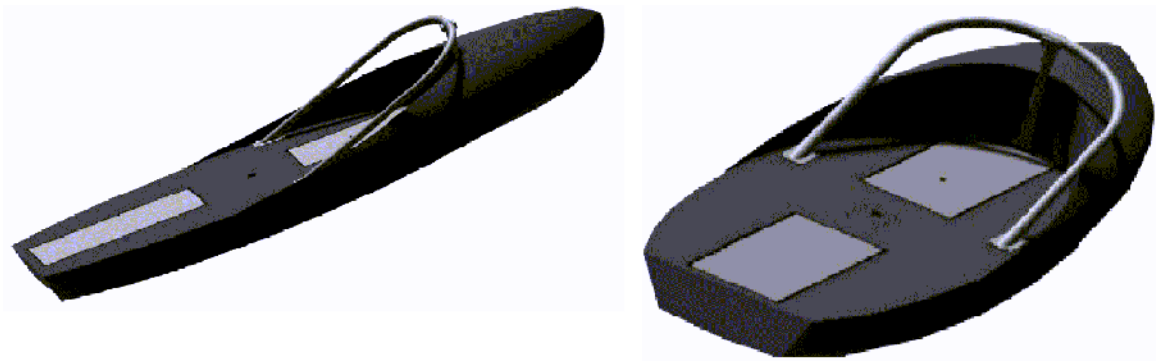


FIG. 7A

Ex-1003-Woolley at Fig 7A. Forward blade 40 and aft blade are interconnected via strut 44. Ex-1003-Woolley at 10:38-40 (“The planing blade or blade assembly 38 advantageously has a front blade 40 and a rear blade 42 interconnected by a fuselage 44.”). Ex-1002-Brizzolara-Decl., ¶87. Accordingly, POSITA would have found claim 7 rendered obvious by EvoloReport in combination with Woolley.

8. **Claim 11: A watercraft in accordance with claim 2, wherein the battery and motor speed controller are contained in a water-proof compartment integrated into the flotation device.**

Evoloreport discloses a watercraft having a waterproof compartment integrated into the flotation device. Ex-1002-Brizzolara-Decl., ¶89. The waterproof compartment of Evoloreport is shown by the grey plates in the below



Figures 11 and 12. Ex-1003-Evoloreport at 550; 327 (“this throttle should be placed **inside the waterproof battery container** that encloses the top of the mounting of the strut.... This is the critical point of the cable routing due to the fact that **the battery container must be waterproof.**”)

These waterproof compartments house the batteries. Ex-1003-Evoloreport at 550 (“The floating body has sufficient volume to be able to stay afloat with the driver. **It should also have room for batteries.**”). Ex-1002-Brizzolara-Decl., ¶89.

Evoloreport further discloses including additional electronics (i.e., the throttle, lanterns, and a display screen) in the waterproof battery compartment. Ex-

1003-EvoloReport at 327 (“this throttle should be placed **inside the waterproof battery container** that encloses the top of the mounting of the strut.”); Ex-1003-EvoloReport at 524 (“A slightly larger volume is also required for other reasons **such as containing batteries and electronics**. The vision is that **this volume should also be able to contain a waterproof storage compartment, a clear LCD screen with information about speed, battery level, depth, position, etc., and lanterns.**”). Although EvoloReport discusses incorporating both the throttle and batteries into the waterproof compartment, EvoloReport specifically chooses to use a Torqeedo motor largely because the Torqeedo was already available and was provided with all the required components in a preassembled package. Ex-1003-EvoloReport at 180 (“The motor available today is a Torqeedo Cruise 2.0R....The **advantages of this system are that it is a complete driveline. Control systems are available and can be modified to work on Evolo.**”); Ex-1003-EvoloReport at 490 (“There are several options on the market today in terms of **ready-made electric motor concepts** for marine use. The method would be to source a product... then **remove the excess parts to build the motor and electrical system into the Evolo’s design.**”) Ex-1002-Brizzolara-Decl., ¶91.

EvoloReport does not specifically disclose whether the motor speed controller is contained within the waterproof motor pod or within the waterproof battery container as EvoloReport drafters purposely chose the already completed Torqeedo

motor unit. Ex-1003-EvoloReport at 8 (“[The throttle] is designed like a bicycle brake, see Appendices 20 and 44, and **its wiring is passed through the** strut down to the motor and its control unit.”); Ex-1003-EvoloReport at 181 (“When it comes to controlling the motors, there is no major difference as Torqeedo’s options include complete systems and VIAB’s only need some form of potentiometer to regulate the current.”); Ex-1003-EvoloReport at 498 (“Since most industrial and marine motors on the market, eg Torqeedo, are asynchronous motors there is a need to summarize their function and control... Since the motor control of asynchronous motors is of a control technology type and that the skills required to manufacture an own system are not available in the project today, it is strongly recommended to purchase an already completed system, adapted to the motor that is finally chosen for Evolo.... Due to the complexity of motor control of asynchronous motors, it is strongly recommended to use the motor manufacturer’s own control system.”); Ex-1002-Brizzolara-Decl., ¶92.

EvoloReport discloses obtaining alternative engine systems and that a control unit would need to be obtained and connected with the chosen motor. Ex-1002-Brizzolara-Decl., ¶93. Ex-1003-EvoloReport at 189 (“The purpose of this study is to make a benchmarking of what opportunities there are to develop your own motor solution instead of modifying an existing one and what consequences and opportunities it gives the project.... **Another challenge is that such an motor**

requires control. This is not built yourself.”); Ex-1003-EvoloReport at 193 (“The company could also sell a control unit for about 350 dollars plus shipping.... **The advantage of these motors is that they are completely ready and “only “ to integrate and connect with a control unit.”**”). EvoloReport also discusses integrating a control unit (i.e., a potentiometer) near the handle mounted throttle control. Ex-1002-Brizzolara-Decl., ¶94. Ex-1003-EvoloReport at 184 (“This has a great advantage in view of the fact that **the potentiometer, or control unit for the motor, can be placed separately from the handle** and that the handle can then be moved more easily.... The cable to the potentiometer can be selected as a regular bicycle brake cable. **If the motor is a torquedo, the wiring to the motor bulb**, which is an ordinary telephone cable with connectors at the ends, can be easily spliced and extended, which **provides easy movement and separation of handles, control unit and motor.”**) Ex-1003-EvoloReport at 185-186 (“The components are easy to procure or manufacture and **allow a wide variety of final placement**. However, **the control itself should not be made too far** as it will then be pulled obliquely if you do not apply the throttle in the middle of the control.”).

Further, EvoloReport states that the throttle control for the Torquedo motor, should logically be located in the waterproof battery container to ensure that the throttle control will always be dry. Ex-1003-EvoloReport at 327 (“Preliminarily,

this **throttle control should be placed inside the waterproof battery container** that encloses the top of the mounting of the strut. This means that **the throttle control will always be dry and is currently the logical choice....** This is the critical point of the cable routing due to the fact **that the battery container must be waterproof** and the cable must be pulled in such a way that they do not destroy it.”). Ex-1002-Brizzolara-Decl., ¶95. EvoloReport thus teaches that it is important to keep sensitive electronics, such as the batteries and throttle controls, dry to prevent water damage.

Accordingly, a POSITA would have been motivated, based on EvoloReport’s own teachings, to incorporate the motor speed controller into the waterproof compartment of the flotation device if a preassembled waterproof engine were not used. Ex-1002-Brizzolara-Decl., ¶96.

9. Claim 12: 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.

EvoloReport discloses a watercraft having an electric motor integrated in a waterproof, streamlined pod. Ex-1002-Brizzolara-Decl., ¶97.; *See* Ex-1003-EvoloReport at 492, Fig. 2.



In EvoloReport, the structure of the Torqeedo motor is altered such that only the waterproof pod housing and vertical steel rod that houses the cables are retained from the stock image of the Torqeedo motor shown above. Ex-1003-EvoloReport at 276 (“There are several options on the market today in terms of **ready-made electric motor concepts for marine use**. The method would be to source a product... then **remove the excess parts to build the motor and electrical system into the Evolo’s design.**”); Ex-1002-Brizzolara-Decl., ¶96. EvoloReport retains the waterproof, streamlined pod of the Torqeedo motor and removes the lower fin, propeller, and upper controls to allow the motor to be integrated into the motor pod mountings. Ex-1002-Brizzolara-Decl., ¶96.

Additionally, the disclosed Torqeedo 4.0 R includes a cooling system. Ex-1003-EvoloReport at 257 (“...holes in the mold must be left around the center of the motor because **the cooling to the motor is there....**aluminum plates must be ast into the mold around **the motor’s cooling part.**”) Ex-1002-Brizzolara-Decl., ¶97.

Evoloreport further discloses constructing a streamlined, watertight housing having a cooling system for the motor in the event a completed marine motor was unavailable. Ex-1003-Evoloreport at 515 (“If an option not initially adapted to drive a propeller in water is chosen, **the motor must be built into some kind of watertight housing.** Construction of such must be verified, **both in terms of strength and resistance contribution to the craft but also in terms of function such as cooling** and that it holds tight.”). Ex-1002-Brizzolara-Decl., ¶97.

Evoloreport therefore discloses a watercraft having an electric motor that is integrated into a waterproof, streamlined pod and the watercraft comprises a cooling system. Ex-1002-Brizzolara-Decl., ¶97.

10. Claim 13: A watercraft in accordance with claim 2, wherein the electric motor is removably interconnected with the hydrofoil through a fitting.

Evoloreport discloses a watercraft having an electric motor that is removably interconnected to the hydrofoil through a fitting. Ex-1002-Brizzolara-Decl., ¶98; Ex-1003-Evoloreport at 256-257 (“...the **hydrofoil must be fixed to the motor without the use of glue or screws.** To solve this the easiest way, we recommend molding the entire underwater body into two parts. These parts are then **enclosed around the motor so that the hydrofoil is prevented from shifting in all degrees of freedom...**In addition, the shape should be **fixed by screws to the fin that usually sits under the bulb.**”). The hydrofoil is formed with a center cut out allowing the

hydrofoil to be mounted on the flange of the motor pod, which sections are then sized to fit around the electric motor. Ex-1002-Brizzolara-Decl., ¶98. Ex-1003-EvoloReport at 271 (“The mounting of the front hydrofoil and the strut with the motor is done by **bolting the hydrofoil against the flange located on the motor pod.**”) Thus, the hydrofoil is designed to be removably attached with bolts to the motor pod which is designed to wrap around the electric motor. Ex-1003-EvoloReport at 271.

Accordingly, EvoloReport discloses an electric motor removably interconnected with the hydrofoil through a fitting. Ex-1002-Brizzolara-Decl., ¶98.

11. Claim 14: A watercraft in accordance with claim 10, wherein the first hydrofoil wing includes winglets extending at an angle to a main body of the first hydrofoil wing.

Woolley teaches that the first hydrofoil wing contains winglets that extend at an angle to a main body of the first hydrofoil wing. Ex-1002-Brizzolara-Decl., ¶99., Ex-1011-Woolley at 11:17-19 (“The valleys 116, 118 **terminate into stabilizing fins 120, 122** that extend downward and away from the seated rider.”).

Figure 9A shows a front view of the planing blade 40, shown in Figure 8A, below.

Ex-1011-Woolley, 4:65-67 (“FIG. 8A is an exploded perspective view of another preferred embodiment of a planning blade for the ski of FIG. 1”), Ex-1011-

Woolley, 5:3-4 (“FIG.9A is a front elevational view of a front planing blade for the ski of FIG. 1”).

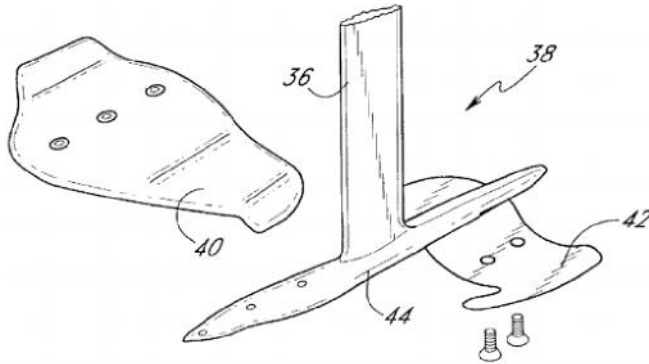


FIG. 8A

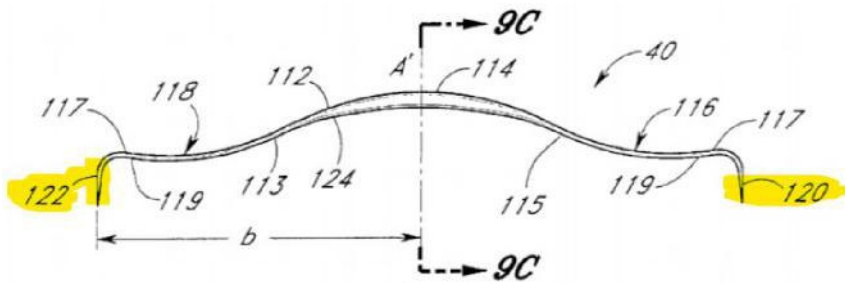


FIG. 9A

Accordingly, Woolley teaches the use of winglets extending away from the main body of the first hydrofoil wing to provide stability to the watercraft. Ex-1002-Brizzolara-Decl., ¶99.

12. **Claim 15: A watercraft in accordance with claim 11, 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.**

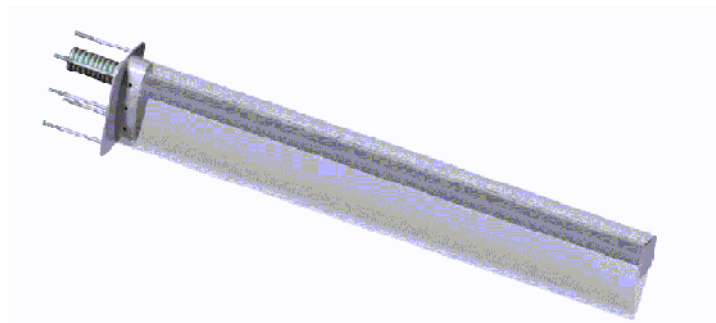
Evoloreport discloses or renders obvious a watercraft comprising a wireless handheld controller having a transmitter, and a throttle interface having a receiver, wherein the transmitter is adapted to send wireless signals to the receiver that cause an output of the propulsion system (motor) to change. Ex-1002-Brizzolara-Decl., ¶100. Ex-1003-Evoloreport at 524 (“The handles have controls for the engine and dead man’s switch. For even greater freedom, you should be able to remove the stays for the handles completely and disconnect the handles, **which can then regulate the motor wirelessly.**”) Although wireless control of the motor was not implemented in the final design of Evoloreport, it was clearly contemplated in the early design stages of the project. Therefore, the authors of Evoloreport, who contain less skill than a POSITA, were motivated to incorporate a wirelessly controlled motor. Ex-1002-Brizzolara-Decl., ¶¶100-101.

A POSITA would have had the knowledge and experience to incorporate a wirelessly controlled motor via a handheld transmitter and throttle interface receiver as this is the primary way to incorporate a wireless control device to operate an electric motor. Ex-1002-Brizzolara-Decl., ¶101. Therefore, a POSITA would have

been motivated to modify the watercraft of Evolo to incorporate the wireless motor control that is discussed in Evolo-Report's conceptual design to yield predictable results (a wirelessly controlled watercraft). Ex-1002-Brizzolara-Decl., ¶101. A POSITA would have a reasonable expectation of success given that remote control technology was well known at the time and incorporating a remote control is well within the skill of a POSITA. Ex-1002-Brizzolara-Decl., ¶101.

13. Claim 17: A watercraft in accordance with claim 1, wherein the hydrofoil is spaced a fixed distance apart from the flotation device.

EvoloReport discloses a watercraft having a hydrofoil that is indirectly connected to the flotation device by a fixed length strut. Ex-1002-Brizzolara-Decl., ¶102. *See* Ex-1003-EvoloReport Fig.5 at 275. The strut is made from carbon fiber and includes a steel rod at its core. Ex-1003-EvoloReport at 9 (“The strut is the part that connects the floating body and the hydrofoil.”).



Further, the hydrofoil is intended to operate at a depth of approximately 830 mm below the flotation device. Ex-1003-EvoloReport at 275 (“By using this shaft, the design is modified to suit Evolo’s purpose, in which case the shaft must be extended to give Evolo the desired de[pth] of 830 mm.”) Thus, EvoloReport discloses a hydrofoil that is spaced a fixed distance (830 mm) apart from the flotation device. Ex-1002-Brizzolara-Decl., ¶103.

14. Claim 18: A watercraft in accordance with claim 15, wherein the strut has an internal passage and electrical wires extend from the electric motor to the waterproof compartment inside the strut through the internal passage for controlling the electric motor.

EvoloReport discloses that the strut contains an internal passage to allow electrical wires to extend from the electric motor to the waterproof compartment through the internal passage. Ex-1002-Brizzolara-Decl., ¶104. Ex-1003-EvoloReport at 14 (“The metal bar **is part of the original engine structure** and is retained as it provides a guaranteed watertight link down to the engine bulb.”) As described above at Section IX.A.13, the strut includes the hollow rod that links the electric motor to the battery compartment. Ex-1003-EvoloReport at 276.

The strut is then connected to the flotation device by bolting a base plate to the flotation device. Ex-1003-EvoloReport at 275 (“The existing motor construction consists of the motor unit which is linked to the steering by means of a 750 mm long steel shaft with an outer diameter of 35 mm, **through which shaft control cables and power cables run.**”); Ex-1003-EvoloReport at 276 (“**Note the hole for the cables at the aft towards the battery boxes [3],** as well as the threaded upper part of the shaft....The function of the base plate is to transmit the forces and torques absorbed by both the shaft and the profile to the floating body.”) Ex-1002-Brizzolara-Decl., ¶105. As shown below, the rod contains a passage to allow for



Figure 2. Steel shaft from motor.

cables to be routed from the motor to the battery and controls to provide power and control signals to the motor. Ex-1003-EvoloReport at 276.

EvoloReport therefore discloses a watercraft having a strut with an internal passage and electrical wires extending from the electric motor to the waterproof compartment inside the strut through the internal compartment for controlling the electric motor. Ex-1002-Brizzolara-Decl., ¶106.

15. Claim 20: A watercraft in accordance with claim 11, wherein the electric motor is a brushless motor.

Evoloreport discloses using a brushless electric motor (the Torqeedo Cruise 2.0) in the watercraft's propulsion system. Ex-1002-Brizzolara-Decl., ¶107., Ex-1003-Evoloreport at 498 (“...an asynchronous motor is a type of alternating current motor. It is unique in that **it lacks directly connected parts and carbon brushes...it is an asynchronous motor that is now being investigated in the project, Torqeedo Cruise 2.0.**”).

16. Claims 21: A watercraft in accordance with claim 1, wherein the propulsion system is directly or indirectly connected to the hydrofoil.

To the extent this claim provides limitations in excess of Claim 1, Evoloreport discloses a hydrofoil that is directly or indirectly connected to the propulsion system. Ex-1002-Brizzolara-Decl., ¶108. Evoloreport discloses a watercraft having a propulsion system (an electric motor) and a hydrofoil in which the hydrofoil is directly or indirectly connected to the propulsion system by a flange located on the motor pod. Ex-1003-Evoloreport at 271 (“The mounting of the front hydrofoil and the strut with the motor is done by **bolting the hydrofoil against the flange located on the motor pod.**”); Ex-1003-Evoloreport at 370 (“The proposal is to partly **build the “sleeve” around the motor** so that it goes up a few centimeters around the strut, and partly just **have a horseshoe-shaped, aluminum-reinforced**

flange around the sides and in front of the motor into which you can **fasten a loose hydrofoil** in the same way as on the experimental craft.”). Thus, EvoloReport discloses a watercraft having a propulsion system (the electric motor) and hydrofoil that are indirectly or directly connected. Ex-1002-Brizzolara-Decl., ¶108.

B. Ground 2

EvoloVideos in combination with Woolley renders claims 1, 5-8, 10, 17, and 21 obvious under 35 USC §103.

1. Claim 1

- (a) [1Preamble] A passively stable, weight-shift controlled personal hydrofoil watercraft, comprising:

EvoloVideos refers to the collection of three separate videos, Ex-1006-EvoloVideos-ProtoypeRun, Ex-1008-EvoloVideos-EvoloMovie, and Ex-1010-EvoloVideos-Torqueedo. A POSITA would have been motivated to combine the disclosures of these three videos because the videos are related to the disclosure of the same information – the development of the Evolo Project. Ex-1002-Brizzolara-Decl., ¶110.

To the extent that the preamble of Claim 1 is limiting, EvoloVideos discloses a weight-shift controlled personal hydrofoil water.



Ex-1006-EvoloVideos-PrototypeRun at 1:21. Ex-1002-Brizzolara-Decl., ¶110. EvoloVideos disclose a single person on a watercraft utilizing weight-shift to control the watercraft. Ex-1006-EvoloVideos-PrototypeRun at 1:21. Ex-1002-Brizzolara-Decl., ¶110. As discussed further at IX.B.1(f), to the extent that the EvoloVideos do not sufficiently disclose a watercraft that is passively stable, it would have been obvious to a POSITA to modify the watercraft disclosed in the EvoloVideos to make it passively stable. Ex-1002-Brizzolara-Decl., ¶110.

- (b) [1A1] a floatation device that has a fore-aft length greater than a lateral width, the floatation device having a top surface and a bottom surface,;

EvoloVideos discloses a floatation device that has a fore-aft length greater than a lateral width, with the floatation device having a top surface and a bottom surface. Ex-1002-Brizzolara-Decl., ¶111.

EvoluVideos disclose a floatation device having a fore-aft length greater than the lateral width.



Ex-1006-EvoluVideos-PrototypeRun at 0:27 – 0:30. EvoluVideos disclose that the floatation device has a top surface and a bottom surface.



Ex-1006-EvoloVideos-PrototypeRun at 0:09. Ex-1002-Brizzolara-Decl., ¶111.

- (c) [1A2] wherein a user can be disposed on the top surface of the flotation device in a prone, kneeling, or standing position,;

EvoloVideos discloses a watercraft where a user can be disposed in a kneeling position on the top of the surface of the flotation device.



Ex-1006-EvoloVideos-PrototypeRun at 1:21. Ex-1002-Brizzolara-Decl., ¶112.

- (d) [1A3] the floatation device having a forward section, a middle section, and a rear section;

The claim terms “a forward section, a middle section and a rear section” are referenced in the ‘044 patent as labels of the fore, middle, and aft sections of the floatation device. Ex-1001-USP044, 3:27-31; Fig. 1; Ex-1002-Brizzolara-Decl., ¶113. To the extent that the floatation device claimed in the ‘044 Patent “may be said to have” a forward section, middle section, and a rear section, EvoloVideos discloses a floatation device having such sections. Ex-1006-EvoloVideos-PrototypeRun at 0:09; Ex-1002-Brizzolara-Decl., ¶113.

- (e) [1B] 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.

Evolovideos discloses the use of a strut having an upper end and a lower end with the upper end fixedly interconnected with the flotation device between the middle section and the rear section of the flotation device.



Ex-1006-Evolovideos-PrototypeRun at 0:09; Ex-1002-Brizzolara-Decl., ¶114.

- (f) [1C] a hydrofoil fixedly interconnected with the lower end of the strut, the hydrofoil having no moveable surface and designed to provide passive static stability controlled solely by weight shift of the user

Evolovideos discloses a hydrofoil fixedly interconnected with the lower end of the strut. Ex-1006-Evolovideos-PrototypeRun at 0:09; Ex-1002-Brizzolara-Decl., ¶115.

Evolovideos further discloses that the hydrofoil has no moveable surface. Ex-1006-Evolovideos-PrototypeRun at 0:09; Ex-1002-Brizzolara-Decl., ¶116.

In Evolovideos, the user of the watercraft is shown to control the watercraft solely by the weight shift of the user. Ex-1006-Evolovideos-PrototypeRun at 0:50-1:00.



Ex-1006-Evolovideos-PrototypeRun at 1:53. Ex-1002-Brizzolara-Decl., ¶116.

A POSITA would have been motivated to combine the watercraft disclosed in the Evolovideos with Woolley to provide for a passively stable hydrofoil. Ex-1002-Brizzolara-Decl., ¶117.

As disclosed in Section IX.A.1(f), Woolley discloses a hydrofoil fixedly interconnected with the lower end of a strut, the hydrofoil having no moveable

surface and designed to provide passive static stability controlled solely by weight shift of the user.

- (g) [1D] a propulsion system for propelling the watercraft in a body of water, wherein the propulsion system is connected to the hydrofoil; and

Evolovideos disclose a propulsion system for propelling the watercraft in a body of water, wherein the propulsion system is connected to the hydrofoil.



Ex-1006-Evolovideos-PrototypeRun at 0:09; Ex-1002-Brizzolara-Decl., ¶118.

- (h) [1E] the watercraft having no movable steering system.

The watercraft disclosed by the EvoloVideos has no movable steering system.

Ex-1002-Brizzolara-Decl., ¶119.

2. **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.

The hydrofoil disclosed by Woolley provides passive static stability through a combination of airfoil design, planform design and tailoring of span-wise twist distribution as previously discussed in Section IX.A.3. Ex-1002-Brizzolara-Decl., ¶121.

- 3. Claim 6: A watercraft in accordance with claim 1, wherein the hydrofoil is wing shaped with a front edge and a rear edge that both curved rearwardly.**

As discussed previously in Section IX.A.4, Woolley further discloses a hydrofoil in which the front and rear edges are curved rearwardly. Ex-1002-Brizzolara-Decl., ¶122.

- 4. Claim 7: A watercraft in accordance with claim 1, wherein the hydrofoil is indirectly connected to the strut.**

Evolovideos shows a watercraft having a hydrofoil that is indirectly connected to the strut. Ex-1008-Evolovideos-Evolomovie, 1:42. Ex-1002-Brizzolara-Decl., ¶123.



The red circle above depicts the mounting point between the hydrofoil and the motor pod housing, which is further shown in a partially disassembled state, below. Ex-1010-Evolovideos-Torquedo, 0:23. Ex-1002-Brizzolara-Decl., ¶123.



The motor pod is then reassembled with the top and bottom sections encasing the motor. Ex-1010-EvoloVideos-Torqueedo, 0:25; Ex-1002-Brizzolara-Decl., ¶123.



The hydrofoil is then bolted onto the flange that extends around the motor pod to secure the two halves of the motor pod and the hydrofoil. Ex-1010-EvoloVideos-Torqueedo, 0:28; Ex-1002-Brizzolara-Decl., ¶123.



The top half of the motor pod is integrally formed with the strut as shown. Ex-1010-EvoloVideos-Torqueedo, 0:27; Ex-1002-Brizzolara-Decl., ¶123.



As the hydrofoil is directly connected (bolted) to the flange of the motor pod and not the strut, the hydrofoil is indirectly connected to the strut via the motor pod. Ex-1002-Brizzolara-Decl., ¶124.

5. Claim 8: A watercraft in accordance with claim 7, wherein the strut is directly connected to the propulsion system.

EvoloVideos depict a watercraft wherein the strut is directly connected to the propulsion system. Ex-1002-Brizzolara-Decl., ¶125. EvoloVideos-Torqeedo depicts installation of a Torqeedo motor by routing the top rod of the motor through the strut such that the rod of the motor becomes a part of the strut. Ex-1010-EvoloVideos-Torqeedo, 0:00-0:01.



Ex-1002-Brizzolara-Decl., ¶125. As shown, the rod connecting the motor to the motor controls and battery is being inserted into the strut to allow the motor pod to be closed around the motor. Ex-1010-EvoloVideos-Torqeedo. As shown above,

with respect to Claim 7, the motor is encapsulated by the top and bottom sections of the motor pod. *See* Section IX.B.4. The assembled motor pod is displayed below and shows the top section of the motor pod (inverted) integrally formed with the strut. Ex-1010-EvoloVideos-Torqueedo, 0:28. Ex-1002-Brizzolara-Decl., ¶125.

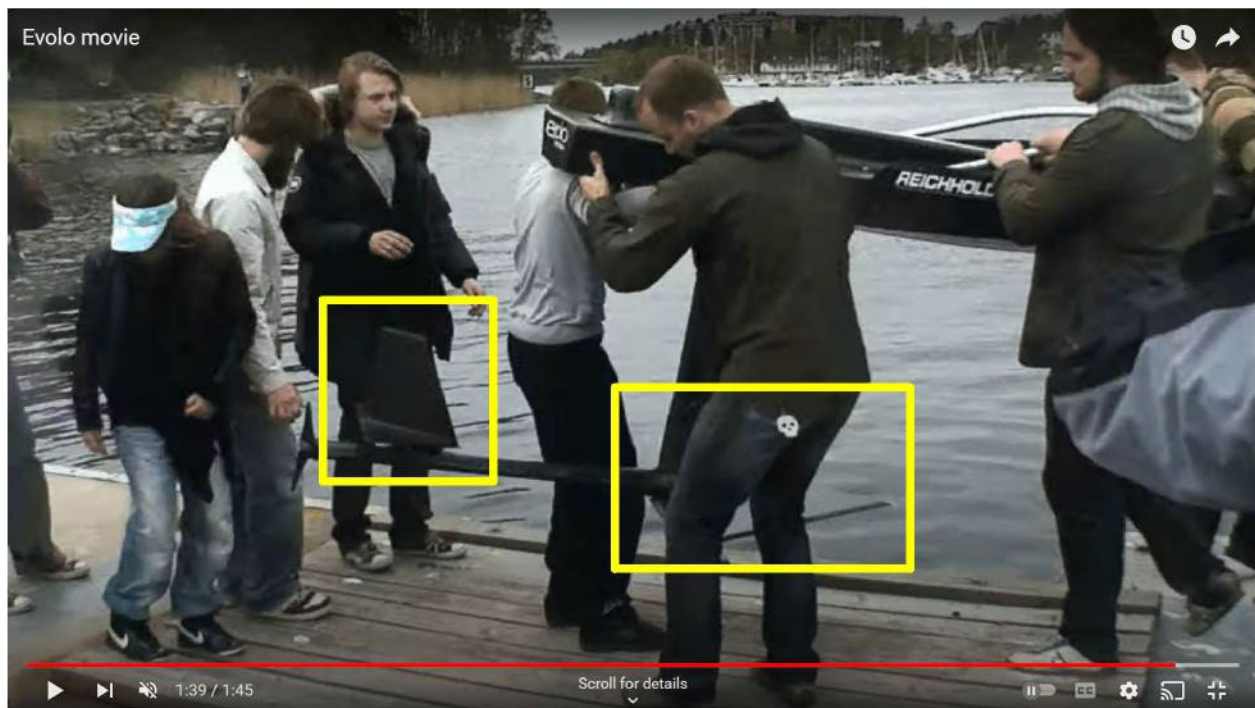


As the metal rod that is connected to the engine extends through the hollow strut, EvoloVideos-Torqueedo discloses a watercraft in which the propulsion system (electric motor) is directly connected to the strut. Ex-1002-Brizzolara-Decl., ¶125.

6. Claim 10: A watercraft in accordance with Claim 7, wherein the hydrofoil comprises a plurality of wings that are interconnected by way of a strut.

As discussed previously in Section IX.A.7, Woolley discloses a hydrofoil comprised of two wings – its front blade and rear blade – interconnected by way of a strut. Ex-1002-Brizzolara-Decl., ¶126.

Furthermore, Ex-1008-EvoloVideos-EvoloMovie shows a watercraft having a hydrofoil comprised of a plurality of wings connected by a strut. Ex-1008-EvoloVideos-EvoloMovie, 1:39.



As shown above, EvoloVideos-EvoloMovie displays a watercraft having a hydrofoil composed of a front and a rear wing. Ex-1002-Brizzolara-Decl., ¶127. The rear wing is mounted on a strut that leads to the motor pod, which is connected to

the hydrofoil. Ex-1002-Brizzolara-Decl., ¶127. Therefore, the rear wing is connected to the front wing of the hydrofoil by a strut. Ex-1002-Brizzolara-Decl., ¶127. Accordingly, the combination of the watercraft disclosed by EvoloVideos and Woolley discloses this element. Ex-1002-Brizzolara-Decl., ¶127.

7. Claim 17: A watercraft in accordance with claim 1, wherein the hydrofoil is spaced a fixed distance apart from the flotation device.

EvoloVideos-Prototype-Run depicts a watercraft wherein the hydrofoil is spaced a fixed distance apart from the flotation device. Ex-1002-Brizzolara-Decl., ¶128. The Evolo-Prototype-Run contains a fixed distance strut that links the flotation device to the motor and hydrofoil as shown below. Ex-1006-EvoloVideos-PrototypeRun, 0:09.



As shown above, the strut provides a fixed distance between the flotation device and the hydrofoil. Ex-1002-Brizzolara-Decl., ¶128.

8. Claim 21: A watercraft in accordance with claim 1, wherein the propulsion system is directly or indirectly connected to the hydrofoil.

To the extent that Claim 21 is limiting in excess of Claim 1, EvoloVideos-PrototypeRun discloses a propulsion system directly connected to the hydrofoil. Ex-1002-Brizzolara-Decl., ¶129.

C. Ground 3

EvoloVideos in combination with Woolley and TorqeedoManual renders claims 2, 11-14, and 20 obvious under 35 USC §103.

1. Claim 2: 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.

EvoloVideos disclose an electric powered watercraft. Ex-1008-EvoloVideos-EvoloMovie, 0:11; Ex-1002-Brizzolara-Decl., ¶131.



EvolosVideos discloses an electric watercraft having a battery compartment and a propeller. Ex-1006-EvolosVideos-PrototypeRun, 0:09; Ex-1002-Brizzolara-Decl., ¶131.



As shown in EvoloVideos-PrototypeRun, the disclosed watercraft contains a raised compartment to store the batteries. Ex-1006-EvoloVideos-PrototypeRun; Ex-1002-Brizzolara-Decl., ¶131. The electric motor is housed in the motor pod at the bottom of the strut and powers the propeller located at the rear of the lower section. Ex-1006-EvoloVideos-PrototypeRun; Ex-1002-Brizzolara-Decl., ¶131.

EvoloVideos-Torqueedo shows the installation of the Torqeedo 4.0 R electric motor into the motor pod of the watercraft. Ex-1010-EvoloVideos-Torqueedo, 0:23 (showing the installation of the motor into the motor pod); Ex-1002-Brizzolara-Decl., ¶132.



EvoloVideos-Torqeedo further depicts the Torqeedo motor causing rotation of a propeller. Ex-1010-EvoloVideos-Torqeedo, 0:40-0:50; Ex-1002-Brizzolara-Decl., ¶132.



TorqeedoManual describes that the motor and the motor speed controller (electronic control system) of Torqeedo motors are located in the lower pylon. Ex-1014-TorqeedoManual at 23 (“The motor and the electronic control system are located in the pylon.”). Further, TorqeedoManual states that Torqeedo Cruise model motors can be operated by battery power. Ex-1014-TorqeedoManual, p.13 (“The Cruise models can be operated with lead-acid, lead-gel, AGM or lithium-based batteries.”). Ex-1002-Brizzolara-Decl., ¶133.

A POSITA would have been motivated to combine the teachings of the TorqeedoManual with the EvoloVideos. Ex-1002-Brizzolara-Decl., ¶¶134-137. First, each of these references relate to electric powered water vehicles. Ex-1014-TorqeedoManual at 7 (“We, Torqeedo GmbH, with sole responsibility, declare the

conformity of the Cruise 2.0 product range with the following provisions: Small water vehicles”); Ex-1002-Brizzolara-Decl., ¶135. Further, the watercraft shown in the EvoloVideos uses a torqeedo brand motor. Ex-1010-EvoloVideos-Torqeedo. Ex-1002-Brizzolara-Decl., ¶135 Second, EvoloVideos-Torqeedo depicts the installation of a Torqeedo motor into the disclosed watercraft. Ex-1010-EvoloVideos-Torqeedo. Ex-1002-Brizzolara-Decl., ¶136

As such, a POSITA would have understood that the watercraft disclosed in the EvoloVideos all show a watercraft containing batteries, an electric motor, a motor speed controller (electronic control system), and a propeller. Ex-1002-Brizzolara-Decl., ¶137.

2. Claim 12: 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.

EvoloVideos-Torqeedo and TorqeedoManual disclose that the electric motor is integrated into a waterproof, streamlined pod and the watercraft comprises a cooling system. Ex-1002-Brizzolara-Decl., ¶138.; Ex-1010-EvoloVideos-Torqeedo 0:01, Ex-1014-TorqeedoManual.



As shown above, EvoloVideos-Torqeedo depicts installation of the Torqeedo motor into a streamlined pod of the watercraft. *See generally* Ex-1010-EvoloVideos-Torqeedo.

TorqeedoManual describes that Torqeedo motors contain temperature protection measures that will reduce the motor speed to allow the motor to cool off (a cooling system). Ex-1014-TorqeedoManual (“If the motor overheats, **the motor control system reduces the output of the drive until a temperature equilibrium is established between generated and disposed heat.**”); Ex-1002-Brizzolara-Decl., ¶139. Further, the Torqeedo 4.0 that is being installed is a marine motor that is intended to be used underwater and is therefore waterproof. Ex-1014-

TorqueedoManual; Ex-1002-Brizzolara-Decl., ¶140. Accordingly, EvoloVideos and TorqedoManual disclose where the electric motor is integrated into a waterproof, streamlined pod and the watercraft comprises a cooling system. Ex-1002-Brizzolara-Decl., ¶141.

3. Claim 13: A watercraft in accordance with claim 2, wherein the electric motor is removably interconnected with the hydrofoil through a fitting.

EvoloVideos discloses a watercraft having an electric motor that is removably interconnected with the hydrofoil through a fitting. Ex-1002-Brizzolara-Decl., ¶142; Ex-1010-EvoloVideos-Torqedo, 0:01-0:28 (depicting installing an electric motor into a housing and mounting hydrofoil to the housing).



As shown above, the electric Torqeedo 4.0 R motor is installed by inserting the shaft extending upwards from the motor into the upper motor pod portion. Ex-1010-EvoloVideos-Torqeedo. Ex-1002-Brizzolara-Decl., ¶142. Next, the bottom motor pod portion is secured to the upper motor portion. Ex-1010-EvoloVideos-Torqeedo, 0:23-0:25. Ex-1002-Brizzolara-Decl., ¶142



Finally, the hydrofoil is bolted to the motor pod to secure the hydrofoil to the sections of the motor pod. Ex-1010-EvoloVideos-Torqeedo, 0:28. Ex-1002-Brizzolara-Decl., ¶144



The hydrofoil has a cutaway portion to allow the hydrofoil to wrap around the motor pod and attach to the flange on the front and both sides of the flange. Ex-1002-Brizzolara-Decl., ¶144.

As such, Evolo-Torqeedo depicts a watercraft in which the electric motor is removably interconnected through bolt connections to the hydrofoil by a fitting (fitted connection between the flange of the motor pod and the hydrofoil). Ex-1002-Brizzolara-Decl., ¶145.

4. **Claim 14: A watercraft in accordance with claim 10, wherein the first hydrofoil wing includes winglets extending at an angle to a main body of the first hydrofoil wing.**

As discussed above in Section IX.A.11, Woolley discloses the features of claim 14.

5. **Claim 20: A watercraft in accordance with claim 11, wherein the electric motor is a brushless motor.**

EvoVideos-Torqueedo discloses the elements of Claim 20. As explained above for Claim 13, EvoVideos-Torqueedo depicts installing a Torqueedo Cruise 4.0 R motor on the watercraft. See Claim 13, above at IX.C.3. The Torqueedo Cruise 4.0 R is a brushless electric motor. Ex-1002-Brizzolara-Decl., ¶147.

D. Ground 4

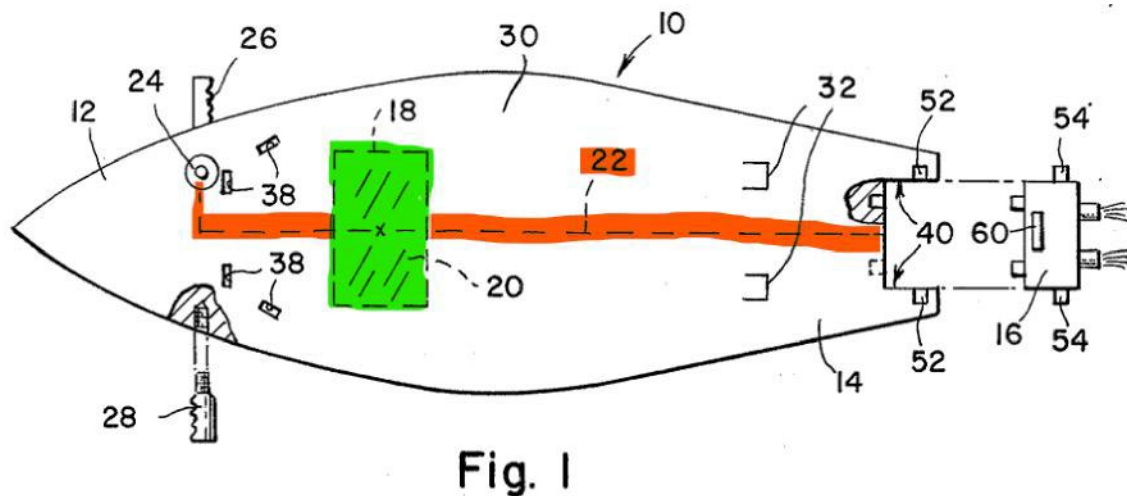
Claim 11 is rendered obvious under 35 U.S.C. §103 by the combination of EvoVideos, Woolley, TorqueedoManual, and Gleason.

1. **Claim 11: A watercraft in accordance with claim 2, wherein the battery and motor speed controller are contained in a water-proof compartment integrated into the flotation device.**

Gleason discloses a motorized surfboard having an electric motor that is powered by batteries located in a compartment of the board. Ex-1012-Gleason, 2:16-21 (“An electric storage battery 20 is positioned within the storage

compartment and is operatively connected with the motor 16 by means of electrical conductors 22), Ex-1012-Gleason at 2:39-46 (“Although not shown it

will be understood that speed control means can be incorporated with control means 24.... In the event that an electric motor is employed **any of the usual speed regulators can be provided.**") As shown below in Gleason Fig. 1, the battery 20 is located in a **container** within the flotation device (the surfboard deck 30) and connected to the motor **with electrical conductors 22.**



Ex-1012-Gleason at Fig1. Ex-1002-Brizzolara-Decl., ¶149.

Further, Gleason describes providing a motor speed controller (speed control means) for the electric motor along with the other controls to operate the electric motor. These are positioned along the **electrical conductors**, which pass through the battery **container** to connect the battery to the motor. Ex-1012-Gleason at Fig1. Ex-1002-Brizzolara-Decl., ¶150.

As shown below in the yellow highlighted section, EvoloVideos-PrototypeRun depicts a flotation device having a container for batteries within the

flotation device. Ex-1006-EvoloVideos-PrototypeRun, 0:09; Ex-1002-Brizzolara-Decl., ¶151.



A POSITA would have been motivated to combine the teachings of Gleason and EvoloVideos-PrototypeRun to create a watercraft having a motor speed controller and battery in a waterproof container within the flotation device for several reasons. Ex-1002-Brizzolara-Decl., ¶152.

First, EvoloVideos-PrototypeRun and Gleason are both related to electric powered watercraft intended for recreational use. Ex-1002-Brizzolara-Decl., ¶153. Second, EvoloVideos-PrototypeRun and Gleason both use a battery storage compartment within the flotation device of the watercraft that house a battery to power the electric motor. Ex-1002-Brizzolara-Decl., ¶153; Ex-1012-Gleason 2:16-

21 (“An electric storage battery 20 is positioned within the storage compartment and is operatively connected with motor 16....”). It is known that water damages electronics and therefore any electronics should be shielded from contact with water. Ex-1002-Brizzolara-Decl., ¶153. Ex-1014-TorqueedoManual at 5 (“However, you must not submerge the tiller and the shaft head and you must keep the plug contacts in the tiller dry. Submerging the tiller and the shaft can irreparably damage the electronics.”) A POSITA would therefore be motivated to keep the electronics in the watercraft dry.

Therefore, a POSITA would combine the teachings of Gleason with those of EvoloVideos to arrive at a watercraft in which the battery and motor speed controller are located in a waterproof container. Ex-1002-Brizzolara-Decl., ¶154.

E. Ground 5

Claim 15 and 18 are rendered obvious under 35 U.S.C. §103 by the combination of EvoloVideos, TorqueedoManual, Woolley, Gleason, and Manning.

- 1. Claim 15: A watercraft in accordance with claim 11, 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.**

Manning discloses a wireless handheld device that is intended to affect the output of a motor controller mounted to a water board. Ex-1013-Manning, 2:37-41

(“Another object of the invention is to provide a **power water board comprising a booster system electrically associated with a controller wherein said controller includes a wireless interface in communication with a remote module associated with a user.**”) As shown below, Manning teaches a hand-held apparatus that allows the user to control multiple functions of the board, including an output of the motor. Ex-1013-Manning at 9:24-28 (“For example, the resistive value of control lines (110) changes as control lines (110) **are stretched when a user makes a fist.** Such **changes are sensed by user module (120)** and the **appropriate booster system control signals are sent to controller (34).**”), Ex-1013-Manning at Fig.7.

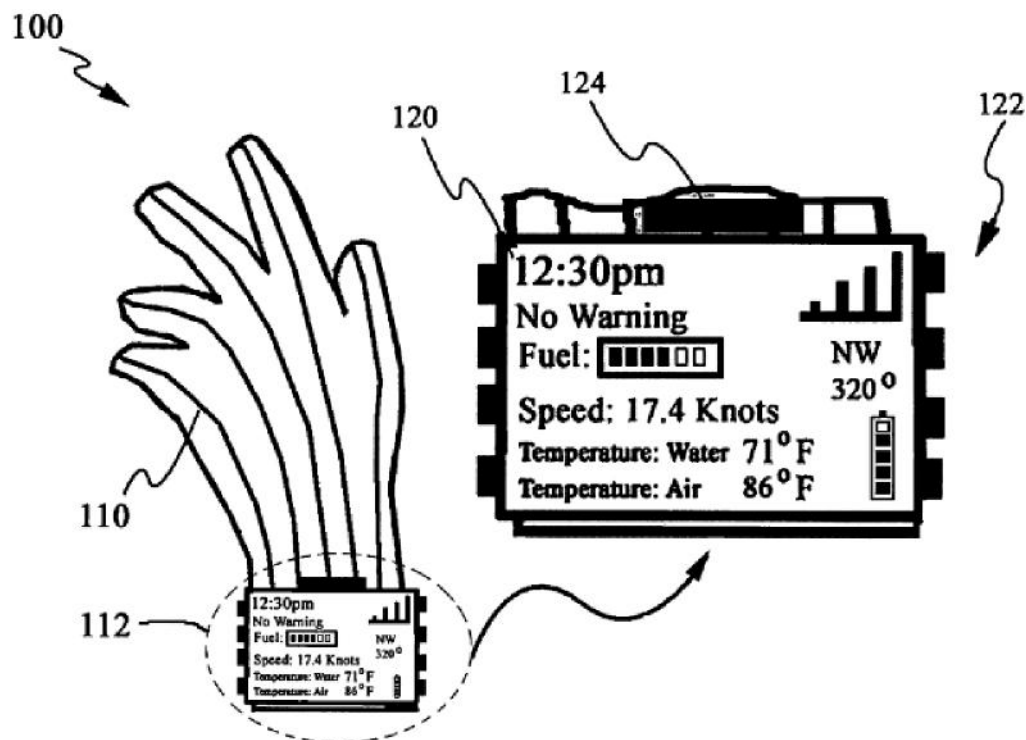
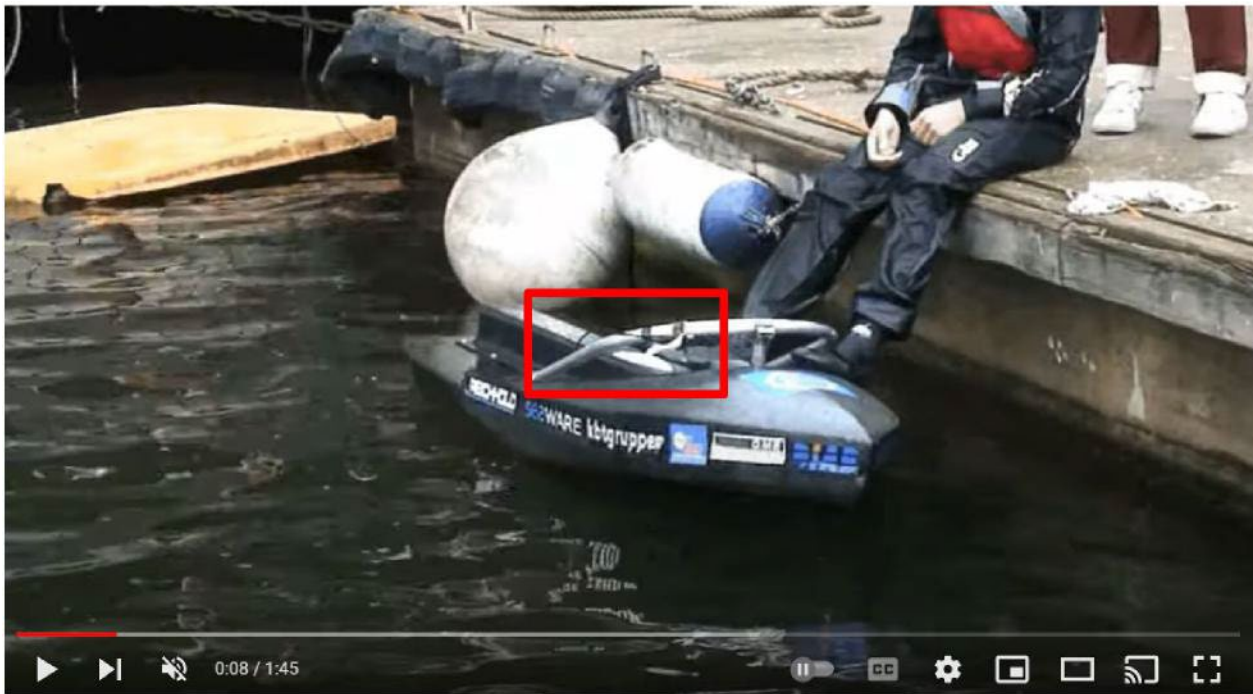


Fig. 7

Thus, Manning discloses using a handheld wireless controller having a transmitter (user module 120) to send signals via a transmitter to a throttle interface having a receiver (controller 34). Ex-1013-Manning, 9:24-28; Ex-1002-Brizzolara-Decl., ¶¶156-157.

A POSITA would have been motivated to combine the teachings of Manning with EvoloVideos with a reasonable expectation of success. Ex-1002-Brizzolara-Decl., ¶158.

First, Manning and EvoloMovies are all related to powered water sporting devices. *See, e.g.* Ex-1013-Manning, Ex-1006-EvoloVideos-PrototypeRun. Second, as the watercraft displayed in EvoloVideos-EvoloMovie uses a handle mounted throttle (shown in red box below), the user must constantly grip the handle at the specific location of the throttle. Ex-1008-EvoloMovies-EvoloMovie, 0:08.



By removing this limitation, a user would be able to grip the handles in whatever location is most comfortable and offers the most support and control. Ex-1002-Brizzolara-Decl., ¶159.

Third, wireless control devices were generally known in the art and it would be well within the skill of a POSITA to use a wireless connection to control the output of an electric motor. Ex-1002-Brizzolara-Decl., ¶160.

Therefore, a POSITA would have readily applied Manning's wireless handheld control device to the watercraft in EvoloVideos to yield predictable results (a wireless handheld controller having a transmitter and a throttle interface having a receiver, wherein the controller can cause an output of the propulsion system to

change). A POSITA would have combined EvoloVideos' and Manning's teachings with a reasonable expectation of success given that

Manning's wireless handheld controller would be used for its intended purpose of controlling the output of a motor on a watercraft. Ex-1002-Brizzolara-Decl., ¶161.

2. Claim 18: A watercraft in accordance with claim 15, wherein the strut has an internal passage and electrical wires extend from the electric motor to the waterproof compartment inside the strut through the internal passage for controlling the electric motor.

EvoloVideos teaches a strut having an internal passage and electrical wires extending from the electric motor to the waterproof compartment inside the strut through the internal passage for controlling the electric motor. Ex-1002-Brizzolara-Decl., ¶162; Ex.1010-EvoloVideos-Torqueedo, 0:30.



As depicted above, the strut contains a passage having electrical wires extending from the strut. Ex-1002-Brizzolara-Decl., ¶163. As described above with respect to Claim 13, the motor includes a rod for cables that is inserted into the strut and connects to the flotation device. See Section IX.C.3.

Evolovideos-PrototypeRun shows the watercraft in a completed state having the strut connected to the craft below the battery compartment. Ex-1002-Brizzolara-Decl., ¶164. Ex-1006-Evolovideos-PrototypeRun at 0:09.



As shown, the strut connects to the flotation device and provides an internal passage for the electrical wires between the battery compartment and the motor. Ex-1002-Brizzolara-Decl., ¶165.

XI. CONCLUSION

Petitioner respectfully requests institution of IPR to cancel claims 1, 2, 5-8, 10-15, 17-18, and 20-21.

Dated: June 6, 2024

Respectfully Submitted,

/ Alexander B. Stein /
Alexander B. Stein (Reg. No. 71,397)

Table of Exhibits for U.S. Patent 9,359,044 Petition for *Inter Partes* Review

Exhibit	Description
1001	U.S. Patent No. 9,359,044 (“’044 Patent”)
1002	Declaration of Stefan Brizzolara, Ph.D.
1003	Certified English Translation of Evolo slutrapport (“Evoloreport”)
1004	Affidavit of Bjorn Lofgren Regarding Translation of EvoloReport
1005	Swedish-Language Version of Evolo slutrapport
1006	YouTube.com , <i>Evolo prototype run</i> [https://www.youtube.com/watch?v=a-OCN50aWo&t=10s] (“Evoloprototypelrun”)
1007	Screenshot of EvoloPrototypelrun Page Information
1008	YouTube.com , <i>Evolo movie</i> [https://www.youtube.com/watch?v=zL9fO8tF118] (“Evolomovie”)
1009	Screenshot of EvoloMovie Page Information
1010	YouTube.com , <i>Test run – the new Torqeedo 4.0 R installed on Evolo!!!</i> [https://www.youtube.com/watch?v=fKOQ0JwQnjc] (“Evolotorqeedo”)
1011	U.S. Patent No. 6,443,786 (“Woolley”)
1012	U.S. Patent No. 4,020,782 (“Gleason”)
1013	U.S. Patent No. 8,290,636 (“Manning”)
1014	Torqeedo Motor Operating Manual for Torqeedo Cruise 2.0 S/L
1015	U.S. Patent No. 9,586,659 (“’659 Patent”)
1016	Prosecution History of ‘044 Patent
1017	Prosecution History of ‘659 Patent
1018	Declaration of Jakob Kutteneuler
1019	Affidavit of Ingmarie Rohdin Regarding English Language Translation of Batnytt Magazine Article; Swedish Language Version of Batnytt; English Translation of Båtnytt Magazine Article (“Batnytt”)

Petition for *Inter Partes* Review of U.S. Patent No. 9,359,044
IPR2024-00998

Exhibit	Description
1020	Affidavit of Ingmarie Rohdin Regarding Translation of Batnytt Magazine Viewership Information for 2009; Swedish Language Version of Batnytt Viewership Information; English Language Translation of Batnytt Viewership Information (“BatnyttViewership”)
1021	Internet Archive Declaration of Nathaniel E Frank-White
1022	Screenshot of EvoloTorquedo Page Information
1023	Claim Construction Order from <i>MHL CUSTOM, INC. v. WAYDOO USA, INC. and SHENZHEN WAYDOO INTELLIGENCE TECHNOLOGY CO., LTD</i> , C.A. No. 21-0091-RGA
1024	Email Correspondence with Foil’s Counsel

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §§ 42.6(e) and 42.105, lead counsel for Petitioner hereby certifies that on June 6, 2024, a copy of this Petition and all supporting exhibits was sent via Priority Mail Express to the correspondence address of record for the '044 patent:

Lerner David LLP
20 Commerce Drive, Suite 400
Cranford, NJ 07016
UNITED STATES

A courtesy copy of this Petition and all supporting exhibits were also served via email on June 6, 2024 on Patent Owner's counsel of record in *MHL Custom, Inc. v. Waydoo USA, Inc. et al*, DDE-1-21-cv-00091:

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Dated: June 6, 2024

Respectfully Submitted,

/ Alexander B. Stein /
Alexander B. Stein (Reg. No. 71,397)

WORD COUNT CERTIFICATE OF COMPLIANCE

I hereby certify that the foregoing contains 12,714 words as measured by the word processing software used to prepare the document, in compliance with 37 C.F.R. § 42.24(d).

Dated: June 6, 2024

Respectfully Submitted,

/ Alexander B. Stein /

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