

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LUXOTTICA OF AMERICA INC.,

Petitioner

v.

E-VISION OPTICS, LLC

Patent Owner

Case No. IPR2024-01071

Patent No. 8,905,541

**DECLARATION OF JAMES H. OLIVER, PHD IN SUPPORT OF PATENT
OWNER'S RESPONSE TO PETITION**

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EXHIBIT LIST

Exhibit	Description
2001	<i>eVision Optics, LLC and Vision Smart Optics, Inc. v. Luxottica Group S.P.A. and Luxottica of America Inc.</i> , Case No. 8:23-cv-02013 AB (SHK) Order Denying Defendants' Motion to Stay, Dkt. 75 (Aug. 21, 2024 C.D. Cal.)
2002	<i>eVision Optics, LLC and Vision Smart Optics, Inc. v. Luxottica Group S.P.A. and Luxottica of America Inc.</i> , Case No. 8:23-cv-02013 AB (SHK) Order Re Civil Jury/Court Trial, Dkt. 54 (April 4, 2024 C.D. Cal.)
2003	<i>eVision Optics, LLC and Vision Smart Optics, Inc. v. Luxottica Group S.P.A. and Luxottica of America Inc.</i> , Case No. 8:23-cv-02013 AB (SHK) Order Scheduling Additional Dates and Correcting Scheduling Order, Dkt. 58 (April 18, 2024 C.D. Cal.)
2004	<i>eVision Optics, LLC and Vision Smart Optics, Inc. v. Lenovo Group, Ltd., et al.</i> , Case No. 8:23-cv-01860 AB (SHK) Defendants' Preliminary Invalidity Contentions (July 19, 2024 C.D. Cal.)
2005	<i>eVision Optics, LLC and Vision Smart Optics, Inc. v. Luxottica Group S.P.A. and Luxottica of America Inc.</i> , Case No. 8:23-cv-02013 AB (SHK) Defendants' Invalidity Contentions (July 12, 2024 C.D. Cal.)
2006	<i>eVision Optics, LLC and e-Vision Smart Optics, Inc. v. Lenovo Group, Ltd. et al.</i> , Case No. 8:23-cv-01860-AB-SHK, Order re Civil Jury/Court Trial, Dkt. 54 (April 3, 2024 C.D. Cal.)
2007	Lex Machina – Federal Court – Federal District Court Cases in C.D. Cal, Pending Between 2019-09-01 and 2024-09-19
2008	Vacancies in the Federal Judiciary 118th Congress, last updated on 9/23/2024, https://www.uscourts.gov/judges-judgeships/judicial-vacancies/current-judicial-vacancies
2009	<i>eVision Optics, LLC and Vision Smart Optics, Inc. v. Luxottica Group S.P.A. and Luxottica of America Inc.</i> , Case No. 8:23-cv-02013 AB (SHK) Order Scheduling Additional Dates and Correcting Scheduling Order, Dkt. 58 (April 18, 2024 C.D. Cal.)
2010	<i>eVision Optics, LLC and e-Vision Smart Optics, Inc. v. Lenovo Group, Ltd. et al.</i> , Case No. 8:23-cv-01860-AB-SHK, Order

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Exhibit	Description
	Granting Joint Stipulation to Schedule Additional Dates, Dkt. 56 (April 18, 2024 C.D. Cal.)
2011	<i>eVision Optics, LLC and Vision Smart Optics, Inc. v. Luxottica Group S.P.A. and Luxottica of America Inc.</i> , Case No. 8:23-cv-02013 AB (SHK) (IN CHAMBERS) Order Continuing Claim Construction Hearing, Dkt. 97 (Oct. 7, 2024 C.D. Cal.)
2012	<i>eVision Optics, LLC and e-Vision Smart Optics, Inc. v. Lenovo Group, Ltd. et al.</i> , Case No. 8:23-cv-01860-AB-SHK, (IN CHAMBERS) Order Continuing Claim Construction Hearing, Dkt. 74 (Oct. 7, 2024 C.D. Cal.)
2013	<i>eVision Optics, LLC and e-Vision Smart Optics, Inc. v. Lenovo Group, Ltd. et al.</i> , Case No. 8:23-cv-01860-AB-SHK, Order Granting Joint Stipulation to Modify Order, Dkt. 78 (Dec. 4, 2024 C.D. Cal.)
2014	Declaration of James D. Oliver, PhD in Support of Patent Owner's Response
2015	James D. Oliver Curriculum Vitae
2016	https://museumoffailure.com/exhibition/oakley-thump
2017	https://www.cnet.com/reviews/oakley-thump-review/
2018	https://www.globenewswire.com/news-release/2004/11/15/318738/2175/en/Exclusive-Media-Event-Marks-Debut-of-OAKLEY-THUMP.html
2019	Nugroho, et al. "Understanding and Evaluating User Centered Design in Wearable Expressions"
2020	Wearable Computing – a new approach in Concurrent Enterprising, Conference Paper, June 2006

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I. Introduction

1. My name is Dr. James H. Oliver. I have been retained by counsel on behalf of E-Vision Optic, LLC ("E-Vision") to serve as a technical expert in this case, and to provide my opinions regarding the patentability of claims 1-19 of U.S. Patent Nos. 8,905,541 ("the '541 patent") in light of the Petition (Paper 1).

2. I am being compensated at my standard rate of \$500 per hour for my time, plus reasonable out-of-pocket expenses. I have received no additional compensation for my work in these proceedings, and my compensation does not depend upon the contents of this declaration, any testimony that I may provide, or the ultimate outcome of these proceedings.

II. Background and Qualifications

3. The details of my education, work experience, research, and publications are summarized in my curriculum vitae ("CV") attached hereto as EX-2015. I provide here a summary of some of the relevant information from my CV as well as other relevant background information.

4. I currently hold the rank of University Professor and serve as the Pithan Director of Innovation at Iowa State University. For more than forty years, I have studied, worked in, and taught mechanical engineering, computer graphics, software

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development, and human-computer interaction, as well as virtual and augmented reality.

5. I received a Bachelor of Science in Mechanical Engineering degree from Union College in Schenectady, New York in 1979. My earliest engineering experience exposed me to advanced analysis of dynamic mechanical systems. While working at Mechanical Technology Inc., I conducted computational analyses of operating rotor-bearing systems, including critical speed, unbalanced response, and stability in both torsional and lateral machine dynamics. This experience led to a graduate fellowship at Michigan State University in East Lansing, Michigan, where my Master's thesis focused on harmonizing computational modal analysis (i.e., vibrational characteristics) of mechanical systems with equivalent experimental results. In 1981, I received a Master of Science degree in Mechanical Engineering from Michigan State University. In 1986, I received a Ph.D. in Mechanical Engineering, also from Michigan State University.

6. I have taught at different universities as a professor in Mechanical Engineering, Electrical and Computer Engineering, and Aerospace Engineering. Starting in August 1988 until August 1991, I was an Assistant Professor in the Department of Mechanical and Aerospace Engineering at the State University of New York at Buffalo, New York. I have also held various professor positions at

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Iowa State University, including Assistant Professor in the Department of Mechanical Engineering starting in August 1991, before becoming an Associate Professor in April 1993. I held that position until July 2000, and eventually returned to the same position in September of 2001, before being promoted to the rank of Professor in April 2004. In August 2012, I became a University Professor, an honorary title acknowledging lasting impact on the entire university. In addition to teaching as part of the Department of Mechanical Engineering at Iowa State University, I have received courtesy appointments to the Department of Aerospace Engineering since March 2005; the Department of Electrical and Computer Engineering since June 2005; and the Department of Industrial and Manufacturing Systems Engineering since May 2007—appointments which I still hold. From May 2010 to July 2011, I was a Visiting Professor at Image Institute in the Ecole Nationale Supérieure d'Arts et Métiers, ParisTech in Chalon-sur-Saône, France.

7. Over my career, I have taught numerous other university courses, including “Mechanical Systems Design,” “Virtual Environments, Virtual Worlds and Applications”; Computer Graphics and Geometric Modeling; “Computer-Aided Design Applications;” and “Computer-Integrated Manufacturing.” For example, I co-developed the content for the introductory design course, ME 270 Introduction to Mechanical Engineering Design. Referred to as our “cornerstone” design course,

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ME 270 is intended to provide students with context for the in-depth analysis-intensive courses they encounter later in our curriculum. It provides a broad introduction to contemporary mechanical design practice, while incorporating technical modeling and analysis techniques drawn from the basic physics and calculus courses that students have completed to that point in their overall curriculum. Specific course topics include market evaluation, customer requirements, ideation, conceptual design, mathematical modeling and analysis, business case development, detail design, prototype fabrication, prototype testing, resolving analysis predictions with test results, cost analysis, and final product proposal. At the senior undergraduate level, I teach ME 415 Mechanical Systems Design. This course is referred to as our “capstone” design course because it draws from all of the student’s experience gained through the core curriculum to provide an integrative, culminating, and in-depth product design experience. Design challenges for this course are typically solicited from regional industry partners. Students often work in close collaboration with industry colleagues on design problems with actual market impact. Many of the projects focus on electro-mechanical systems.

8. In addition to teaching at Iowa State University, I have also been involved in the University’s research and development efforts. I have served as an

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Associate Director from April 1993 to July 1997 at the Iowa Center for Emerging Manufacturing Technology (later renamed as the Virtual Reality Applications Center), where I assisted in building a world-renowned research center for applied virtual reality. In fall 2003 I was named director of the Virtual Reality Applications Center and fostered its continued growth until July 2019. Under my leadership the Virtual Reality Applications Center's ongoing contract research has increased from \$9M to \$20M, and faculty involvement has broadened to encompass colleagues from all Iowa State University colleges. From 2005 to 2007, I led fundraising, technical specification, bid process, and vendor management for a \$5M upgrade of our flagship device, the C6—now the world's highest resolution immersive VR facility—and in 2008 led an \$800K upgrade of Lee Liu Auditorium in Howe Hall, making it the world's highest resolution stereoscopic immersive theater.

9. I have also had extensive experience in the software industry, including as Director, Senior Director, and Vice President of Product Development for various companies. From April 1987 to August 1988, I was a Software Research Engineer at International TechneGroup, Inc., where I conducted software research and development and provided engineering consulting. From 1997-2001, I took a leave from my university position to work in the software industry. I joined Engineering Animation Inc. to lead their core technology team, focused on CAD-independent,

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large model visualization to facilitate virtual product prototyping. In 1999, I conceptualized, planned, and led development of e-Vis, the first commercial software product to combine high-performance product visualization with secure Internet-based collaboration capabilities to empower distributed product development and supply chain integration. After several corporate acquisitions, these technologies are now referred to as TeamCenter Visualization, part of the Siemens PLM Software tool suite, and are used by manufacturers around the world.

10. In 2007, I co-founded BodyViz, a high technology startup focused on low cost, easy-to-use medical visualization with sales in the medical, education, veterinary, and legal markets. BodyViz delivers access to real human anatomy by creating easy to use, interactive 3D MRI and CT scan experiences. BodyViz won the Prometheus Award for "Start up Company of the Year" from the Technology Association of Iowa in 2008, and also won first place in the John Pappajohn Iowa Business Plan Competition in 2009.

11. I have received financial support for my research programs from several federal sources, including the National Science Foundation, NASA, and the research branches of the Navy, Air Force, and Army. Industry sponsors of my research include John Deere, Rockwell Collins, and Boeing. I have received numerous professional honors and awards, including the Gustus L. Larson Memorial

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Award from the American Society of Mechanical Engineering, recognizing early career achievement, and the National Science Foundation's prestigious Young Investigator Award. I served six years as Associate Editor of the ASME Transactions, Journal of Computing and Information Science in Engineering. I am a Fellow of the American Society of Mechanical Engineering. I have been a member of the Institute of Electrical and Electronics Engineers since 1983, and the Association for Computing Machinery since 2010. I was also elected Fellow of the American Society of Mechanical Engineers in 2006. I hold four US patents on innovations in mechanical design and manufacturing as well as virtual reality.

III. Legal Standards

12. I am not a lawyer, and I will not provide any legal opinions. Although I am not a lawyer, I have been advised certain legal standards are to be applied by technical experts in forming opinions regarding the meaning and validity of patent claims.

A. Anticipation

13. I understand that a patent claim is invalid if it is anticipated or obvious in view of the prior art, and that a claim can be unpatentable even if all of the requirements of the claim cannot be found in a single prior-art reference. I further understand that invalidity of a claim requires that the claim be anticipated or obvious

from the perspective of a person of ordinary skill in the art at the time the invention was made.

B. Obviousness

14. I have been informed that a patent claim is invalid if it would have been obvious to a person of ordinary skill in the art. In analyzing the obviousness of a claim, I understand the following factors may be taken into account: (1) the scope and content of the prior art; (2) the differences between the prior art and the claims; (3) the level of ordinary skill in the art; and (4) any so called “secondary considerations” of nonobviousness if they are present.

15. I have been informed that a claim can be obvious in light of a single prior art reference or multiple prior art references. I understand that to prove that prior art or a combination of prior art renders a patent obvious, it is necessary to:

- a. Identify the particular references that, singly or in combination, make the patent obvious;
- b. Specifically identify which elements of the patent claim appear in each of the asserted references; and
- c. Explain why a person of ordinary skill in the art would have combined the references, and how they would have done so, to create the inventions

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claimed in the patent. I further understand that exemplary rationales that may support a conclusion of obviousness include:

- Combining prior art elements according to known methods to yield predictable results;
- Simple substitution of known element for another to obtain predictable results;
- Use of known technique(s) to improve similar devices (methods or products) in the same way;
- Applying a known technique to a known device (method or product) ready for improvement to yield predictable results;
- “Obvious to try” – choosing from a finite number of identified, predictable solutions with a reasonable expectation of success;
- Known work in one field of endeavor may prompt variations of the work for use in either the same field or a different field based on design incentives or other market forces if the variations are predicable to a person of ordinary skill in the art; and
- Some teaching, suggestion, or motivation in the prior art that would have led a person of ordinary skill in the art to modify the prior art

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reference or to combine the prior art reference teachings to arrive at the claimed invention.

16. I have been informed that, in considering obviousness, hindsight reasoning derived from the patent-at-issue may not be used.

C. Claim Construction

17. I am informed that claim construction is a matter of law to be decided by the Court. I understand that claim terms are presumed to have their plain and ordinary meaning, as understood by a person of ordinary skill in the art at the time of the invention, in the context of the patent specification, the prosecution history, and any other relevant evidence.

18. I am informed that to determine how a person of ordinary skill in the art would understand a claim term, one should look to those sources available that show what a person of skill in the art would have understood the disputed claim language to mean. Such sources include the words of the claims themselves, the remainder of the patent's specification, the prosecution history of the patent and the cited references (all considered "intrinsic" evidence), and "extrinsic" evidence, such as dictionary definitions, learned treatises and the opinions of qualified experts concerning relevant scientific principles, the meaning of technical terms, and the state of the art.

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19. I am informed that, in construing a claim term, one looks primarily to the intrinsic patent evidence, including the words of the claims themselves, the remainder of the patent specification, and the prosecution history.

20. I am informed that extrinsic evidence, which is evidence external to the patent and the prosecution history, may also be useful in interpreting patent claims when the intrinsic evidence itself is insufficient.

21. I understand that words or terms should be given their ordinary and accepted meaning unless it appears that the inventors were using them to mean something else. In making this determination, the claims, the patent specification, and the prosecution history are of paramount importance. Additionally, the specification and prosecution history must be consulted to confirm whether the patentee has acted as its own lexicographer (i.e., provided its own special meaning to any disputed terms), or intentionally disclaimed, disavowed, or surrendered any claim scope.

22. I understand that the claims of a patent define the scope of the rights conferred by the patent. The claims must particularly point out and distinctly claim the subject matter that the patentee regards as his invention. Because the patentee is required to define precisely what he claims his invention to be, it is improper to construe claims in a manner different from the plain import of the terms used

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consistent with the specification. Accordingly, a claim construction analysis must begin and remain centered on the claim language itself. Additionally, the context in which a term is used in the asserted claim can be highly instructive. Likewise, other claims of the patent in question, both asserted and unasserted, can inform the meaning of a claim term. For example, because claim terms are normally used consistently throughout the patent, the usage of a term in one claim can often illuminate the meaning of the same term in other claims. Differences among claims can also be a useful guide in understanding the meaning of particular claim terms.

23. I understand that a person of ordinary skill in the art is deemed to read a claim term not only in the context of the particular claim in which the disputed term appears but in the context of the entire patent, including the specification. For this reason, the words of the claim must be interpreted in view of the entire specification. The specification is the primary basis for construing the claims and provides a safeguard such that correct constructions closely align with the specification. Ultimately, the interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually invented and intended to envelope with the claim as set forth in the patent itself.

24. I understand that while intrinsic evidence is of primary importance, extrinsic evidence, e.g., all evidence external to the patent and prosecution history,

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including expert and inventor testimony, dictionaries, and learned treatises, can also be considered. For example, technical dictionaries may help one better understand the underlying technology and the way in which one of skill in the art might use the claim terms. Extrinsic evidence should not be considered, however, divorced from the context of the intrinsic evidence. Evidence beyond the patent specification, prosecution history, and other claims in the patent should not be relied upon unless the claim language is ambiguous in light of these intrinsic sources. Furthermore, while extrinsic evidence can shed useful light on the relevant art, it is less significant than the intrinsic record in determining the legally operative meaning of the claim language.

25. I understand that the Petitioner does not propose that any of the challenged claims be construed, and proposes that “no claim terms require construction to resolve the obviousness challenges here.” Petition at 12. Therefore, in applying my analysis, I apply the plain and ordinary meaning of the terms used in the challenged claims of the '541 patent.

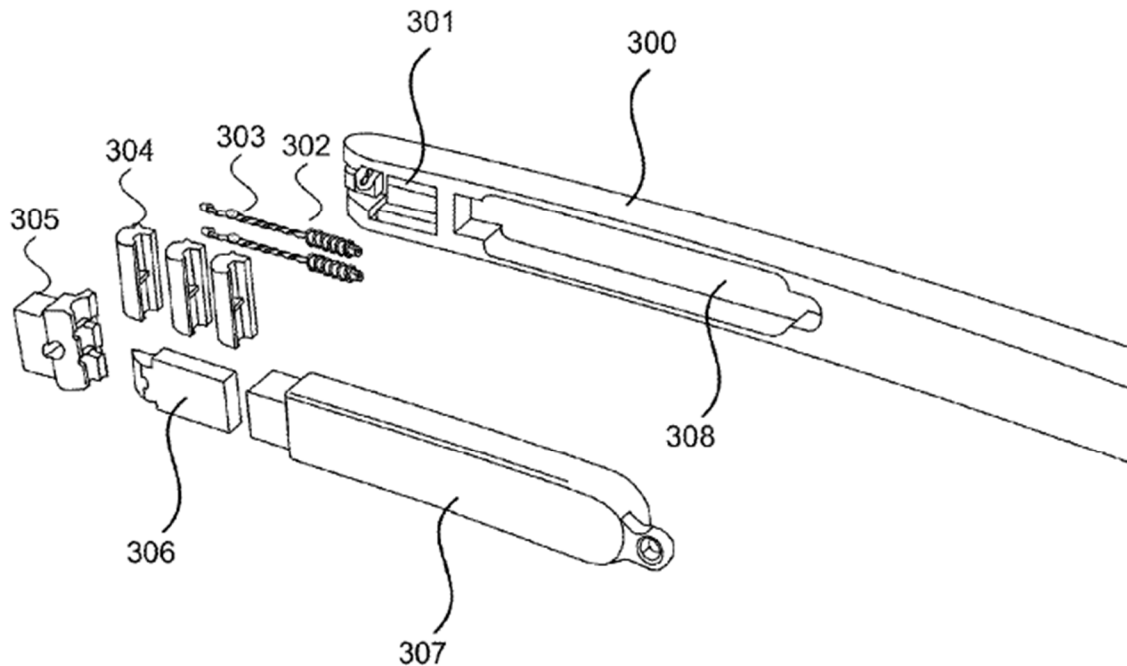
IV. Overview of the Patented Technology

26. The '541 patent relates to a subset of wearable electronics, specifically electronic eyewear frames. EX-1001, Abstract. At the time of the invention of the '541 patent, eyeglass frames were designed with a strong focus on aesthetics. *Id.*

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at 1:25-29. With the advent of incorporating consumer electronics into staple apparel items, it became desirable to incorporate electronics into eyeglasses as well. *Id.* at 1:30-33; EX-2018 at 327-328 (“Comfort and appearance are amongst other important key factors. . . [A]n integral element of interactive systems should be the body.”). Finding a balance between aesthetics and functionality therefore became crucial. *Id.* at 1:33-44. The invention of the ’541 patent struck this balance, in part by carefully controlling conductive pathways between electrical components where necessary, and incorporating these electrical components into eyeglasses without compromising their aesthetic appeal. *See, e.g., id.* at 1:48-5:20.

27. Examples of the electronic eyewear frames claimed in the ’541 patent may include an electronics module, which may be a collection of electronic components, such as a power source, a controller, and a sensing mechanism (such as a capacitive touch switch that affords a user the ability to control the device with a simple touch of the finger).



Id., FIG. 3.

28. Since capacitive touch sensors are sensitive to touch, they are also highly electrically conductive. This results in an increased risk of electrical interference between the switch and other components within the eyeglasses (e.g., other electrical components, electrically conductive elements outside the eyewear such as a human finger, etc.), the '541 patent teaches various ways to minimize that interference. As an example, the '541 patent describes a housing module that may be formed from a non-conductive material to insulate the electrical components of the electronics module from the structural member of the eyewear. *Id.* at 51:59-52:4.

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29. The '541 patent also describes an insulating layer, which can be disposed between different electrical components, such as the sensing mechanism noted above and other elements, such as the housing module itself. EX-1001, 51:59-52:11. A capacitive touch switch “generally requires that the electrical charge generated by the interaction with the wearer be dissipated.” *Id.* at 63:34-37. This is because the interaction with the wearer is the source of its functionality – the added electrical charge from the user's touch produces an input to the capacitive touch switch. If the capacitive touch switch builds up electrical charge, a higher amount of electrical charge would become necessary to exceed whatever threshold is established for the capacitive touch switch to “switch” from an inactive state to an active state. Accordingly, the '541 patent notes that the use of an insulator may be particularly necessary with the use of a capacitive touch switch to prevent a buildup of electrical charge within the capacitive touch switch (e.g., from other conductive elements in close proximity to the capacitive touch switch). *Id.* at 63:9-42; 68:61-69:3. This may be particularly necessary when the frame includes a conductive material that provides an increased risk that electrical charge received by the capacitive touch switch may be stored by the frame. *Id.* at 57:17-60, 62:10-20, 63:39-42.

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30. While it was not unknown in the art to incorporate insulation into an electrical circuit to prevent short circuits, leakage current, and other complications that could result in electrical circuits being in close proximity to one another, this concept presented a number of complications with respect to electronic eyewear. As noted by the '541 patent, simply incorporating any number of electronics into eyewear would impede the aesthetics and comfort of the eyewear, which would defeat the purpose of incorporating those electronics because it would be unfeasible to do so and expect a consumer to adopt this technology. *See id.* at 1:25-44. In fact, many have tried and failed to strike the balance accomplished by the '541 patent, such as the Oakley Thump, which encountered significant user dissatisfaction due to its poor aesthetic qualities, despite having several different functions. EX-2015; EX-2016; EX-2017; see also EX-2019 (“A mayor [sic] drawback in past developments in wearable computing was just the fact that these developments lacked user acceptance.”).

V. Level of Ordinary Skill in the Art

31. I understand that certain issues relating to the validity of the '541 patent must be judged from the perspective of a person of ordinary skill in the relevant art, as I discuss below. I have been asked to define the level of a “person having ordinary skill in the art” or “POSITA” that someone would have had at the time the alleged

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invention as claimed was made. In deciding the level of ordinary skill, I have considered the following factors, which I have been informed are relevant in determining the level of ordinary skill in the art:

- The levels of education and experience of persons working in the field;
- The types of problems encountered in the art;
- The prior art solutions to these problems;
- The rapidity with which innovations are made; and
- The sophistication of the technology.

32. In my opinion, a POSITA at the time of the invention of the '541 patent (around July 2, 2010) would have had a bachelor's degree in mechanical engineering, electrical engineering, or computer engineering, or an equivalent degree and, in addition, approximately two years of work experience with embedded electronic devices. More advanced degrees or training in a related discipline or both can compensate for shorter work experience.

33. I understand that Petitioner has defined the level of ordinary skill in the art as:

Based on the relevant factors, *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995), a hypothetical person of ordinary skill in the art ("POSITA") would have had at least a bachelor's degree in mechanical or manufacturing engineering; mechatronics; electrical engineering plus

coursework in mechanical engineering, manufacturing engineering, or mechatronics; or a similar technical degree. Ex. 1002 ¶¶30-34. A POSITA would have also had at least 2 years of experience designing consumer electronics, such as eyewear with electronics. *Id.* Work experience could substitute for formal education and additional formal education could substitute for work experience. *Id.*

This Petition does not turn on this specific definition of the level of ordinary skill. The claims would be obvious from the perspective of a POSITA under any reasonable definition. *Id.*

Petition at 11-12.

34. Despite some variations in these two positions, these variations would not alter my opinions expressed in this Declaration.

35. Based on either standard, I was at least a person of ordinary skill in the art at the time of the invention of the '541 patent.

VI. Overview of the Relevant Prior Art

A. Howell-596

36. Howell-596 describes an “electronic circuit having radiation monitoring capability . . . provided within eyewear so that the user of the eyewear is able to easily monitor their exposure to radiation.” EX-1004, Abstract. This “electronic circuit” is a UV radiation detection system that measures UV light that

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the eyewear is exposed to and provides an indicator of the UV exposure via some form of output interface. The UV radiation detection system of Howell-596 uses various components such as photodetectors to absorb light through which the UV radiation may be emitted. EX-1004, ¶[0006]. As shown in Figure 1 below, Howell-596 describes a pair of eyeglasses having temples 108, one of which includes a circuit board 112.

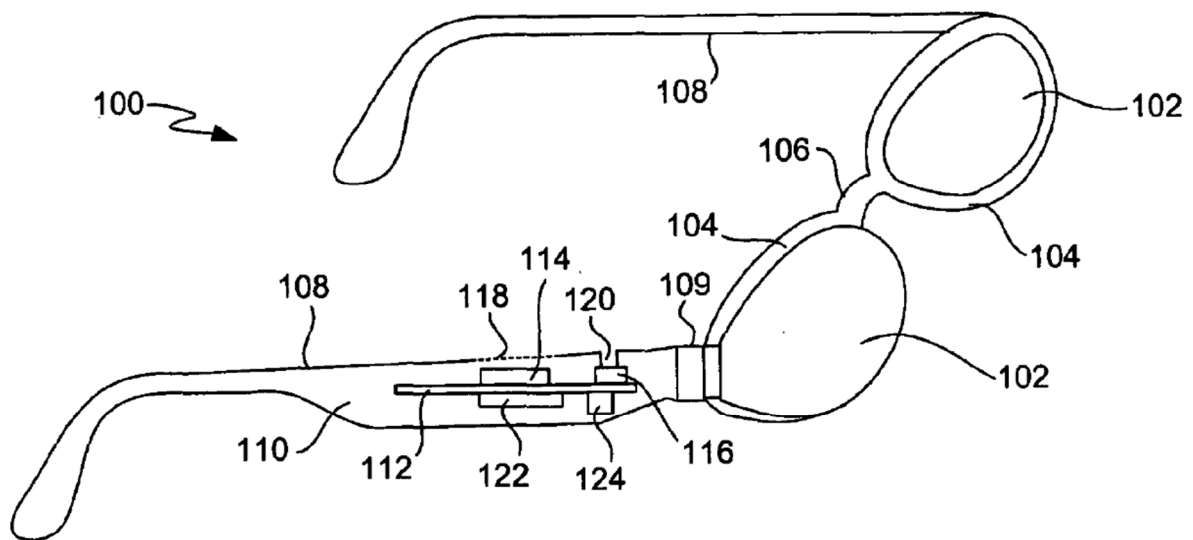
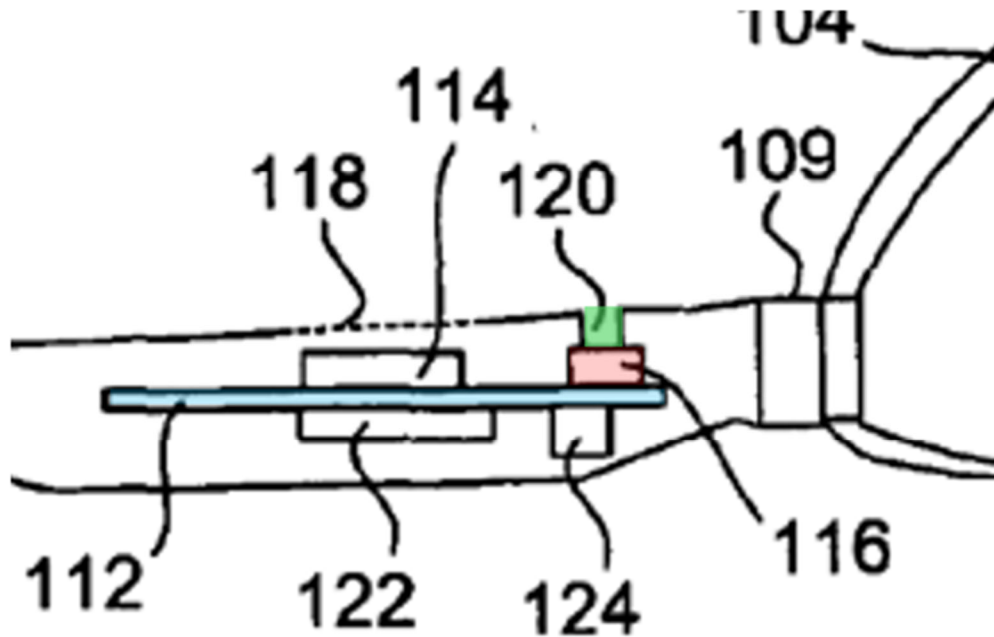


FIG. 1

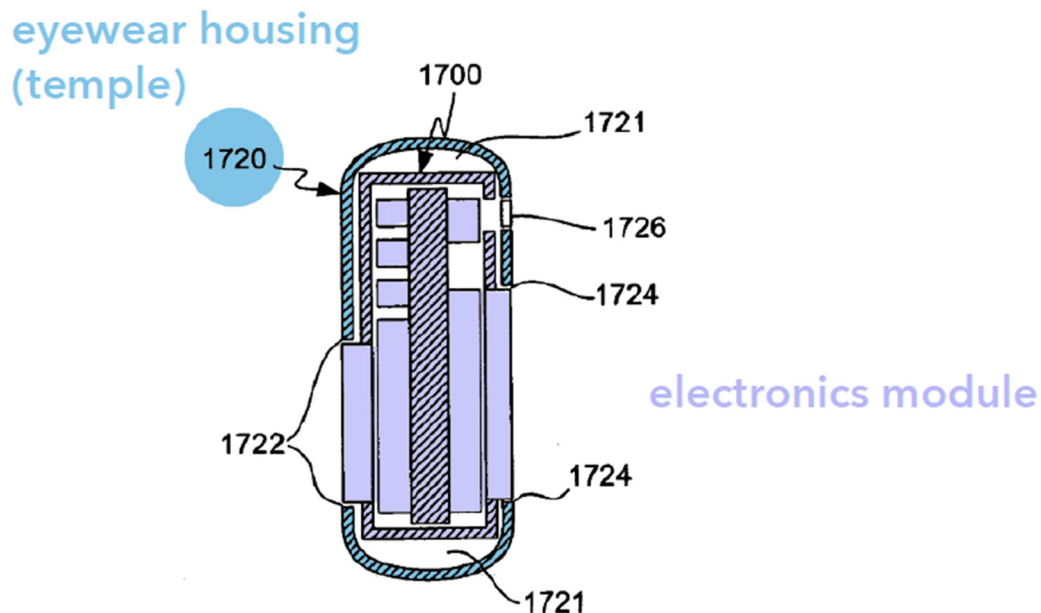
EX-1004, FIG. 1.



EX-1004, FIG. 1 (annotated).

37. Howell-596 states that the circuit board 112 “can have or couple to a . . . UV detector 116.” *Id.* at ¶[0073]. The UV detection system receives light through an opening 120, which it measures and provides an indication of UV radiation. *Id.* That indication is provided through an output mechanism, such as a display device. *Id.*

38. For several of its grounds, Petitioner points to the electrical components within the module housing 1700 of Howell-596 as being the “electronics module.” Petition at 19.



Id. (citing EX-1004, FIG. 17B (annotations in Petition)).

39. Howell-596 notes that the module housing 1700 may protect the module from, for example, water, but “can also be used to regularize or standardize the form factor for the UV detection system.” EX-1004, ¶¶[0194]-[0195]. Howell-596 describes several components within the module housing 1700 that need to be present to carry out the desired functionality of the UV detection system. As shown in FIG. 17B above, Howell-596 does not describe an insulating layer disposed

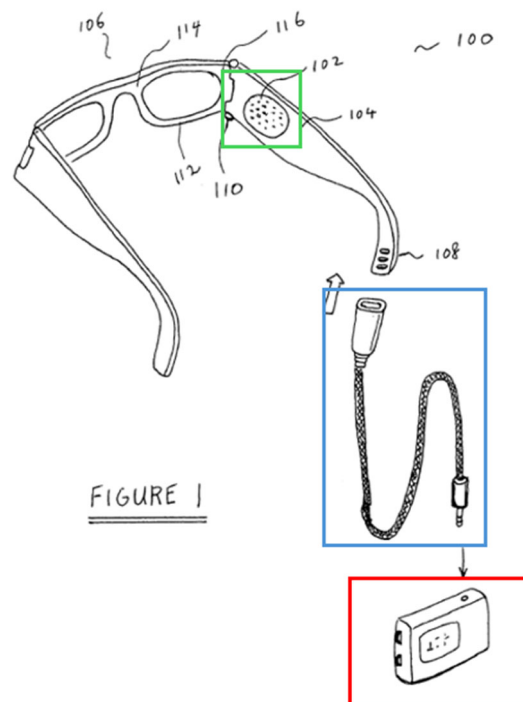
between the “electronics module” and the “eyewear housing” relied upon by Petitioner.

40. The UV detection system disclosed in Howell-596 includes a detector (for detecting and measuring light), electrical circuitry (for calculating the light measured by the detector) and an output device (for indicating the UV levels detected by the detector and calculated by the electrical circuitry). EX-1004, ¶[0069]. The UV detection system can alternatively include a phototransistor. *Id.* at [0096]. This circuitry of the UV detection system requires a power source, and Howell-596 accordingly discloses that the system includes a battery and/or a solar cell. *Id.* Howell-596 also discloses that the UV detection system could include even more components, such as an optical filter (*id.* at ¶[0078]), additional sensors (e.g., a thermal sensor, motion detector, stress sensor, and/or a switch in addition to the photodetector, *id.* at ¶¶[0078], [0080]), communication circuitry (*id.* at ¶[0078]), a circuit board (*id.* at ¶[0073]), a display device (*id.*), a speaker (*id.* at ¶[0078]), a heart monitor (*id.* at ¶[0091]), and tethering components so that all of these components can be integrated in a single pair of glasses without sacrificing the aesthetics and/or wearability of the eyewear that would be inherent in attempting to package all of these components in one device (*id.* at ¶¶[0007], [0070]).

41. In addition to these components, Howell-596 requires the UV detection system to be exposed to the external environment to facilitate the photodetector's reception of inputs in the form of light for determining UV radiation levels. This exposure is carried out using an opening in which the UV detection system and associated components can be exposed to open space. *Id.* at ¶[0075].

B. Howell-158

42. Howell-158 describes eyeglasses with multimedia functionality. EX-1006, Abstract. As shown in the figure below, the eyeglasses of Howell-158 include a speaker 102 (green box), an electrical connector (blue box), and a storage medium (red box) for storing multimedia.



EX-1006, FIG. 1 (annotated).

43. Unlike Howell-596, Howell-158 does not disclose a sensor. *See, generally*, EX-1006. However, like Howell-596, Howell-158 notes the challenges associated with incorporating several electronic components into electronic eyeglasses, and as an alternative to incorporating the electrical components of its multimedia system within the eyeglasses, a tethering mechanism can be used to connect the eyeglasses to a separate electronic device that can handle some of the functionality that the eyeglasses cannot. EX-1006, ¶[0013].

44. Howell-158 also describes a limited instance in which its eyeglasses can include metal frames, as opposed to plastic or some other non-conductive material. To account for the potential interference between the metal frames and the electrical components, Howell-158 discloses “an insulating layer” between the metal frames and those electrical components. EX-1006, ¶[0053]. This “insulating layer” in Howell-158 is a dielectric tape, which Howell-158 states plays one of two roles: insulation; and mechanical stiffness. *Id.*

C. Kokanaski-166

45. Kokanaski-166 describes to eyeglasses having electro-active lenses. EX-1008, Abstract. Kokanaski-166 notes that a primary purpose of its disclosed

invention is to provide “a cosmetically pleasing manner that allows a platform of frame systems to be built from a single electronic module.” *Id.*

46. As shown in the figure below, Kokonaski-166 discloses an electronics module 1000 that includes a recharging coil 1060 (blue box) that provides for the battery 1050 of the electronics module to be inductively charged – that is, “without direct contact.” *Id.* at ¶[0087]. Using the recharging coil 1060, “the [electronics] module may be hermetically sealed while still allowing the battery to be recharged without breaking the moisture resistant seal.” *Id.* The “moisture resistant seal” is the silicone piece that Petitioner relies on in Ground 5 of its Petition. Petition at 56-57. Kokonaski-166 also discloses frames that can partially include metal. *Id.* at ¶[0084].

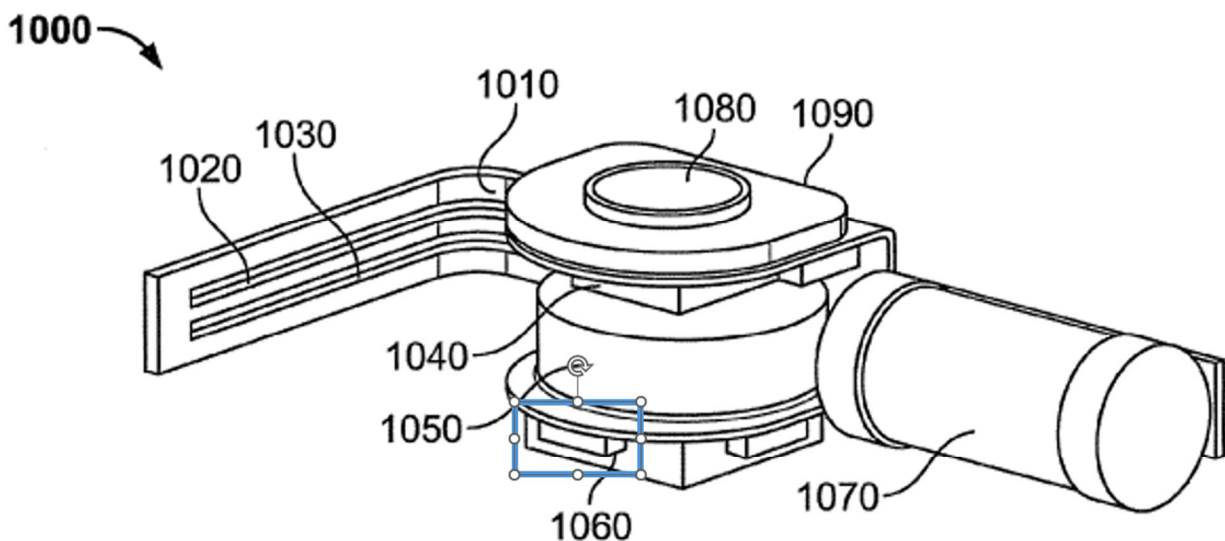
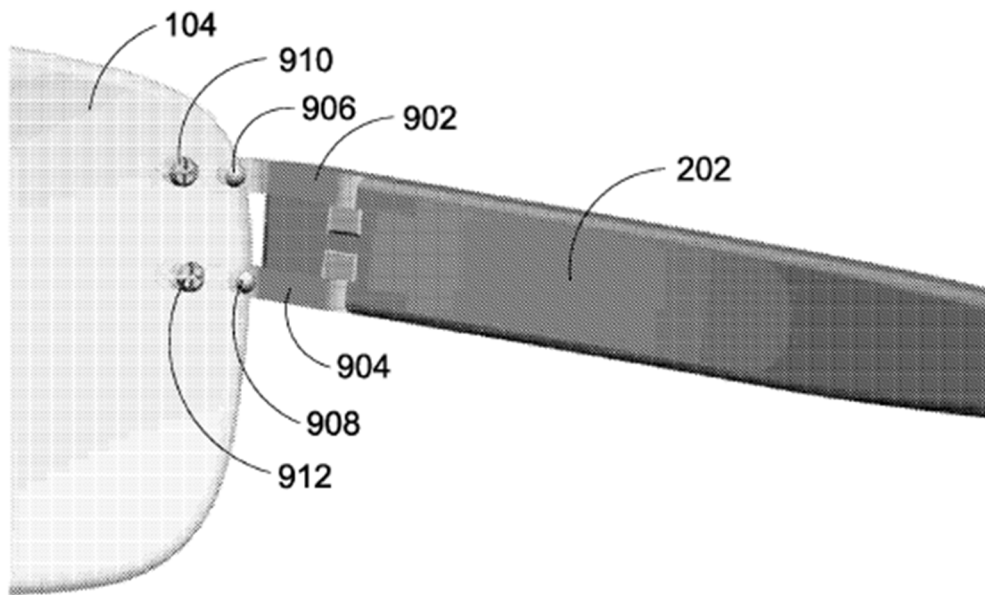


FIG. 10

EX-1008, FIG. 10 (annotated).

D. Kokonaski-999

47. Kokonaski-999 is directed to “electronics for controlling and synchronizing operation of electro-active lenses.” EX-1009, Abstract.



EX-1009, FIG. 9.

48. As shown above, Kokonaski-999 describes a non-conductive frame that includes discrete conductive components for connecting to the electronics module to allow the electrical components of the module to function with the other elements of the eyeglasses. I understand that Petitioner does not argue in its Petition that Kokonaski-999 includes an insulating layer. I agree that Kokonaski-999 does not include an insulating layer. Instead, the frame described in Kokonaski-999 can

include a frame with non-conductive portions which obviate any need for an insulating layer between the frame and electrical components of the electronics module. *Id.* at ¶¶[0032], [0035]. Kokonaski-999 further describes “electronics for controlling and synchronizing operation of electro-active lenses that can be housed in any type of frame in a cosmetically acceptable and easily implementable manner.” *Id.* at ¶[0004]. Kokonaski-999 further teaches the use of conductive portions of an eyeglass frame to facilitate the functionality of electronics contained therein. *Id.* at ¶¶[0032], [0035].

VII. Petitioner Fails to Show that the Cited References Render the Challenged Claims Unpatentable

A. Ground 1: Claims 1-18 are Patentable over Howell-596 in view of Howell-158

1. Claim 1

49. It is my opinion that the Petition fails to show that the combination of Howell-596 and Howell-158 renders obvious claim 1 of the '541 patent. Claim 1 is reproduced below, with the relevant claim limitation not rendered obvious in bold and italics:

1. A first device, comprising:

a frame comprising a first temple and a second temple, wherein the frame comprises a housing module coupled to a structural member;

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a first lens and a second lens coupled to the frame; and
an electronics module, wherein the electronics module is located within the housing module;

wherein the electronics module comprises at least any two of: a power source; a controller; and a sensing mechanism; and

wherein an insulating layer is disposed between one or more electronic components located within the electronics module and the frame of the first device.

a) There is No Motivation to Combine Howell-596 with Howell-158

50. It is my opinion that there is no motivation to combine any of the cited references with Howell-158's limited disclosure of an insulating layer being used for eyewear with metal frames.

51. Petitioner's arguments ultimately hinge on the premise that a POSITA would have been motivated to encase the one or more components of the purported frame in Howell-596 in metal and then apply an insulating layer to account for the counterproductive decision to incorporate metal-casing, even though Howell-596 describes a kitchen-sink approach to describing the possible materials of its housings with the notable exception of metal. Petition at 22.

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52. This flawed premise permeates throughout the remainder of Petitioner's flawed analysis. First, the mere fact that Howell-158 incorporates by reference Howell-596 (Petition at 22), does not mean that a POSITA would have been motivated to then reverse course and specifically incorporate Howell-158's metal frames into Howell-596's UV detection system. Doing so would defeat the purpose of that UV detection system. In fact, the fact that Howell-158 incorporates by reference Howell-596, but still does not make the combination proposed by Petitioner, indicates that such a combination was not obvious, even to Howell and the other inventors listed in Howell-596 and Howell-158. This is further evident by the fact that Howell-158, spanning 198 paragraphs, devotes only a portion of a single paragraph to its discussion of insulation. EX-1006 ¶[0053]. Similarly, Howell-596 spans 240 paragraphs and never makes the combination that the Petitioner now claims would have been obvious at the time of the invention of the '541 patent. I also note that the Petition does not point to any other reference authored by the inventors listed in Howell-596 or Howell-158 that makes the combination that the Petitioner now claims would have been obvious in July 2010. For example, while Howell-158 generally mentions an environmental sensor (such as an ultraviolet radiation sensor) amongst a vast array of possible embodiments, EX-1006 ¶[0167], Howell-158 never actually instructs one of ordinary skill in the art to combine

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Howell-596 with Howell-158, nor does Howell-158 provide any explanation for how to make such a combination while accounting for the incompatibilities that I describe in greater detail below.

53. In my opinion, Petitioner's combination creates problems in Howell-158 by incorporating Howell-158 into Howell-596 – Howell-596 does not indicate that its eyeglasses suffer from potential “circuits [] being shorted” or “leakage current.” Petition at 22-23 (citing EX-1006, ¶53; EX-1002, ¶66). In fact, Howell-596 does not have these problems because it does not have the metal frames that Petitioner proposes incorporating into Howell-596. *See generally* EX-1004. Petitioner also argues that because insulation has been used in electrical systems generally, it would have been obvious to a POSITA to simply insert one into Howell-596. Petition at 23. This argument illustrates the greatest flaw in Petitioner's reasoning – Petitioner's motivation to combine suggests that a POSITA would have engaged in a series of cascading errors, first making the mistake of incorporating metal frames into Howell-596, next realizing that doing so increases the risk of short circuits and leakage current, and then lastly attempting to fix this new problem adding an insulating layer. Petitioner's argument does not resolve the additional problems that it leaves unaddressed – accounting for the added weight, complexity, and components added to a pair of electronic eyeglasses that require exposure to light for the UV

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detection system to work, all while ensuring the aesthetics of the design are not compromised. The Petition also does not explain how double-sided tape could have been incorporated into any of the several parts that make up the UV detection system of Howell-596. The Petition also doesn't account for the challenges that would have occurred in incorporating double-sided tape in an electrical system, particularly one such as Howell-596 that relies on a combination of electrical circuits and access to external environments in order to receive the necessary inputs. In fact, I note that dielectric tape is not suitable for all applications, and the Petition fails to explain how dielectric tape would be suitable for the combination it proposes. EX-1011 at 17 ("Not all adhesives are suitable for direct application on or near electronic products due to either their chemical or dielectric properties. Incorrect selection of materials may result in product degradation or failure.").

54. As I noted earlier, at the time of the invention of the '541 patent, it was important to balance the technical necessities of incorporating several electronic devices into eyewear for functional purposes against the need for maintaining comfortability, aesthetics, and overall optimizing user experience. EX-2018; EX-2019. Others failed to accomplish this feat. EX-2015; EX-2016; EX-2017. Incorporating Howell-158 into Howell-596 as Petitioner proposes would be yet another failed attempt.

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55. I note that Petitioner argues that Howell-158 only discloses three materials (metal, plastic, and rubber; Petition at 23) for making its eyeglass frames, therefore suggesting that using metal to form electronic eyeglass frames would be inevitable. I disagree. Using metal in electronic eyewear would increase weight, costs, and would require additional elements such as an insulating layer to account for the conductivity of the metal frames. In light of this, Howell-596's silence as to metal frames or metal housings is not an oversight. A combination of Howell-596 with the metal frame of Howell-158 would yield the exact opposite results of what Howell-596 aimed to achieve. Some sensors, like capacitive touch switches, are highly sensitive to electrical charge and need an insulating layer to dissipate stored electrical charge (as explained and claimed in the '541 patent). In contrast, the sensor of Howell-596 is part of a UV detection system that is sensitive to light, and needs maximum exposure to its surroundings so that it can absorb as much light as possible to determine UV radiation levels. This is a complicated system in which Howell-596 utilizes a power source (a battery or solar cell), a photodetector, a circuit board, an output device, and potentially several other components to make the UV detection system work. Adding metal frames to the eyeglasses of Howell-596 when doing so is not necessary, and then applying an insulating layer to that metal frame to account for the associated drawbacks, would result in a heavier, more complicated, and

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potentially less aesthetically pleasing pair of eyeglasses. In light of the sheer magnitude of electronic components that would need to be implemented in the device disclosed by Howell-158, as well as the need for eyewear to be comfortably worn by a user, a POSITA would actually aim to minimize the weight and number of components added to the eyewear, rather than adding to the weight and number of components, as suggested by Petitioner. In fact, Howell-158 aims for its UV detection system to have a “minimal impact on design of the end product and no tedious wiring is required.” EX-1004, ¶¶[0183]-[0184].

56. Another reason that a POSITA would not have been motivated to incorporate metal frames and an insulating layer into Howell-596 because Howell-596 already discloses an alternative to an insulating layer – air gaps. In fact, the air gap further accomplishes the purpose of Howell-596 because the lack of components intervening between the outside light and the photodetector facilitates the photodetector to receive the light. For example, Howell-596 discloses “one or more vents or holes so that air can circulate through the module housing 1700.” EX-1004, ¶[0194]. This alternative is also consistent with a more general-purpose approach to circuit design, which indicates that “[a]dequate physical and electrical clearance must be provided between stiffeners, conductors, and components.” EX-1011 at 64. A POSITA would not have discarded this alternative in favor of an insulating layer

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that would eliminate these benefits. Howell-596 also eliminates a need for metal frames by describing a plethora of eyewear embodiments that do not involve an insulating layer, and also describes several characteristics of the disclosed eyewear structure, none of which include a description that would suggest that metal frames would be beneficial to its structure. *See, e.g., id.* at ¶¶[0067]-[0072]. As another example, Howell-596 describes placing its electrical components in fixed positions, minimizing the risk of conductive portions colliding during use in a way that would cause those conductive portions to short circuit one another. EX-1004, ¶[0184]. As such, Howell-596 provides that the electrical components forming the UV detection system are mounted or wire bonded onto a substrate such as the printed circuit board relied upon by Petitioner, rather than being loosely connected by wires, and therefore would not need further insulation between electrical components because they would already be separated. *Id.*

57. Howell-596 also teaches that this approach would serve Howell-596's oft-repeated goal of "maintain[ing] a thin profile for the UV detection system." *Id.* Such methods for printed circuit board design were well known in the art, and would not contradict Howell-596's goal of a thin profile, as opposed to forcing metal frames and an insulating layer into Howell-596 (like Petitioner suggests). EX-1011, 64. Howell-596 also discloses a module housing that protects the UV detection

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system, further obviating the need for an insulating layer between the housing module 1700 and the eyeglass frame. EX-1004, ¶[0195]. Howell-596's exterior-facing UV detection system therefore obviates the need for an insulating layer – in fact, the UV detection system would not come into contact with the frame or housing of the eyeglasses. In yet numerous other embodiments, Howell-596 discloses windows that would enclose the UV detection system in order to allow light to pass through the window to the UV detection system. EX-1004, ¶¶[0194]-[0206]. In fact, Howell-596 states that “a number of previously described transparent regions, portions, or sheets of material . . . can be translucent (or partially translucent). Still another alternative is that the eyewear housing 1800 could be primarily translucent.” EX-1004, ¶[0199]. Furthermore, as noted during prosecution of the '541 patent, there are other ways in which short circuiting can be prevented, such as “if the frame is not electrically conductive, the components of the electronics module could contact the frame without creating a short circuit.” EX-1003, 65. A POSITA would therefore understand that there would not only be no need for an insulating layer, but rather it would impede on the UV detection system to employ a metal casing or frame, and then incorporate yet another component such as an insulating layer between the UV detection system and the window. In contrast, Howell-158 discloses metal frames entirely enclosing electrical components, which would impede the UV

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detection system of Howell-596, which needs to be exposed to the external environment of the eyewear so that it can detect light and UV radiation.

58. Accordingly, it is my opinion that a POSITA would not have found it obvious to combine Howell-596 and Howell-158, and the claimed “insulating layer” of claim 1 is not obvious over the prior art.

2. Claim 12: “The first device of claim 1, wherein the structural member comprises a cavity in the first temple; and wherein the housing module is configured to be selectively placed within the cavity.”

59. For claim 12, Petitioner selects different prior art elements as meeting the claimed limitations that are inconsistent with the elements that Petitioner selected with respect to claim 1. For example, the remapping of prior art to claim limitations is provided below:

Petitioner's Mapping of Claim 1		Petitioner's Mapping of Claim 12	
Claim 1 element	Howell-596	Claim 12 element	Howell-596
“frame”	Frame 100	“frame”	Frame 100
“housing module”	Housing 1720	“housing module”	Housing 1700
“structural member”	Any portion of frame 100	“structural member”	Housing 1720
“electronics module”	Housing 1700	“electronics module”	“insulating layer” of Howell-158
“insulating layer”	“insulating layer” of Howell-158	“insulating layer”	

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60. Petitioner does not explain how this new proposed combination renders obvious claim 12. For example, Petitioner does not identify any prior art element that meets the “insulating layer” limitation of claim 12. Because Petitioner’s proposed combination lacks this limitation, it is my opinion that Petitioner’s analysis fails to prove that claim 12 is obvious over Howell-596 and Howell-158.

61. Petitioner states that the dielectric tape is the electronics module, which means that it encapsulates the entirety of the electronics module, including the circuit board, output device, and most problematically – the photodetector that needs access to light. A POSITA would not have been motivated to “encapsulate” the UV detection system of Howell-596 within the dielectric tape disclosed in Howell-158 because that would have entirely eliminated the functionality of the UV detection system by depriving it of the light from which it is supposed to measure UV radiation levels. The result of Petitioner’s proposed combination would not only directly eliminate the functionality of the photodetector of Howell-158, but it would also result in the function of the “being worn” switch of Howell-158 being eliminated, the lower cover of Howell-158 would not be removable any more, and the battery and other electronic components of Howell-158 would no longer be accessible due to their being encapsulated in double-sided dielectric tape. In fact, Petitioner does not explain how a POSITA would have encapsulated the UV detection system of

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claim 1 at all, let alone doing so without interfering with the UV detection systems various components that need direct access to the external environment and therefore cannot be “encapsulated.” Petitioner does not address this new problem it creates by this proposed combination.

62. In addition, Petitioner's argument that the dielectric tape can provide the structural integrity needed by the UV detection system of Howell-596 is dubious. While Howell-158 states that its dielectric tape can, “*to a certain degree*,” provide “mechanical stiffness,” Petitioner fails to explain how dielectric tape would accomplish such a feat for the UV detection system of Howell-596. EX-1006, ¶[0053]. Further, because Howell-596 describes UV detection system as being a standalone device that can be inserted into the electronic eyeglasses disclosed therein, Petitioner fails to explain how a POSITA would have understood dielectric tape to be a suitable means for “encapsulating” the UV detection system while providing “mechanical stiffness” as a standalone device.

63. In fact, Howell-596 emphasizes the importance of housing its UV detection system in a casing and the purpose that such a casing would need “to regularize or standardize the form factor for the UV detection system.” EX-1004, ¶[0195]. Based on my understanding of Howell-596, a mere dielectric tape will not serve that purpose because it's simply a piece of tape – it conforms to the shape of

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whatever it encases, but it does not provide a regular or standard form factor to what it encases. At best, the “mechanical stiffness” provided by dielectric tape forces components within the electronics module to remain in proximity to one another (hence why it is a “tape”), but it does not regularize or standardize a grouping of electronics. In fact, it does the opposite – it conforms to whatever it encapsulates.

64. I would like to reiterate that the Petitioner and Mr. Feland fail to explain how such a modification or combination would be carried out. Nevertheless, Petitioner's basis for including an insulating layer is deeply flawed, and heavily relies on the assumption that the UV detection system of Howell-596 would even need an insulating layer at all.

3. Claim 18: “The first device of claim 1, wherein the housing module has a thickness that is less than or equal to approximately 0.7 mm.”

65. Petitioner's challenge to claim 18 fails because it points to nowhere in Howell-596 or Howell-158 in which the limitation “wherein the housing module has a thickness that is less than or equal to approximately 0.7 mm” exists. Rather, Petitioner simply disparages the value of such a limitation. Petitioner provides no evidence that a POSITA would have been motivated to combine or modify Howell-596 or Howell-158 as recited in claim 18.

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66. The evidence that Petitioner provides does not relate to electronic eyewear. In fact, Petitioner argues that “multiple references,” neither of which are Howell-596 or Howell-158, “disclosed temples whose entire widths were less than approximately 0.7mm thick.” Petition at 42 (citing EX-1002 and EX-1013). In fact, both of these references (Dudli and Della) are simply spectacles – they do not describe electronic eyewear at all, nor do they describe any electronics to be incorporated into eyewear. Based on my understanding of Dudli and Della, they appear to be completely irrelevant to the subject matter of claim 18, especially given that Petitioner provides no evidence (or argument) that a POSITA would have been motivated to use either these two references to modify the combination that Petitioner proposed regarding claim 1 for Howell-596 and Howell-158. In fact, Petitioner says nothing about why or how a Petitioner would have used the frames of the non-electronic eyewear or Dudli or Della to construct a frame or housing module for the electronic eyewear of claim 18.

67. It is my opinion that Petitioner's motivation to combine is vague, and in fact belies its motivation to combine Howell-596 with Howell-158. Petitioner argues that minimizing housing module thickness as proposed in Dudli and Della would “maintain design ergonomics and aesthetics of the electronic eyewear,” but then directly contradicts this by positing that a POSITA would have opted for

incorporating all of the electrical components of the UV detection system of Howell-596, housed those components in a metal frame that could interfere with the functionality of the UV detection system, and then add an insulating layer that could further impede the ability of the UV detection system to detect light. This combination proposed by Petitioner is not only internally inconsistent, but also in direct contradiction to evidence cited by Petitioner, which notes a desire to “maintain a thin profile for the UV detection system.” EX-1004, ¶[01841].

4. Claims 2-11 and 13-17

68. Claims 2-11 and 13-17 are dependent claims, as noted above. Thus, for at least the same reasons stated above, claims 2-11 and 13-17 are patentable.

B. Ground 2: Claims 16 and 17 are Patentable Over Howell-596, Howell-158, and Hattori-913

69. Petitioner's Ground 2 relies on Ground 1, specifically Petitioner's contention that claim 1 of the '541 patent is obvious over Howell-596 in view of Howell-158. Petitioner only relies on the addition of a third reference – Hattori-913 – to argue that the additional limitations recited in claim 16 (which depends from claim 1) and claim 17 (which depends from claim 16). Since the Petition fails to establish that claim 1 is unpatentable, dependent claims 16 and 17 are therefore patentable for at least the same reasons set forth above in **Section VII.A.**

C. Ground 3: Howell-596 Alone Does Not Render Claim 1 Obvious

1. Claim 1

70. With respect to Ground 3, Petitioner deviates from Ground 1 (asserting that Howell-596 would have been obvious by incorporating a metal frame and insulating layer of Howell-158) and argues that Howell-596 alone would have rendered the Challenged Claims obvious. Petition at 47-49. Primarily, Petitioner relies on an embodiment described in the specification of the '541 patent that states that the housing of an electronics module may constitute the insulating layer. Petitioner also reiterates its prior arguments set forth in Ground 1, such as the general existence of insulation in electrical circuits (Petition at 48) and Howell-158's teachings that electronic eyeglasses may be made of plastic (Petition at 49).

71. Petitioner's argument that a POSITA would have been motivated to modify Howell-596 based on knowledge of a POSITA is incorrect for several reasons. Petitioner's reference to the embodiment described in the '541 patent is irrelevant, as it provides no insight into a POSITA's motivation to modify the purported prior art reference, and is rather an improper attempt to apply hindsight to the analysis. Further, Petitioner's arguments continue to rely on the false assumption that a POSITA would have been motivated to incorporate metal casings into the

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devices disclosed in Howell-596. These improper arguments are fatal to Petitioner's grounds.

72. First, based on my understanding of the prosecution history, the applicant for the '541 patent disclaimed this embodiment during prosecution when it noted that the prior art cited by the Examiner did not disclose or require the claimed "insulating layer" element because the frame disclosed in the cited reference could have been formed of a non-conductive material in order to prevent short circuiting. Specifically, during prosecution of the '541 patent, the Examiner found the pending claims unpatentable as anticipated by Kokanaski-166. EX-1003, 76-77 ("Regarding claim 49, Kokanaski et al discloses the insulating layer between the electronic components and frame implicitly states otherwise there would be short circuit, the wires can have insulating material.")). The applicant then argued that the insulating layer was not taught by Kokanaski:

Kokonaski does not disclose each and every feature recited by independent claim 48, as amended. The Office attempts to rely on the theory that the features are "implicitly" disclosed, suggesting that "the wires *can have* insulating material." So the Office acknowledges this is merely one "possibility", which is insufficient to satisfy the standard quoted above. The Office does not show that the missing feature is "necessarily present", as required. ***Indeed, there are other ways in which Kokonaski could prevent a short circuit. For example, if the frame is not electrically conductive, the components of the electronics module could contact the frame without creating a short circuit.*** Thus, Kokonaski does not require the claimed elements.

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73. *Id.* at 66 (emphasis added). Consistent with this approach, Howell-596 describes a UV detection system installed on a pair of electronic eyeglasses. I also note that Howell-596 is a very expansive reference, describing several embodiments and combinations of those embodiments. Yet nowhere in its 65-page, 240-paragraph disclosure does Howell-596 describe any embodiment consistent with a metal frame. As Petitioner admits, plastic materials were known in the art for building eyeglass frames, and such a material would obviate a need for an insulating layer between the electronics module and the frame. Petition at 49; *see also* EX-1004, ¶183 (“Advantageously, in one embodiment, the UV detection system is such that has minimal impact on design of the end product and no tedious wiring is required.”).

74. Nevertheless, because a POSITA would have understood that it would be preferential to use plastic frames to obviate a need to insulate the electronics module from the housing module, the housing 1700 of the UV detection system described in Howell-596 is not an “insulating layer,” given that it does not “insulate” in any way. It is merely a housing that could provide structural integrity to the electrical components that form the UV detection system, which may then be inserted into an eyeglass frame. It is therefore not an “insulating layer.” Howell-596 stresses that it is crucial to employ a material that allows its UV detection system to have access to the external environment so that it can detect light and UV radiation

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levels, but also does not impede the aesthetic design of the eyeglasses. EX-1004, ¶¶[0183]-[0184]. Accordingly, Howell-596 does not disclose any metal cased components, and in fact teaches against metal cased components, as explained above. Indeed, much like the proposed combination of Howell-596 with Howell-158, Petitioner's arguments rely on the counterproductive and undisclosed metal casing discussed by Howell-158. Petition at 49 (citing EX-1006, ¶51).

75. Ultimately, Petitioner's argument amounts to creating a problem (adding metal casing) and then endeavoring to solve only one of those problems (adding an insulating layer to offset the conductivity of the metal casing), while ignoring all of the other problems caused by Petitioner's proposed modification (added complexity, bulk, weight, etc.). Selecting an insulating material is not merely the result of simple design choice. In order to develop eyeglasses with various electronic components, it is crucial to consider design constraints, including user experience as well as functionality. EX-1004, ¶¶[0183]-[0184]. Adding a metal housing to Howell-158 would add unnecessary components to an already component-heavy device, causing several drawbacks. *Id.* Every instance in which Petitioner suggests that a POSITA would have incorporated metal frames further requires the incorporation of an insulating layer to a device that would otherwise not

need such insulation. Following Petitioner's approach would counteract the stated goals of Howell-596. Petition at 47-48.

2. Claims 2-11, 13-18

76. Claims 2-11 and 13-18 are dependent claims, as noted above. Thus, for the same reasons stated above, claims 2-11 and 13-18 are patentable.

D. Ground 4: Claims 16-17 are Patentable Over Howell-596 and Hattori-913

77. Petitioner's Ground 4 relies on Ground 3, specifically Petitioner's contention that claim 1 of the '541 patent is obvious over Howell-596. Petitioner only relies on the addition of a third reference – Hattori-913 – to argue that the additional limitations recited in claim 16 (which depends from claim 1) and claim 17 (which depends from claim 16). Since the Petition fails to establish that claim 1 is unpatentable, dependent claims 16 and 17 are therefore patentable for the same reasons set forth in **Sections V.A.1 and V.B.**

E. Ground 5: Claims 1-9, 11, and 13-18 are Patentable Over Kokonaski-166 in View of Howell-158

1. Claim 1

78. Petitioner's analysis is largely identical to that of Ground 1, except that Petitioner substitutes Howell-596 for Kokonaski-166. Petitioner argues that it would have been obvious to a POSITA to combine Howell-158 into Kokonaski-166 for the

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claimed "insulating layer" limitation of claim 1. Petition at 57. Specifically, Petitioner argues that because Kokonaski-166 discloses frames that *may* include some degree of metal, a POSITA would have been motivated to use metal to form the particular portion of the frame of Kokonaski-166, thereby necessitating an insulating layer, and then use the insulating layer of Howell-158. *Id.* Petitioner also argues that because Kokonaski-166 discloses using a silicone seal to prevent water leakage, that silicone seal is an "insulating layer." *Id.* at 56-57.

79. Petitioner's analysis regarding Kokonaski-166 suffers from the same flaws as that of Howell-158. First, Kokonaski-166 does not disclose an insulating layer merely because it includes silicone for water resistance. Second, a POSITA would not have been motivated to combine Kokonaski-166 with Howell-158 for the same reasons as stated above with respect to Howell-596. In fact, Kokonaski-166 teaches that a frame could include portions that are not made of metal, which is consistent with an embodiment disclaimed by the applicant during prosecution and expressly outside the scope of the claims. In fact, Kokonaski-166 was specifically discussed during prosecution of the '541 patent, and the applicant successfully argued that the claimed insulating layer was not taught by Kokonaski-166:

Kokonaski does not disclose each and every feature recited by independent claim 48, as amended. The Office attempts to rely on the theory that the features are "implicitly" disclosed, suggesting that "the

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wires *can have* insulating material." So the Office acknowledges this is merely one "possibility", which is insufficient to satisfy the standard quoted above. The Office does not show that the missing feature is "necessarily present", as required. ***Indeed, there are other ways in which Kokonaski could prevent a short circuit. For example, if the frame is not electrically conductive, the components of the electronics module could contact the frame without creating a short circuit.*** Thus, Kokonaski does not require the claimed elements.

80. *Id.* at 66 (emphasis added). As such, the mere fact that Kokonaski-166 teaches a frame with metal portions does not mean that Kokonaski-166 teaches a metal frame, and even then, a POSITA would have understood that if short circuiting were a concern, not using metal frames would be preferable.

81. Petitioner's reliance on Kokonaski-166 as disclosing a silicone "insulating layer" is also flawed. For instance, Petitioner's allegation is belied by Kokonaski-166 itself, which explains that the silicone used therein is merely a seal (not a layer) in a system intended to allow a device to be water resistant while still allowing the battery in Kokonaski-166's device to be inductively charged by a charging coil. Further, the silicone seal not described as being between the electronics module and housing module. EX-1008, ¶[0087]. As taught by Kokonaski-166, this allows for the electronics module to be "hermetically sealed while still allowing the battery to be [inductively] recharged without breaking a moisture resistant seal." *Id.* Accordingly, Kokonaski-166 teaches that the use of the

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seal is limited to preventing water seepage, and it is not used to encase or otherwise form a layer between electrical components and the frame. *See id.*

82. Similarly, a POSITA would not have been motivated to incorporate Howell-158's teachings into those of Kokonaski-166. In fact, although Kokonaski-166 indicates that a frame may be "made of zyle, metal, or any combination thereof," it does not indicate that the frame should be made entirely of metal. Indeed, as noted by the applicant during examination, the Examiner rejected the claims "by merely asserting that [Kokonaski-166] discloses the insulating layer between electronic components and frame implicitly states [sic] otherwise there would be short circuit, the wires can have insulating material." EX.1003 at 65. In response to the Examiner's rejection, the applicant noted that "there are other ways in which [Kokonaski-166] could prevent a short circuit. For example, if the frame is not electrically conductive, the components of the electronics module could contact the frame without creating a short circuit. Thus, [Kokonaski-166] does not require the claimed elements [of an insulating layer]." EX-1003, 66. Accordingly, a POSITA would have understood from Kokonaski-166 not to use metal frames, or at the very least ensuring that any portion of the housing module that comes into contact with the electronics module is not made of metal. Indeed, as Petitioner has already noted, Kokonaski-166 teaches the importance of aesthetic design, and admits that using

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fewer or lighter materials, rather than more, would further that aesthetic design. Petition at 43 (citing EX-1008, ¶6). I note that in addition to Petitioner's failure to explain how or why a POSITA would have incorporated an insulating layer into Kokonaski-166, Petitioner also fails to explain how, in particular, a POSITA would have incorporated double-sided dielectric tape into the system of Kokonaski-166. As such, for the same reasons I noted above regarding Howell-158 and Petitioner's proposed incorporation into Howell-596, there is no motivation to make such a combination, and the Petition does not explain how or why a POSITA would do so.

83. In fact, Kokonaski-166 notes that it is important that certain components be interchangeable, so that a "module can be replaced without having to repurchase a complete pair of new electronic eyewear (lenses and frames) or just the frames." EX-1008 ¶[0098]. Double-sided tape would not serve that function of interchangeability, and would in fact impede it. The Petition does not explain how to reconcile the potential need to replace a module as described in Kokonaski-166 with its proposed double-sided dielectric tape, such as how the adhesiveness of the tape can be counteracted so as to not restrict all of the electrical components that it is forced to adhere to.

84. Additionally, similar to the issues I noted above with respect to Ground 3, the result of Petitioner's proposed incorporation of Howell-158 would eliminate

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certain functions of Kokonaski-166. For example, Kokonaski-166 describes a manual touch switch 106 disposed on top of the electronics module and extends through the frame. EX-1008 ¶[0074]. As another example, Kokonaski-166 includes a lower module receptacle cover 107 that can be removed to provide access to electrical components such as a battery. EX-1008 ¶[0083]. The adhesive used for the double-sided tape of Howell-158 could create a number of complications, such as immobilizing the manual touch switch, and impeding the removability of the cover. All of these complications could be avoided simply by using one of the alternatives described by Kokonaski-166 (e.g., not using metal frames).

85. Petitioner fails to reconcile how a POSITA would have considered Petitioner's understanding of Kokonaski-166's aesthetic considerations with Petitioner's suggestion to use metal frames for Kokonaski-166, then add an insulating layer (a double-sided dielectric tape), even though neither is necessary or beneficial (but in fact detrimental) to the functionality of Kokonaski-166.

86. I also note that many of Petitioner's arguments are identical and incorporated from its arguments from Ground 1. Accordingly, for the same reasons I believe those reasons to be insufficient to render the challenged claims obvious, they also fail with respect to Ground 5.

2. Claims 2-9, 11, and 13-18

87. Claims 2-9, 11, and 13-18 are all dependent claims that, either directly or through intervening claims, depend from claim 1. Accordingly, for at least the same reasons set forth above regarding claim 1, claims 2-9, 11, and 13-18 are patentable over Kokonaski-166 in view of Howell-158.

F. Ground 6: Claims 1-9, 11, and 13-18 are Patentable Over Kokonaski-999 in View of Howell-158

1. Claim 1

88. For Ground 6, Petitioner argues that Kokonaski-999 discloses a frame having one or more conductive portions, and that a POSITA would have been motivated to needlessly place the conductive portions directly onto an electronics module and then employ an insulating layer to solve the problem that creates. This scenario, however, was expressly discussed during prosecution of the '541 patent, and the applicant expressly noted that a frame without a conductive portion in contact with the electronics module is an alternative taught in the prior art that would not be within the scope of claim '541. EX-1003, 65.

89. In fact, Petitioner's reliance on Kokonaski-999 directly contradicts the teachings of Kokonaski-999. Kokonaski-999 teaches against combining the eyeglasses disclosed therein with Howell-158 by specifically using the conductive portions of the frame to facilitate communication between electronic components,

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which would be impeded (if not destroyed) by placing an insulating layer therebetween. Other portions of the frame can be non-conductive to the extent necessary to prevent short circuiting and leakage current without adding the potentially cumbersome insulating layer, and Kokonaski-999 describes such a scenario as being particularly beneficial to its stated goal of aesthetics and minimal design (especially given that the eyeglasses of Kokonaski-999 need to be comfortably placed on a person's head). The non-conductive portions of the frame would not meet the "insulating layer" limitation, as explained during prosecution. EX-1003, 65. Specifically, as Petitioner notes, "Kokonaski-999 discloses frame 102 having 'one or more conductive portions.'" Petition at 69 (citing EX-1009, ¶32). Petitioner overlooks the remaining portions of the entire section of Kokonaski-999 cited by Petitioner, which provides that "the first and second electronic modules can communicate using one or more conductive wires" or "one or more conductive portions of the frame." EX-1009, ¶32. Accordingly, not only would a POSITA not have been motivated to incorporate an insulating layer from Howell-158 into Kokonaski-999, but the POSITA would have actually been motivated against doing so, because the "conductive links embedded within any portion of the frame" are used in Kokonaski-999 to facilitate interaction between electrical components, and

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incorporating an insulating layer as Petitioner suggests would have eliminated such functionality.

90. I also note that many of Petitioner's arguments are identical and incorporated from its arguments from Ground 1. Accordingly, for the same reasons I believe those reasons to be insufficient to render the challenged claims obvious, they also fail with respect to Ground 6.

2. Claims 2-9, 11, and 13-18

91. Claims 2-9, 11, and 13-18 are dependent claims, as noted above. Thus, for at least the same reasons stated above, claims 2-9, 11, and 13-18 are patentable.

VIII. Conclusion

92. For the foregoing reasons, it is my opinion that claims 1-18 are patentable over the references cited in the Petition.

Executed this 31st day of March, 2025 in Des Moines, Iowa.

Respectfully submitted,



James H. Oliver, Ph.D.