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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ARNOLD & RICHTER CINE TECHNIK GMBH & CO. BETRIEBS KG,
Petitioner,

v.

ROTOLIGHT LIMITED,
Patent Owner.

Case IPR2022-00099
Patent 10,845,044

DECLARATION OF ERIC BRETSCHNEIDER, PH.D.

ROTOLIGHT 2011
Arnold & Richter v Rotolight
IPR2022-00099

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TABLE OF MATERIALS CONSIDERED

Exhibit Number	Description
1001	U.S. Patent No. 10,845,044 B2 (the “’044 Patent”)
1002	File History for U.S. Patent Application Serial No. 15/481,460 which issued as U.S. Patent No. 10,845,044
1003	Astera AX10 SpotMax™ User Manual (“Astera” or “Astera Manual”)
1004	U.S. Patent No. 9,743,010 to Edwards (“Edwards”)
1005	American National Standard E1.11 – 2008 (2013), Entertainment Technology USITT DMX512-A, Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories, ANSI (2017)
1006	Declaration of Mr. Michael Wood (“Wood Declaration”)
1007	Curriculum Vitae of Mr. Michael Wood
1008	Declaration of Simon Canins (“Canins Declaration”)
1009	Second Declaration of Simon Canins (“Second Canins Declaration”)
1010	Attachment A to Second Declaration of Mr. Simon Canins
Paper 1	Petition for <i>Inter Partes</i> Review of U.S. Patent No. 10,845,044 Under 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42.100 <i>et set.</i> (“Petition”)
Paper 8	Decision Granting Institution of <i>Inter Partes</i> Review 35 U.S.C. § 314, 37 C.F.R. § 42.4 (“Institution Decision”)

Exhibit Number	Description
	<i>Arnold & Richter Cine Technik GmbH & Co. Betriebs KG v. Rotolight Limited</i> , IPR2022-00099, Paper 10 (PTAB April 11, 2022)
2001	Declaration of Eric Bretschneider, Ph.D.
2002	<i>Curriculum Vitae</i> of Eric Bretschneider, Ph.D.
2003	Declaration of Dustin N. Ferzacca
2004	Screen capture of the Google Play store page for the AsteraApp™ from Astera LED Technology GmbH as of June 9, 2016 from the Internet Archive site WayBack Machine (the “AsteraApp Google Play store page”)
2005	European Patent Application No. EP 17 165 609.3 EP Register File History (downloaded February 16, 2022)
2006	Screen capture of the Google Play store page for the “AsteraApp Classic” from Astera LED Technology GmbH updated July 17, 2019 (the “AsteraApp Classic Google Play store page”)
2007	Screen capture of the ApkGk.com site for the AsteraApp™ Version 9.111 from Astera LED Technology GmbH updated July 17, 2019 (the “AsteraApp Version 9.111 web page”)
2008	Declaration of Dustin N. Ferzacca
2009	Screen captures of the AsteraApp™ v.11.57 Build 385 (05/02/2022 14:21) taken April 13, 2022 and April 15, 2022
2012	Deposition Transcript of Michael Wood dated June 7, 2022 in IPR2021-01496, IPR2021-01497, and IPR2021-01498
2013	Deposition Transcript of Michael Wood dated June 8, 2022 in IPR2021-01496, IPR2021-01497, and IPR2021-01498
2014	Deposition Transcript of Michael Wood dated July 20, 2022 in IPR2022-00099

Exhibit Number	Description
2015	<i>Vitec Production Solutions, Inc. v. Rotolight Limited</i> , IPR2022-00261, Paper 8 (PTAB June 8, 2022)
2016	<i>Vitec Production Solutions, Inc. v. Rotolight Limited</i> , IPR2022-00262, Paper 7 (PTAB June 8, 2022)
2017	Deposition Transcript of Simon Canins dated May 20, 2022 in IPR2021-01496

I, ERIC BRETSCHNEIDER, HEREBY DECLARE:

1. I have been retained by counsel for Patent Owner Rotolight Limited (“Patent Owner” or “Rotolight”) in connection with the above-captioned *Inter Partes* Review (“IPR”) proceeding.

2. I submit this Declaration in the above-captioned proceeding to provide my expert opinion in support of Patent Owner’s Response to the Petition for IPR submitted by Arnold & Richter Cine Technik GmbH & Co. Betriebs KG (“Petitioner”) of U.S. Patent No. 10,845,044 (the “’044 Patent”, **EX1001**).

3. I am being compensated at an hourly rate of \$475 for my time spent working on this IPR. My compensation is in no way dependent on the statements I set forth herein or the outcome of this proceeding. I hold no interest in either the Patent Owner (Rotolight Limited) or the Petitioner (Arnold & Richter Cine Technik GmbH & Co. Betriebs KG).

I. EXPERTISE

A. Professional Qualifications And Experience

4. I have almost thirty (30) years of experience with lighting and light emitting diodes (“LEDs”), including a comprehensive background on the full range of LED production technologies, including metal organic chemical vapor phase deposition (“MOCVD”) hardware/process, fabrication, LED chip and package

testing and reliability, optical design, thermal management, color conversion, and solid-state lighting (“SSL”) fixture/lamp design, integration, and reliability.

B. Education

5. I graduated in 1984 from high school at Admiral Farragut Academy as Valedictorian. I was a Battalion Executive Officer from the NJROTC program, was a member of the National Honor Society, participated in various sports and was a member of the school band.

6. In 1989, I graduated from Tulane University with a Bachelor’s Degree in Chemical Engineering. While at Tulane University, I was the Vice President of the AIChE Student Chapter. I was also a member of the Bursar Tau Epsilon Phi fraternity, the office manager of the Tulane University Video Access Center and a Member-at-Large of the Tulane Media Board. As an undergraduate student, I received a merit-based scholarship and received the highest grade in three different graduate level technical elective courses in the department.

7. I earned my Ph.D. in Chemical Engineering from the University of Florida in 1997, where my graduate work focused on development of optoelectronic devices, including novel silicon-based visible LEDs and sulfide-based thin film electroluminescent device (“TFELD”) structures and zinc selenide blue LEDs. While at the University of Florida, I was the President of the Aikido Club, the President of the Isshinryu Club, a Member and the President of the

Sports Club Presidents Council, and a SCUBA Instructor. I also developed the world's first crystalline silicon-based visible LEDs. Additionally, I tested and verified the efficacy of novel precursors for p-type doping of ZnSe materials in LED structures and was responsible for the modification, operation, and maintenance of the MOCVD system for the growth of wide bandgap compound semiconductor materials. I also trained post docs and graduate students in the theory, operation, and maintenance of MOCVD systems.

C. Career Overview

8. I am currently the Chief Technology Officer/Principal Consultant at EB Designs & Technology. In that capacity, I am responsible for, among other things, the design of solid-state lighting technologies for clients ranging from startup companies to Fortune 100 companies.

9. From February 2013 through August 2014, I worked as the Director of Engineering at HeathCo LLC. In that capacity, I was responsible for advanced technology/product development, strategic planning, product launches, product recall management and regulatory compliance related to solid state lighting, sensors, notifications, and control products. Under my leadership, HeathCo transitioned to a LED-based consumer product entity.

10. From October 2011 through January 2013, I was the Chief Engineer, ETi Lighting Research Institute, and VP of Research and Development at ETi

Solid State Lighting Inc. I was responsible for developing all technology and product roadmaps for markets in North America, China, Europe, and Japan.

11. From June 2008 through October 2011, I was employed at Lighting Science Group Corp., first as a Product Development Manager, and then as the Vice President of Research. As the Vice President of Research, I assembled and managed research and development teams for projects related to solid state lighting, including the optical, mechanical, and electrical design. I was directly responsible for modeling and determining product and component lifetimes based on the optical, thermal, mechanical, and electrical analysis with respect to intended operating environments. While at Lighting Science Group, I also served as the company's representative on industry standards committees related to SSL technology (LM79, LM80, TM21, etc.). As a Product Development Manager, I was responsible for developing solid state lighting products and served as the primary technical resource for all OEM customers. I also managed the group responsible for all product certifications and standards requirements including UL, FCC, CE, Energy Star and DLC, as well as IES lighting requirements for outdoor lighting products.

12. Between December 2004 and May 2008, I was employed at Toyoda-Gosei as the Head of Sales, where I was responsible for developing and managing existing LED die and package sales accounts for the Eastern region of North

America. I also served as the primary technical resource for all customers in North and South America, as well as Europe.

13. From December 2003 through November 2004, I was the Director of Solid State Lighting Engineering at Beeman Lighting. My responsibilities included leading the development of solid state lighting systems and materials with a focus on chip and board applications and devices. Additionally, I managed all intellectual property issues and worked with existing and potential customers to ensure new products met or exceeded their requirements and expectations. While at Beeman Lighting, I developed Red-Green-Blue (“RGB”) LED-based landscape lighting with minimal environmental impact.

14. From March 2003 through October 2003, I was employed as the Intellectual Property Manager for the University of South Florida, where I managed the Intellectual Property portfolio of over 100 active patents and patent applications for the University faculty.

15. Between April 1998 and August 2003, I was employed at Uniroyal Optoelectronics. From April 1998 to April 2001, I was the Team Leader of Epitaxial Materials & Characterization. In this capacity, I was responsible for the design and capital equipment selection for the Raw Materials storage and handling areas, Epitaxial Growth areas/facilities and Materials Characterization areas for a full visible spectrum LED fabrication facility. Between April 2001 and August

2003, I was promoted to the Director of IP of University Relations & Government Contracts. My responsibilities included MOCVD hardware modification, epitaxial process design and development, development and testing of new LED chip structures for both AlInGaP and GaN-based material systems. While at Uniroyal Optoelectronics, I developed one of the first commercial Ultraviolet (“UV”)/near UV LED products. In my role as Director of Government Contracts, I also authored a proposal for the DARPA SUVOS (Semiconductor Ultra-Violet Optical Source) program that was ranked second overall out of 34 entries.

16. Between October 1996 and April 1998, I was a Process Engineer at Emcore Corporation. There I was responsible for installation, materials demonstration, and production process qualification and transition into manufacturing of MOCVD systems in an ISO9000 manufacturing environment. Some of the processes that I developed included both Aluminum, Indium, Gallium, and Phosphorous (“AlInGaP”) and Gallium Nitride (“GaN”) based LED structures. I developed the MOCVD industry’s first comprehensive cost and throughput model for epitaxial growth processes. This model significantly reduced production costs and increased throughput across a variety of MOCVD processes.

D. Publications And Patents

17. I am listed as an inventor on at least 40 issued patents, and over 40 pending U.S. and international patent applications, including multiple patents in

the field of LED lighting electrical systems and controls. I have authored 13 publications and presented 34 presentations and seminars. For details thereon, please see the *curriculum vitae* filed previously as **EX2002**.

E. *Curriculum Vitae*

18. Additional details of my background are set forth in my *curriculum vitae* (see EX2002), which provides a more complete description of my educational background and work experience.

19. Based on the above education and experience, I believe that I have a detailed understanding of the state of the art during the relevant period, as well as a sound basis for opining on how a person of ordinary skill in the art at that time would understand the technical issues in this case.

20. On the basis of my education and the experience described above, I believe I am qualified to give the opinions set out herein.

II. MATERIALS CONSIDERED

21. For purposes of this Declaration, I have reviewed and, where applicable, relied upon the information and/or teachings of the documents identified in the TABLE OF MATERIALS CONSIDERED following the TABLE OF CONTENTS above.

22. In particular, I have carefully considered the Petition, Declaration of Michael Wood (“Wood Declaration”) (EX1006), Declaration of Simon Canins

(“Canins Declaration”) (EX1008), Second Declaration of Simon Canins (“Second Canins Declaration”) (EX1009), and all references cited therein, even if inadvertently omitted from my Table of Materials Considered above.

23. I also base my opinions on my professional and academic experience.

24. The opinions to which I will testify, if asked, are set forth in this Declaration. My opinions in this Declaration are based upon the information that I have received to date.

A. Reservation Of Rights

25. My opinions may be supplemented or modified if additional information is received.

26. This Declaration and my opinions are based on knowledge and information currently available to me. I reserve the right to supplement the opinions set forth in this Declaration to the extent that additional information becomes available or if I am asked to consider additional information. Further, I reserve the right to consider and comment on any statements or opinions rendered by any declarants in this matter.

III. LEGAL PRINCIPLES USED IN THE ANALYSIS

27. While I am neither a patent lawyer nor an expert in patent law, I have been informed of the applicable legal standards for patent invalidity. I have relied

upon these legal principles, as explained to me by counsel, in forming my opinions set forth in this Declaration.

28. I understand that a petitioner in an *inter partes* review proceeding must prove unpatentability by a preponderance of the evidence. The statements below are my understanding regarding the law. I have used my understanding of these legal principles, as set forth in this section, to analyze the '044 Patent.

29. It is my understanding that a patent can be found invalid for several reasons. It is my understanding that these reasons include, among others: (i) being anticipated by the prior art; or (ii) being obvious in view of the prior art. My understanding of each of these bases for invalidity is discussed in greater detail below.

30. I understand that in undertaking an invalidity analysis, the claims are to be interpreted from the perspective of a person of ordinary skill in the art (“POSITA”) at the time of the effective filing date of the patent. The analysis I discuss throughout this report is intended to reflect these parameters even if, *e.g.*, I use the present tense.

A. Anticipation

31. I understand that one way to show that a patent claim is invalid is to show that the claim is anticipated by a prior art reference. I understand this to mean that the patent claim is not new or novel in view of the prior art.

32. I further understand that to determine whether a prior art reference anticipates a patent claim requires a comparison of the claim language to the prior art on a limitation-by-limitation basis. I have been informed that a prior art reference “anticipates” under 35 U.S.C. § 102 and renders a patent claim invalid if all of the claim’s limitations are expressly or inherently disclosed in that single prior art reference. The disclosure in the prior art reference does not have to use the same words as the claim, but all of the requirements of the claim must be expressly or inherently present.

33. I have been informed of the scope of prior art that can be used in an anticipation analysis as set forth in 35 U.S.C. § 102. In particular, I understand that a patent or publication qualifies as prior art to an asserted patent claim if it was published prior to the invention of the asserted patent claim or more than one year before the filing date of the application of the asserted patent. I further have been informed that a patent issued on a patent application filed before the invention of the asserted patent claim also is prior art to the asserted patent claim.

34. I understand that a prior art reference anticipates a patent claim when the claim limitations are not expressly found in that reference, but the claim limitations are nonetheless inherent in it. I understand that express disclosure means that the subject matter is clearly described in the prior art reference.

35. I understand that a limitation or the entire invention is inherent and in the public domain if it is the natural result flowing from the explicit disclosure of the prior art. I understand that for a claimed element to be inherently present within a prior art document, it must be necessarily present. That is, the prior art reference must necessarily function in accordance with or include the claimed element. I understand that inherency may not be established by probabilities or possibilities—the mere fact that a certain thing may result from a given set of circumstances is not sufficient.

36. I understand that in some cases, the inherent property corresponds to a claimed new benefit or characteristic of a purported invention otherwise in the prior art. I understand that in such circumstances, the new realization alone does not render the old invention patentable. I further understand that when a prior art method is at issue, the inherent anticipation examines the natural and inherent results in that method without regard to the full recognition of those benefits or characteristics within the art field at the time of the prior art disclosure.

B. Obviousness

37. I have been informed that a patent claim is invalid as being obvious in view of the prior art if the differences between the patented subject matter and the prior art are such that the subject matter as a whole would have been obvious at the time of the invention to a person having ordinary skill in the art. *See* 35 U.S.C.

§ 103. In making a determination of obviousness, I understand that the following factors are analyzed: (i) the scope and content of the prior art, (ii) the differences, if any, between the prior art and the claims at issue, (iii) the level of ordinary skill in the pertinent art, and (iv) objective evidence of non-obviousness, if any exists.

38. I have been informed that any of the following rationales are some of the acceptable bases for the conclusion that a claim is obvious: (i) the claimed invention is simply a combination of prior art elements according to known methods to yield predictable results, (ii) the claimed invention is a simple substitution of one known element for another to obtain predictable results, (iii) the claimed invention uses known techniques to improve similar devices (methods, or products) in the same way, (iv) the claimed invention was “obvious to try” because it was a choice from a finite number of identified, predictable solutions, with a reasonable expectation of success, (v) there is known work in one field of endeavor that may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces, if the variations would have been predictable to a POSITA, or (vi) there is some teaching, suggestion, or motivation in the prior art that would have led a POSITA to modify the prior art references or to combine prior art reference teachings to arrive at the claimed invention.

39. I have been informed that in order for a patent claim to be considered obvious, at the time the invention was made, each and every limitation of the claim must be present within the prior art, or within the prior art in combination with the general knowledge held by a POSITA, and that such a person would have a reasonable expectation of success in combining these teachings to achieve the claimed invention. I also understand that the reason to select and combine features, the predictability of the results of doing so, and a reasonable expectation of success of doing so may be found in the teachings of the prior art themselves, in the nature of any need or problem in the field that was addressed by the patent, in the knowledge of a POSITA in the field at the time, as well as in common sense or the level of creativity exhibited by a POSITA. There need not be an express or explicit suggestion to combine references.

40. I understand that substituting one known element for another known element would have been obvious when it leads to reasonably predictable results.

41. I understand that a combination of elements would have been obvious when a POSITA has a good reason to pursue the combination, which is among a finite number of known options within his or her technical grasp, and leads to reasonably expected results.

42. A prior art reference can be said to teach away when a POSITA would be discouraged from following the path set out in the reference, or would be led in

a direction divergent from the path that was taken in the claimed invention. The mere disclosure of more than one alternative does not constitute a teaching away from alternatives that are not disclosed when the prior art does not criticize, discredit, or otherwise discourage the solution claimed in the alleged invention. Similarly, a prior art reference that merely expresses a general preference for an alternative invention does not teach away.

C. Public Accessibility Of Prior Art Reference

43. I understand that in order to be considered as prior art, a reference needs to be publicly accessible before the priority date of the patent-at-issue. I understand that public accessibility requires more than technical accessibility. Specifically, I understand that in some cases, such as cases involving references published online, public accessibility hinges on whether an interested skilled artisan, using reasonable diligence, would have found the resource online. Accordingly, I understand that the critical question for public accessibility is whether a POSITA would have been independently aware of a reference's existence and would have reasonably been able to find the reference. I understand that the burden of showing that a reference was publicly accessible rests with the Petitioner.

44. I have relied upon this understanding of the applicable legal standards in reaching my opinions set forth in this Declaration.

IV. PERSON HAVING ORDINARY SKILL IN THE ART (“POSITA”)

45. I understand that an assessment of the claims of the '044 Patent should be undertaken from the perspective of what would have been known or understood by a POSITA as of the earliest claimed priority date of the patent claims, which I have assumed is April 8, 2016.

46. Counsel has advised me that to determine the appropriate level of one of ordinary skill in the art, I may consider the following factors: (a) the types of problems encountered by those working in the field and prior art solutions thereto, (b) sophistication of the technology in question, and the rapidity with which innovations occur in the field, (c) the educational level of active workers in the field, and (d) the educational level of the inventor.

47. The relevant technical field for the '044 Patent is lighting systems, in particular involving lighting effects used in cinematography. Based on this, and the four factors above, in my opinion a POSITA as of April 8, 2016 would have had the equivalent of a Bachelor's degree in electrical or chemical engineering with 2 to 5 years of working experience in the design of entertainment lighting systems. Additional education, such as a Master's degree in electrical or chemical engineering, could substitute for some of the work experience, and similarly, extensive experience in the field could serve as a substitute for formal education.

48. My opinions regarding the level of ordinary skill in the art are based on, among other things, my extensive experience in the relevant field, my understanding of the basic qualifications that would be relevant to an engineer tasked with investigating the methods and devices in the relevant area, and my familiarity with the backgrounds of colleagues, co-workers, and employees, both past and present, who work in that area.

49. Although my qualifications and experience exceed those of the hypothetical POSITA defined above, my analysis and opinions regarding the '044 Patent are based on the perspective of a POSITA as of April 8, 2016.

50. Further, I understand that Petitioner and its expert, Mr. Wood, posit that a POSITA “would have had a good working knowledge of electrical engineering and entertainment lighting systems, controls, and effects.” Petition, 7; EX1006, ¶38. The Petition and the Wood Declaration further opine: “[s]he would have gained this through an undergraduate Bachelor’s degree in electrical engineering, or a comparable field as well as some experience in the field (*e.g.*, in entertainment lighting systems).” Petition, 7-8; EX1006, ¶38.

51. While I prefer my definition, my opinions herein regarding the understanding of a POSITA and my other opinions set forth herein would remain the same under Petitioner’s definition of a POSITA. Also, I would qualify as a POSITA under Mr. Wood’s definition based on my extensive background in

entertainment lighting systems, controls, and effects, including particularly the electrical components and circuitry used in entertainment lighting, and a degree in a comparable field in this area, along with all of my other credentials identified above. *See also* EX2012, 46:1-48:13 (explaining that a particular degree is not required but a POSITA must have knowledge of the internal workings of the lighting device).

V. U.S. PATENT NO. 10,845,044

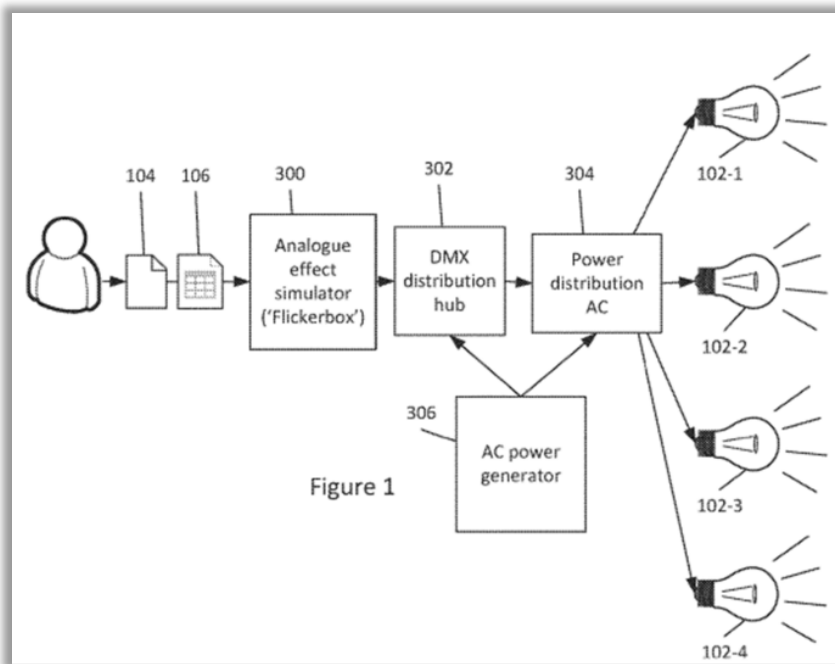
52. U.S. Patent No. 10,845,044 (EX1001) (“the ’044 Patent”), entitled “Lighting System and Control Thereof,” which issued on November 24, 2020, was filed as U.S. Patent Application Serial No. 15/481,460 (“the ’460 Application”) on April 7, 2017 and is subject to a terminal disclaimer, which application claims priority to foreign Application GB 1606907.2 (“the ’907 Application”) filed on April 20, 2016, which claims priority to U.S. Provisional Application No. 62/319,809 (the “Provisional Application”) filed on April 8, 2016.

53. I understand that Rotolight Limited is the Assignee of the ’044 Patent and Roderick Allen Gammons, Andrew Francis, Roderick Aaron Gammons, and Stefan Lange are the named inventors.

A. Specification

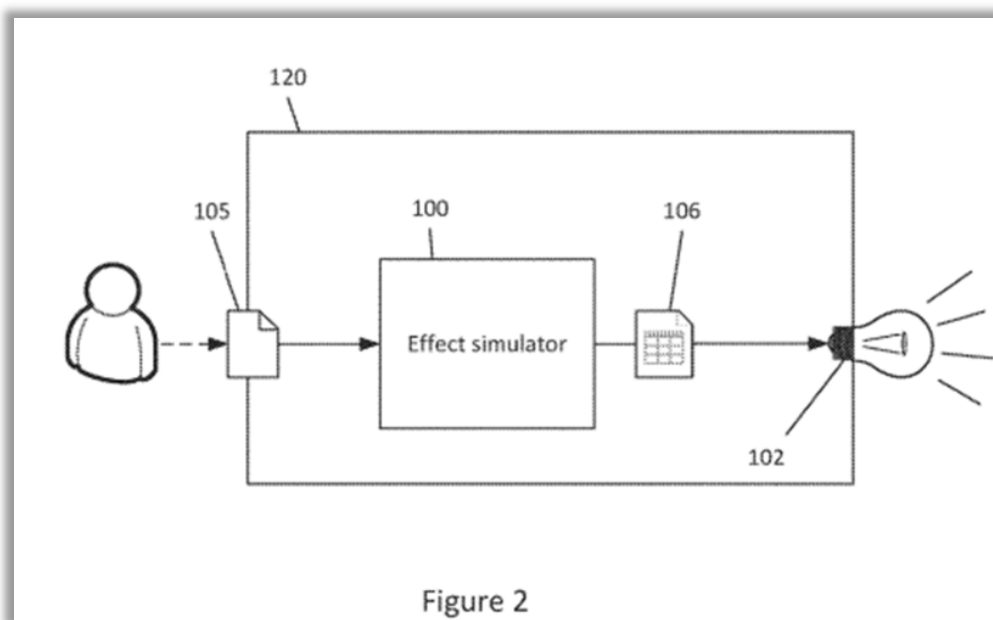
54. The ’044 Patent generally describes a lighting system and method for controlling the lighting system. *See* EX1001, Abstract. In particular, the ’044

Patent relates to “a lighting system for videography, broadcasting and cinematography.” EX1001, 1:16-17. The ’044 Patent explains that in the film, broadcast and TV industry, there is an apparatus called a “flicker box” which is provided independently of the lighting device(s) to mimic flickering light such as a fire place, candle, electrical spark or lightning. EX1001, 1:18-23. Use of a flicker box is a “complex, costly and time consuming process that requires the setup, connection and control of multiple pieces of hardware typically including external Digital Multiplex (DMX) and power distribution devices.” EX1001, 1:27-31. Flicker boxes also require specialists. EX1001, 1:33-35. FIG. 1 of the ’044 Patent shows this conventional arrangement:



EX1001, FIG. 1.

55. The '044 Patent discloses an improved lighting system that involves controlling the lighting device to produce a user-customizable lighting effect that is time varying. EX1001, 1:46-51. As shown in FIG. 2, the '044 Patent provides a single studio lamp device 120 with an integrated light 102 and a lighting effect simulator 100. EX1001, 5:54-64, FIG. 2.



EX1001, FIG. 2.

56. This arrangement allows for the DMX distribution hub and more complex circuitry associated with a “flicker box” to be dispensed with, and yet also provides more flexibility in producing lighting effects. EX1001, 5:54-63.

57. This flexibility is provided in the lighting system by providing a control panel 104 that includes, *e.g.*, buttons, knobs, or a digital interface for user input of parameters for simulating an effect. EX1001, 5:63-6:2. The lighting

system includes an effect simulator integrated into the lamp device 120 for performing calculations such as how the lighting changes over time in order to produce the desired lighting effect. EX1001, 5:61-63, 7:26-42, 9:40-61, FIG. 4. This combination of a user interface, effect simulator (which calculates the time-varying lighting value), and lighting device introduces a simpler, less expensive, and more flexible system. *See* EX1001, 6:9-36.

B. Prosecution History

58. I have reviewed and analyzed the prosecution history of the '044 Patent. *See generally* EX1002. I understand the '044 Patent was filed on April 7, 2017, and claims priority to U.S. Provisional Application 62/319,809, filed April 8, 2016. EX1002, 3. The '044 Patent was originally filed with claims 1-54. EX1002, 24-29. A Preliminary Amendment filed August 17, 2017 cancelled claims 1-54 and added new claims 55-74. EX1002, 56-58. On March 9, 2018, the Examiner issued a non-final Office Action rejecting claims 55-74 based on non-statutory double patenting over U.S. Patent Application No. 15/820,469, the application which would later issue as U.S. Patent No. 10,197,257 ("the '257 Patent"). EX1002, 127-134. The '257 Patent is a continuation of the '044 Patent. On September 7, 2018, the Applicant filed an amendment cancelling claims 1-74 and adding new claims 75-94. EX1002, 154-160. On December 31, 2018, the Examiner issued a Final Office Action rejecting the pending claims under § 112,

citing new matter in the independent claims. EX1002, 208-219. In response, on July 1, 2019, Applicant filed a Request for Continued Examination along with an Amendment. EX1002, 231-239. In that Response, the Applicant included in the remarks a table of the claim elements challenged as new matter with citations to the specification's support for those elements. EX1002, 267.

59. On October 24, 2019, the Examiner filed a Notice of Allowance. EX1002, 310-313. Concerning reasons for allowance, the Examiner stated the prior art references, alone or in combination, failed to teach or suggest “an effect simulator adapted to: recall from said memory said at least one stored user input simulation parameter; and calculate a time varying lighting value based on said recalled simulation parameter; wherein the effect simulator is adapted to output said calculated time varying lighting value to the at least one lighting device thereby to simulate a lighting effect.” EX1002, 311.

60. On January 14, 2020, the Applicant filed a Request for Continued Examination, along with a Supplemental Information Disclosure Statement disclosing, among others, the Astera AX10 SpotMax™ User Manual (“Astera Manual”) – the same Astera Manual asserted against the '044 Patent in the present action. EX1002, 382-395; EX1003. On January 29, 2020, the Examiner filed a Notice of Allowance, accompanied by a List of References cited by Applicant and considered by Examiner. EX1002, 399, 411-417. The bottom of the submitted list

reads “ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH.” EX1002, 412. None of the references, including the Astera Manual, were lined through, indicating that the Examiner considered the Astera Manual. EX1002, 412.

61. On March 5, 2020, the Applicant filed another Request for Continued Examination with another Supplemental Information Disclosure Statement. EX1002, 418-428. On April 1, 2020, the Examiner once again issued a Notice of Allowance, indicating that the Examiner considered each of the newly filed references. EX1002, 432-452.

62. On June 30, 2020, Applicant filed a final Request for Continued Examination, along with a Supplemental Information Disclosure Statement. EX1002, 454-464. The references cited include European Patent Office filings concerning the Astera Manual. EX1002, 461. The Examiner filed a final Notice of Allowance on July 28, 2020, and the application issued as the '044 Patent on November 24, 2020. EX1002, 467-490, 496.

C. Claims Of The '044 Patent

63. Petitioner has challenged all nineteen (19) claims of the '044 Patent (the “Challenged Claims”), of which claims 1, 12, and 19 are independent claims. Independent claims 1, 12, and 19 recite a method for controlling a lighting device, a system adapted to control at least one lighting device, and a computer program

product comprising software code for controlling a lighting device, respectively.

EX1001, 11:43-58, 12:29-47, 12:66-13:16. Each of the independent claims recites generally similar limitations, though there are a few differences. *Id.* Claims 2-11 depend from claim 1, and claims 13-18 depend from claim 12. EX1001, 11:59-12:65.

VI. GROUND SUMMARY

64. I understand that a Petition for *Inter Partes* Review was filed against claims 1-19 of the '044 Patent on October 25, 2021 (IPR2022-00099, Paper 2), and that on May 12, 2022, the Patent Trial and Appeal Board ("PTAB") instituted *Inter Partes* Review proceedings (Decision Granting Institution of *Inter Partes* Review in IPR2022-00099 (Paper 13)). I understand that this Petition seeks cancellation of claims 1-19 of the '044 Patent on the following Grounds:

Ground	Basis	Reference(s)	Claims
1	§§ 102 / 103	Astera (EX1003)	1-19
2	§§ 102 / 103	Edwards (EX1004)	1-19

See Petition, 3-4; Institution Decision, 7, 25.

VII. CLAIM CONSTRUCTION

65. I understand that in interpreting claims, I should consider the literal language of the claim at issue, as well as the language of other claims, the specification, and the prosecution history of the underlying claims. I also

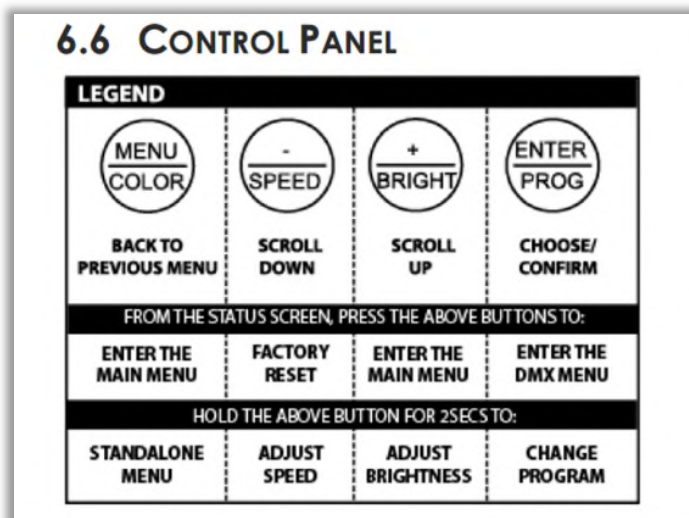
understand that the words of a claim should be given their ordinary meaning as understood by those of skill in the art, unless it is clear from the specification or prosecution history (or both) that a different meaning was intended.

66. I understand that Petitioner takes the position that no claim constructions are necessary. Petition, 7. For purposes of this Declaration and in relation to the invalidity arguments raised by Petitioner, I have analyzed the claims under their ordinary meaning as understood by a POSITA. I do not believe that any formal constructions are necessary to resolve this IPR.

VIII. SCOPE AND CONTENT OF PRIOR ART RELIED ON BY PETITIONER

A. Summary Of The Astera Manual

67. The Astera Manual is a user manual for the Astera AX10 SpotMax™ LED (“AX10”) spotlight. EX1003, cover. The Astera Manual discloses that the AX10 can be controlled using a local control panel, an ARC1 infrared remote control, the AsteraApp™, or CRMX wireless DMX. EX1003, 9-11. The local control panel includes a simple interface for selecting between menus:



EX1003, 11.

68. As I understand it, the local menu allows a user to input basic things like increased brightness or to select a “predefined program[]” for a single lighting device. EX1003, 20-21. The pre-defined programs in the Astera Manual are shown here:

6.16.1 Predefined Programs

The predefined programs may use more than one pixel. To display these effects properly with your light, it is first necessary to group them into Flow-Sets and control them by the AsteraApp™ (see chapter 7.4).

If several lights are grouped into a Flow-Set, they form a virtual big light with several pixels.

Name	Pattern
ONE COLOR STATIC	A static color is displayed on the whole virtual light.
TWO COLOR STATIC	The virtual light is split into two halves and two colors are displayed.
THREE COLOR STATIC	The virtual light is split into three parts and three colors are displayed.
FOUR COLOR STATIC	The virtual light is split into four parts and four colors are displayed.
ONE COLOR FADE	For all FADE programs, the whole color palette of four colors is used. Those colors are faded in and out one by one. Here, the whole virtual light shows the same color.
TWO COLOR FADE	The virtual light is split and shows two colors at a time.
THREE COLOR FADE	The virtual light is split and shows three colors at a time.
FOUR COLOR FADE	The virtual light is split and shows four colors at a time.
SIMPLE RUNNING	A running light; the background and the running pixels color can be set.
DOUBLE RUNNING	Two pixels are running in opposite direction.
TWO COL RUNNING	The two pixels are of different color even.
FLAG RUNNING	A three color flag is running over the background color.
DOUBLE FLAG RUNNING	Two flags are running over background in opposite direction.
SPIRAL 4 COLORS	The color is changed pixel by pixel. All four colors are used one after the other.
SPIRAL 2 COLORS	The color changes between color 1 and 2 from the outside to the inside, pixel by pixel.
RAINBOW	A rainbow effect is displayed.
FIRE	The fire effect is a random flicker between two colors, background and flickering color.

EX1003, 21.

69. The Astera Manual explains that “[y]our light has a built in standalone engine. It can display static colors or replay a number of predefined effect patterns with a customizable color palette.” EX1003, 24. I understand that the “standalone engine” is within the lighting device, although I note that no further details of its components or functionality are particularly provided in the Astera Manual.

70. My understanding is that using the AsteraApp™ (which runs from a mobile device, such as a smart phone or tablet), expands the functionality.

EX1003, 23 (“[t]he buttons of the AX10 only allow a basic operation of the light.

To gain full control over all features, the AsteraApp™ should be used.”)

Specifically, the Astera Manual discloses that lighting “effects can be created and be sent to the light.” EX1003, 24. Once selected, “[t]he effects are ... triggered and then each light replays them autonomously until a new effect is sent.” *Id.*

71. The Astera Manual discloses customizability of the effects within the AsteraApp™. EX1003, 27. Specifically, aspects of the effect like “speed”, “crossfade”, and “brightness” can be adjusted to customize the lighting effect. *Id.*

72. While the effects may be customized, they are based on pre-defined patterns. In particular, the Astera Manual discloses that “[t]he effects’ patterns are pre-defined and cannot be modified by the user. They are pre-programmed inside of each light. Still they can be parameterized.” EX1003, 28. Essentially, the Astera Manual discloses two capabilities: (1) the ability to replay, on a loop, a series of pre-programmed effect patterns, and (2) the ability to modify the playback parameters of the effect pattern, *e.g.*, the playback speed. However, this modification of the playback parameters of the effects described in the Astera Manual does not change the underlying effect pattern and it does not involve a calculation, as further explained below.

B. Summary Of Edwards

73. U.S. Patent No. 9,743,010 to Edwards (“Edwards”) generally relates to a “method and system for synchronizing LED lighting to the shutters of fast

digital cameras.” EX1004, Abstract. In particular, Edwards focuses on synchronizing changes in lighting to the camera shutter for videos and motion pictures to enable all lighting transitions to be done between frames. EX1004, 1:25-28. This synchronization is done to obtain a clean image capture, free from artifacts that occur when lighting changes in the middle of a frame. EX1004, 1:28-30.

74. To achieve the desired synchronization, Edwards describes programming the intensity value of each of the light fixtures to change while the camera shutters are closed. EX1004, 1:44-54. Edwards’ invention further purports to be “a new type of motion picture control system that utilizes synchronized control of both high speed digital motion picture cameras and digital LED lighting systems to enable multiple ‘lighting schemes’ to be filmed simultaneously.” EX1004, 3:13-18.

75. Edwards explains that these “lighting schemes” may be implemented using commands. EX1004, 7:20-22. That is, commands may be implemented using a control panel on each light or DMX by a cinematographer using a “SETUP” command to adjust the light color, color temperature, and dimming of each light fixture. EX1004, 7:20-31. The cinematographer may then use a “STORE” command to save the light scheme settings. EX1004, 7:32-37. This allows for the light schemes to be sequentially replayed when the cinematographer

provides a “RECORD” command (*i.e.*, to start filming with the desired lighting).

EX1004, 7:54-58. Edwards provides an example of a cinematographer inputting light schemes “1, 3, 5” such that these light schemes occur sequentially, with the change between schemes synchronized to the camera shutter. EX1004, 7:54-8:1.

76. Edwards discloses several other aspects and embodiments of the lighting system. Pertinent to my discussion below, Edwards describes an ability for a board operator to use a DMX console to adjust the lighting of each video track in real time. EX1004, 11:19-24. Edwards provides an example of dimming and increasing a spot light in real time on just one track using the DMX address of the track. EX1004, 11:24-26.

77. Further, Edwards explains that “[i]n film and broadcast lighting there are frequently times when dynamic lighting is used as a special effect, editing element or to simulate an environment in the film.” EX1004, 11:33-35. Edwards then provides several examples of these dynamic lighting special effects, such as lightning, gun shot, a flashing sign, or a fire. EX1004, 11:36-53.

IX. THE '044 PATENT IS VALID OVER THE ASTERA MANUAL AND EDWARDS BECAUSE PETITIONER FAILS TO PROPERLY ADDRESS THE CALCULATING LIMITATION

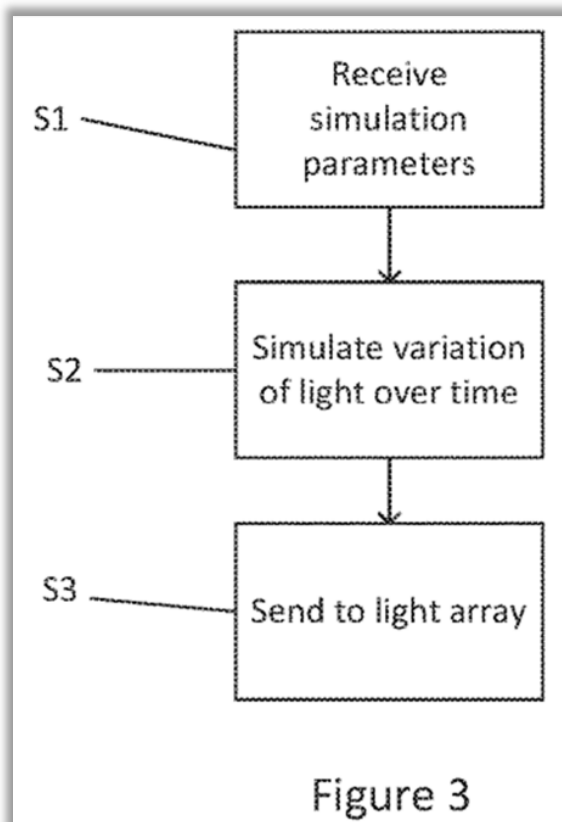
78. Before turning to the specific Grounds and a more detailed explanation of particular claim limitations relative to the prior art, there is one

important claim recitation that I believe merits an initial, collective discussion as it distinguishes over both the Astera Manual and Edwards Grounds.

79. Each of independent claims 1, 12, and 19 of the '044 Patent requires a variation of “calculating, using an effect simulator, a time varying lighting value based on said recalled simulation parameter.” EX1001, cls. 1 and 19; *see also id.*, cl. 12 (“calculate a time a time varying lighting value based on said recalled simulation parameter”).

80. I do not believe that this limitation is present in the Astera Manual or Edwards. In my opinion, the Petition and Wood Declaration fail to address the plain meaning of this phrase as it would have been understood by a POSITA in view of the specification and drawings of the '044 Patent.

81. The specification of the '044 Patent describes the calculating step, stating that “[t]he simulation calculates how the lighting changes over time in order to produce the desired lighting effect.” EX1001, 7:31-33. This calculating step is further embodied in the flow chart in FIG. 3:



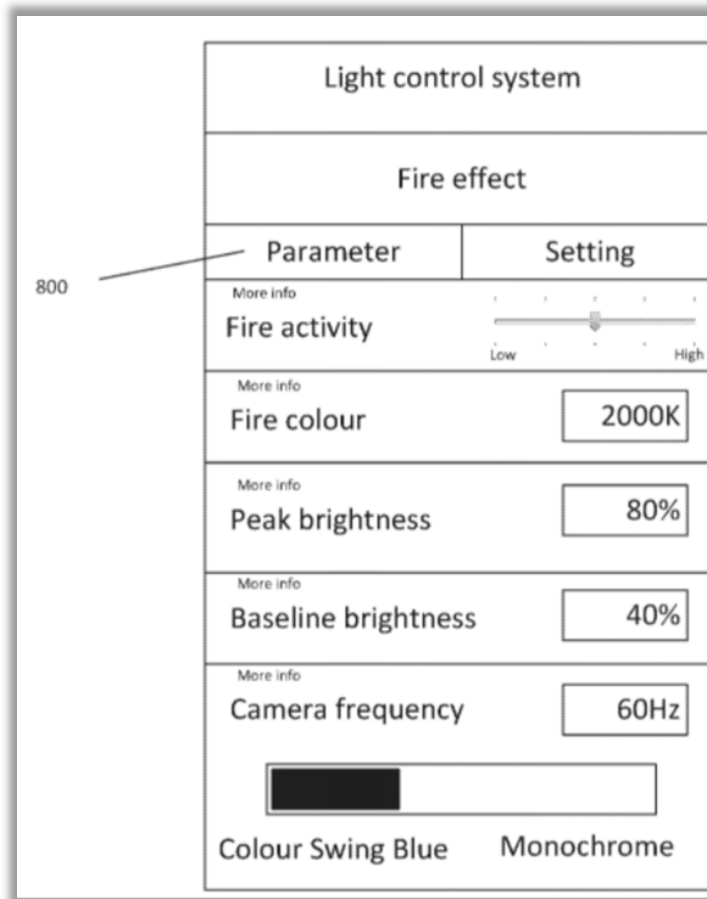
EX1001, FIG. 3.

82. As shown above, the lighting device first receives simulation parameters (*e.g.*, a user input simulation parameter), and simulates the variation of light over time. EX1001, 7:19-28, FIG. 3. The “user input simulation parameters may be stored in memory 220 and recalled from the memory 220 at a later time.” EX1001, 9:31-33. The lighting device simulates the effect by using the user input simulation parameters to calculate how the lighting changes over time. EX1001, 7:31-33. Critically, this ties the “calculating” step (and “calculating” / “calculate” claim limitations) directly to a user input simulation parameter that is stored and

recalled (*i.e.*, the calculating is “based on said recalled simulation parameter”).

EX1001, 11:54-56, 12:40-44, 13:12-14.

83. FIG. 6 of the '044 Patent illustrates an embodiment of a control panel that receives user input of a parameter to simulate a lighting effect, which is helpful to illustrate the meaning of the “calculating” / “calculate” limitations of the independent claims:



EX1001, FIG. 6.

84. In the example shown in Figure 6, the “customized lighting effect” is a “Fire effect.” The user is able to input a “simulation parameter,” such as fire

color or peak brightness. The “time varying lighting value” is calculated by the lighting effect simulator 100 based on said recalled simulation parameter.

EX1001, 5:61-63, 7:19-33, 7:40-42, 8:27-29, 9:57-61.

85. The '044 Patent discloses and claims an effect simulator that *calculates a time varying lighting value* based on said recalled simulation parameter. EX1001, 5:61-63, 7:19-33, 7:40-42, 8:27-29, 9:57-61; cls. 1, 12, 19. In the context of the above, as an example, assume that the “simulation parameter” is “peak brightness” and the user input is “80%.” This means that the effect simulator uses the user input simulation parameter to calculate a time varying lighting value, *i.e.*, uses the “80% brightness” as a simulation parameter input to a calculation that outputs a time varying lighting value. Notably, recalling a pre-stored lighting pattern or replaying a pre-defined lighting effect does not satisfy this claim language.

86. Figure 7 demonstrates an example with the brightness varying over time generated algorithmically by the effect simulator disclosed in the '044 Patent. EX1001, 10:30-46. In particular, the '044 Patent provides an example of a fire-effect-generating algorithm that calculates such a brightness-over-time pattern:

Fire is simulated as a series of “sparks”. Each spark has the following random parameters:

Interval: New sparks are generated at an interval which varies randomly between a defined maximum and minimum interval.

Peak: The peak luminance of each spark varies randomly between a defined minimum and maximum.

Ramp-up time: The luminance of each spark ramps up to the peak at a randomly generated rate.

Fade-down time: The fade from the peak is linked to the ramp-up time but is much slower—simulating the gradual decline in luminance of a burning ember.

EX1001, 9:42-53.

87. A series of sparks is generated sequentially to produce a realistic fire simulation, according to an algorithm like the one described below:

At the end of a spark up and down period:

Reset duration for next spark to between 2.5 s to 5 s

Generate new brightness targets for the next spark between 12.5% and 100% of current maximum brightness setting.

Offset the random brightness targets by the requested brightness floor value

Set the new peak brightness target for the new spark

Ensure the new targets are greater than the existing faded brightness value to prevent downward jumps

Set the fade direction to UP

Start new animation frame:

Calculate brightness fade step sizes:

Fade up fast, progressively larger fade step sizes

Change fade direction at peak

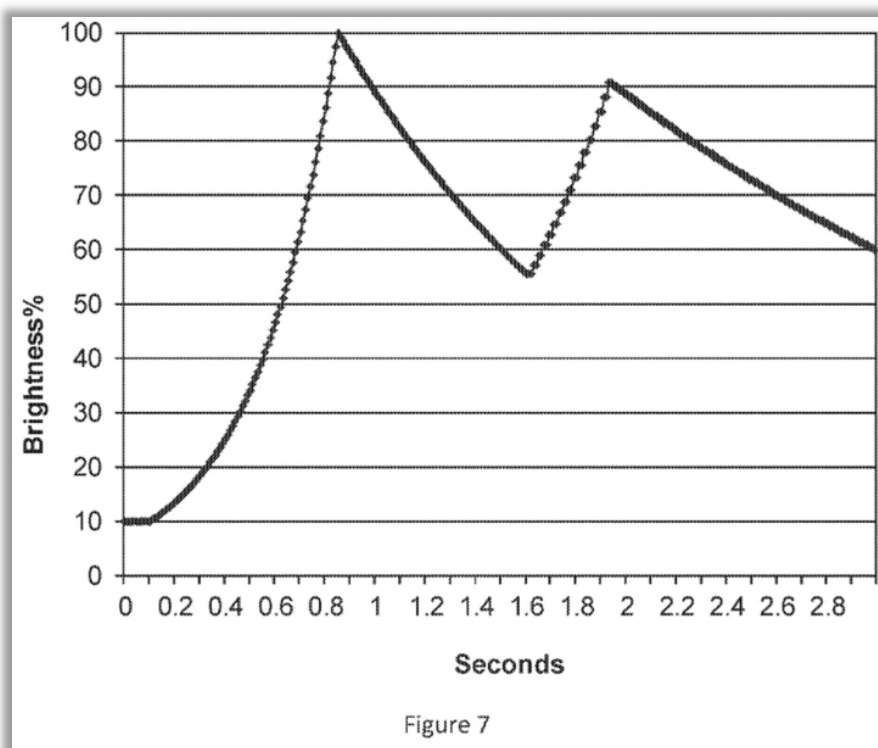
Fade down slow, progressively smaller fade step sizes

Set the frame rate for the new spark to a random value

prevent the curtailment of a long fade by a new short pulse: if the faded brightness is still >25% of max then don't allow new FramePeriod to be less than old.

EX1001, 10:9-29.

88. The above algorithm provides an example demonstrating how the effect simulator *calculates a time varying lighting value* based on various recalled simulation parameters. The '044 Patent also provides an example of time varying lighting values, calculated by the effect simulator, in Figure 7:



EX1001, FIG. 7.

89. The '044 Patent further explains “[t]he lighting effect simulator typically cycles round a loop calculating new lamp brightness and colour values.”

EX1001, 9:57-58.¹

90. Performing a calculation in this manner using an algorithm generates more controllable and realistic-looking fire effects than replaying a pre-recorded set of values chosen to mimic a fire. In particular, “[g]enerating the light output

¹ Unless noted otherwise, I added the emphasis in quotations throughout this Declaration.

with the simulation provides a greater level of user adjustment and control than that produced by simply sampling the intensity of a real flame and replaying it at different speeds.” EX1001, 10:3-6. An effect generated by the algorithm described in the ’044 Patent is characterized by a continuous stream of sparks, where “each spark has a different speed, duration and peak – simulating the look of a real flame.” EX1001, 9:67-10:2.

91. Critically, the ’044 Patent is not simply recalling a stored lighting value or set of stored lighting values and adjusting them to create variations of effects. When the effect simulator disclosed in the ’044 Patent generates a lighting effect, it does so by *actively calculating time varying lighting values* based on a recalled simulation parameter, not by *passively replaying* an existing lighting effect stored in memory.

92. In contrast, in the Astera Manual and Edwards references, pre-defined lighting effect patterns are stored and then recalled. There is no “calculating” by an effect simulator. And there is not a calculation “based on” at least one recalled simulation parameter. The entire lighting effect may be recalled/replayed, but there is not a calculation performed based on a recalled simulation parameter. The specifics of these references are discussed in more detail below, but I believe it is noteworthy that the ’044 Patent is fundamentally different than these prior art

techniques because of the “calculating” limitation that appears in each of the independent claims.

93. Further, even where a device includes the option to customize or modify a pre-recorded set of lighting values, a POSITA would have understood that parametrizing or customizing those pre-recorded values does not involve a “calculation.” Parameterizing a pre-recorded lighting scheme does not require calculating anything; it simply involves adjusting the pre-recorded parameters. For example, if a fire special effect is pre-recorded and the playback speed is increased, there is no “calculating” within the meaning of the ’044 Patent claims—the pre-recorded lighting effect is simply played slower or faster. The same holds true for a brightness adjustment, *i.e.*, pre-recorded time varying lighting values for the fire are replayed and the overall brightness may change, but there is no “calculating” of the time varying lighting values (nor a calculation “based on” the adjusted brightness).

94. As an analogy, compare a live jazz performance to a mp3 recording of a jazz song. When the listener plays the recording, the mp3 player is not calculating a time varying musical signal, it is simply recalling a pre-defined pattern of musical notes. Conversely, at the live jazz performance, the musician is actively choosing which notes to play next. In this analogy, the jazz musician takes the place of the “effect simulator,” the notes she plays are the time varying

musical signal, and her choice of which notes to play next is her calculation thereof – the algorithm she uses to choose each note. On the other hand, the mp3 player is a passive system that merely replays a pre-defined musical pattern. While the user may adjust parameters of that signal (*e.g.*, the volume, the playback speed, etc.), the musical signal is not “calculated,” it is simply recalled.

95. While the mp3 player and the jazz musician may both output a nearly identical song, the method at which each arrived at that output is entirely different. In particular, the mp3 player will consistently play the same exact song, but it will never give the user a “concert” experience. That realism is only achievable with a live musician actively choosing (in a sense, calculating) the next notes. The ’044 Patent recognizes that realism in lighting effects is not achievable by layering customized parameters over a pre-recorded pattern.

96. In my opinion, Mr. Wood takes an overly broad view with respect to what the “calculating” limitation encompasses. For example, I reviewed Mr. Wood’s deposition transcript, and he seems to believe that *any* analog circuit that receives a user input and outputs lighting values is performing a “calculation.” EX2012, 70:2-71:21, 95:8-100:1, 158:4-159:3; EX2013, 369:13-17. Further, Mr. Wood seems to believe that *any* conversion from a manual input to a lighting output involves a “calculation.” EX2012, 110:3-112:4 (increasing the volume of a radio involves a calculation), 112:17-114:9 (a Super Strobe from the 1980s

receiving a manual input of a flash rate and converting it to an output performs a calculation). I understood Mr. Wood to argue that receiving a manual input (*e.g.*, of a brightness increase) and converting it to an LED signal using PWM requires a calculation. EX2014, 61:10-62:11; EX2012, 145:6-146:18, 149:7-150:19, 154:12-155:18; EX2013, 343:5-7, 427:16-21.

97. Finally, and perhaps most notably, I see that Mr. Wood takes the position that replaying pre-defined effect patterns includes calculating. EX2014, 82:4-10 (“Q: Would recalling stored values for schemes and replaying them in order require a calculation? A: Yes. Q: Would the replaying of stored lighting values require a calculation? A: Yes.”); EX2012, 200:22-201:22 (“Q: So is it your position that the replaying of a number of predefined effect patterns includes calculating? A: Absolutely. ... So, yeah, this absolutely requires calculation.”).

98. I disagree that the claimed “calculating” of the ’044 Patent is as broad as Mr. Wood seems to understand it. Mr. Wood’s view would encompass every light that allowed, *e.g.*, a user input to increase brightness, a digital light that received a signal to change color, or any digital light that is merely capable of receiving a signal. EX2013, 337:9-11 (“Q: Is the light listening for new commands calculating? A: Absolutely.”) Further, Mr. Wood’s view would encompass the mere “replaying” of a *pre-defined* lighting pattern. EX2014, 82:8-10 (“Q: Would the replaying of stored lighting values require a calculation? A: Yes.”); *see also id.*

at 82:4-7; EX2012, 200:22-201:22. That is simply not how a POSITA would have understood “calculating” in the context of the ’044 Patent, as I have explained above.² Further, the conversion of signals into a form the lighting device can receive cannot be the “calculating” by the effect simulator in the ’044 Patent, as the patent consistently describes and claims the “effect simulator” (which performs the calculations) from the “converter” (which converts the output from the effect simulator into signals for the lighting device). *See e.g.*, EX1001, cl. 9 (reciting that the method, which has already been defined to include the “calculating” step, may further comprise “converting” the brightness or color data into a lighting signal); 8:27-39 (explaining a converter may be provided to convert the data “*from* the lighting effect simulator 100 into a suitable signal for a particular light,” by using,

² Additionally, I have also reviewed institution decisions regarding IPR petitions for the ’044 Patent and family members U.S. Patent No. 10,197,257 and U.S. Patent No. 10,197,258. *See* EX2015 (IPR2022-00261, Paper 8) and EX2016 (IPR2022-00262, Paper 7). I observe there that the Board found a prior art reference’s disclosure of searching a library of pre-packaged effects (EX2016, 24) and modifying the pre-packaged effects (EX2015, 19) do not involve “calculating a time varying lighting value.” I concur and this finding underscores the same flaw in Petitioner’s arguments.

e.g., PWM and demonstrating the converter is a separate component from the effect simulator).

X. CLAIMS 1-19 ARE VALID OVER THE ASTERA MANUAL

A. The Astera Manual Is Not Prior Art

1. Petitioner Has Not Shown that Astera Was Publicly Available to a POSITA Prior to April 8, 2016

99. In my opinion, Petitioner has not shown that the Astera Manual was publicly available before the priority date of the '044 Patent. First, the Astera Manual's date of publication is ambiguous based on Astera's typical date format convention. Second, there is no evidence that the Astera Manual was available to POSITAs—the Petitioner at most established that *customers* could access the manual but is missing the link that customers are POSITAs as defined by either myself or by their expert, Mr. Wood.

100. ***Petitioner Failed to Establish a Publication Date Prior to the '044 Patent.*** Petitioner argues, somewhat ambiguously, that the Astera Manual was publicly available in May or June of 2015. Petition, 8. I characterize Petitioner's argument as ambiguous because Petitioner states that “Astera bears a date of May 7, 2015, and was made publicly available ... at least in June of 2015.” Petition, 8. Further, Petitioner previously argued in this IPR proceeding that “[t]he Astera Manual on its face bears a date of May 7, 2015” and that public availability was “in this timeframe.” Petitioner's Reply to Patent Owner's Preliminary Response,

Paper 10, 2. Accordingly, it is unclear what weight and significance Petitioner is giving the May 7, 2015 date appearing on the face of the Astera Manual, since Petitioner appears to concede that the Astera Manual may not have been publicly available until after May 7, 2015.

101. Despite Petitioner seeming to assign the May 7, 2015 date at least some significance, that date, in my opinion, does not have any bearing on public availability. Specifically, Mr. Canins testified that the date on the face of the Astera Manual was “the date [Astera] finalized this document.” EX2017, 39:21-40:1. Accordingly, the May 7, 2015 date does not indicate when, if ever, the Astera Manual was made publicly available.

102. Instead, Petitioner relies on the “Quick Start Guide” to establish when customers of Astera first had access to the Astera Manual. Mr. Canins testified that Astera does not include a physical copy of the Astera Manual in the box with its product. EX1008, 2; EX2017, 34:14-18. Rather, Astera included only a Quick Start Guide with a QR code and a link to an electronic version of the Astera Manual. EX1008, 2; EX2017, 34:14-18, 35:4-6. Thus, the earliest date Petitioner can establish that Astera customers were directed to the electronic copy of the Astera Manual is the date on the Quick Start Guide.

103. Mr. Canins testified that Astera typically uses the Chinese date format (Year-Month-Day). EX2017, 40:1-6. Specifically, Mr. Canins personally uses this

date format because it is “the best date format” for electronic records filing; Mr. Canins stated that Year-Month-Date is “the most common [date format] we use in the company.” EX2017, 40:15-17, 40:11-13. Moreover, Mr. Canins was personally involved in drafting the Quick Start Guide. EX2017, 21:21-22:7.

104. The Quick Start Guide bears a “Date of Issue” of “16/06/15.” EX1008, ¶6, Exhibit B at 1. While Mr. Canins asserted (without any further explanation) in his declaration that this date indicates June 16, 2015, his deposition testimony regarding commonly used date formats suggests the actual date of issue is June 15, 2016. EX1008, ¶¶2, 6. In particular, Mr. Canins testified that the (Year, Month, Day) format was most commonly used by Astera and that he personally used this format. EX2017, 40:7-13, 40:18-22. The date “16/06/15” is at best ambiguous, but, given Mr. Canins testimony about date formats, likely indicates **June 15, 2016**.

105. The priority date of the '044 Patent is April 8, 2016. EX1001, cover. As such, a June 15, 2016 publication date of the Quick Start Guide does not pre-date the priority of the '044 Patent.

106. As a separate, additional point, I observe that Mr. Canins asserts that the Quick Start Guide directed customers to the Astera Manual. EX1008, ¶7. This assertion does not help Petitioner meet the burden of showing to *which version* of the Astera Manual the Quick Start Guide was linked.

107. *Petitioner Failed to Establish Public Accessibility by a POSITA.*

Even if the Quick Start Guide was on the Astera website in 2015 – which Petitioner has not shown – Petitioner has not submitted sufficient evidence that the Astera Manual constitutes a publicly available printed publication for the purposes of establishing the reference as prior art.

108. I understand that in order to be considered a printed publication, a reference published online needs to have been accessible by a POSITA applying reasonable diligence. *See* Section III.C., *supra*. Here, Petitioner has only presented evidence that Astera customers had access to the Quick Start Guide, and thus the link to the electronic version of the Astera Manual. *See* EX1008, ¶4; EX2017, 34:14-18. But, Petitioner has not submitted any evidence that customers who purchased the Astera AX10 were POSITAs. Specifically, Petitioner argues that a POSITA “would have had a good working knowledge of electrical engineering” gained “through an undergraduate Bachelor’s degree in electrical engineering.” Petition, 7.

109. However, Petitioner has not shown that Astera AX10 *customers* were electrical engineers with engineering Bachelor’s degrees. Mr. Canins testified that the “most important” customers are “rental companies” – companies that invest in Astera lighting devices and rent them out to end-users. EX2017, 35:7-16. In addition to rental companies, Mr. Canins testified that customers and end-users

work in “film and TV ... and events.” EX2017, 36:20-37:1. Likewise, Mr. Wood testified that the typical end user of the types of lighting devices at issue is a lighting operator working at the direction of a lighting designer, neither of whom were established to be POSITAs. EX2012, 50:22-52:22. Neither Mr. Canins, nor Petitioner, submitted any evidence showing that these customers and end-users of the Astera AX10 meet the credentials of a POSITA as defined by either Petitioner or Patent Owner. Accordingly, Petitioner has not shown that Astera’s customers were POSITAs.

110. Further, Petitioner has not submitted evidence that the website containing the link to the Astera Manual was known to POSITAs, or that a POSITA would have been able to access the Astera Manual by applying reasonable diligence. Petitioner did not submit any evidence of anyone accessing the Astera Manual. Mr. Canins admitted that he did not submit any evidence of customers or end-users actually accessing the electronic version of the Astera Manual. EX2017, 38:9-15. At most, Petitioner only established that *customers* could access the manual; Petitioner has not shown that customers actually did, let alone that *POSITAs could have* reasonably found the Astera Manual.

111. Therefore, the evidence presented by Petitioner is insufficient to show that a POSITA could have, through an exercise of reasonable diligence, located the Astera Manual.

2. Astera Discloses Features that Petitioner Has Not Shown to Have Been Available Prior to April 8, 2016

112. As I have just discussed, in my opinion, Petitioner has not met its burden of showing that the Astera Manual is prior art to the '044 Patent. Therefore, it is also my opinion that the Astera Manual cannot anticipate and/or render obvious the Challenged Claims of the '044 Patent.³ In addition to the lack of evidence of public availability, I am also of the opinion that the Astera Manual discloses features that were apparently not available as of the asserted public availability date. In order to form this opinion, I reviewed the Astera Manual, the Declaration of Simon Canins, the Second Declaration of Simon Canins, and various documents relating to the publication of the Astera Manual. *See* EX1003; EX1008; EX1009; EX1010; EX2004; EX2003; EX2005, 87, 102-107, 122-123.

113. As discussed above, the priority date of the '044 Patent is April 8, 2016. EX1001, cover. I understand that Petitioner asserts that the Astera Manual was publicly available at least as of June 2015, based on the Declaration of Simon Canins (EX1008) and the Second Declaration of Simon Canins (EX1009). *See*

³ I am aware that the European Patent Office considered the release date of the Astera Manual and EX2004, and came to the same conclusion I have – namely, that there is not sufficient evidence to show that Astera is prior art to a family member of the '044 Patent. *See* EX2005, 87, 102-107, 122-123.

EX1003; EX1008, ¶6; EX1009, ¶4; Petition, 8. Mr. Canins, the R&D Director for Astera, asserts that the reference is the “true and correct copy” of the Astera AX10 User Manual “distributed to customers from at least June 2015 through at least June 2017.” EX1008, ¶6.

114. However, the Astera Manual is a user manual that discloses features of the Astera AX10 product. As detailed below, the Astera Manual includes disclosure of features that were not released before the priority date of the '044 Patent, let alone as of the asserted June 2015 public availability date. Because these features appear to have been implemented only after the priority date of the '044 Patent, it is my opinion that Petitioner has not met its burden of showing that the May 7, 2015 date is the actual publication date of the Astera Manual. Further, because the relevant features were not available until after the priority date of the '044 Patent, as discussed in more detail below, in my opinion, the Astera Manual is not prior art to the '044 Patent.

115. It is my opinion that a user manual would not have been publicly released describing certain product features until those product features were in the released product. I form this opinion based on my extensive experience working with companies in the lighting industry as outlined above. *See* Section I.A-D. In particular, I have been personally responsible for generating and distributing user manuals at Uniroyal Optoelectronics, Beeman Lighting, Lighting Science Group

Corp., ETi Lighting Research Institute, HeathCo and QuarkStar. In my experience, companies do not release user manuals until a product is publicly available. This timing is adhered to in the industry because, for example, releasing manuals regarding unreleased features causes consumer confusion and raises concerns that consumers have a defective or deficient product. In addition, releasing a manual prior to public launch of a product risks the perception of the product being perceived “vapor ware” – that is to say a fake product that is used as a marketing ploy to increase short term interest in a company.

116. Turning to the Astera Manual specifically, Petitioner has failed to establish that the user manual was publicly available prior to April 8, 2016 (the effective filing date of the '044 Patent) because features in the user manual were not present until a software version released in June 2016. As described in the Astera Manual, the relevant functions are only accessible to users through the mobile app. EX1003, 23. Specifically, the Astera Manual states “[t]he buttons of the AX10 only allow a basic operation of the light. To gain full control over all features, the AsteraApp™ should be used.” *Id.* From this, I understand that some of the features of the Astera AX10 product are only accessible via the AsteraApp™.

117. Two such features are the “anti-flicker” and “theft alarm” described in Sections 7.12 and 7.13 of the Astera Manual. EX1003, 32-33. The “anti-flicker”

and “theft alarm” features were not released until at least the summer of 2016. To reach that conclusion, I reviewed a screenshot of the Google Play store page for the AsteraApp™, which lists “theft alarm” and “anti-flicker” features as added in version 9 of the app. EX2005, 102-103 (listing “theft alarm” and “anti-flicker” under features of version 9; “AsteraApp™ v9 with Talkback+ is now online!”); *see also* EX2006 (confirming the v9.111 release date) and EX2007, 2 (confirming functionality including “theft alarm” and “anti-flicker” were apparently added in v9). Specifically, the context in which the features at issue are presented in the exhibit demonstrates that the features were new to that version of the app. EX2007; EX2005, 102-103. The exhibits show the Google Play Store page when AsteraApp™ v9 was introduced. EX2007; EX2005, 102.

118. The first line reads “AsteraApp v9™ with Talkback+ is now online!” EX2005, 102. Below, “Theft Alarm” and “Anti-flicker” are listed as highlighted features, along with “Talkback+”. *Id.*, 102-103. Taken together, the exhibits demonstrate “Talkback+,” “theft alarm,” and “anti-flicker” were features new to v9. According to the same Google Play store page, as of July 17, 2019, the current version of the app was version 9.111. EX2005, 103; *see also* EX2004, 1 (confirming the v9.111 release date).

119. Additionally, I reviewed a copy of the same Google Play store page, obtained using the WayBack Machine archive. *See* EX2008; EX2004. The page

was archived on June 9, 2016, two months after the priority date of the '044 Patent.

EX2004, 1. As of that date, the current version of the AsteraApp™ was version 8.43. EX2004, 2. Accordingly, the WayBack Machine archive shows that version 9 was not released until after June 9, 2016, and consequently, after the priority date of the '044 Patent. In my opinion, this is consistent with the Google Play store screenshot, which shows that version 9.111, presumably an early software patch to version 9, was launched on July 17, 2019, a full three years after the priority date of the '044 Patent. EX2005, 103; *see also* EX2007, 1 (confirming the v9.111 release date).

120. Based on the above, my opinion is that the “anti-flicker” and “theft alarm” features – new to version 9 of the AsteraApp™ – do not appear to have been available before the priority date of the '044 Patent.

121. Consequently, in my opinion, Petitioner has not shown sufficient facts to meet its burden of showing that the Astera Manual is prior art to the '044 Patent. The Astera Manual's disclosure of features and functionalities not available until after the priority date of the '044 Patent is at odds with the date identified on the reference's cover.

122. The first Declaration of Simon Canins that Petitioner asserts supports the claimed May 7, 2015 publication date, does nothing to rebut the above

evidence, and contains only conclusory assertions that the publication date is “true and correct.” EX1008, ¶6.

123. Specifically, Mr. Canins references sales of the AX10 devices in the United States and worldwide, and cites to the “Quick Start Guide” included with each AX10. EX1008, ¶¶4-5. Neither of these two pieces of evidence help Petitioner meet its burden of showing that the Astera Manual is valid prior art.

124. Mr. Canins’ testimony that AX10s were sold worldwide in 2015 does not bolster Petitioner’s argument that the Astera Manual was available before the priority date of the ’044 Patent. All Mr. Canins’ statements support is that some version of the AX10 device was sold prior to the ’044 Patent with a quick start guide linking to a user manual, but that does not address the specific challenge here—*i.e.*, that *the version Petitioner has submitted as the Astera Manual* was not available until after the priority date of the ’044 Patent. *See* ¶¶105-112 *supra*. Petitioner has failed to tie the sales of AX10s to this particular version of the Astera Manual (*i.e.*, including the version with anti-flicker and theft alarm functionality). Indeed, these features were not released until later, as explained above.

125. Finally, I note that in the European Patent Office proceedings (EX2005) mentioned above, a key issue was whether or not the Astera Manual was prior art to the ’044 Patent’s family member application. The European Patent

Office concluded the Astera Manual was not shown to be prior art. EX2005, 87.

The basic reasoning was the same as I discuss above, *e.g.*, functionality such as the “anti-flicker” and “theft alarm” for the AsteraApp™ discussed in the Astera Manual was not released until after the effective filing date of the ’044 Patent, calling into question the date listed on the cover of the Astera Manual. *Id.*; EX1003, 1. The Petition and Declaration of Mr. Canins do not squarely address this functionality release discrepancy, instead only focusing on the release/sale dates of the general AX10 product. Therefore, the Petitioner had notice of this particularly problematic discrepancy and yet failed to address it, further demonstrating the failure to show that the Astera Manual is prior art by a preponderance of the evidence.

126. In my opinion, the Astera Manual is not prior art because the Astera Manual appears to be improperly dated, while the evidence shows that the features relevant to this analysis and described in the Astera Manual were not publicly available until after the priority date of the ’044 Patent. Thus, the Astera Manual could not have been available before the priority date of the ’044 Patent, and does not qualify as prior art under the relevant statute.

3. Petitioner’s Supplemental Evidence Does Not Resolve the Issues with the Astera Manual’s Status as Prior Art

127. The supplemental evidence Petitioner submitted (*see* EX1009, EX1010) do not change my opinion that the Astera Manual is not prior art. For

example, the supplemental evidence does nothing to resolve the issues with the date format despite this issue being raised in the Patent Owner's Preliminary Response. IPR2022-00099, Paper 8 at 12-13. Mr. Canins was thus on notice of the date discrepancy but failed to provide a sufficient explanation. Further, the supplemental evidence does not explain how the Astera Manual was reasonably available to a POSITA (and not merely customers).

B. Astera Does Not Anticipate Independent Claims 1, 12, And 19

128. Even if the Astera Manual qualified as prior art, which, in my opinion, it does not, the Astera Manual does not anticipate the independent claims of the '044 Patent. Claims 1, 12, and 19 are the only three independent claims of the '044 Patent. EX1001, cls. 1, 12, 19. Claim 1 is directed to a method for controlling a lighting device, claim 12 is directed to a system adapted to control a lighting device, and claim 19 is directed to software for controlling a lighting device. *Id.* The three independent claims share similar limitations, including a limitation drawn to calculations performed by an effect simulator based on at least one recalled simulation parameter. *Id.* Because these claims share materially similar limitations at least with respect to the distinguishing points over the Astera Manual, my analysis of specific claim elements of claim 1 should be understood as also applying to the corresponding limitations found in claims 12 and 19, even if I only use the language of claim 1.

1. The Astera Manual Does Not Disclose “calculating, using an effect simulator, a time varying lighting value”

129. In my opinion, the Astera Manual does not disclose the “calculating” limitation because the Astera Manual only discloses replaying pre-defined lighting values. As discussed above, replaying pre-defined patterns is distinct from, and thus does not anticipate, “calculating ... a time varying lighting value.” EX1001, cl. 1; *see* Section IX. Specifically, the Astera Manual discloses a lighting system capable of “display[ing] static colors or replay[ing] a number of predefined effect patterns with a customizable color palette.” EX1003, 24. While the Astera Manual discloses customizing the available lighting effects using the AsteraApp™, such customizing does not alter the underlying pre-defined pattern, and is therefore distinct from the “calculating” limitation required by the claims of the ’044 Patent. *Id.*, 27.

130. While the Astera Manual discloses lighting effects, in my opinion, a POSITA would not understand Astera to disclose *calculating* those effects. The Astera Manual explicitly states that “[t]he effects’ patterns are pre-defined and cannot be modified by the user. They are pre-programmed inside of each light.”⁴ EX1003, 28. Accordingly, a POSITA would understand that the Astera Manual

⁴ Mr. Wood’s interpretation of Astera’s “predefined effect patterns” is contrary to this explicit description. *See* EX2012, 184:21-186:22, 200:22-201:14, 204:11-12.

merely describes recalling and replaying pre-defined effects, or time varying lighting values, rather than *calculating* those time varying lighting values.

131. Returning to the above Jazz analogy, the Astera Manual describes the lighting equivalent of a mp3 player. While it can play songs – time varying patterns of sound – it does not *generate* or *calculate* those songs like a musician can. A user may be able to modify the volume, or playback speed, but those modifications do not constitute *calculating* the time varying pattern of sound. The pattern itself is pre-defined. Likewise, to the extent that the effects disclosed in the Astera Manual constitute “time varying lighting value[s],” they are pre-defined and stored in the Astera SpotMax™. The Astera Manual discloses only recalling and replaying the pre-programmed “time varying lighting value;” no “calculating” functionality is described. Accordingly, the Astera Manual does not disclose “calculating, using an effect simulator, a time varying lighting value.”

2. Petitioner Has Not Met Its Burden of Showing that the Astera Manual Discloses “calculating, using an effect simulator, a time varying lighting value”

132. My analysis above shows why the Astera Manual does not disclose the “calculating” limitation of the independent claims. The above analysis alone is sufficient, in my opinion, to rebut Petitioner’s contentions regarding anticipation of the ’044 Patent independent claims by the Astera Manual. For the sake of completeness, however, I next address in more detail why Petitioner’s and Mr.

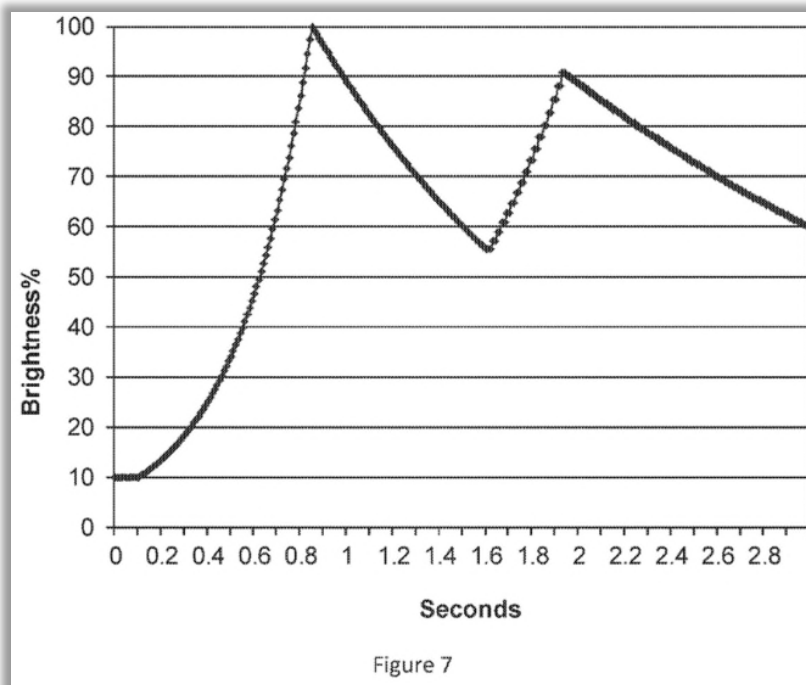
Wood’s analysis falls short of showing that the Astera Manual discloses the “calculating” limitation.

133. *Petitioner and Mr. Wood mischaracterize the Astera Manual’s disclosure of pre-recorded effects as “creating” data.* In my opinion, Petitioner has not met its burden of showing that the Astera Manual anticipates the “calculating” limitation of independent claim 1 of the ’044 Patent.

134. The Wood Declaration quotes the ’044 Patent as disclosing an “effect simulator” that “creates data 106 characterizing a lighting effect.” EX1006, ¶72 (quoting EX1001, 7:37-42). In so describing, Mr. Wood admits the difference between the Astera Manual’s disclosure of lighting effects and the “calculating” limitation of the ’044 Patent. Specifically, the effect simulator, in “calculating ... a time varying lighting value,” *creates data* that is later output to generate a lighting effect. The Astera Manual, on the other hand, merely discloses recalling and replaying effects that are “pre-programmed inside of each light.” EX1003, 28. The effects disclosed in the Astera Manual are not *created* by the light’s controller – they are pre-defined effects that have already been programmed and loaded into the light. *Id.* (“The effects’ patterns are pre-defined and cannot be modified by the user. They are pre-programmed inside of each light.”)

135. Turning to the example discussed above, compare how the Astera Manual discloses outputting a fire effect with how the ’044 Patent outputs a fire

effect. Assume that Figure 7, reproduced below, shows the time varying brightness output of a lighting device simulating a fire effect:



EX1001, FIG. 7.

136. When the device disclosed in the Astera Manual outputs the fire effect, a POSITA would have understood that each of the points on the above graph (disclosing a brightness percentage output at a time), are pre-programmed into the controller (EX1003, 27), and merely sequentially recalled to simulate fire. That is, 0.9 seconds into the fire simulation, the controller disclosed in the Astera Manual retrieves from memory the appropriate brightness percentage for that time – here, 100%. Conversely, the '044 Patent discloses “calculating” that lighting value. Accordingly, when a device according to the '044 Patent outputs a fire

effect, the effects simulator uses an algorithm to *calculate the data point* (0.9s, 100% brightness).

137. The Wood Declaration goes on to say “[t]he Astera Manual describes how the Control Panel and AsteraApp include effect simulators to calculate time varying lighting values for generating special effects based on recalled simulation parameters.” EX1006, ¶72. Mr. Wood does not provide *any citation* to the Astera Manual that supports his contention that the Control Panel and the AsteraApp™ “calculate values.” *Id.*; EX2012, 161:14-15, 178:18-179:3, 204:13-205:4.

138. The first part of Mr. Wood’s argument appears to rely on adjustments to the pre-defined effects, which he asserts somehow *create* new data. EX1006, ¶73 (“these effects with adjusted parameters are stored and recalled from the AX10 (via the Control Panel) in order for the user to make selections and adjustments and play the desired effect....The Control Panel creates data characterizing the adjusted lighting effect based on the recalled effect settings, in the form of values and settings for the LEDs”). In support of this contention that the Control Panel “creates data,” Mr. Wood cites to the Astera Manual at pages 12, 17 and 20-21. Nothing on these pages teaches or suggests that the Control Panel “creates data” or indeed is capable of any functionality reasonably involving “calculating ... a time varying lighting value.” *See* EX1003, 12, 17, 20-21.

139. In fact, page 12 of the Astera Manual merely discusses the main menu options and shortcuts. EX1003, 12. Page 17 of the Astera Manual only discusses different modes for controlling the color output of the lighting device. EX1003, 17. Pages 20 and 21 only discuss the functionality of the “predefined patters [*sic*]” and “predefined programs,” for example, how to group multiple lights together to form a “virtual big light” for outputting effects. *Id.*, 20-21. While the “fire effect” is described as having a “random flicker,” this functionality is listed in the “Pattern” column of a section labeled “Predefined Programs.” *See* EX1003, 21; *see also id.*, 20 (identifying the table below as showing “predefined patter[n]s”). In my opinion, a POSITA would have understood that the Astera Manual is simply disclosing a pre-defined pattern that *looks* random to a user; not a genuinely random pattern for a fire effect that involves a “calculation.”

140. The sections of the Astera Manual Mr. Wood cites as teaching the *creation of data* do nothing more than discuss the recalling and replaying of pre-defined patterns, which does not meet the claim language. *See, e.g.*, EX1003, 28; *see also* Section X.B.1, *supra*.

141. In my opinion, Mr. Wood’s understanding of the Astera Manual’s disclosure as it relates to the calculating limitation is fundamentally incorrect. Mr. Wood is reading into the reference disclosure of features that he admits are not described in that reference. *See* EX2012, 161:11-15 (admitting the Astera Manual

does not describe how speed is adjusted), 178:18-179:3 (admitting neither his declaration nor the Astera Manual describe how a device according to the Astera Manual generates a fire effect), 204:13-205:4 (admitting the Astera Manual does not describe how the light produces effects).

142. In my opinion, a POSITA would have understood that the Astera Manual's disclosed effects are pre-defined as that is how the manual repeatedly discusses the lighting effects. *See* EX1003, 10 (the "standalone engine...can display static colors or *replay* a number of *predefined effect patterns*"), 24 (same), 20 ("Select one of the *predefined* pattern[s]"), 21 ("The predefined programs may use more than one pixel"), 28 ("effects' patterns are *pre-defined and cannot be modified*"). A POSITA would understand these descriptions to disclose simply recalling and replaying pre-defined patterns, *not* "calculating" (let alone calculating "based on" a recalled simulation parameter).

143. Mr. Wood ignores this distinction and instead submits conclusory statements about how an anticipatory prior art reference *would have to work* in order to anticipate the '044 Patent. But the Astera Manual is not an anticipatory reference, specifically because the Astera Manual's disclosed effects are *pre-defined*. Mr. Wood fails to cite any part of the Astera Manual suggesting that a device according to the Astera Manual calculates time varying lighting values as described in the '044 Patent. The '044 Patent describes effects where each next

value is actively calculated, without relying on a pre-recorded pattern, and thus distinguishes over the Astera Manual.

144. ***Mr. Wood's Declaration helps show the distinction.*** Mr. Wood's own explanation helps illustrate that the Astera Manual *only* discloses recalling and replaying pre-defined lighting patterns, not "calculating." In paragraph 73 of his declaration, Mr. Wood states:

[T]he contents of the effects, including the LEDs in use, their brightness, their colors, and the dynamic qualities such as fade-in time and strobe rate, can be saved and recalled on the AsteraApp. When a user recalls a saved effect to play on the light, ***the values corresponding to the effect parameters are then sent to the light which replays them on its effects engine using the values and times sent from the AsteraApp.*** The effects engine in the light provides controls for the brightness and color of every LED in the light from moment to moment in a time varying manner using these values received from the AsteraApp.

EX1006, ¶73.

145. In my opinion, this explanation helps demonstrate that the Astera Manual does not disclose “calculating” because Mr. Wood acknowledges that when a user recalls a saved effect, the “values corresponding to the [saved] effect parameters are then sent to the light.” EX1006, ¶73. There is no calculation. Further, Mr. Wood’s description is consistent with the Astera Manual’s description of effects that are “just triggered and then each light replays them autonomously until a new effect is sent.” EX1003, 24. Accordingly, I believe that Mr. Wood’s own characterizations help show the Astera Manual describes nothing more than recalling and replaying pre-defined effects and does not disclose “calculating.”

146. *Petitioner and Mr. Wood mischaracterize the Astera Manual’s disclosure of the ability to adjust parameters of pre-recorded effects as “calculating,” which it is not.* Petitioner and Mr. Wood argue that the ability to customize the pre-defined effects patterns disclosed in the Astera Manual constitutes “calculating,” stating that “users can select from different lighting effects, such as ‘fire,’ ‘chasers,’ ‘rainbow,’ and ‘stroboscope’.... Selected effects can then ‘be highly customized’, to adjust parameters” EX1006, ¶74. However, the Astera Manual’s disclosure of customization of pre-recorded effects does not involve “calculating” time varying lighting values as described in the ’044 Patent. See Section IX.

147. As a preliminary matter, I believe that Petitioner's and Mr. Wood's analysis is insufficient to establish anticipation because it: (i) fails to point to explicit disclosures in the Astera Manual of "calculating"; and (ii) does not explain why a POSITA would have understood the Astera Manual to necessarily disclose "calculating." For instance, while Mr. Wood states that "after recalling saved effects, AsteraApp calculates time varying lighting values," nothing in the cited pages explains *how* adjusting parameters of the effects requires any *calculation*. EX1006, ¶75 (citing EX1003, 23-29).

148. While Petitioner cites to the Astera Manual's statement that "[w]ith the AsteraApp™ these effects can be created and be sent to the light by the built in UHF receiver" (EX1003, 24), the Astera Manual makes clear that no "calculation" is performed to create the effects—they are merely parameterized. EX1003, 28 ("[t]he effects' patterns are pre-defined and cannot be modified by the user. They are pre-programmed inside of each light. Still they can be parameterized."); *see also id.*, 27 (explaining the adjusted lighting effects are stored).

149. The specification of the '044 Patent distinguishes its algorithmic generation capabilities from prior art systems that, like that disclosed in the Astera Manual, merely allow for customization of pre-recorded patterns. For example, the specification of the '044 Patent states "[g]enerating the light output with the simulation provides a greater level of user adjustment and control than that

produced by simply sampling the intensity of a real flame and replaying it at *different speeds.*” EX1001, 10:3-6. The calculation of time varying lighting values claimed in the ’044 Patent is, in my opinion, both a distinct concept from that described in the Astera Manual, and a vast improvement over systems, like that disclosed in the Astera Manual, based around pre-recorded effect patterns.

150. Accordingly, in my opinion, customization of pre-recorded values, as disclosed in the Astera Manual, does not anticipate “calculating, using an effect simulator, a time varying lighting value.” EX1001, 11:54-56. While a user may adjust the playback speed, color, or overall intensity of a pattern in the Astera Manual, the underlying pattern is not actually changed – thus, further demonstrating no calculation is performed. Returning to the mp3 player Jazz analogy, adjusting the volume, or playback speed, of a recorded song does not change the pattern of notes that the mp3 player is repeating. The output is changed, but time varying musical notes are not “calculated.”

151. As with the mp3 player Jazz analogy, adjusting playback parameters of the lighting effects as disclosed in the Astera Manual is not the same as “calculating, using an effect simulator, a time varying lighting value based on said recalled simulation parameter.” EX1001, 11:54-56. Moreover, in my opinion, I understand Petitioner bears the burden to demonstrate invalidity, and I believe it has failed to do so by failing to point to any disclosure in the Astera Manual that

requires “calculating,” nor articulating how (or why) such a calculation is actually performed by a device disclosed in the Astera Manual.

152. Accordingly, I believe that claims 1, 12 and 19 of the '044 Patent distinguish over the Astera Manual.

C. The Astera Manual Does Not Invalidate Dependent Claim 15

153. As discussed above, in my opinion, the Astera Manual does not invalidate independent claim 12. *See* Sections X.A.3 *supra*. Claim 15 depends from claim 12, and therefore, the Astera Manual does not anticipate claim 15 at least for the same reasons set forth above (or render obvious based on the reasons below). Further, in my opinion, the Astera Manual does not anticipate claim 15 or render dependent claim 15 obvious because the Astera Manual does not disclose “[a] system adapted to control at least one lighting device” (EX1001, 12:29-30) wherein the “at least one lighting device is integrated in a combined unit.” EX1001, 12:54-55.

154. *The Astera Manual does not anticipate claim 15.* The Astera Manual does not disclose a lighting system wherein “said at least one lighting device is integrated in a combined unit” because the Astera Manual does not disclose that its store and recall functionality is available through the device’s standalone mode. Petitioner and Mr. Wood rely on the Astera Manual’s disclosure of the ability to store and recall effects to anticipate the independent claims of the '044 Patent. *See*

Petition, 25-27; *see also* EX1006, ¶¶61-67. However, neither Petitioner nor Mr. Wood cite any evidence that Astera's effect storing capability is available on the built-in controller. *See, e.g.*, EX1006, ¶62 (citing only EX1003, 27, the relevant image showing effect storing capability available only on the AsteraApp™). Further, while Petitioner states that "Astera anticipates and renders obvious Claim 15," neither Petitioner nor Mr. Wood explicitly state that the effect storing capability disclosed in Astera is available in standalone mode.⁵ Petition, 58-62; EX1006, ¶¶127-129. Indeed, the majority of both Petitioner's and Mr. Wood's discussion for this claim is an obviousness analysis as to why a POSITA would

⁵ On the contrary, Mr. Wood agreed in his deposition that neither effect storing capability nor anti-flicker features are available through the standalone mode. Mr. Wood was shown the last page of the Astera Manual, which contains a flowchart showing all menu options of the built-in controller. The flowchart does not include an option for effect storing or anti-flicker, since neither are available in standalone mode. Mr. Wood agreed that all the features discussed in the manual were represented on the flowchart, and that he was not aware of any features available on the built-in controller or in standalone mode that are not shown on the flowchart. *See* EX2014, 114:8-17.

have combined the functionality of the AsteraApp™ with the built-in controller disclosed in the Astera Manual. *See* Petition, 60-62; *see also* EX1006, ¶¶128-129.

155. Neither the Petitioner nor Mr. Wood articulated a proper anticipation analysis for claim 15 because neither argued that the effect storing capability disclosed in the Astera Manual is available through the built-in controller and “standalone” mode. For the sake of completeness, the Astera Manual does not anticipate claim 15 of the ’044 Patent because the functionality required to anticipate all elements of the independent claim (the effect storing capability) is only available through the AsteraApp™, and the AsteraApp™ – an application running on a smartphone – is not “integrated in a combined unit” with the lighting device.

156. Mr. Wood further relies on the Astera Manual’s disclosure that adjustments to anti-flicker frequency are preserved. *See* EX1006, ¶62 at n.4. But while the Astera Manual discloses preserving frequency adjustments, those adjustments can only be made on the AsteraApp™. *See* EX1006, ¶68 at n.5, *supra*; *see also* EX1003, 32, 36 (showing full flowchart of menu options; no anti-flicker option is shown). Accordingly, the Astera Manual does not disclose a lighting device “integrated in a combined unit” because storing the anti-flicker value requires the use of a separate controller.

157. *The Astera Manual does not render obvious claim 15.* Petitioner and Mr. Wood appear to recognize the Astera Manual's failure to expressly disclose effect storing capability on the built-in controller, since the bulk of the analysis focuses on how integrating the functionality of the AsteraApp™ into the built-in controller would have been obvious. *See* Petition, 60-62; *see also* EX1006, ¶¶128-129.

158. In my opinion, it would not have been obvious to a POSITA to modify the integrated controller disclosed in the Astera Manual to include the functionality of the AsteraApp™ because the Astera Manual teaches away from such a modification. Specifically, the Astera Manual discloses that the built-in controller “only allow[s] a basic operation of the light. To gain full control over all features, the AsteraApp™ should be used.” EX1003, 23. The built-in controller is purposefully set up to receive and replay effects sent from the AsteraApp™. EX1003, 24 (“these effects can be created and be sent to the light by the built in UHF receiver. The effects are *just triggered* and then each light replays them autonomously until a new effect is sent.”)

159. A POSITA would not have been motivated to combine the effect selecting, parameter editing, and saving and recalling features and functionality from the AsteraApp™ with the built-in controller disclosed in the Astera Manual because the built-in controller disclosed in the Astera Manual is only configured to

replay effects sent to it from the AsteraApp™. *See* EX1006, ¶128 (listing features obvious to integrate into the built-in controller.)

160. A POSITA would have understood that providing advanced functionality in an app (*i.e.*, an application on a smartphone or tablet) provides several specific benefits. For example, the user is likely already familiar with the user interface on their own device, and so allowing the user to control the lighting device from, *e.g.*, their smartphone provides desirable, convenient operability. Additionally, providing the functionality on the AsteraApp™—and not the local control panel—provides numerous benefits that a POSITA would have appreciated, such as freeing up memory and processing load for the local system and avoiding having to introduce a significantly more complicated user interface locally on the lighting device.

161. I do not believe a POSITA would have been motivated to modify the local control panel to include the functionality of the AsteraApp™ as alleged by Petitioner. Accordingly, in my opinion, the Astera Manual does not render dependent claim 15 obvious.

D. The Astera Manual Does Not Anticipate The Other Dependent Claims

162. Claims 2-11, 13-14, and 16-18 ultimately depend from either independent claim 1 or 12. I believe that these claims are distinguishable over the Astera Manual at least for the reasons discussed above regarding claims 1 and 12,

including that the Astera Manual is not prior art and that the Astera Manual does not disclose certain limitations of claims 1 and 12. Claims 2-11, 13-14, and 16-18 are thus not anticipated by the Astera Manual at least due to their dependence from claims 1 and 12.

E. Petitioner Did Not Articulate Any Obviousness Position Beyond Anticipation

163. While Ground 1 based on the Astera Manual as described in the Petition cited 35 U.S.C. 102/103 (Petition, 4), I do not believe that the Petition, nor the Wood Declaration, sets forth any obviousness analysis beyond anticipation, at least for independent claims 1, 12, and 19. While I am not an attorney, my understanding is that obviousness requires analyzing certain factors, which include an assessment of the content of the prior art reference and an identification of the differences between the prior art reference and the claims. *See* Section III.B *supra*. I further understand that in order to establish obviousness, there must be an articulated reason for modifying the underlying reference to arrive at the claimed invention.

164. I have reviewed the analysis set forth in the Petition and in the Wood Declaration regarding independent claims 1, 12, and 19. *See* Petition, 10-37; EX1006, ¶¶50-84. I do not see that there is an analysis presented regarding the scope and content of the Astera Manual or identification of any limitation in independent claims 1, 12, and 19 missing from the Astera Manual that would

purportedly have been obvious to a POSITA based on the Astera Manual. Further, I do not see any rationale provided in the Petition or the Wood Declaration articulating a reason to modify the Astera Manual in such a manner to arrive at the claimed invention, or any of the other factors for an obviousness analysis I summarize above.

165. Therefore, it is my opinion that the Petition and the Wood Declaration, do not demonstrate that claims 1, 12, and 19 would have been obvious based on the Astera Manual for the same reasons as explained above regarding anticipation and because no further obviousness analysis was presented in the Petition. The dependent claims are distinguishable at least due to their dependence from a patentable independent claim.

166. For completeness, and in order to respond to the conclusory obviousness position alleged in the Petition, I have considered the matter and it is further my opinion that a POSITA would not have found claims 1, 12, and 19 obvious in view of the Astera Manual. For example, it would not have been obvious to a POSITA to modify the Astera Manual to include the functionality of “calculating, using an effect simulator, a time varying lighting value.” Specifically, the Astera Manual only discloses a relatively simple system for storing “pre-programmed” effects and recalling and replaying those effects “autonomously until a new effect is sent.” EX1003, 28, 24. The “effect

simulator” capable of “calculating ... a time varying lighting value,” is, in comparison, a unique functionality that distinguishes over the Astera Manual’s disclosed lighting system. Petitioner has not identified any reason to modify the system disclosed in the Astera Manual to include the “calculating” functionality, nor do I believe a POSITA would have been so motivated. Further, Petitioner, and Mr. Wood, did not offer any opinion that the system disclosed in the Astera Manual could have been modified to include the “calculating” functionality with a reasonable expectation of success.

XI. CLAIMS 1-19 ARE VALID OVER EDWARDS

A. Edwards Does Not Anticipate Independent Claims 1, 12, and 19

167. As mentioned above, claims 1, 12, and 19 contain several similar limitations, so I will again address these independent claims together. *See* Section X.A.3.

1. Edwards Does Not Disclose “calculating, using an effect simulator, a time varying lighting value”

168. I believe the Petition and the Wood Declaration overstate the actual teachings of Edwards with respect to this element. When more carefully considered, I believe a POSITA would have understood that Edwards’ system does

not calculate a time varying lighting value based on the recalled simulation parameter.

169. The primary deficiency in the Petition is that Edwards does not disclose *calculating a time varying* lighting value, let alone a system or method wherein “calculating, using an effect simulator, a time varying lighting value based on said recalled simulation parameter.” EX1001, 11:54-56.

170. Edwards discloses receiving user input to set up a lighting scheme, storing the lighting schemes, and retrieving/outputting the lighting schemes. EX1004, 7:20-8:1. Edwards explains that the lighting schemes can be replayed in sequence and synchronized to change based on the camera shutter. EX1004, 7:54-65.

171. In my opinion, a POSITA would have understood that recalling stored lighting schemes and playing them sequentially at evenly-spaced intervals (*i.e.*, to correspond to the camera shutter) does not involve ***calculating a time varying lighting value*** based on a user input parameter. The cinematographer is simply directing the lighting system to sequentially play pre-stored lighting schemes. Edwards does not disclose calculating a “time varying” lighting value, and especially does not disclose calculating a time varying lighting value based on” the recalled user input simulation parameter. Rather than calculating values, Edwards specifically discloses ***reading stored values***. EX1004, 7:62-8:1, 11:27-28.

172. First, I directly address the positions advanced in the Petition, and in the accompanying Wood Declaration, to illustrate why the Petition has failed to establish this element as presented in Edwards. Second, I provide an example to give some context for the distinction and some discussion about how a POSITA would have understood both the '044 Patent and the entirety of the Edwards patent.

173. *The Petition fails to demonstrate unpatentability of the “calculating” limitation.* The Petition sets forth two paragraphs of analysis regarding this claim limitation. Petition, 68-69. The Wood Declaration also contains two paragraphs addressing this claim element. EX1006, ¶¶143-144. No additional analysis is provided for the other two independent claims—claims 12 and 19. Petition, 70-72 (explaining these claims, at least with respect to the calculating/calculate limitations, are met in the same way); EX1006, ¶¶148-152 (same).

174. The first paragraph in this portion of the Petition points out that “Edwards discloses a ‘lighting controller’ (effect simulator) that receives (a) ‘commands that control the lights’ (e.g., to produce an effect on the light) and (b) a ‘sync signal’ for when the lights should turn on/off.” Petition, 68 (citing EX1004, 5:18-23); *see also* EX1006, ¶143. This paragraph also notes that the lighting controller can be inside each LED light fixture or provided externally. Petition, 68; *see also* EX1006, ¶143.

175. Even if this paragraph of the Petition were entirely correct, all it asserts is that Edwards discloses a controller that receives commands. Receiving commands does not disclose “calculating.” In particular, Edwards’ disclosure that the lighting controller that receives synchronization commands and controls lights using the synchronization commands (typically called synchronization signals) does not mean that the lighting controller “calculates” anything. These disclosures of Edwards certainly do not establish that the lighting controller calculates a “time varying” lighting value, let alone calculating “based on” a recalled simulation parameter.

176. The Petition and Wood Declaration’s discussion of the lighting controller’s location (*i.e.*, in a lighting fixture or provided externally) is irrelevant to the analysis regarding the “calculating” limitation, which does not recite a particular location. *See* Petition, 68; EX1006, ¶143. Regardless, the citations related to where the lighting controller is located do not teach the “calculating” limitation, nor does “coordinat[ing] the commands” require a calculation. *See* Petition, 68 (citing EX1004, 6:57-62, 5:19-31, 7:2-8:1, 10:59-66, 15:46-16:36); EX1006, ¶143 (same).

177. The second paragraph of the two provided in the Petition and Wood Declaration for this element relies entirely on the passage in Edwards spanning

column 7 line 20 to column 8 line 1. Petition, 69; *see also* EX1006, ¶144. That passage from Edwards states:

Some embodiments of the present invention use commands to implement the lighting system. The SETUP command is used to setup the schemes. Using either the control panel on each light or using DMX commands, the cinematographer adjusts each light until he/she has the desired settings on all lights for the “lighting scheme”. This includes the light levels, and color controls for each “active light” source on the set. Some lights will support setting of color temperature as well as dimming. Other lights may support full color (like RGB). The most critical and common setting is dimming which controls the percentage of light coming out of the fixture.

Once all lights on the network are setup at the correct settings the STORE command is issued. Multiple schemes can be stored, preferably digitally, each featuring different light levels, color controls and other settings per active LED light. . . .

In one embodiment of this invention, when the RECORD command is issued a list of schemes would also be selected by the cinematographer (1, 3, 5 for example). In that example, all lights would prepare to replay scheme 1, then 3 then 5 in sequence throughout the filming. All lights would wait for the rising edge of the sync signal to trigger turning on each scheme frame. At the falling edge the lights would all turn off. At the

next rising edge all lights would turn on the next sequential scheme. **Each active light in the network or system [] will therefore recall the stored values for each of these schemes and replay them in order, sequentially in sync with the sync signal.** When filming starts the sync signal will initialize the record sequence and all lighting will continue to sequentially replay each scheme until the sync signal stops, indicating the filming has stopped. EX1004, 7:20-8:1.

178. I think that this passage is important because it illustrates how the effects are pre-recorded and then recalled.

179. I have emphasized one particular sentence because I believe that it captures the key deficiency in Edwards—Edwards’ system recalls stored values sequentially and in sync with the camera shutter, but it does not calculate a “time varying” lighting value based on the user inputted simulation parameter.

180. Notably, Petitioner quotes Edwards’ disclosure that by using the RECORD command, the “lighting controllers ‘recall the stored values’ for the desired lighting schemes from memory and ‘replay them in order, sequentially in sync with [a] sync signal.’” Petition, 69 (quoting EX1004, 7:54-8:1); *see also* EX1006, ¶144 (same). This passage however, does not teach “calculating.” Rather, it emphasizes that Edwards merely *recalls* and *replays* pre-defined lighting patterns.

181. There is no disclosure in Edwards that replaying stored lighting schemes “sequentially in sync with [a] sync signal” requires *a calculation*. Outputting one signal (*e.g.*, signals for a stored lighting scheme) in sync with another signal (*e.g.*, a camera shutter signal) does not involve calculating a time varying lighting value. The signals are just synchronized, so that the replay begins at a specific time. Put another way, a sync signal is equivalent to a starter’s gun in a race. The sound of the gun provides a reference so all runners start at the same time. The sync signal of Edwards merely provides a reference point to begin replaying a stored lighting scheme.

182. In my opinion, a POSITA would have understood that the passage beginning in column 7 of Edwards reproduced above explains that the cinematographer may manually input lighting values to create a desired lighting scheme and then store that lighting scheme. EX1004, 7:20-36 (explaining entering the “SETUP” mode, inputting a particular lighting scheme, and entering a “STORE” command to save the lighting scheme). A POSITA would have known that manually inputting a lighting scheme, including aspects of the light intensity (dimming) and color, does not involve *calculating* a time varying lighting value. Further, there is nothing in this passage (nor do I see a description in the Petition or Wood Declaration) explaining how Edwards discloses an effect simulator that calculates a time varying lighting value.

183. *A POSITA would have understood Edwards operates in a fundamentally different manner than this element.* In Section IX above, I reviewed in detail how the '044 Patent “calculating, using an effect simulator, a time varying lighting value.” Turning to Edwards in more detail, a POSITA would have understood the passage of Edwards regarding user input (*i.e.*, EX1004, 7:20-8:1) as disclosing this sequence:

- (i) receiving user input of a lighting scheme;
- (ii) storing that lighting scheme;
- (iii) recalling the lighting scheme; and
- (iv) outputting the lighting scheme, optionally in a particular sequence.

184. Claim 1 of the '044 Patent is fundamentally different than Edwards because claim 1 involves an extra aspect that is not present in Edwards—calculating the time varying lighting value based on the recalled user input simulation parameter. EX1001, cls. 1, 12, 19; *see* Section IX (providing a further explanation regarding the “calculating” limitation in the context of the '044 Patent).

185. The sequence in Edwards above highlights the key distinction between claim 1 of the '044 Patent and Edwards. Namely, Edwards does not involve a user inputting a particular simulation parameter, followed by an effect simulator calculating a time varying lighting value *based on* that recalled user

input simulation parameter. Instead, Edwards requires a user to input a lighting scheme, store it, and replay the stored lighting scheme. EX1004, 7:20-8:1. There is not a calculation of a time varying lighting value (to simulate a lighting effect, such as fire).

186. It is worth noting that, even though not discussed with respect to this element in the Petition or Wood Declaration, Edwards does disclose dynamic lighting effects such as fire, candle light, or lightning. EX1004, 11:33-53. This disclosure, however, does not change any of the analysis because these dynamic lighting effects are pre-programmed sequences that can simply be recalled during filming. *See id.* There is no disclosure of a user entering a simulation parameter related to one of these dynamic lighting effects, and then an effect simulator in the system calculating a time varying lighting value *based on* that user input simulation parameter (let alone a user input simulation parameter that is stored and thereafter “recalled” as in the independent claims).

187. A POSITA would have understood that Edwards simply provides store-and-recall functionality. That is, you could pre-program a lighting scheme, store it, and recall it to output in a sequenced manner. There is no calculation of a “time varying” lighting value, however, that is output to produce a customized lighting effect as in claim 1. There is also no calculation of a time varying lighting value “based on said recalled [user input] simulation parameter” as recited in claim

1. The '044 Patent provides distinct functionality related to an effect simulator calculating a time varying lighting value (for a dynamic lighting effect) that is not present in Edwards.

188. Therefore, it is my opinion that Edwards does not anticipate the “calculating” limitation in claim 1. It is further my opinion that Edwards does not disclose the “calculate” limitation in claim 12 or the “calculating” limitation in claim 19 for the same reasons. Accordingly, I conclude that Edwards does not anticipate any of the independent claims of the '044 Patent.

B. Edwards Does Not Anticipate The Dependent Claims

189. Claims 2-11 and 13-18 depend from one of the independent claims discussed above. I believe that these claims are distinguishable over Edwards at least for the reasons discussed above regarding claims 1 and 12, including that Edwards does not disclose certain limitations of claims 1 and 12. Claims 2-11 and 13-18 are thus not anticipated by Edwards at least due to their dependence from claims 1 and 12.

C. Petitioner Did Not Articulate Any Obviousness Position Beyond Anticipation

190. While Ground 2 based on Edwards as described in the Petition cited 35 U.S.C. §§ 102/103 (Petition, 4), I do not believe that the Petition, nor the Wood Declaration, sets forth any obviousness analysis beyond anticipation at least with respect to the independent claims. While I am not an attorney, my understanding

is that obviousness requires analyzing certain factors, which include an assessment of the content of the prior art reference and an identification of the differences between the prior art reference and the claims. *See* Section III.B *supra*. I further understand that in order to establish obviousness, there must be an articulated reason for modifying the underlying reference to arrive at the claimed invention.

191. I have reviewed the analysis set forth in the Petition and in the Wood Declaration regarding independent claims 1, 12, and 19. *See* Petition, 62-72; EX1006, ¶¶134-152. I do not see that there is an analysis presented regarding the scope and content of Edwards or identification of any limitation in independent claims 1, 12, and 19 missing from Edwards that would purportedly have been obvious to a POSITA based on Edwards. Further, I do not see any rationale provided in the Petition or the Wood Declaration articulating a reason to modify Edwards in such a manner to arrive at the claimed invention, or any discussion of any of the other factors required for an obviousness analysis.

192. Therefore, it is my opinion that the Petition, and the Wood Declaration, do not demonstrate that claims 1, 12, and 19 would have been obvious based on Edwards for the same reasons as explained above regarding anticipation and because no further obviousness analysis was presented in the Petition. The dependent claims are distinguishable at least due to their dependence from a patentable independent claim.

193. For completeness, and in order to respond to the conclusory obviousness position alleged in the Petition, I have considered the matter and it is further my opinion that a POSITA would not have found claims 1, 12, and 19 obvious in view of Edwards. For example, it would not have been obvious to a POSITA to modify Edwards to include the functionality of “calculating, using an effect simulator, a time varying lighting value.” EX1001, cl. 1. Specifically, Edwards only discloses a relatively simple system for storing and replaying pre-programmed lighting “schemes.” EX1004, 7:20-36. The “effect simulator” capable of “calculating ... a time varying lighting value,” is, in comparison, a unique functionality that distinguishes over Edwards’ lighting system. Petitioner has not identified any reason to modify Edwards to include the “calculating” functionality, nor do I believe a POSITA would have been so motivated. Further, Petitioner, and Mr. Wood, did not offer any opinion that Edwards could have been modified to include the “calculating” functionality with a reasonable expectation of success.

XII. CONCLUSION

194. For at least the reasons set forth above, I am of the opinion the Challenged Claims would not have been obvious to a POSITA at the time of the invention of the ’044 Patent based at least on the discussed prior art.

195. I understand that this Declaration is to be filed in an IPR proceeding before the PTAB. I acknowledge that I may be subject to cross-examination in the case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

196. I hereby declare under penalty of perjury that the foregoing is true and correct, that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and may jeopardize the validity of the application or any patent issuing thereon. If called to testify as to the truth of the matters stated herein, I could and would testify competently.

Dated: August 8, 2022


Eric Bretschneider, Ph.D.