

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CORETRONIC CORPORATION and OPTOMA CORPORATION,
Petitioners,

v.

MAXELL, LTD.,
Patent Owner

Case: IPR2025-00476

U.S. Patent No. 9,549,226

**PATENT OWNER PRELIMINARY RESPONSE TO PETITION FOR
INTER PARTES REVIEW OF U.S. PATENT NO. 9,549,226**

Mail Stop **Patent Board**
Patent Trial and Appeal Board
U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

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PATENT OWNER’S EXHIBIT LIST

Exhibit No.	Description
EX2001	Complaint, <i>Maxell, Ltd. v. Coretronic Corp., et al.</i> , No. 5:24-cv-00088-RWS-JBB (E.D. Tex. Jul. 9, 2024) (“Complaint”)
EX2002	March 26, 2025, Memorandum to All PTAB Judges from Coke Morgan Stewart, Acting Secretary of Commerce for Intellectual Property, Regarding the Interim Processes for PTAB Workload Management (“Memo”)
EX2003	First Amended Docket Control Order, <i>Maxell, Ltd. v. Coretronic Corp., et al.</i> , No. 5:24-cv-00088-RWS-JBB (E.D. Tex.) (Dkt. 91) (April 24, 2025)
EX2004	Order Resetting <i>Markman</i> Hearing, <i>Maxell, Ltd. v. Coretronic Corp., et al.</i> , No. 5:24-cv-00088-RWS-JBB (E.D. Tex.) (Dkt. 91) (April 24, 2025)
EX2005	Order Denying Motion to Transfer, <i>Maxell, Ltd. v. Coretronic Corp., et al.</i> , No. 5:24-cv-00088-RWS-JBB (E.D. Tex.) (Dkt. 85) (March 25, 2025)
EX2006	Order Granting Motion to Dismiss, <i>Optoma Technology, Inc. v. Maxell, Ltd.</i> , No. 3:24-cv-08147-TLT (N.D. Cal.) (Dkt. 58) (March 14, 2025)
EX2007	Plaintiff’s Preliminary Election of Asserted Claims, <i>Maxell, Ltd. v. Coretronic Corp., et al.</i> , No. 5:24-cv-00088-RWS-JBB (E.D. Tex.) (Dkt. 78) (March 11, 2025)
EX2008	Petitioners’ Invalidity Contentions for <i>Maxell, Ltd. v. Coretronic Corp., et al.</i> , No. 5:24-cv-00088-RWS-JBB (E.D. Tex.) (served on December 27, 2024)
EX2009	Petitioners’ Preliminary Election of Asserted Prior Art for <i>Maxell, Ltd. v. Coretronic Corp., et al.</i> , No. 5:24-cv-00088-RWS-JBB (E.D. Tex.) (served on March 25, 2025)
EX2010	U.S. Pub. No. 2010/0328628 (“Masuda”)
EX2011	U.S. Pub. No. 2010/0328628 (“Matsubara”)
EX2012	U.S. Pub. No. 2010/0328632 (“Kurosaki ’632”)
EX2013	USPTO Rescinds Memorandum Addressing Discretionary

	Denial Procedures (February 28, 2025), https://www.uspto.gov/about-us/news-updates/uspto-rescinds-memorandum-addressing-discretionary-denial-procedures
EX2014	March 24, 2025, Memorandum to Members of the Patent Trial and Appeal Board from Scott R. Boalick, Chief Administrative Patent Judge, Guidance on USPTO’s Recission of “Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation” (“Memo 2”)
EX2015	USPTO, <i>FAQs for Interim Processes for PTAB Workload Management</i> , https://www.uspto.gov/patents/ptab/faqs/interim-processes-workload-management (last visited May 7, 2025)
EX2016	Joint Claim Construction, <i>Maxell, Ltd. v. Coretronic Corp., et al.</i> , No. 5:24-cv-00088-RWS-JBB (E.D. Tex.) (Dkt. 89) (April 22, 2025)
EX2017	Preliminary Constructions, <i>Maxell, Ltd. v. Coretronic Corp., et al.</i> , No. 5:24-cv-00088-RWS-JBB (E.D. Tex.) (May 9, 2025)
EX2018	CV of Michael Lebby, D. Eng., Ph.D., MBA
EX2019	Declaration of Michael Lebby, D. Eng., Ph.D., MBA, Regarding the Validity of U.S. Patent No. 9,547,226

LISTING OF CHALLENGED CLAIMS¹

Claim Element	Claim Text
[8.0]	A projection-type image display device comprising:
[8.1]	a light source device;
[8.2]	an image display element;
[8.3]	an illumination optical system having a plurality of optical elements for irradiating the image display element with light from the light source device; and
[8.4]	a projection lens for enlarging an optical image formed by the image display element to project the resulting image,
[8.5]	wherein the light source device includes: an excitation light source for emitting excitation light;
[8.6]	a fluorescent material for emitting fluorescent light when excited by the excitation light; and
[8.7]	an optical member for directing the excitation light to the fluorescent material, and
[8.8]	the optical member has a curvature that is set such that a light-condensing position of the excitation light is positioned on an emission side of the excitation light relative to the fluorescent material,
[8.9]	a dichroic mirror disposed between the excitation light source and the fluorescent material; and
[8.10]	a condenser lens for condensing the excitation light disposed between the fluorescent material and the dichroic mirror,
[8.11]	wherein the optical member is disposed between the excitation light source and the dichroic mirror, and
[8.12]	wherein the optical member is a convex lens and a concave lens, with the convex lens and the concave lens being disposed in this order from the excitation light source toward the dichroic mirror.

¹ For convenience purposes only, Patent Owner adopts for this Preliminary Response a numbering of claim elements advanced by Petitioner in the Petition. Patent Owner does not concede the appropriateness of such grouping and numbering of claim elements.

Claim Element	Claim Text
[10.0/10.1]	The projection-type image display device according to claim 8, wherein at least either one of the convex lens and the concave lens has a curvature that is set so as to allow the excitation light to be made incident on the fluorescent material at a front side of the fluorescent material as a light-condensing position.
[12.0]/[12.1]	The projection-type image display device according to claim 8, wherein the excitation light irradiated onto the fluorescent material has a luminance distribution that is substantially analogous to the image display element.

I. INTRODUCTION

Patent Owner Maxell, Ltd. (“Patent Owner”) respectfully requests that the Board deny institution because Petitioners Coretronic Corporation and Optoma Corporation (collectively “Petitioners”) have failed to demonstrate a reasonable likelihood of success on the grounds submitted in its Petition for challenging the patentability of claims 8, 10, and 12 (the “challenged claims”) of U.S. Patent No. 9,547,226 (“the ’226 Patent”).

None of the cited references alone or in combination disclose or suggest the arrangement of each limitation of claims 8, 10, and 12. Moreover, the Petition is filled with conclusory statements that fail to demonstrate a reasonable likelihood of success on any ground and are neither bolstered nor supported by declaration of Jose Sasian, Ph.D., which parrots Petitioner’s conclusory statements without additional analysis or evidence. *See* 37 C.F.R. §42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”).

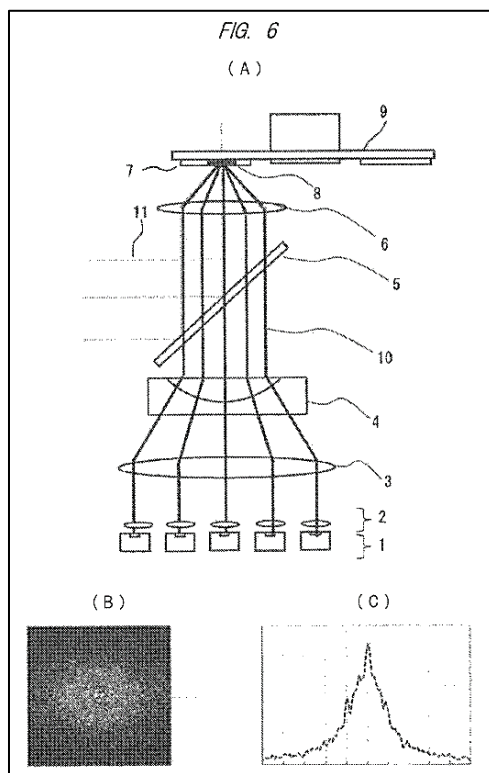
For at least these reasons, Petitioner has failed to meet its burden of showing a reasonable likelihood of prevailing. Accordingly, the Board should deny Petitioner’s request to institute *inter partes* review.

II. BACKGROUND

A. Overview of the '226 Patent

The '226 Patent has a priority date of November 1, 2012, issued on January 17, 2017, and is entitled “Light Source Device and Projection-Type Image Display Device.” The '226 Patent is directed to a light source device and a projection-type image display device which can improve light emitting efficiency and service life of a fluorescent material. *See* EX1001 at Abstract.

At the time of the priority date of the '226 Patent (around November 1, 2012), projection-type image display devices were designed to have the excitation light irradiated onto only a concentrated portion of fluorescent material. EX2019 at ¶ 46 (citing EX1001 at 1:34-38). This manner of concentrating the excitation light on only certain parts of the fluorescent material caused deterioration in the fluorescent material and decreased light-emitting efficiencies and the service life of the fluorescent material, which in turn shortened the life of the light source device. *Id.*



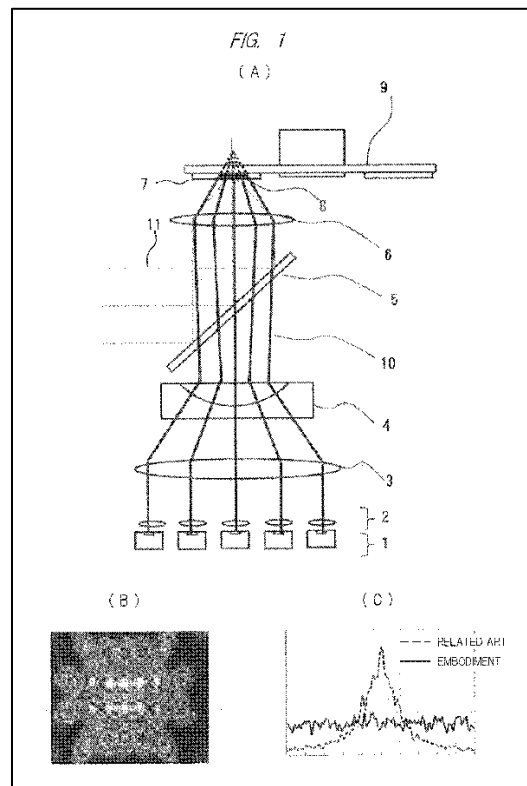
EX1001 at Figs. 6(A) – 6(C)

The problems with these configurations are also illustrated in Figs. 6(A) – 6(C) (reproduced above). See EX1001 at 2:27-29, Fig. 6. As illustrated in Fig. 6(A), the excitation light **10** passes through collimate lens **2**, convex lens **3**, concave lens **4**, a dichroic mirror **5**, and condenser lens **6**, which is made incident on a disc **9** that is coated with a fluorescent material **7**. See EX1001 at 2:30-54.

The problems in these earlier projection-type image display devices are further illustrated in Fig. 6(B) and Fig. 6(C)—how the light is made incident on the fluorescent material. Fig. 6(B) is a 2D distribution drawing of excitation light on the fluorescent material, where the luminance distribution in which the center portion is bright with peripheral portion being dark. See EX1001 at 2:57-58, 59-62. Fig. 6(C)

shows a luminance distribution in one cross-section, which also illustrates the concentration of luminance distribution in the center. *See* EX1001 at 2:58-59. Further, high luminance in the center of the irradiation region causes the fluorescent material to generate excessive heat due to the energy difference between absorbed and emitted light, reducing the material's efficiency and lifespan. *See* EX1001 at 2:62-3:3.

The '226 Patent's inventors solved this problem by re-designing arrangement and curvatures of the optical member to direct the excitation light that passes through the optical member to be made incident on the fluorescent material to improve the light emitting efficiency and service life of the fluorescent material. *See* EX1001 at 1:46-62. One embodiment disclosed in the '226 Patent achieves this goal by making adjustments in the luminance distribution of excitation light that is irradiated onto the fluorescent material. *See* EX1001 at 1:45-48. By increasing the area of where the excitation light is irradiated onto the fluorescent material, which in turn distributes the light more evenly across the fluorescent material, as shown for example in Fig. 1(C), the temperature of the fluorescent material will be lowered. This reduction of temperature would extend the lifespan of the fluorescent material and that of the light emitting device. *See* EX1001 at 1:39-42.



EX1001 at Figs. 1(A) – 1(C)

B. Patent Prosecution History

U.S. Patent Application No. 14/439,931 issued as the '226 Patent on January 17, 2017. The '226 Patent claims priority to the PCT No. PCT/JP2012/078280, filed on November 1, 2012.

In the Notices of Allowance, the Examiner identified Kitano (U.S. Patent Application Publication No. 2013/0088471) as “the closest available prior art,” which Petitioners rely on as a primary reference in Ground 4. EX1002 at 5. The Examiner also considered the following references as noted in Notice of Reference Cited, EX1002 at 63, and in the Information Disclosure Statement by Applicant,

EX1002 at 64:

- U.S. Patent Application Publication No. 2011/0128505 (Okamoto)
- U.S. Patent Application Publication No. 2010/0328628 (Masuda)
- U.S. Patent Application Publication No. 2013/0222772 (Matsubara)
- U.S. Patent Application Publication No. 2010/0328632 (Kurosaki)
- U.S. Patent Application Publication No. 2011/0280032 (Kishimoto)

The Examiner issued an office action and the Applicant filed a response with arguments and amendments to the claims before Examiner allowed the Application.

C. Summary of Petitioner's Proposed Grounds for Unpatentability

Petitioner alleges that claims 8, 10, and 12 are unpatentable based on four grounds. *See* Pet. at 12. The alleged invalidity grounds are summarized as follows:

Ground	Patent Claims	Type of Challenge	Primary Reference	Secondary References
1	8, 10, 12	pre-AIA 35 U.S.C. §§ 102(e)(2) and/or 103(a)	Kurosaki '087	
2	8, 10	pre-AIA 35 U.S.C. § 102(a) and/or 103(a)	Miyamae	
3	12	pre-AIA 35 U.S.C. § 103(a)	Miyamae	Kurosaki '087
4	8, 10, 12	pre-AIA 35 U.S.C. § 103(a)	Kitano	Kurosaki '087

III. LEVEL OF ORDINARY SKILL

A person of ordinary skill in the art ("POSITA") would have had a Bachelor of Science degree in Electrical Engineering, Physics, Optics or an equivalent degree,

and at least one year of industrial field experience working in the field of optical engineering, optical design, or a related field. Additional education and/or industrial field experience may provide a substitute for one of the qualifications of a POSITA. EX2019 at ¶ 52.

Contrary to the Petitioners and Dr. Sasian's position regarding a POSITA, the technology disclosed in the '226 Patent does not require a POSITA to have a Ph.D. in electrical engineering, physics, optical sciences, optical engineering, or a related scientific or engineering field, and at least one to two years of work or research experience in optical engineering, optical design, or a related field. See EX1004 ¶ 31; EX2019 at ¶ 53. Therefore, should the Board institute review of the '226 Patent, Patent Owner's definition of POSITA should be adopted.

The Federal Circuit has repeatedly emphasized “the need to adhere to the statute, *i.e.*, to hold that an invention would or would not have been obvious, as a whole, when it was made, to a person of ‘ordinary skill in the art’—not to the judge, or to a layman, or to those skilled in remote arts, or to geniuses in the art.” See *Env't. Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 697 (Fed. Cir. 1983). Petitioners' attempt to define POSITA at an artificially high level casts further doubts on already tenuous merits of Petitioners' obviousness arguments. See *Innovation Toys, LLC v. MGA Entertainment, Inc.*, 637 F.3d 1314, 1323 (Fed.Cir.2011) (finding that a less sophisticated level of skill generally favors a determination of nonobviousness and

therefore the patentee, while a higher level of skill favors a determination of obviousness). Petitioners’ improper definition of the level of ordinary skill in the art—set too high—undermines their obviousness arguments, as courts have repeatedly held that an erroneously elevated POSITA standard can improperly skew the analysis. *Id.*

IV. CLAIM CONSTRUCTION

A. Agreed Construction in the District Court Litigation

In the District Court Litigation, both Petitioners and Patent Owner have agreed that the phrase “a front side of the fluorescent material” in claim 10 should be construed to mean “surface of the fluorescent material on the side facing the excitation light source.” EX2016 at 5. This construction is likely to be adopted by the District Court; therefore, to the extent that construction of “a front side of the fluorescent material” is necessary, this agreed construction should be adopted.

Term	Agreed Construction (EX2016 at 5)
“a front side of the fluorescent material” (’226 Patent, cl. 10)	“the surface of the fluorescent material on the side facing the excitation light source”

B. Disputed Constructions

Patent Owner agrees with the preliminary construction of the disputed phrase below of the ’226 Patent in the District Court Litigation. Petitioners’ and Dr. Sasian’s constructions are inconsistent with the District Court’s preliminary

construction of a phrase in the '226 Patent that includes both of these disputed terms; the Court's preliminary construction also contradicts Petitioners' assertion of alleged ambiguity of these terms of the '226 Patent. *See* EX2017 at 4; *see also* EX2019 at ¶¶ 56-58.

Term	Maxell's Construction	Petitioner and Dr. Sasian's Construction	Preliminary Construction in the District Court Litigation
“the optical member has a curvature that is set such that <i>a light-condensing position</i> of the excitation light is positioned on <i>an emission side of the excitation light relative to the fluorescent material</i>” ('226 Patent, cl. 8)	Plain and ordinary meaning, for example, the optical member has a curvature that causes <i>a light-condensing position</i> of the excitation light to be positioned on <i>an excitation light's exit side of the fluorescent material that faces away from the excitation light source</i>	If the Court determines that this term is amenable to construction, then Defendants propose that “a light-condensing position” be construed to mean: An illumination region formed by converging light rays	Plain and ordinary meaning OR “the optical member has a curvature that causes <i>a light-condensing position</i> of the excitation light to be positioned on <i>an excitation light's exit side of the fluorescent material that</i>

			<i>faces away from the excitation light source”</i>
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Based on the preliminary construction of the phrase above, Patent Owner proposes the following constructions of the disputed terms, which are consistent with the '226 Patent's intrinsic evidence and Dr. Lebby's expert opinion:

Term	Maxell's Proposed Construction Based on Preliminary Construction in the District Court Litigation (EX2017 at 4)	Petitioners' Proposed Construction
“a light-condensing position” (’226 Patent, cl. 8)	Plain and ordinary meaning	“an illumination region formed by converging light rays”
“an emission side of the excitation light relative to the fluorescent material” (’226 Patent, cl. 8)	“an excitation light’s exit side of the fluorescent material that faces away from the excitation light source”	“the surface of the fluorescent material on the side facing the excitation light source”

1. “a light-condensing position” (Claim 8)

Term	Maxell’s Proposed Construction Based on Preliminary Construction in the District Court Litigation (EX2017 at 4)	Petitioners’ Proposed Construction
“a light-condensing position” (’226 Patent, cl. 8)	Plain and ordinary meaning	“an illumination region formed by converging light rays”

Petitioners’ shifting-sands approach to claim construction should be rejected. On the one hand, Petitioners contend that “a light-condensing position” is ambiguous. Pet. at 22 (citing EX1004 at ¶¶ 26-29). On the other hand, Petitioners explicitly construe “a light-condensing position” as “an illumination region formed by converging light rays” *Id.* In proposing this construction, Petitioners solely rely on less than two pages of their expert’s declaration without any further analysis. EX1004 at ¶¶ 26-28.

Petitioners’ construction of “light-condensing position” is fundamentally flawed because it is inconsistent with the claim language and the specifications of the ’226 Patent. See EX2019 at ¶¶ 66-109. Adopting Petitioners’ constructions would explicitly read out the very invention that the ’226 Patent was intended to cover, contrary to *Phillips*:

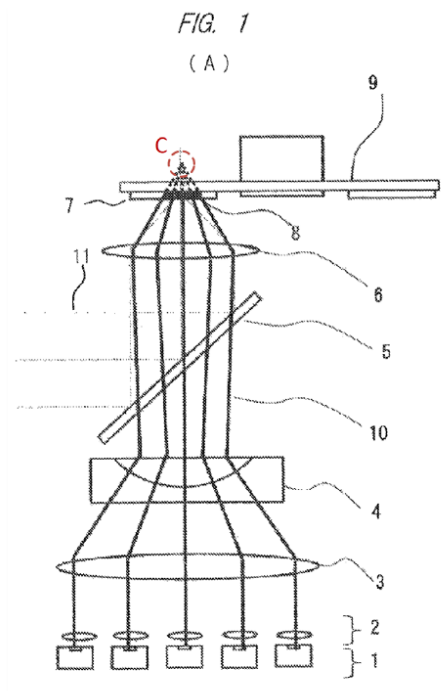
Ultimately, the interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually invented and intended to envelop with the claim. The construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction.

Phillips v. AWH Corp., 415 F.3d 1303, 1316 (Fed. Cir. 2005). Petitioners' improper construction undermines the entire Petition because claim construction is a predicate to assessing all unpatentability arguments. 37 C.F.R. §42.204(b)(3).

No construction is necessary for the term “a light-condensing position” because that the plain and ordinary meaning of this claim term is abundantly clear, especially in view of the specification. EX2019 at ¶ 65. In the parallel District Court Litigation, preliminary construction of the phrase in claim 8 that includes the term “a light-condensing position” is construed as “plain and ordinary meaning” or recites the phrase with “a light-condensing position” without further construction of the term. See EX2017 at 4; EX2019 at ¶¶ 57-60.

Even Petitioners' expert acknowledges that a POSTIA understands “a light-condensing position” “could mean a location where light rays come to a point, as indicated by the annotation ‘C’ in Fig. 1, reproduced below, of the '226 Patent.” EX2019 at ¶ 68 (citing EX1004 at ¶ 27). This is the proper, plain and ordinary meaning of term in the context of the claim and specification. *Id.*

EX1004 at ¶ 27 (Dr. Sasian’s Annotation of Fig. 1)



EX1001, FIG. 1 (annotated)

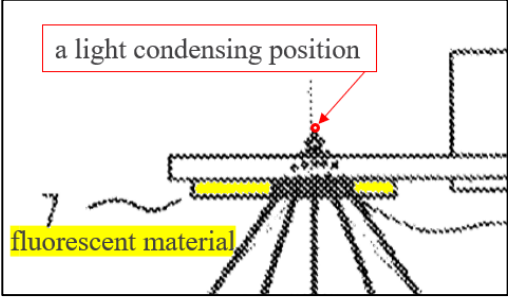
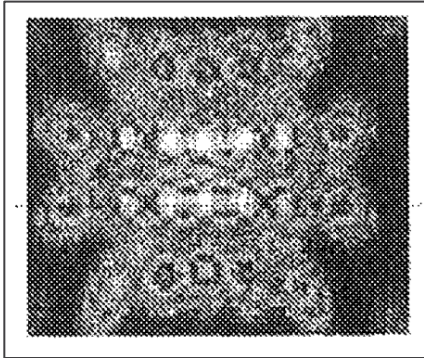
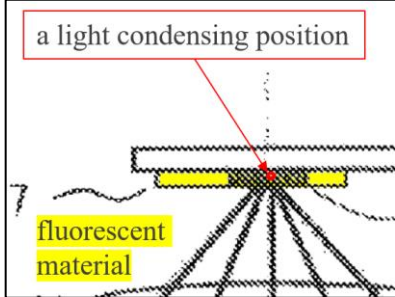
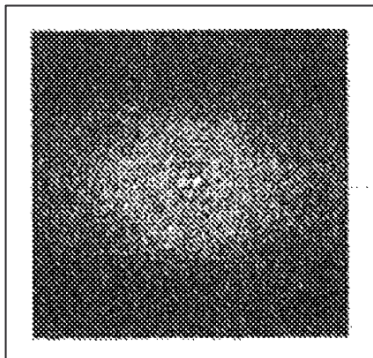
Petitioners’ proposed construction of “a light-condensing **position**” as “an illumination **region** formed by converging light rays” fails to distinguish the differences between a specific “**position**” and a general “**region**” of the light rays; Petitioners’ construction conflates “a light-condensing position” with a different part of the light rays in Fig. 1(A) (“irradiation region 8”). EX2019 at ¶¶ 69-76.

To a POSITA, confirmed by Dr. Lebby, it is clear that the terms (“**position**” and “**region**”) connote two different things in this context, especially when reading specification (e.g., EX1001 at 3:39-4:23) in view of the figures of the embodiments (e.g., Fig. 1) while comparing them to the conventional arts (Fig. 6). EX2019 at ¶ 76 (citing EX1001 at 3:39-4:23; Fig. 1, 6).

The distinction between “a light-condensing position” and “irradiation region 8” is especially important because the terms “a light-condensing position” and “an irradiation region 8” are used to describe how the optical elements were modified in the '226 Patent to alter the manner in which light is incident on the fluorescent material. *See supra* Section II.A.; *see also* EX2019 ¶¶ 77-79. The dispersion of excitation light incident on the fluorescent material is the key to the invention of the '226 Patent, which solves the issue of deterioration of fluorescent materials caused by extreme heat resulting from the way light converged onto the surface of the fluorescent material. EX2019 ¶ 78 (citing EX1001 at 1:30-62, 2:66-3:3, 3:39-59, Fig. 1, 6).

Specifically how the invention of the '226 Patent dispersed the light incident on the fluorescent material can be observed by comparing the figures of the conventional art and embodiments of the '226 Patent. Fig. 6(B) depicting the conventional art shows “the irradiation region 8 of the excitation light 10 on the fluorescent material 7, [and] Fig. 6(B) is a two-dimensional distribution drawing of excitation light.” EX2019 ¶ 77 (citing EX1001 at 2:55-58). Fig. 1(B) depicting one of the embodiments shows “irradiation region 8 of the excitation light 10 on the fluorescent material 7, [and] Fig. 1(B) is a two-dimensional distribution drawing of excitation light.” EX2019 ¶ 77 (citing EX1001 at 3:60-64). When comparing the distribution of light on Fig. 1(B) with Fig. 6(B), a POSITA would note that the light

that was concentrated on the fluorescent material as depicted on the conventional art—Fig. 6(B)—no longer has a sharp focus on the fluorescent material in the embodiment of the '226 Patent as shown in Fig. 1(B). EX2019 at ¶ 77 (citing EX1001 at Fig. 1, 6).

Exemplary Embodiments of the Invention	Conventional Light Source Device
 Fig. 1(A) (annotation added)  Fig. 1(B)	 Fig. 6(A) (annotation added)  Fig. 6(B)

EX2019 at ¶ 77.

As such, adopting Petitioners’ construction would improperly conflate “a light-condensing position” with “irradiation region 8,” effectively reading out the specific embodiments that demonstrate how the '226 Patent improved upon the conventional art by changing “a light-condensing position” to control how the light

is incident on the “irradiation region 8” of the fluorescent material. *See e.g., Oatey Co. v. IPS Corp.*, 514 F.3d 1271, 1277 (Fed. Cir. 2008) (“[W]here claims can reasonably [be] interpreted to include a specific embodiment, it is incorrect to construe the claims to exclude that embodiment ...”); *see also* EX2019 at ¶¶ 78-80.

As such, should the Board should reject Petitioners’ construction of “a light-condensing position” because no further construction of the term is needed.

2. “an emission side of the excitation light relative to the fluorescent material” (Claim 8)

Term	Maxell’s Proposed Construction Based on Preliminary Construction in the District Court Litigation (EX2017 at 4)	Petitioners’ Proposed Construction
“an emission side of the excitation light relative to the fluorescent material” (’226 Patent, cl. 8)	“an excitation light’s exit side of the fluorescent material that faces away from the excitation light source”	“the surface of the fluorescent material on the side facing the excitation light source”

Petitioners also failed to demonstrate that “an emission side of the excitation light relative to the fluorescent material” is ambiguous. Pet. at 22 (citing EX1004 at ¶¶ 26-29). Further, Petitioners’ construction of “an emission side of the excitation light relative to the fluorescent material” as “the surface of the fluorescent material

on the side facing the excitation light source” is inconsistent with the preliminary construction in the District Court Litigation and intrinsic evidence of the ’226 Patent. *Id.* In proposing these constructions, Petitioners solely rely on one paragraph of their expert’s declaration without any further analysis. EX1004 at ¶¶ 29.

Patent Owner agrees with the above preliminary construction in the District Court Litigation because the intrinsic evidence and Dr. Lebby’s position makes clear that “an emission side of the excitation light relative to the fluorescent material” is not ambiguous and should be construed as “an excitation light’s exit side of the fluorescent material that faces away from the excitation light source.” EX2019 at ¶ 81 (citing EX2017 at 4).

As discussed below in further detail, the intrinsic evidence makes clear that “an emission side of the excitation light relative to the fluorescent material” should be construed as “an excitation light’s exit side of the fluorescent material that faces away from the excitation light source.” EX2019 at ¶¶ 81-108. Further, this term is not ambiguous. *Id.*

Petitioners’ construction of “an emission side of the excitation light relative to the fluorescent material” is fundamentally flawed because it is inconsistent with the claim language and the specifications of the ’226 Patent. *See* EX2019 at ¶¶ 66-109. Adopting Petitioners’ constructions would explicitly read out the very invention that the ’226 Patent was intended to cover, against the guidance of *Phillips*:

Ultimately, the interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually invented and intended to envelop with the claim. The construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction.

Phillips v. AWH Corp., 415 F.3d 1303, 1316 (Fed. Cir. 2005). Petitioners' improper construction undermines the entire Petition because claim construction is a predicate to assessing all unpatentability arguments. 37 C.F.R. §42.204(b)(3).

- a. **“An emission side of the excitation light relative to the fluorescent material” is not ambiguous and should be construed as “an excitation light’s exit side of the fluorescent material that faces away from the excitation light source.”**

A POSITA would understand from the disclosures of the intrinsic evidence that there are two sides to the fluorescent material: (1) the front side and (2) the emission side. EX2019 at ¶ 84 (citing EX1001 at 3:45-59).

First, Parties are in agreement that “a front side of the fluorescent material” should be construed as “the surface of the fluorescent material on the side facing the excitation light source.” EX2016 at 5. This agreed construction is supported by the specification; the front side is where the excitation light “that has passed through the condenser lens is made incident on the fluorescent material.” EX1001 at 3:45-47. In

other words, “a front side” is the side of the fluorescent material that faces the excitation light sources. EX2019 at ¶ 85.

For the phrase “an emission side of the excitation light relative to the fluorescent material,” Petitioners offer only a conclusory statement, failing to explain or justify why “front side” and “emission side” should be considered the same, and provide no basis to overcome the presumption that different terms have different meanings. *See* EX1004 at ¶ 29; *see also* EX2019 at ¶¶ 82-109. The Federal Circuit has repeatedly instructed that “different claim terms are presumed to have different meanings.” *MicroStrategy Inc. v. Bus. Objects Ams.*, 238 F. App’x 605, 609 (Fed. Cir. 2007) (citing *CAE Screenplates Inc. v. Heinrich Fiedler GmbH & Co. KG*, 224 F.3d 1308, 1317 (Fed. Cir. 2000) (“In the absence of any evidence to the contrary, we must presume that the use of these different terms in the claims connotes different meanings.”)).

Second, a POSITA reading the recited part of the claim would understand that “an emission side of the excitation light relative to the fluorescent material” is where the light-condensing position is located, describing how such a dispersed distribution of light on the fluorescent material can be achieved through the arrangement and configuration of the optical member, thereby avoiding issues caused by hot spots in the fluorescent material. EX2019 at ¶ 86 (citing EX1001 at claim 8; Figs. 1-4).

The spatial relationship between the fluorescent material and emission side that is defined by the location of a light-condensing position can be confirmed in claim 8:

the optical member has a curvature that is set such that *a light-condensing position* of the excitation light is positioned on **an emission side of the excitation light relative to the fluorescent material**

EX2019 at ¶ 87 (citing EX1001 at cl. 8 (emphasis added)).

The specification also provides consistent explanations about “an emission side of the excitation light relative to the fluorescent material.” EX2019 at ¶ 88. The emission side is where “the light-condensing position is positioned...relative to the fluorescent material 7,” EX2019 at ¶ 88 (citing EX1001 at 3:48-51). Based on the claim language and specifications, Dr. Lebby provides annotated Fig. 1(A):

Dr. Lebby's annotation of Fig. 1(A) based on specifications of the '226 Patent (EX2019 at ¶ 89)

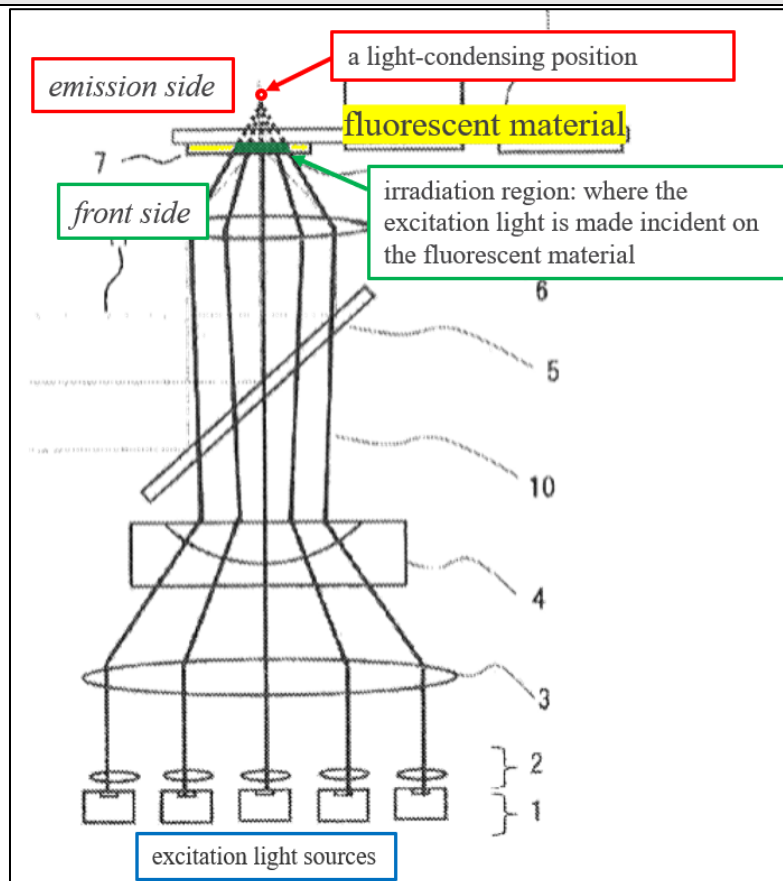
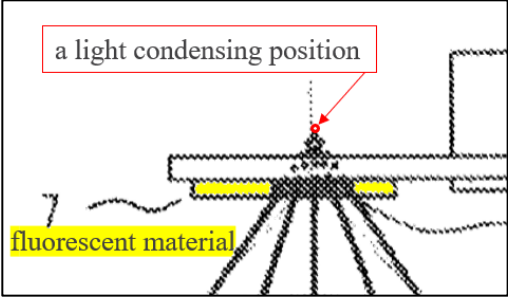
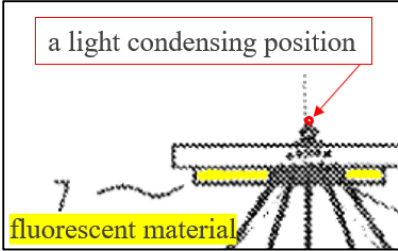
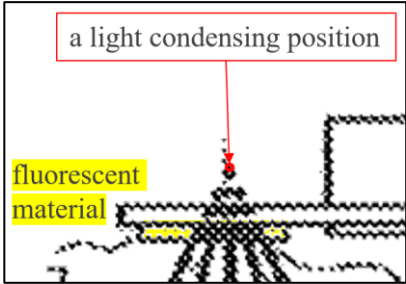
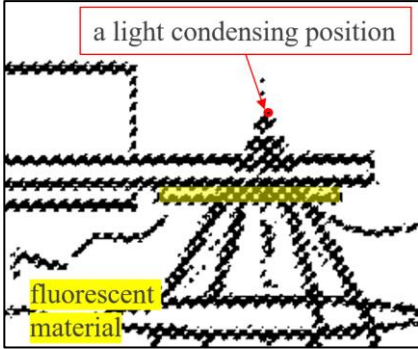
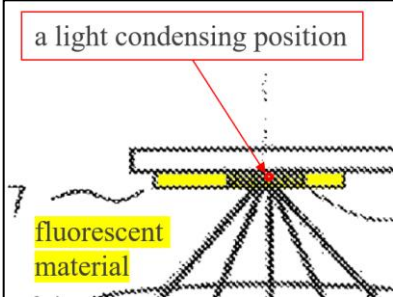


Fig. 1(A) (annotation added)

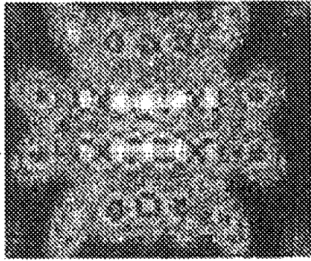
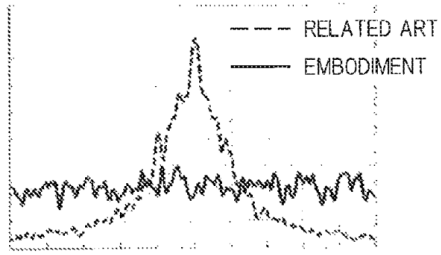
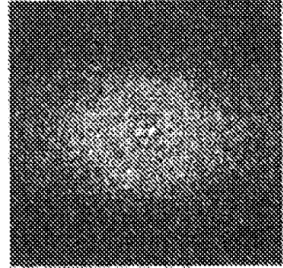
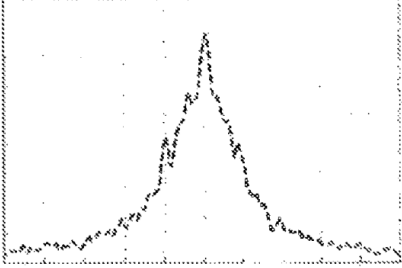
Specification also provides further context and explanations of “an emission side of the excitation light relative to the fluorescent material.” The '226 Patent “improve[s] the light-emitting efficiency and service life of the fluorescent material” by adjusting distribution of the light incident on the fluorescent material, EX2019 at ¶ 90 (citing EX1001 at 1:39-43)—to avoid having the sharp focus that leads to excessive heat on the fluorescent material that causes shortened service life. EX2019 ¶ 90 (citing EX1001 at 3:64-4:5).

At the priority date of the '226 Patent, the light-condensing position was embedded within the fluorescent material, as illustrated in Fig. 6(A); the proposed arrangement is intended “so that the excitation light **10** is prevented from being condensed onto the single portion on the fluorescent material **7**.” EX2019 at ¶ 91 (citing EX1001 at 2:55-66; 3:10-16). In contrast, the disclosures of the '226 Patent, as exemplified in each of the Figs. 1–4, place the light-condensing position on “an excitation light’s exit side of the fluorescent material that faces away from the excitation light source.” EX2019 at ¶ 91. “A main difference between FIG. 1(A) and FIG. 6(A) lies in that by devising the convex lens **3** and the concave lens **4**, or the positions and curvature radiuses of the two lenses, the excitation light **10** is made incident on the condenser lens **6** in a manner *so as to be diffused*.” EX2019 at ¶ 91 (citing EX1001 at 3:40-45 (emphasis added)). Dr. Lebby provided the following annotated figures (EX2019 at ¶ 91):

Exemplary Embodiments of the Invention	Conventional Light Source Device
 Fig. 1(A) (annotation added)  Fig. 2(A) (annotation added)  Fig. 3(A) (annotation added)  Fig. 4(A) (annotation added)	 Fig. 6(A) (annotation added)

In the disclosed embodiments illustrated in the Fig. 1, this diffused light would then “consequently form[] a substantially uniform luminance distribution slightly

defocused” on the fluorescent material. EX2019 at ¶ 92 (citing EX1001 at 3:64-4:4). For example, Fig. 1(B) is “a two-dimensional distribution drawing of excitation light” and Fig. 1(C) “shows a luminance distribution on one cross-section.” EX2019 at ¶ 92 (citing EX1001 at 3:60-64). The corresponding figures (Fig. 6(B), 6(C)) are visual illustrations for the conventional arts—comparison of these figures with those for the exemplary embodiments provides clear visualizations of how the change in the location of “a light-condensing” position” resulted in changes in the way the lights are dispersed on “an emission side of the excitation light relative to the fluorescent material.” EX2019 at ¶ 92 (citing EX1001 at 3:64-4:4). Specifically, Fig. 1(B) and 1(C) shows that, “in the irradiation region 8, a plurality of excitation light rays are irradiated not onto one portion, but onto positions that are substantially scattered evenly, thereby consequently forming a substantially uniform luminance distribution slightly defocused.” EX2019 at ¶ 92 (citing EX1001 at 3:64-4:1).

Exemplary Embodiments of the Invention	(B)  (C)  --- RELATED ART — EMBODIMENT Figs. 1(B), (C)
Conventional Light Source Device	(B)  (C)  Figs. 6(B), (C)

In sum, “an emission side of the excitation light relative to the fluorescent material” is not ambiguous and should be construed as “an excitation light’s exit side of the fluorescent material that faces away from the excitation light source” as supported by disclosures in the specifications. EX2019 at ¶ 93.

i. “Emission Side” In the Specification Has an Established Meaning in Optical Systems

As noted by Dr. Lebby, the term “emission side” represents an inherently physical characteristic—light has a definable propagation direction that can both be measured and verified. EX2019 at ¶ 95. This term does not require subjective interpretation; rather, it refers to an objectively determinable feature of the system

that establishes an objective and measurable relationship between the light and the components of a projection-type image display device, as denoted in the specification. *Id.*

In the context of the '226 patent, a POSITA would also understand that “emission **side**” should be distinguished from the **surface** of the fluorescent material. *Id.* at ¶ 96. Specifically: (1) the term “emission **side**” refers to the side where a light-condensing position is located, *id.* (citing EX1004 at Fig. 1(A), 2(A), 3(A), 4(A)); and (2) the **surface** of fluorescent material is where the excitation light interacts with the fluorescent material to produce fluorescent light. EX2019 at ¶ 96 (citing EX1001 at 2:30–54). The Figs. 3(B) and 4(B) (reproducing Dr. Lebby’s annotation below), which illustrates the “luminance distribution of the emission **surfaces**,” further confirms that **surface** of the fluorescent material should be distinguished from “emission **side**,” as illustrated in Figs. 1(A), 2(A), 3(A), and 4(A), where the light-condensing positions are located. EX2019 at ¶ 96 (citing EX1001 at 4:34-38).

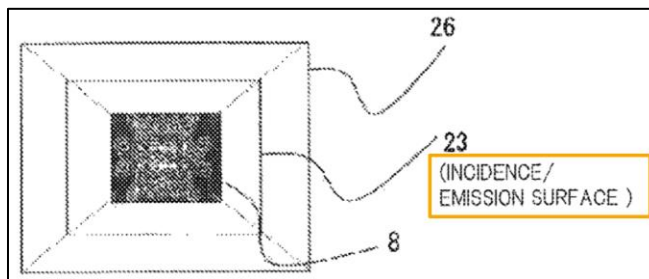


Fig. 3(B) (annotation added)

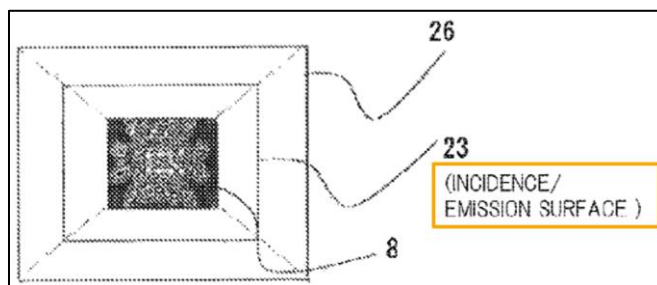


Fig. 4(B) (annotation added)

The specification provides illustrations and descriptions demonstrating how excitation light interacts with the fluorescent material and is subsequently emitted, providing further support that “emission side” is well-defined. EX2019 at ¶ 97.

ii. “Relative to the Fluorescent Material” Provides a Clear Reference Point

The phrase “relative to the fluorescent material” eliminates any ambiguity by defining the emission side in relation to a fixed, well-known component of the system, especially to a POSIA reading the claim in view of the specification. EX2019 at ¶ 98. The fluorescent material serves as a clear reference, which is labeled consistently as “7” across all the figures. In this exemplary embodiment, “the light-condensing position is positioned on the emission side of the excitation light **10** relative to the fluorescent material **7**.” *Id.* (citing EX1001 at 3:49-51).

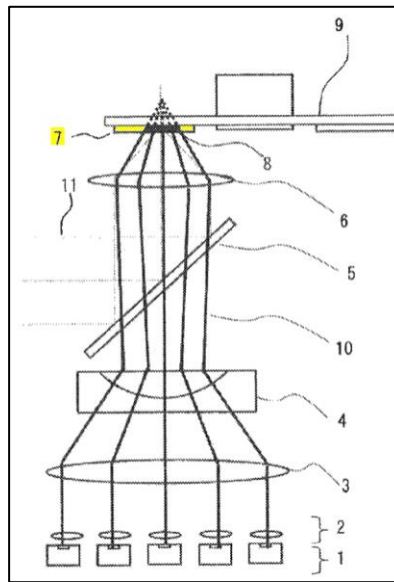


Fig. 1(A) (annotation added)

As noted by Dr. Lebby, these disclosures ensure that a POSITA can determine the emission side examining the arrangement of the fluorescent material, especially in relation to the light rays. EX2019 at ¶ 99. To a POSITA, the disclosures in the specifications of the '226 Patent should make clear which side of the fluorescent material corresponds to the “emission side” for the specific exemplary embodiment. *Id.*

Thus, a POSITA reading “an emission side of the excitation light relative to the fluorescent material,” in claim 8, in light of the specification, would have informed the scope of the with reasonable certainty because a POSITA skill in the art would understand which side of the fluorescent material would correspond to the emission side. *Id.* at ¶ 100. Therefore, as articulated by Dr. Lebby, “an emission side

of the excitation light relative to the fluorescent material” is not ambiguous. *Id.* at ¶ 101.

Additionally, “an emission side of the excitation light relative to the fluorescent material” should be construed as “an excitation light’s exit side of the fluorescent material that faces away from the excitation light source” as supported by disclosures in the specifications. *Id.* at ¶ 102.

b. Dr. Sasian and Petitioners’ proposed construction that a light-condensing position of the excitation light is positioned on “the surface of the fluorescent material on the side facing the excitation light source” contradicts disclosures in the specifications.

As explained by Dr. Lebby, Dr. Sasian’s construction that the light-condensing position should be located on “the ***surface*** of the fluorescent material on the ***side facing the excitation light source***” contradicts the core principle of the disclosures in the ’226 Patent. EX2019 at ¶ 103 (citing EX1004 at ¶ 29).

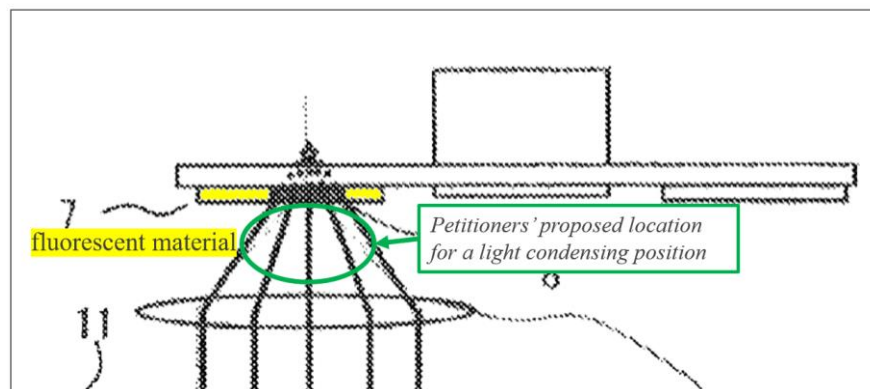
First, the “emission side” cannot be located on the ***surface*** of the fluorescent material. *Id.* at ¶ 104. The specification identifies that the problem with prior light source devices stems from high irradiation region in the center, as illustrated in Fig. 6, which places the light-condensing position on the ***surface*** of the fluorescent material. *Id.* at ¶ 104 (citing EX1001 at 3:4-35). The disclosed arrangements are designed “so that the excitation light is prevented from being condensed on the

single portion on the fluorescent material.” EX2019 at ¶ 104 (EX1001 at 3:14-16, 3:29-32).

As this focused condensing of light on the fluorescent material is precisely what the ’226 Patent—and specifically claim 8—sought to overcome, Dr. Sasian’s proposed construction would preclude exemplary embodiments. This is legally improper. *Oatey*, 514 F.3d at 1277.

Second, Dr. Sasian’s proposed construction of having a light-condensing position to be located on “the surface of the fluorescent material ***on the side facing the excitation light source***” precludes embodiments disclosed in this ’226 Patent. *Id.* at ¶ 106 (citing EX1004 at ¶ 29).

Dr. Sasian’s proposed construction places the light-condensing position on the other side of the fluorescent material (“the fluorescent material that faces the excitation light source”—marked with green circle in the annotated Fig. 1(A) below) as illustrated in the annotated figure below. EX2019 at ¶ 107 (citing EX1004 at ¶ 29). This side of the fluorescent material is not where the light condensing position of claim 8 is located, as intended by the arrangements of the optical member. EX2019 at ¶ 107.



EX2019 at ¶ 107 (Fig. 1(A) (Annotated))

Consequently, Dr. Sasian’s proposed construction excludes the exemplary embodiment of placing the light-condensing position at “an excitation light’s exit side of the fluorescent material that faces away from the excitation light source” as illustrated in Fig. 1(A), 2(A), 3(A), and 4(A) and described, for example, in 3:39-59 which discusses Fig. 1(A). EX2019 at ¶ 108 (citing EX1004 at ¶ 29). It is legally inappropriate to interpret a term in a manner that excludes the disclosed embodiments. *See e.g., Oatey* 514 F.3d at 1277 (“[W]here claims can reasonably [be] interpreted to include a specific embodiment, it is incorrect to construe the claims to exclude that embodiment ...”)

As such, “an emission side of the excitation light relative to the fluorescent material” should be construed as “an excitation light’s exit side of the fluorescent material that faces away from the excitation light source.”

V. LEGAL STANDARD

Under 35 U.S.C. § 102(a) (pre-AIA), an issued patent is invalid if “the invention [therein] was . . . described in a printed publication . . . before the invention thereof by the applicant.” This statute “embodies the concept of novelty—if a device or process has been previously invented (and disclosed to the public), then it is not new, and therefore the claimed invention is ‘anticipated’ by the prior invention.” *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008). To anticipate, “the prior art reference . . . must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements ‘arranged as in the claim.’” *Id.* (citing *Connell v. Sears Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983)).

A claim is also not patentable if the differences between the claim and the prior art are such that the subject matter as a whole would have been obvious to a POSITA at the time of the invention. 35 U.S.C. § 103(a) (pre-AIA). Obviousness requires assessing (1) the “level of ordinary skill in the pertinent art,” (2) the “scope and content of the prior art,” (3) the “differences between the prior art and the claims at issue,” and (4) “secondary considerations” of non-obviousness such as “commercial success, long felt but unsolved needs, failure of others, etc.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007) (quoting *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18 (1966)).

It is the petitioner's burden to prove unpatentability, *E.I DuPont de Nemours & Co. v. Synvina C.V.*, 904 F.3d 996, 1007 (Fed. Cir. 2018), and "to demonstrate both 'that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.'" *Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367-68 (Fed. Cir. 2016) (quotations and citations omitted). However, a petitioner must first show that all of the claimed elements are disclosed in the prior art. *See Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1164 (Fed. Cir. 2006) (considering motivation to combine and reasonable expectation of success only "if all the elements of an invention are found in a combination of prior art references").

VI. THE PETITION DOES NOT SHOW A REASONABLE LIKELIHOOD OF PREVAILING WITH RESPECT TO ANY CHALLENGED CLAIM

The Petition should be denied because it does not establish a reasonable likelihood of prevailing on any of the asserted grounds against any of the challenged claims. All of Petitioners' grounds fall on issues of claim construction because Petitioners have applied incorrect interpretations of "a light-condensing position" and "an emission side of the excitation light relative to the fluorescent material" in claim 8 of the '226 Patent. Petitioners' constructions of these terms effectively void the key inventions of the '226 Patent, rendering suspect Petitioners' prior art

comparison to such improper construction of the claim 8. Additionally, for Grounds 3 and 4, Petitioners do not adequately articulate a rationale for the combination of the proposed references.

A. Grounds 1-4 Have No Likelihood of Success Because Petitioners Applied Incorrect Claim Constructions to Claim 8 of the '226 Patent

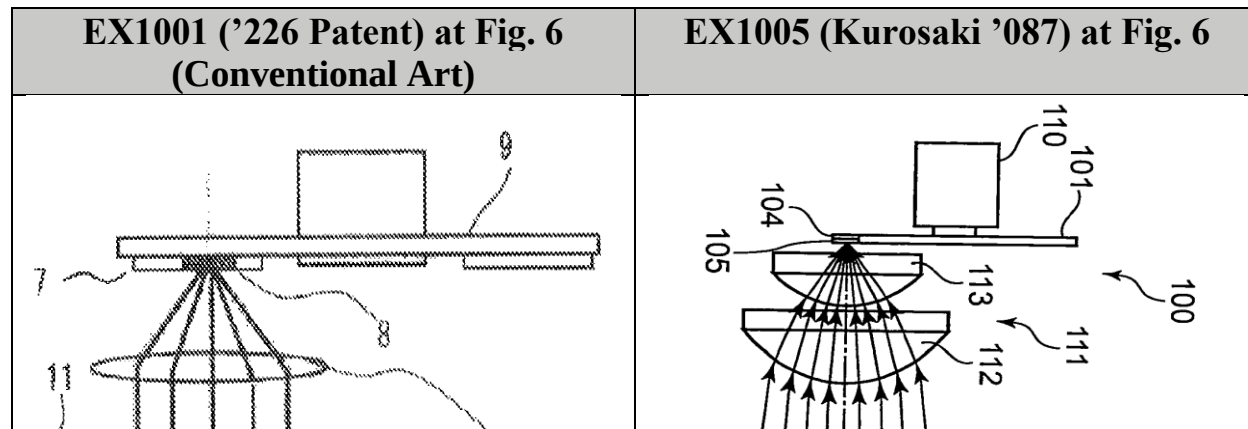
There is no likelihood of prevailing with respect to Grounds 1-4 because Petitioners have applied incorrect claim constructions to claim 8 of the '226 Patent in the analysis of the Kurosaki '087, Miyamae, and Kitano.

1. Petitioner Fails to Establish that Claim Limitation [8.8] Is Disclosed by Kurosaki '087

Petitioners fail to show a likelihood of prevailing with respect to Kurosaki '087 in Grounds 1, 3, and 4 because Petitioners' analysis of Kurosaki '087 for claim element "[8.8] the optical member has a curvature that is set such that a light-condensing position of the excitation light is positioned on an emission side of the excitation light relative to the fluorescent material" is based on claim constructions that are not only inconsistent with the District Court's preliminary constructions but also effectively read out the key inventions of the '226 Patent. EX2019 at ¶ 118 (citing EX1004 at ¶¶ 25-29, ¶ 87).

Kurosaki '087 discloses the arrangements and curvatures of the lenses that result in a light-condensing position on the surface of the fluorescent material that

mirrors that of the **conventional art** disclosed in the '226 Patent. EX2019 at ¶ 119 (citing EX1005 at Fig. 6; EX1001 at Fig. 6). In other words, the '226 Patent was improved upon precisely the type of art disclosed in Kurosaki '087. EX1004 at ¶ 87; EX1005 at Fig. 6.



EX2019 at ¶ 119. 120. Yet, Petitioners argue that Kurosaki '087 discloses “the excitation light is incident on the fluorescent material as a light-condensing position that is an emission light of the excitation light relative to the fluorescent material.” Pet. at 23. This statement is based on an incorrect interpretation of “a light-condensing position” and “an emission light of the excitation light relative to the fluorescent material.” EX2019 at ¶ 120 (citing EX1004 at ¶¶ 25-29).

For Kurosaki '087 to read on claim 8 (and specifically [8.8]) of the '226 Patent, the “excitation light” should be incident on the **irradiation region** of fluorescent material—not “a light-condensing position.” EX2019 at ¶ 121. The importance of the distinguishing “irradiation region” from “a light-condensing

position” in claim 8 of the ’226 Patent is explained in Section IV.A.

As Petitioners and Dr. Sasian base the analysis of Kurosaki ’087 on flawed claim constructions inconsistent with the preliminary constructions in the District Court. Petitioners’ constructions also read out the key invention of the ’226 Patent and the Petition is silent regarding how Kurosaki ’087 discloses “a light-condensing position” that is located on “an emission side of the excitation light relative to the fluorescent material”—or the exit side of the fluorescent material that faces away from the excitation light source. EX2019 at ¶ 122; *see* Pet. 22-23; *see also* EX1004 at ¶ 87.

Moreover, Dr. Sasian’s description of Kurosaki ’087 further confirms that Kurosaki ’087 resembles the **conventional art** as described in the specification of the ’226 Patent. EX2019 at ¶123 (citing EX1001 at 2:15-3:3). For example, as disclosed in Kurosaki ’087 “the beams from the excitation light sources 71 are more **concentrated** in the rectangular area $L_x \times L_y$ on the phosphor layer 104” EX1004 at ¶ 87 (emphasis added). As Dr. Lebby describes in Sections V and VII of his declaration, the invention of the ’226 Patent was to avoid such concentration of light on specific portions of the fluorescent material to overcome the subsequent issues of hot spots in the **conventional art**. EX2019 at ¶¶ 45-49, 55-108, 123 (citing EX1001 at 2:15-3:3, Figs. 1-4, and 6).

As Kurosaki ’087 largely mirrors the conventional art disclosed in the ’226

Patent, Petition fails to show this key invention at least in claim element [8.8] of the '226 Patent where “a light-condensing position” is located on “an emission side of the excitation light relative to the fluorescent material.” Petitioners fail to meet their burden of showing how Kurosaki '087 discloses the dispersion of light on the fluorescent material by placing the light-condensing position on the “excitation light’s exit side of the fluorescent material that faces away from the excitation light source.” EX2019 at ¶¶ 45-49, 55-108, 124.

As claims 10 and 12 depend on claim 8, Petition’s analysis of Kurosaki '087 on Ground 1 also suffers from the same deficiencies. Pet. at 26-28. As Petition also applies the improper constructions for Miyamae (see Section VI.A.2), and Kitano, (see Section VI.A.3), combining Kurosaki '087 with them for Ground 3 and 4 does not resolve this deficiency. Pet. 46-78.

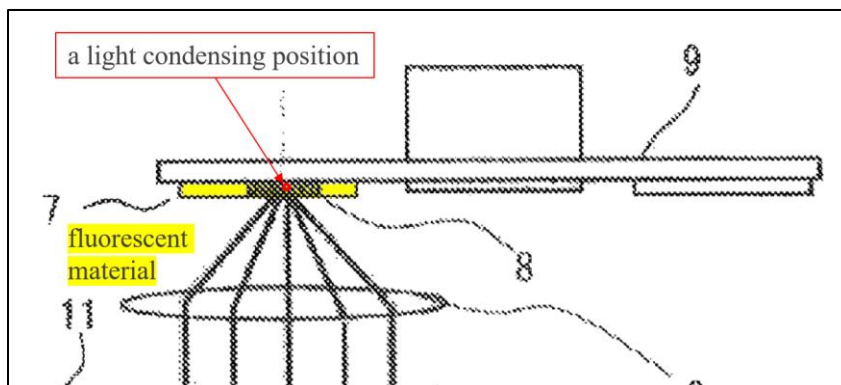
2. Petitioner Fails to Establish that Claim Limitation [8.8] Is Disclosed by Miyamae

Petitioners fail to show a likelihood of prevailing with respect to Miyamae in Grounds 2 and 3. Petitioners’ analysis of Miyamae for claim element “[8.8] the optical member has a curvature that is set such that a light-condensing position of the excitation light is positioned on an emission side of the excitation light relative to the fluorescent material” is based on claim constructions that are not only inconsistent with the District Court’s preliminary constructions but also effectively

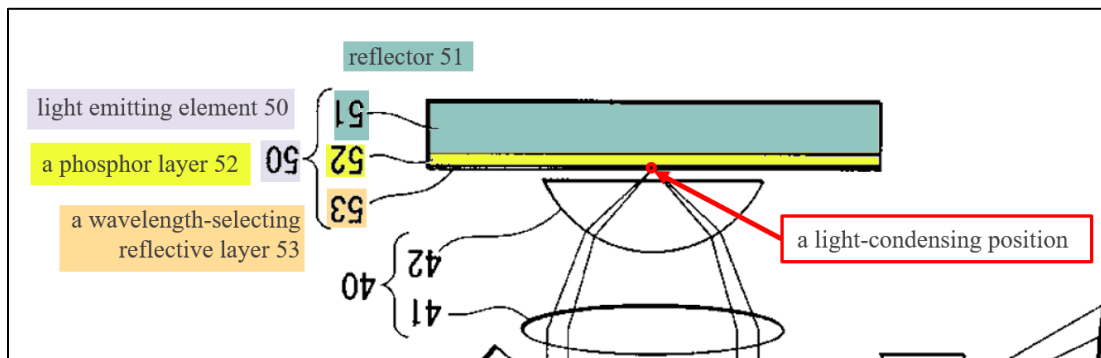
read out the key inventions of the '226 Patent. EX2019 at ¶ 126 (citing EX1004 at ¶¶ 125-28).

Miyamae discloses the arrangements and curvatures of the lenses that result in a light-condensing position being embedded on the fluorescent material that mirrors that of the conventional art disclosed in the '226 Patent. EX2019 at ¶ 127; EX1004 at ¶ 126 (citing Fig. 1 and 5 of Miyamae); EX1001 at Fig. 6. In other words, the '226 Patent was intended to improve upon precisely the type of art disclosed in Miyamae. EX2019 at ¶ 127; EX1004 at ¶¶ 125-28; EX1005 at Fig. 6.

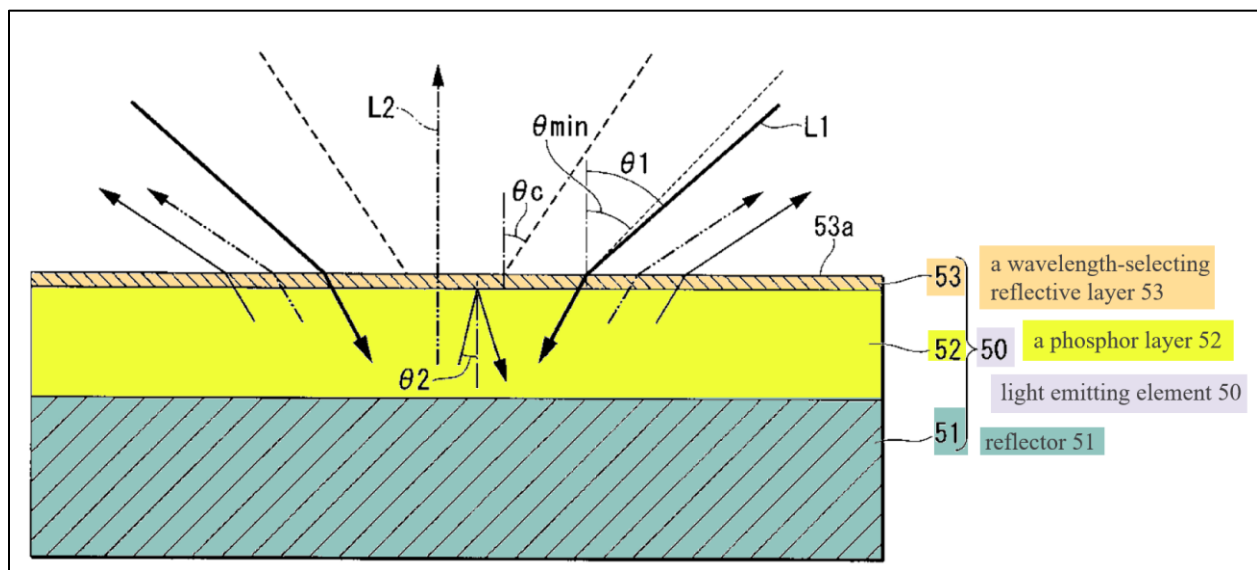
Dr. Lebby's comparison of the **conventional art** in the '226 Patent as depicted in Fig. 6 with the disclosures of Miyamae in Fig. 3 and Fig. 5 which provide a more detailed view of the fluorescent material (also known as phosphor material/layer) and light paths in Fig. 1. EX1001 at Fig. 6 (annotated); EX1006 at Fig. 3 and Fig. 5 (annotated) demonstrates the similarities between the two. EX2019 at ¶ 129.



EX2019 at ¶ 129 (Dr. Lebby's annotation of Fig. 6 (Conventional Art) of the '226 Patent)



EX2019 at ¶ 129 (Dr. Lebby’s annotation of Miyamae at Fig. 3)



EX2019 at ¶ 129 (Dr. Lebby’s annotation of Miyamae at Fig. 5)

As shown in the annotated figures of Miyamae, the light-condensing positions are positioned somewhere within the “a phosphor layer 52.” EX2019 at ¶ 130 (citing EX1006 at Fig. 3, 5). Specifically, the light paths do not reach any point that goes beyond a phosphor layer 52 in Miyamae. EX2019 at ¶ 130 (citing EX1006 at Fig. 3, 5).

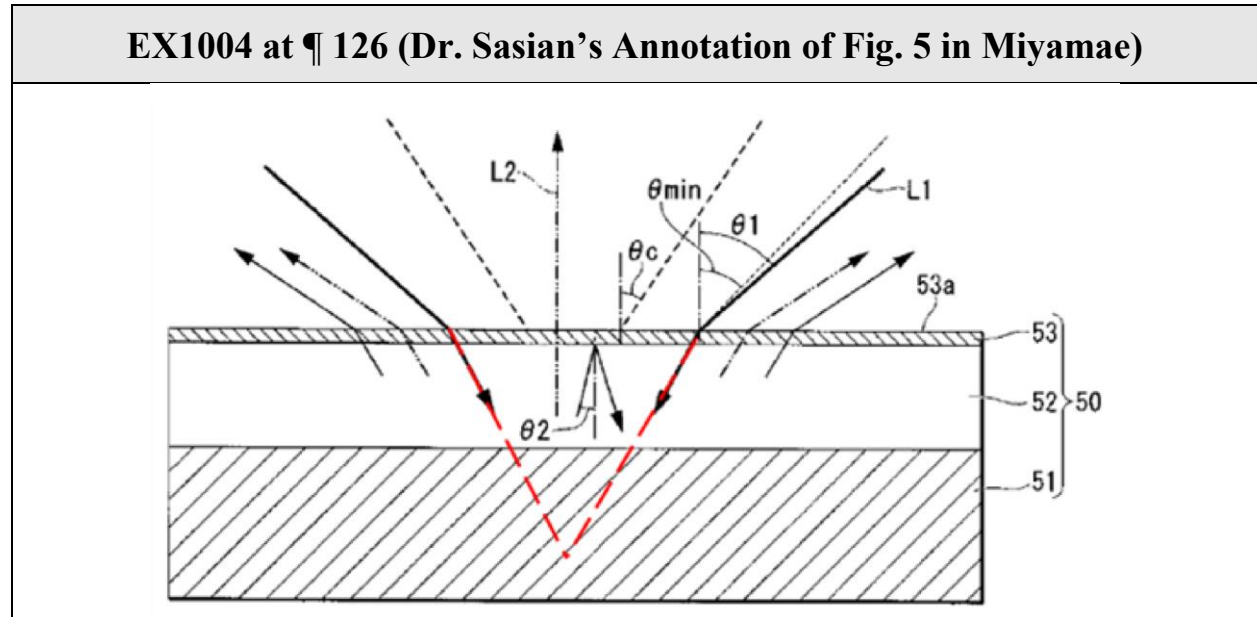
Yet, Dr. Sasian claims that Miyamae discloses the following: “a light-condensing position of the excitation light is positioned on an emission side of the excitation light relative to the fluorescent material.” EX2019 at ¶ 131 (citing EX1004 at ¶ 128). This statement is based on an incorrect interpretation of “a light-condensing position” and “an emission light of the excitation light relative to the fluorescent material.” EX2019 at ¶ 131 (citing EX1004 at ¶¶ 25-29).

As explained in Section IV.B, “emission side” in the ’226 Patent is referring to the side of the fluorescent material that faces away from the excitation light source—the “emission side” is not embedded within the fluorescent material.² EX2019 at ¶ 132 (citing EX1006 (Miyamae) at Fig. 3, 5). Thus, Miyamae does not disclose the light-condensing position on the “emission-side” as disclosed in the ’226 Patent; as described, in Miyamae, the light-condensing positions are embedded on the fluorescent material as found on the conventional arts of the ’226 Patent. EX2019 at ¶ 132 (citing EX1001 at Fig. 6).

Dr. Sasian also states that the “imaginary extensions of the excitation light rays substantially meet at a point in annotated Fig. 5 on the opposite side of the

² Based on the specifications of Miyamae and ’226 Patent, it is clear to a POSITA that the “fluorescent material” in the ’226 Patent would correspond to “the light emitting element 50” in Miyamae. EX2019 at FN 3.

fluorescent layer 52 from the excitation light sources 102, just as shown in the Fig. 1 of the '226 Patent.” EX2019 at ¶ 133 (citing EX1004 at ¶¶ 126, 128).



Yet, these imaginary lines drawn by Dr. Sasian are inconsistent with teachings of Miyamae. EX2019 at ¶ 134 (citing EX1004 at ¶ 126). “Reflector 51 has a surface that **reflects** light (blue light as excitation light and yellow light as fluorescence); a reflective metal material sheet such as an aluminum substrate, or a light transmissive sheet of forming material.” EX1006b at [0062]. Consequently, any light that strikes the reflector 51 will be reflected, and light cannot pass through the reflector as depicted by Dr. Sasian in the annotated figure. EX2019 at ¶ 134 (citing EX1004 at ¶ 126). Dr. Sasian fails to address or explain what this “imaginary lines” means when the specification specifically suggests that the light will not be passing through the reflector. EX2019 at ¶ 134.

Next, Dr. Sasian's annotations and descriptions of Fig. 5 in Miyamae further confirm that the disclosures in Miyamae reflect the conventional technology discussed in the '226 Patent. EX2019 at ¶ 135. Even if there is a "light-condensing position" indicated by the imaginary lines, this position does not extend to the opposite side of the fluorescent material, unlike the embodiments of the inventions described in the '226 Patent. EX2019 at ¶ 135 (citing EX1004 at ¶¶ 126, 128; EX1001 at Figs. 1-4). This location of the light-condensing position within the "light emitting element 50" (and arrangements of the optical member that allows for such light path) is more closely aligned with the conventional art discussed in the '226 Patent and as depicted in the Fig. 6. EX2019 at ¶ 135 (citing EX1001 at Fig. 6; 2:27-3:3).

Dr. Sasian also notes that "Miyamae discloses that '[o]n light emitting element 50, the individual spots of the laser light sources 12 incorporated in light source portion 10A are set so that their focusing positions do not completely overlap....'" EX1004 at ¶ 127 (citing EX1006, [0046]). This fails to resolve the deficiencies of Miyamae because the '226 Patent specifically disclosed an arrangement of optical members that moved the light condensing position away from the surface of the fluorescent material. In Miyamae, the light condensing positions are positioned "**on** light emitting element," as found in the conventional art of

the '226 Patent. EX2019 at ¶ 136 (citing EX1004 at ¶ 127; EX1006, [0046]; EX1001 at Fig. 6).

As claim 10 depends on claim 8, Petition's analysis of Miyamae on Ground 2 also suffers from the same deficiencies. Pet. at 44-46. As the Petition relies on Dr. Sasian's flawed claim construction, Petition failed to show that Miyamae in Grounds 2 and 3 disclose the key inventive feature in at least claim element [8.8] of the '226 Patent. EX2019 at ¶ 137. Instead, Miyamae largely mirrors the conventional art of the '226 Patent which the patent improved upon. EX2019 at ¶ 137. As Petition also applies the same improper constructions for Kurosaki '087 (see Section VI.A.1), combining Miyamae with Kurosaki '087 for Ground 3 does not resolve this deficiency. Pet. 46-49.

3. Petitioner Fails to Establish that Claim Limitation [8.8] Is Disclosed by Kitano

Petitioners fail to show a likelihood of prevailing with respect to Kitano in Ground 4. Petitioners' analysis of Kitano for claim element "[8.8] the optical member has a curvature that is set such that a light-condensing position of the excitation light is positioned on an emission side of the excitation light relative to the fluorescent material" is based on claim constructions that are not only inconsistent with the District Court's preliminary constructions but also effectively read out the key inventions of the '226 Patent. EX2019 at ¶ 161 (citing EX2017 at

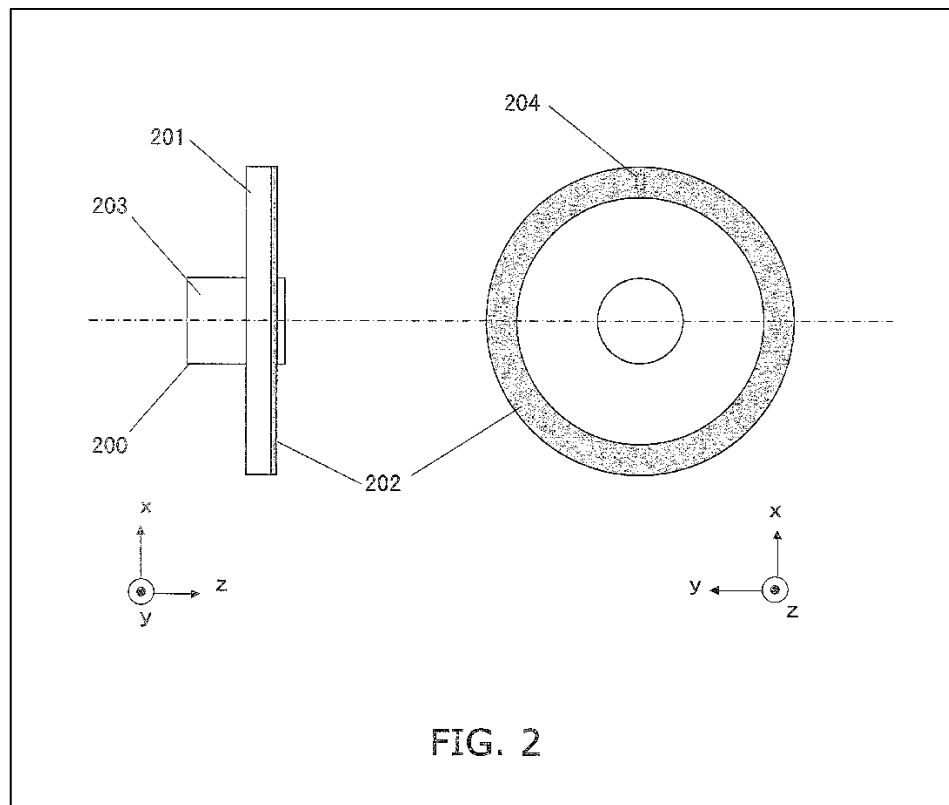
4; EX1004 at ¶¶ 187-93).

Kitano utilizes both LEDs and lasers as light sources but fails to address the hotspot issues on fluorescent materials that can significantly shorten the lifespan of an optical system—a key invention of the '226 Patent. Kitano discloses lens arrangements and curvatures that create a light-condensing position being embedded on the fluorescent material that mirrors that of the **conventional art** disclosed in the '226 Patent. EX2019 at ¶ 162 (citing EX1004 at ¶¶ 187-192; EX1001 at Fig. 6). In other words, the '226 Patent was intended to improve upon precisely the type of art disclosed in Kitano. EX2019 at ¶ 162 (citing EX1004 at ¶¶ 187-92; EX1007 at Fig. 3).

Dr. Lebby's comparison of the **conventional art** in the '226 Patent as depicted in Fig. 6 with the disclosures of Kitano in Fig. 3 as referenced by Dr. Sasian (EX1004 at ¶ 188) show that a light-condensing position is located within the phosphor material. EX2019 at ¶¶ 164-65 (EX1004 at ¶ 188; EX1001 at Fig. 6). Further, Dr. Sasian's annotation (EX1004 at ¶ 188) indicates that this light-condensing position is on the "front side" of the fluorescent material, which is "the surface of the fluorescent material on the side facing the excitation light source." EX2016 at 5. This is precisely what is depicted on Fig. 6 of the '226 Patent as the **conventional art**. EX2019 at ¶ 165; EX1001 at Fig. 6.

Dr. Sasian's description of Kitano in ¶ 189 does not address anything specific to the "light-condensing position." EX2019 at ¶ 166 (citing EX1004 ¶ 189). Yet, the language of Kitano as recited by Dr. Sasian further confirms that disclosures in Kitano mirrors the **conventional art** disclosed in the '226 Patent. EX2019 at ¶ 166 (citing EX1004 ¶ 189). For example, in Kitano, "FIG. 2 shows a specific configuration of the phosphor wheel...as seen in the z axis direction...The shape of a laser light irradiation **spot** 204 on the phosphor 202 is indicated by the broken line." EX1004 ¶ 189 (citing EX1007 at [0052]) (emphasis added). "The laser light flux...is condensed or focused...and is incident on the phosphor...The **spot** of the laser light flux formed on the phosphor measures 2×1.5 mm." EX1004 ¶ 189 (citing EX1007 at [0062]-[0070]) (emphasis added).

As found on **conventional art** of the '226 Patent, the light is incident on the **spot** of the phosphor/fluorescent material. EX2019 at ¶ 168 (citing EX1004 ¶ 189). This resembles the way the light is incident on the fluorescent material as discussed in describing **conventional art** in the '226 Patent. EX2019 at ¶ 168 (citing EX1001 at Fig. 6; 2:27-3:3).



EX1004 at ¶ 189 (Kitano at Fig. 2)

Further, Dr. Sasian argues that “the imaginary extensions of the excitation light rays substantially meet at a point on the opposite side of the phosphor layer from the excitation light source, just as shown in Fig. 1 of the ’226 Patent.” EX2019 at ¶ 169 (citing EX1004 at ¶ 192). This description appears to contradict Dr. Sasian’s own construction of the disputed term in claim 8, and it seems to adopt the first interpretation of “light-condensing position” that Dr. Sasian suggested in the Declaration but did not ultimately adopt. EX2019 at ¶ 170 (citing EX1004 at ¶ 27). And, this definition of the “emission side” as the “opposite side” of the phosphor layer with respect to Kitano contradicts Dr. Sasian’s description of the proper light

paths in the '226 Patent and other prior art. EX2019 at ¶ 170 (EX1004 at ¶¶ 25-29, ¶ 87, ¶¶ 125-28).

Even if the “imaginary extensions of the excitation light rays” were to be extended, as suggested by Dr. Sasian and Petitioners, the convergence of the light (a light-condensing position) will be located on “substrate 301.” Pet. at 67; EX1004 at ¶ 192. As such, the location of “a light-condensing position” fails to reach the other side of the fluorescent material as shown in embodiments in the '226 Patent. EX1004 at ¶ 192; EX1001 at Figs. 1-4. Hence, the light-condensing position would not be located on the opposite side of the phosphor layer as shown in Fig. 1 of the '226 Patent. Rather, as Dr. Sasian noted in the annotated Fig. 3 of Kitano, the light-condensing position is on the front side of the fluorescent material. EX1004 at ¶ 188.

Accordingly, Kitano does not disclose the key inventive feature in claim 8 of the '226 Patent, especially claim element [8.8] because the condensing position is located on the “front side” of the fluorescent material rather than the “emission side.” Pet. at 64-67 (citing EX1004 at ¶ 188).

Further, even if the “imaginary extensions of the excitation light rays” were to be extended, as suggested by Dr. Sasian, the convergence of the light (a light-condensing position) will be located on “substrate 301.” EX1004 at ¶ 192. As such, the location of “a light-condensing position” fails to reach the other side of the

fluorescent material as shown in embodiments of the inventions in the '226 Patent. EX1004 at ¶ 192; EX1001 at Figs. 1-4.

As claims 10 and 12 depends on claim 8, Petition's analysis of Kitano on Ground 4 also suffers from the same deficiencies. Pet. at 64-67. As the Petition relies on Dr. Sasian's flawed claim construction, Petition failed to show that Kitano in Ground 4 disclose the key inventive feature in at least claim element [8.8] of the '226 Patent. EX2019 at ¶ 171. As Petition also applies the same improper constructions for Kurosaki '087 (see Section VI.A.1), combining Kitano with Kurosaki '087 for Ground 4 does not resolve this deficiency. Pet. 64-67.

B. Grounds 3-4 Have No Likelihood of Success Because Petitioners Fail to Articulate a Rationale Underpinning to the Obviousness Combinations

As explained below, Petitioners have not shown a likelihood of prevailing with respect to Grounds 3-4 due to lack of sufficient rationale and motivation to combine the references.

1. Ground 3: Petitioners Failed to Articulate Sufficient Rationale on the Motivation to Combine Miyamae and Kurosaki '087

Ground 3 relies on the purported combination of Miyamae and Kurosaki '087. Petitioners and Dr. Sasian have not shown a reasonable likelihood of prevailing with respect to Ground 3 because a POSITA would not have been motivated to combine

Miyamae and Kurosaki '087 at the time of the invention of the '226 Patent. EX2019 at ¶ 142 (Pet. at 47-48; EX1004 at ¶¶ 148-57).

Dr. Sasian alleges that a POSITA would have recognized that Kurosaki '087's optical subsystems would have been compatible with system described in Miyamae and that "combining Miyamae and Kurosaki ['087] would have amounted to simple substitution of one known element for another to obtain predictable results." EX1004 at ¶ 150. As Dr. Lebby points out, such combination is far from "simple." EX2019 at ¶¶ 144-45.

Combining Miyamae and Kurosaki '087 is not "a simple substitution" and its result is not easily predictable. EX2019 at ¶ 145 (citing EX1004 at ¶ 150). Dr. Sasian failed to demonstrate that a combination of Kurosaki '087 and Miyamae are compatible that such simple substitution of parts in the projector would result in an operable system. EX2019 at ¶ 145. For instance, Dr. Sasian's declaration lacks any simulation or modeling to demonstrate how the lenses in these systems operate upon substitution of the light sources. EX2019 at ¶ 145 (citing EX1004 at ¶¶ 149-57). At minimum, for the combined system to be operable to project an acceptable quality of image, the optical lenses would very likely need to be swapped out and respecified using optical simulation tools because these systems have different lenses that were specifically configured for its corresponding light sources. EX2019 at ¶ 145.

Petitioners not only failed to show how such simple substitution would have resulted in an operable system but also fail to show that a POSITA would have been motivated to make the modifications of prior art to arrive at the claimed invention. EX2019 at ¶ 146. A POSITA would **not** have “naturally looked to both Miyamae and Kurosaki [’087]” due to the inherent differences between Miyamae and Kurosaki ’087. EX2019 at ¶ 147 (citing EX1004 at ¶ 154).

Miyamae and Kurosaki ’087 had different intentions behind their inventions, disclosing different optical systems. EX2019 at ¶ 148. Miyamae is focused on optimal delivery of excitation light to the phosphor to enhance overall efficiency whereas Kurosaki ’087 is focused on developing a simplified and cost-effective structure. *Id.* Miyamae is a light valve device, whereas Kurosaki ’087 is a commercial projector device using DMD. *Id.* Although Miyamae mentions DMD and Liquid Crystal on Silicon (LCoS) that combines both LCD and DLP projectors, Kurosaki ’087 and Miyamae are different systems composed of different optical elements. *Id.* Specifically, Miyamae does not expressly teach how to set up optics for a DMD nor LCoS projector—a POSITA would not have been motivated to combine these two systems. *Id.*

Dr. Sasian and Petitioners failed to provide any convincing rationale as to why a POSITA would have reasonably expected that “substitution of light source of Kurosaki [’087] for the light source of Miyamae” would have resulted in “an

efficient light source for projectors,” nor did Dr. Sasian address the technical challenges and incompatibilities that arises from making such substitution of light sources. EX2019 at ¶ 149 (citing EX1004 at ¶ 151). For instance, Dr. Sasian did not address what about the light source of Miyamae would offer “certain advantages” over the light source of Kurosaki ’087; Dr. Sasian did not address how the substitution of light source will predictably result in “an efficient light source for projectors.” *Id.* Altering a light source almost always requires subsequent alterations to the remainder of the projector—the combination is not straightforward nor predictable without detailed analysis involving modeling and simulation. EX2019 at ¶ 149.

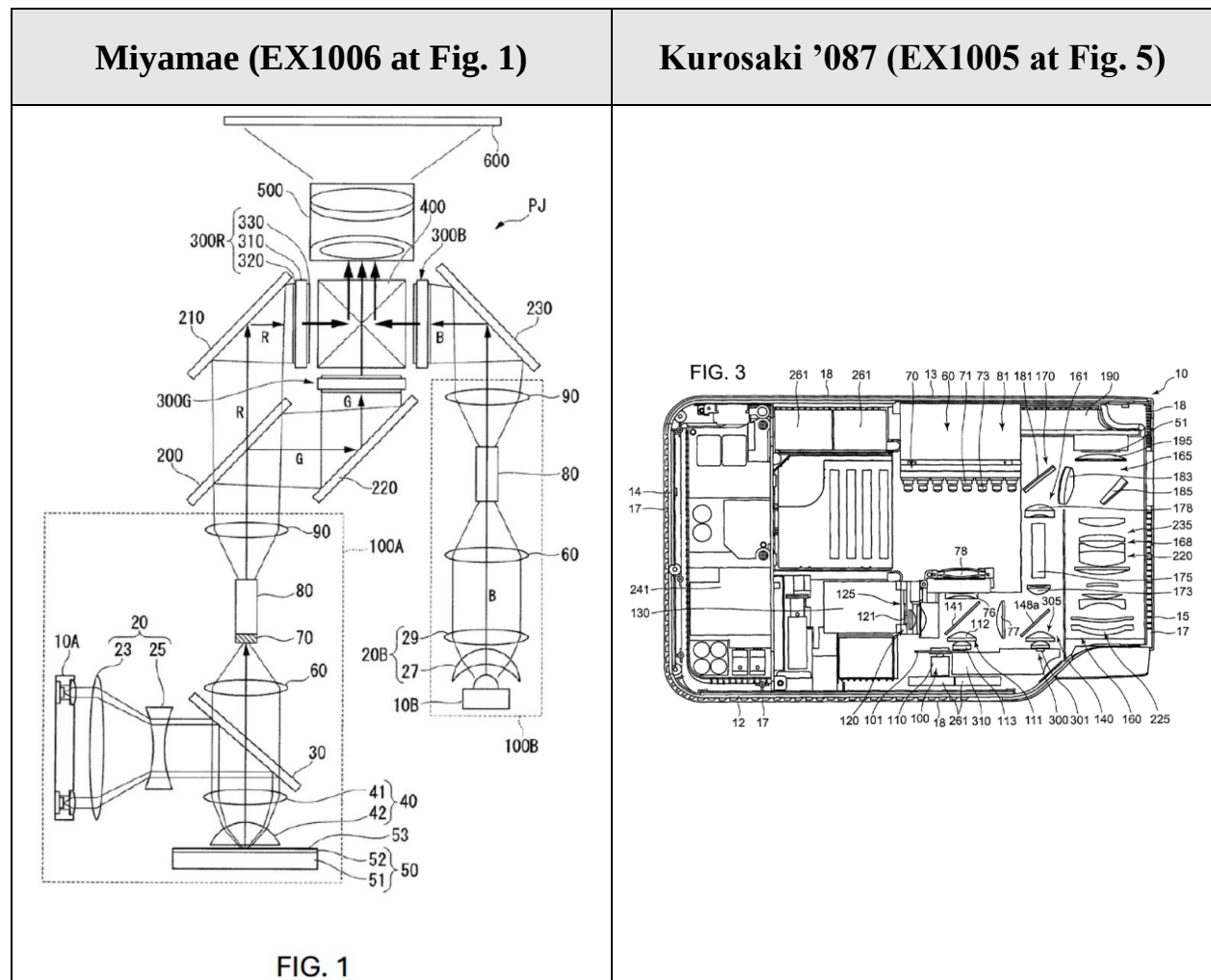
To start, Petitioners and Dr. Sasian’s proposal to combine Miyamae and Kurosaki ’087 through substitution of light sources also overlooks critical details—not indicating which type of the light sources would be subject to this substitution. EX2019 at ¶ 150; Pet. 47-48; EX1004 at ¶¶ 152-57. Dr. Sasian fails to specify whether (i) the laser light source 10A in Miyamae would be replaced with a light source of Kurosaki ’087 or (ii) the LED light source of 10B would be replaced with the light source of Kurosaki ’087. EX1004 at ¶¶ 152-57. In both cases, simulation and modeling of the combined system will be necessary—neither of which Dr. Sasian provided. EX2019 at ¶ 150.

Miyamae and Kurosaki '087 have different types of light sources. EX2019 at ¶ 151. For example, Miyamae includes laser and Light Emitting Diode (LED) light sources with light crystal light valves 300R, 300G, and 300B. EX2019 at ¶ 151 (*see, e.g.*, EX1006b at Fig. 1). On the other hand, Kurosaki '087 only includes laser as its light source. EX2019 at ¶ 151 (*see, e.g.*, EX1005 at Fig. 7).

LEDs and lasers have completely different optical characteristics as light sources for projectors. EX2019 at ¶ 152. For example, LEDs are incoherent light sources with Lambertian light distributions, meaning they emit light that diverges in many directions. *Id.* As a result, the optical system must be designed to efficiently collect light from these wide angles. *Id.* In contrast, lasers are coherent light sources with narrow far-field light distributions, allowing them to be easily focused into a line or point. *Id.* This requires a different set of optical lenses to achieve the necessary convergence. *Id.*

Additionally, when designing the optical structures, the thermal performance of the light source is a critical consideration because it directly impacts the lifetime and reliability of projectors. EX2019 at ¶ 153. Excess heat can lead to accelerated deterioration of projector components. *Id.* Since LEDs and lasers exhibit different thermal characteristics, their integration requires distinct structural arrangements—such as specifically designed heat sinks and fans—to effectively manage these differences and ensure optimal performance and durability. *Id.*

Further, both Miyamae and Kurosaki '087 utilize different combinations of lenses that vary in number, position, size, performance, and cost. EX2019 at ¶ 154. Each lens configuration is specifically designed to accommodate the particular light source used in its embodiment. *Id.* The figures of the two references below visually demonstrates these differences between Miyamae and Kurosaki '087. *Id.* Therefore, substituting the light source would necessitate a re-evaluation and likely require reconfiguration and modification of the lens arrangements. *Id.*



In view of the differences between Miyamae and Kurosaki '087 and the complications associated with substituting light sources, certain functional similarities between “rod integer 80” in Miyamae (EX1005 at [0051]) and the “light tunnel” in Kurosaki '087 (EX1006 at 6:10-13) do not provide a sufficient basis for a POSITA to make such alterations to the light sources, especially when the advantage of such substitution is not apparent. EX2019 at ¶ 155 (citing EX1004 at ¶ 151).

Further, specifications of “rod integer 80” and “light tunnel” are different from one another. EX2019 at ¶ 156 (citing EX1004 at ¶ 151). For example, “rod integer 80” in Miyamae is prism-shaped optical member. EX2019 at ¶ 156 (citing EX1006b at [0051]). The “light tunnel” in Kurosaki '087 has a rectangular cross section, though it may be an arbitrary shape such as a circle or an ellipse. EX2019 at ¶ 156 (citing EX1005 at 6:7-16). These differences in the specifications means they were optically designed, modeled, and simulated using software in different ways. EX2019 at ¶ 156. Additionally, their costs might vary, and the materials used would be different (such as plastics, glass, or perspex). *Id.* Cost is a fundamental and immediate consideration for any optical engineer developing new systems, and should be considered in assessing the motivation to combine the teachings of Miyamae with those of Kurosaki '087. *Id.* at ¶ 157. Their sizes would also differ significantly, to the extent that one might be too large to be used in the application

intended for the other. *Id.* at ¶ 156. None of these factors were even acknowledged or considered by Dr. Sasian. *Id.*

Moreover, the integration of two distinct optical systems usually requires additional rounds of modeling and simulation, each incurring further expense. *Id.* at ¶ 158. These costs must be justified by clear, tangible benefits—otherwise, the combination is not practical from a POSITA’s perspective. *Id.* The selection of compatible lenses, tailored to the specific beam characteristics and power output of the chosen light source, further compounds the overall system cost. *Id.* As Dr. Lebby notes, each design decision has cascading effects, making substitutions of light sources far from “simple.” *Id.*

Dr. Sasian’s assertion that such substitutions are straightforward overlooks the real-world complexities and cost drivers that optical engineers must address. In practice, cost and engineering complexity are inseparable from the design process, and any integration of Miyamae and Kurosaki ’087 would be evaluated through this lens by a POSITA. The realities of system integration demand a careful assessment of both technical and economic factors—an approach that is standard in the industry and cannot be disregarded.

Therefore, Dr. Sasian and Petitioners failed to show that a POSITA would have been motivated to combine Miyamae and Kurosaki ’087 for Ground 3.

2. Ground 4: Petitioners Failed to Articulate Sufficient Rationale on Motivation to Combine Kitano and Kurosaki '087

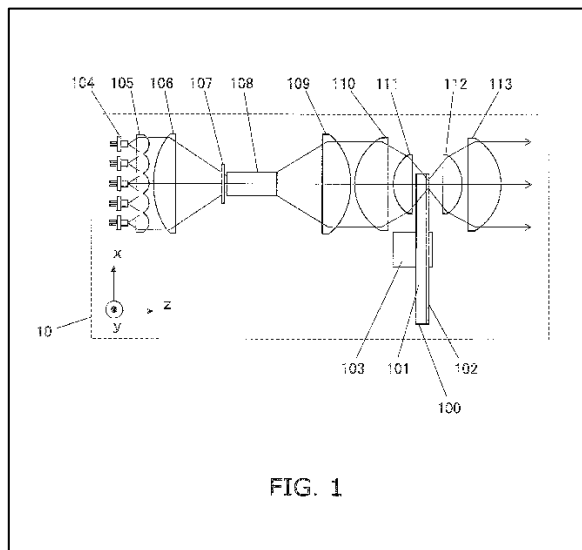
Ground 4 relies on the purported combination of Kitano and Kurosaki '087. Petitioners and Dr. Sasian have not shown a likelihood of prevailing with respect to Ground 4 because a POSITA would not have been motivated to combine Kitano and Kurosaki '087 at the time of the invention of the '226 Patent. Pet. at 54-55; EX1004 at ¶¶ 158-64.

Contrary to Dr. Sasian's opinion, a POSITA would *not* have naturally looked to both Kitano and Kurosaki '087 in their work because they are not in the "same field of endeavor." EX2019 at ¶ 176 (citing EX1004 at ¶ 161).

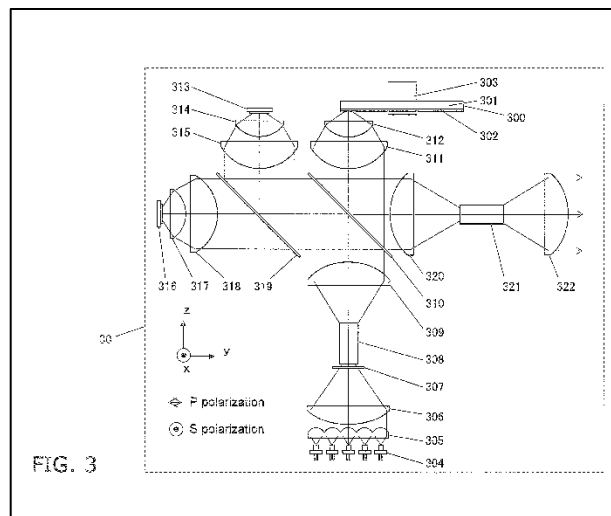
Dr. Sasian fails to provide sufficient explanation as to why a POSITA would have been motivated to combine Kitano and Kurosaki '087. EX2019 at ¶ 177. For instance, Petitioners and Dr. Sasian fail to provide the essential technical details required to demonstrate how the substitution would yield "predictable results"—specifically, how the integration of a phosphor or fluorescent wheel from Kurosaki '087 or the integration of convex lens and concave lens from Kurosaki '087 will work with the projectors disclosed in Kitano. EX2019 at ¶ 178 (citing EX1004 at ¶¶ 158-64).

Dr. Sasian's proposal to combine Kitano with Kurosaki '087 overlooks the critical details—not indicating which one of the embodiments in Kitano would be

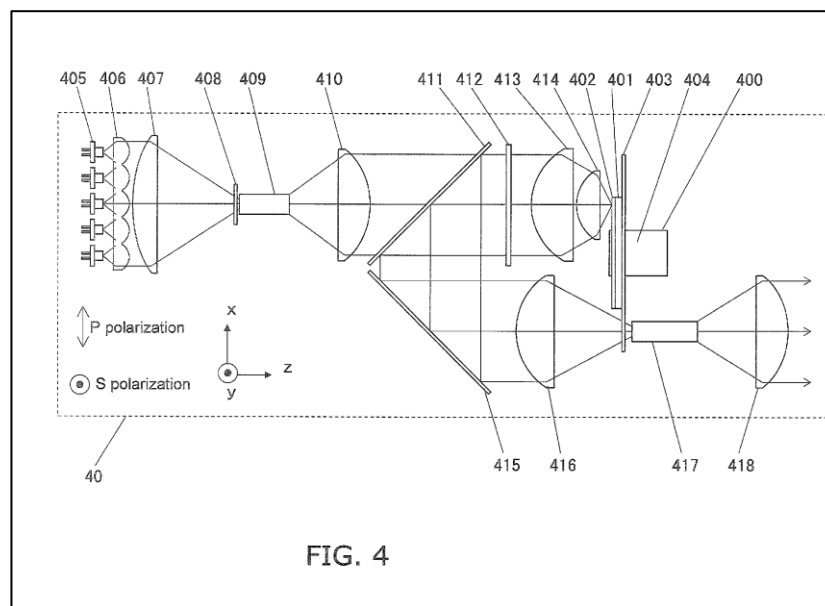
subject to this substitution. EX1004 at ¶¶ 158-64. For example, Kitano discloses different embodiments, each with different phosphor/fluorescent wheel and lens configurations. *See, e.g.*, EX1007 at [0025] (“FIG. 1 is a diagram of the configuration of the light source device pertaining to a first embodiment”); [0027] (“FIG. 3 is a diagram of the configuration of the light source device pertaining to a second embodiment”); [0028] (“FIG. 4 is a diagram of the configuration of the light source device pertaining to a third embodiment”). Yet, Dr. Sasian does not address which one of the embodiments in Kitano should be used for the combination here nor why selection of the particular embodiment would be preferred over others. EX2019 at ¶ 179 (citing EX1004 at ¶¶ 158-64).



EX1007 at Fig. 1



EX1007 at Fig. 3



EX1007 at Fig. 4

By concluding that such combination of Kitano and Kurosaki [’087] is “simple,” Dr. Sasian fails to provide the essential technical details required to demonstrate how such substitution of the fluorescent wheel of one with another lead to predictable results. EX2019 at ¶¶ 180-81 (citing EX1004 at ¶ 161).

As Dr. Lebby notes, the choice of phosphor material is selected to match the specific system, taking into account factors such as the types and arrangements of lenses and light sources in the system. EX2019 at ¶ 182 (citing EX1007 at [0055], [0096]). So, even when using the same type of phosphor or fluorescent wheel, each system is configured to function specifically with its own set of concave and convex lenses. EX2019 at ¶ 182. Subsequently, this combination fails to address how such a substitution in the phosphor wheel would extend its lifespan and improve its reliability. *Id.* Therefore, substituting one phosphor or fluorescent wheel from prior art with another is not a straightforward process, even if they are of the same type. *Id.* at ¶ 183.

Dr. Sasian does not articulate the practical steps or engineering considerations necessary to ensure such compatibility. *Id.* at ¶ 184 (citing EX1004 at ¶ 161). No modeling or simulation was performed, such analysis is also missing here in the combination of Miyamae and Kurosaki '087. Such a “simple” substitution of the fluorescent material is unlikely to result in an operable projector with acceptable image quality—and does not account for the differences in fluorescent materials or wheels, or consider that such substitution may not even be structurally feasible given the differences in the sizes of the fluorescent wheels. *Id.* at ¶ 185. Additionally, the reliability and durability of the fluorescent material would be questionable, as such a mere substitution would not account for optimizations regarding how the light is

incident on the fluorescent material, nor for the thermal control of the optical system. *Id.* at ¶ 187. Dr. Sasian also did not provide any cost analysis regarding this combination of Miyamae and Kurosaki '087. *Id.* at ¶ 186. Petitioners also do not show how such combination will result in an optical system of higher reliability and longer lifespan. *Id.* at ¶ 188.

There are different types of phosphor wheels that are disclosed in Kitano, yet Dr. Sasian does not explain which one of these phosphor wheels should be substituted with the one from Kurosaki '087; different phosphor wheels disclosed in Kitano include at least the following: 100 (Fig. 1), 200 (Fig. 2), 300 (Fig. 3), 400 (Fig. 4), 500 (Fig. 6), 600 (Fig. 7) 700 (Fig. 8), and 400a (Fig. 10). *Id.* at ¶ 189. Phosphor wheels have a wide variety of specifications—and it is unclear from Dr. Sasian's combination whether a copy of one phosphor wheel from one optical system will work in another. *Id.*

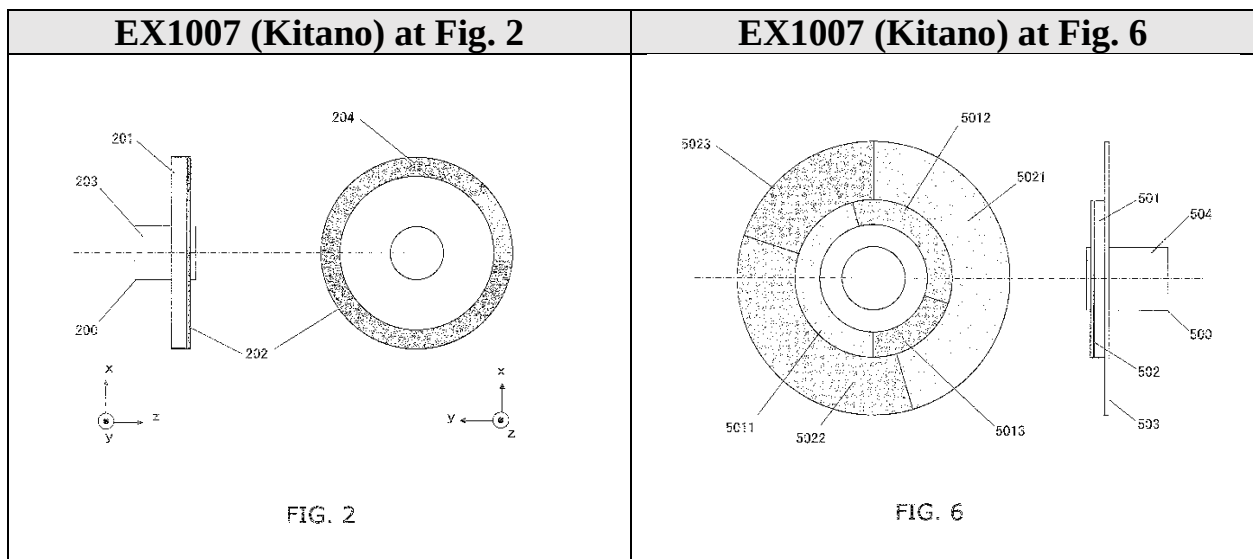
For example, “FIG. 2 shows a specific configuration of the phosphor wheel 100 as seen in the z axis direction. The diameter of a substrate 201 is 60 mm. The outermost peripheral portion of the substrate 201 is coated with a phosphor 202 in a ring shape with a width of 4 mm. The shape of a laser light irradiation spot 204 on the phosphor 202 is indicated by the broken line.” EX1007 at [0052]. “There are no particular restrictions on the material of the phosphor 202, such as a green phosphor. For example, besides a phosphor with a cerium-doped

garnet structure, examples include $(\text{Ba,Sr})_2\text{SiO}_4\text{:Eu}^{2+}$, $\text{SrSi}_2\text{O}_2\text{N}_2\text{:Eu}^{2+}$, $\text{Ba}_3\text{Si}_6\text{O}_{12}\text{N}_2\text{:Eu}^{2+}$, $\text{Sr}_3\text{Al}_3\text{Si}_{13}\text{N}_{23}\text{:Eu}^{2+}$, and $\beta\text{-SiAlON:Eu}^{2+}$ as phosphors with which green fluorescent light can be obtained with a blue laser having a wavelength of 445 nm.” EX1007 at [0055].

As another example of a phosphor wheel, “Fig. 6 shows the specific configuration of the phosphor wheel 400. A phosphor 502 (402) is made up of three spatial segments. The three spatial segments are made up of a red phosphor layer 5011, a green phosphor layer 5012, and a phosphor uncoated face 5013. The red phosphor and the green phosphor are applied by coating a substrate 501, whose surface has been given a mirror finish. The phosphor uncoated face 5013 is a metal mirror face.” EX1007 at [0095]. “The material used for the green phosphor is the same as that in the first embodiment. In this embodiment, the red phosphor is $\text{CaAlSiN}_3\text{:Eu}^{2+}$. Examples of other phosphors that are excited by a blue laser with a wavelength of 445 nm and with which red fluorescent light can be obtained include $\text{Sr}_2\text{Si}_5\text{N}_8\text{:Eu}^{2+}$ and $\text{SrAlSi}_4\text{N}_7\text{:Eu}^{2+}$.” EX1007 at [0096].

The fabrication for coating phosphors varies on both the specific phosphor material and its design. EX2019 at ¶ 192. These differences in fabrication directly impact the performance characteristics of the phosphor, such as efficiency, operational lifetime, and emission properties. *Id.* Additionally, the excitation wavelength of the laser plays a critical role in determining the behavior of the

phosphor. *Id.* For instance, a change in the laser wavelength—from 445 nm to 450 nm—leads to differences in efficiency, output power, and overall performance. *Id.* As a result, simply substituting one phosphor or coating process for another, without careful consideration of these variables, may not yield equivalent or optimal results in a different optical system. *Id.*



While it appears that Dr. Sasian has focused on the embodiments of Kitano with phosphor wheels that are disclosed as 200 (Fig. 2) and 300 (Fig. 3), Dr. Sasian does not address why a POSITA would have been motivated to combine these specific embodiments of Kitano over other phosphor wheels in other embodiments of Kitano with that of Kurosaki '087. EX2019 at ¶ 193 (citing EX1004 at ¶¶ 158-64, ¶¶ 181-85, ¶¶ 189-93).

Also, a POSITA must be able to find a clear advantage that supersedes all of these complications for there to be sufficient motivation to substitute a phosphor or

fluorescent wheel with a different one from a different system. EX2019 at ¶ 194. Yet, Dr. Sasian does not provide any advantage of substituting the phosphor or fluorescent wheel of Kitano with that of Kurosaki '087. *Id.*

Accordingly, Petitioners and Dr. Sasian have not established a motivation to combine Kitano with Kurosaki '087, especially with respect to substituting the phosphor/fluorescent wheel. EX2019 at ¶ 195.

Dr. Sasian argues that “a POSITA would have recognized that substituting certain components by those disclosed in Kurosaki ['087] offer certain advantages” such as the “combination of convex lens 78 and concave lens 76.” EX1004 at ¶ 162. However, Dr. Sasian does not identify which “certain components” of Kitano should be combined with these specific combination of lenses from Kurosaki '087, nor does Dr. Sasian clarify how such a combination would be implemented within Kitano's system. EX2019 at ¶ 196 (citing EX1004 at ¶¶ 158-64, 193).

The purported “certain advantages” from “arrangements of lenses, 78 and 76,” in Kurosaki '087 that “permit[] adjusting the width of the light source to the width of the lenses downstream, and also allows the control of light collimation.” do not provide a sufficient reason for a POSITA to be motivated to substitute Kitano's lens system with the concave and convex lenses of Kurosaki '087. EX2019 at ¶ 197 (citing EX1004 at ¶ 163). In fact, Kitano already discloses its own arrangement of convex and concave lenses, specifically designed for its system and tailored to the

requirements of its optical path, including the light sources, phosphor wheel, and dichroic mirrors. EX2019 at ¶ 197 (citing EX1007 at Figs. 1, 3, 4, 7, 9, 10). More specifically, “the laser light source 104” in Kitano is “collimated by a collimator lens array 105. A single laser diode is disposed for each lens cell of the collimator lens array 105.” EX2019 at ¶ 197 (citing EX1007 at [0040]). These laser beams form “a substantially parallel light flux.” EX2019 at ¶ 197 (citing EX1007 at [0041]).

Thus, the advantages Dr. Sasian attributes to Kurosaki '087 are already present in Kitano. EX2019 at ¶ 198. Dr. Sasian’s motivation to combine the lens systems of Kurosaki '087 with those of Kitano because Kurosaki’s embodiments that allows for “a relatively small projector” would not have been a good enough reason to combine with Kitano that intended to provide “a bright, highly efficient light source device” with a solid-state light source. *Id.* (citing EX1004 at ¶ 162; EX1006 at 14:8-20; EX1007 at [0023]).

A POSITA would also recognize that altering Kitano’s optical system by substituting lenses as proposed by Dr. Sasian would inevitably alter the light paths, necessitating comprehensive re-analysis, modeling, and simulation to ensure the system remains operable and capable of projecting acceptable-quality images. EX2019 at ¶ 199. Any adjustment in the widths or collimation of the light would require a redesign of the entire system, including reconfiguration of the light paths and reassessment of heat dissipation to prevent overheating and maintain system

reliability. *Id.* Accordingly, substitution of lenses that will inevitably alter the light paths will need further analysis such as modeling and simulation to account for those changes—accounting for such details of the new light paths. *Id.* None of these technical aspects were considered by Dr. Sasian. *Id.*

Accordingly, Dr. Sasian has not established a motivation to combine Kitano with Kurosaki '087, especially with respect to substituting the convex and concave lenses. EX2019 at ¶ 200.

Therefore, Dr. Sasian and Petitioners failed to show that a POSITA would have been motivated to combine Kitano and Kurosaki '087. EX2019 at ¶ 201.

VII. CONCLUSION

For at least the foregoing reasons, the Board should deny institution of the Petition.

Dated: June 10, 2025

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CERTIFICATE OF SERVICE

I hereby certify that on this 10th day of June, 2025, a copy of the attached **PATENT OWNER'S PRELIMINARY RESPONSE** was served by electronic mail to the attorneys of record, at the following addresses:

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CERTIFICATION PURSUANT TO 37 C.F.R. § 42.24(d)

Pursuant 37 CFR 42.24(d), the undersigned certifies that this Preliminary Response complies with the type-volume limitation of 37 CFR §42.24(a). The word count application of the word processing program used to prepare this Preliminary Response indicates that the Preliminary Response contains 12,331 words, excluding the parts of the brief exempted by 37 C.F.R. § 42.24(a).

Dated: June 10, 2025

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