

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD., AND
SAMSUNG ELECTRONICS AMERICA, INC.,
Petitioners

v.

SINOTECHNIX LLC,
Patent Owner

Case IPR2025-00331

U.S. Patent No. 7,618,162

PATENT OWNER'S PRELIMINARY RESPONSE

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	THE '162 PATENT AND THE CHALLENGED CLAIMS	1
	A. Overview of the '162 Patent.....	1
	B. Challenged Claims.....	4
III.	LEVEL OF ORDINARY SKILL	7
IV.	CLAIM CONSTRUCTION.....	8
	A. “diverging output beam”	8
V.	APPLICABLE LEGAL STANDARDS	12
	A. Anticipation	12
	B. Obviousness.....	14
	1. Claims cannot be found obvious if an element is absent.....	15
	2. A petition must address the Graham factors.....	15
	3. A petition must provide articulated reasoning with rational underpinning to combine and/or modify references	16
VI.	SUMMARY OF TAWA AND SHIKAMA	17
	A. Overview of Tawa	18
	B. Overview of Shikama	21
VII.	THE PETITION DOES NOT ESTABLISH A REASONABLE LIKELIHOOD OF SUCCESS.....	23
	A. Ground I: The Challenged Claims Are Not Obvious in View of Tawa in Combination with Shikama	24

1. Petitioners have not shown that any proposed modification of, or combination with, Tawa satisfies the challenged claims.....	25
2. Petitioners have not shown that a POSITA would have modified Tawa to achieve the claimed invention.	29
B. Ground II: Claim 9 Is Not Obvious in View of Tawa in Combination with Shikama and Scharf.....	35
C. Grounds III and IV: The Challenged Claims Are Not Anticipated by or Obvious in View of Tawa.....	36
D. Ground V: Claim 9 Is Not Obvious in View of Tawa in Combination with Scharf.....	40
VIII. PATENT OWNER’S FINAL COMMENTS	41
IX. CONCLUSION.....	41

TABLE OF AUTHORITIES

<u>Cases:</u>	<u>Page(s):</u>
<i>ActiveVideo Networks, Inc. v. Verizon Communs., Inc.</i> , 694 F.3d 1312 (Fed. Cir. 2012)	28, 29, 32, 34, 38
<i>Apple Inc. v. Andrea Elecs. Corp.</i> , 949 F.3d 697 (Fed. Cir. 2020).....	11
<i>CFMT, Inc. v. YieldUp Int’l Corp.</i> , 349 F.3d 1333 (Fed. Cir. 2003)	15
<i>Cont’l Can Co. v. Monsanto Co.</i> , 948 F.2d 1264 (Fed. Cir. 1991)	13, 14
<i>Curtiss-Wright Flow Control Corp. v. Velan, Inc.</i> , 438 F.3d 1374 (Fed. Cir. 2006)	11
<i>Eizo Corp. v. Barco N.V.</i> , Case No. IPR2014-00358 (PTAB July 23, 2014).....	16
<i>Enplas Display Device Corp. v. Seoul Semiconductor Co.</i> , 909 F.3d 398 (Fed. Cir. 2018).....	12
<i>Enzo Biochem, Inc. v. Applera Corp.</i> , 780 F.3d 1149 (Fed. Cir. 2015)	10
<i>Garmin Int’l, Inc. v. Patent of Cuozzo Speed Techs. LLC</i> , Case No. IPR2012-00001 (PTAB Jan. 9, 2013).....	15
<i>Graham v. John Deere Co.</i> , 383 U.S. 1 (1966).....	14, 15
<i>Hockerson-Halberstadt, Inc. v. Avia Group Inter., Inc.</i> , 222 F.3d 951 (Fed. Cir. 2000).....	13
<i>HTC Corp. v. Cellular Commc’ns Equip., LLC</i> , 877 F.3d 1361 (Fed. Cir. 2017)	13, 14

<i>In re Kahn</i> , 441 F.3d 977 (Fed. Cir. 2006).....	16
<i>In re Oelrich</i> , 666 F.2d 578 (C.C.P.A. 1981)	14
<i>In re Rijckaert</i> , 9 F.3d 1531 (Fed. Cir. 1993).....	15
<i>In re Royka</i> , 490 F.2d 981 (C.C.P.A. 1974)	15
<i>In re Smith Int’l, Inc.</i> , 871 F.3d 1375 (Fed. Cir. 2017)	12
<i>Intel Corp. v. Qualcomm Inc.</i> , 21 F.4th 784 (Fed. Cir. 2021)	31, 32, 38, 39
<i>InTouch Techs., Inc. v. VGo Comm’ns, Inc.</i> , 751 F.3d 1327 (Fed. Cir. 2014)	15, 35
<i>Johns Manville Corp. v. Knauf Insulation, Inc.</i> , IPR2018-00827 (PTAB Oct. 16, 2018)	17
<i>Krippelz v. Ford Motor Co.</i> , 667 F.3d 1261 (Fed. Cir. 2012)	13
<i>KSR Int’l Co. v. Teleflex Inc.</i> , 550 U.S. 398 (2007).....	15, 16, 32, 35
<i>LG Elecs., Inc. v. Cellular Commc’ns Equip. LLC</i> , Case No. IPR2016-00197 (PTAB April 29, 2016).....	16
<i>Innogenetics, N.V. v. Abbott Labs.</i> , 512 F.3d 1363 (Fed. Cir. 2008)	16
<i>Nystrom v. Trex Co., Inc.</i> , 424 F.3d 1136 (Fed. Cir. 2005)	13

<i>Pacing Techs., LLC v. Garmin Int'l, Inc.</i> , 778 F.3d 1021 (Fed. Cir. 2015)	11
<i>Par Pharm., Inc. v. Twi Pharms., Inc.</i> , 773 F.3d 1186 (Fed. Cir. 2014)	13, 14
<i>Personal Web Techs., LLC v. Apple, Inc.</i> , 848 F.3d 987 (Fed. Cir. 2017).....	17
<i>Phillips v. AWH Corp.</i> , 415 F.3d 1303 (Fed Cir. 2005)	8, 9
<i>Sanofi-Synthelabo v. Apotex, Inc.</i> , 550 F.3d 1075 (Fed. Cir. 2008)	27
<i>Securus Techs., Inc. v. Global Tel*Link Corp.</i> , 701 F. App'x 971 (Fed. Cir. 2017)	17
<i>Summit 6, LLC v. Samsung Elecs., Co.</i> , 802 F.3d 1283 (Fed. Cir. 2015)	12
<i>TQ Delta, LLC v. Cisco Sys.</i> , 942 F.3d 1352 (Fed. Cir. 2019)	28, 29, 30, 40
<i>Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.</i> , 200 F.3d 795 (Fed. Cir. 1999).....	8
<i>Wellman, Inc. v. Eastman Chem. Co.</i> , 642 F.3d 1355 (Fed. Cir. 2011)	8

Rules, Statutes and Regulations:

35 U.S.C. § 103	15, 35
35 U.S.C. § 103(a)	14

35 U.S.C. § 313 1

35 U.S.C. § 314(a) 12, 23

37 C.F.R. § 42.107 1

37 C.F.R. § 42.108(c).....12

PATENT OWNER'S EXHIBIT LIST

Exhibit	Description and Short Name
Ex. 2001	Docket Report for <i>Sinotechnix LLC v. Samsung Electronics Co., Ltd., et al.</i> , 2:24-cv-544-JRG (E.D. Tex. Jul. 17, 2024)
Ex. 2002	<i>Sinotechnix LLC v. Samsung Electronics Co., Ltd., et al.</i> , 2:24-cv-544-JRG-RSP, Dkt. No. 48, Amended Docket Control Order
Ex. 2003	<i>MyPort, Inc. v. Samsung Elecs. Co., Ltd.</i> , Case No. 2:22-cv-00114-JRG, Order, Dkt. No. 73 (E.D. Tex. June 13, 2023)
Ex. 2004	<i>General Access Solutions, Ltd. v. Cellco Partnership</i> , Case No. 2:22-cv-00394-JRG, Order, Dkt. No. 225 (E.D. Tex. May 22, 2024)
Ex. 2005	Excerpts of Petitioners' Amended Invalidity Contentions served in <i>Sinotechnix LLC v. Samsung Electronics Co., Ltd., et al.</i> , 2:24-cv-544-JRG (E.D. Tex. Jul. 17, 2024) (highlighting added)
Ex. 2006	Petitioners' Subpoena to Lumileds, LLC dated February 5, 2025 (trimmed)
Ex. 2007	Petitioners' Subpoena to Osram Sylvania Inc. dated April 14, 2025 (trimmed)
Ex. 2008	Collection of Petitioners' Notices of Subpoenas
Ex. 2009	Minutes Entry for April 10, 2025 Hearing (<i>Sinotechnix LLC v. Samsung Electronics Co., Ltd., et al.</i> , 2:24-cv-544-JRG, Dkt. No. 102 (E.D. Tex. Jul. 17, 2024))
Ex. 2010	Minutes Entry for April 15, 2025 Hearing (<i>Sinotechnix LLC v. Samsung Electronics Co., Ltd., et al.</i> , 2:24-cv-544-JRG, Dkt. No. 120 (E.D. Tex. Jul. 17, 2024))

Ex. 2011	Email from Y. Ha, counsel for Petitioners, to the Board dated April 17, 2025 (highlighting added)
Ex. 2012	Petitioners' Motion to Transfer Venue (<i>Sinotechnix LLC v. Samsung Electronics Co., Ltd., et al.</i> , 2:24-cv-544-JRG, Dkt. No. 53 (E.D. Tex. Jul. 17, 2024)) (highlighting added)
Ex. 2013	Declaration of Thomas William Kennedy Jr.
Ex. 2014	Excerpts of The Merriam-Webster Dictionary (Merriam-Webster Inc. 1998)
Ex. 2015	Excerpts of McGraw-Hill Electronics Dictionary (McGraw-Hill Inc. 6th ed. 1997)
Ex. 2016	Excerpts of McGraw-Hill Dictionary of Scientific and Technical Terms (McGraw-Hill Inc. 6th ed. 2003)

I. INTRODUCTION

Pursuant to 35 U.S.C. § 313 and 37 C.F.R. § 42.107, Patent Owner Sinotechnix LLC (“Patent Owner”) submits this Preliminary Response to the Petition for *Inter Partes* Review (“Petition,” Paper 1) filed by Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (“Petitioners”) challenging claims 1, 4-6, 8, 9, 31, 39 and 43 of U.S. Patent No. 7,618,162 (the “’162 Patent”) (Ex. 1001).

For at least the reasons detailed below, Petitioners have not met their burden of showing a reasonable likelihood of prevailing on any of their proposed grounds of unpatentability, and the Board should not institute *inter partes* review.

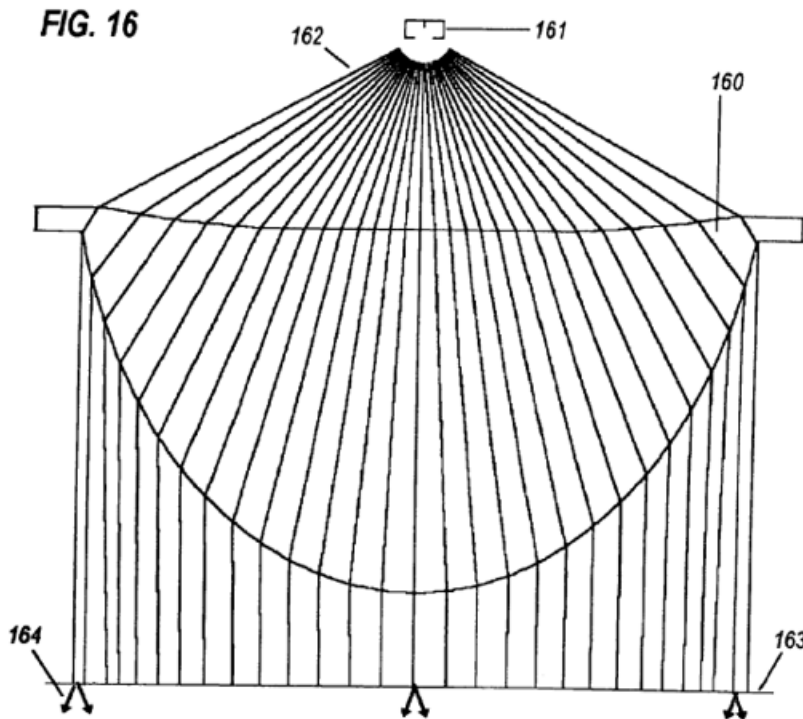
II. THE ’162 PATENT AND THE CHALLENGED CLAIMS

A. Overview of the ’162 Patent

The ’162 Patent “relates generally to illumination lenses, especially for LEDs, that produce uniform output irradiance from highly nonuniform inputs.” ’162 Patent, Ex. 1001 at 1:52-54. The patent notes that “both mirrors and lenses typically have nonuniform illumination across their exit apertures.” *Id.* at 1:17-18. “The present invention addresses this problem with a general method of making a lens achieve uniform exit-aperture irradiance as well as uniform target irradiance.” *Id.* at 1:18-21. According to the patent, “[t]his capability is particularly important for the next generation of high-brightness light-emitting diodes (LEDs).” *Id.* at 1:21-25.

The patent explains, “[i]n general form the present invention comprises a thick aspheric lens lying close to a quasi-hemispheric light source, typically an LED but possibly a combination of incandescent lamp and reflector.” *Id.* at 1:56-60. “The lower surface of the lens acts primarily to redistribute the flux it receives by refracting it in such a way that it has a uniform distribution by the time it has intercepted the front surface, which typically has the form of a thick aspheric section.” *Id.* at 1:60-64. “This top surface then refracts the uniform distribution into a suitable beam.” *Id.* at 1:64-65.

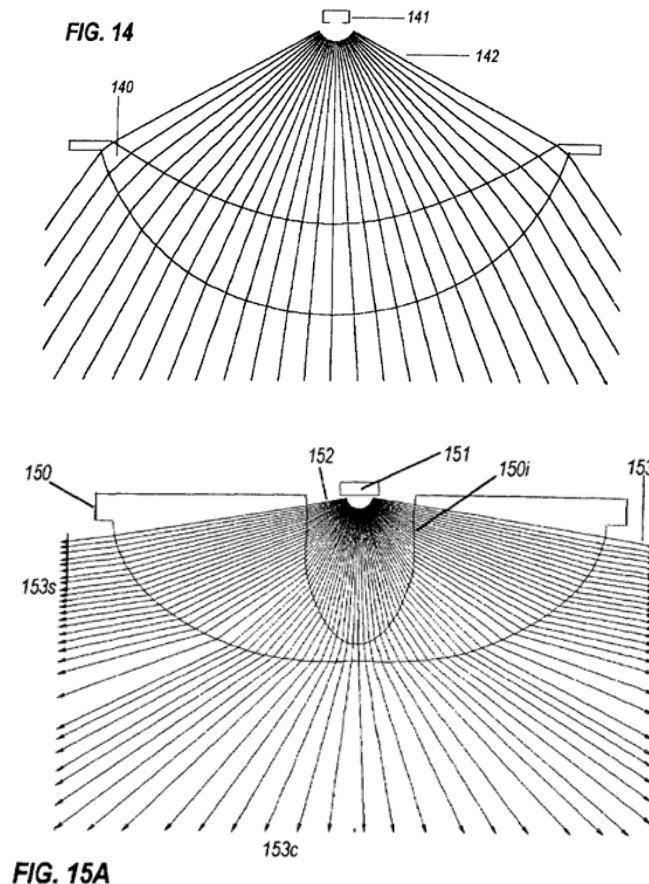
The ’162 Patent describes several embodiments. “One preferred embodiment of this new lens produces a very tightly *collimated* beam with uniform irradiance.” *Id.* at 1:66-67 (emphasis added). A collimated beam is a beam in which light rays are parallel. *See, e.g.*, Merriam-Webster Dictionary, Ex. 2014 at 103 (collimate: “to make (as light rays) parallel”); McGraw-Hill Electronics Dictionary, Ex. 2015 at 82 (collimation: “The process of focusing light rays ... into a parallel beam”; collimator lens: “In optics, a glass or plastic lens that produces parallel rays of light from a diverging light source”). Figure 16 of the ’162 Patent “shows the profile of *collimating* irradiance-redistribution lens 160, illuminated by LED 161 with rays 162 that uniformly illuminate target 163.” ’162 patent, Ex. 1001 at 6:1-3 (emphasis added).



Id. at FIG. 16. As can be seen from the image, and as indicated by use of the term “collimating,” lens 160 produces parallel rays of light (i.e., the lens produces a collimated beam).

The patent also discloses embodiments that produce a “diverging” beam. ’162 Patent, Ex. 1001 at 2:4-7 (“[a]nother preferred embodiment produces a square diverging beam”); *see also id.* at 5:50-64. As its name suggests, a diverging beam is a beam in which light rays diverge from one another. *See, e.g.,* Merriam-Webster Dictionary, Ex. 2014 at 153 (diverge: “to move or extend in different directions from a common point”); McGraw-Hill Dictionary of Scientific and Technical Terms, Ex. 2016 at 633 (divergence: “the spreading apart of a beam of particles of light”), 634 (diverging lens: “a lens whose focal length is negative, so that light incident parallel

to its axis diverges after passing through it”). The embodiments of Figures 14 and 15A illustrate examples of lenses with a diverging beam.



'162 Patent, Ex. 1001 at FIGS. 14, 15A. As can be seen from the figures, and as indicated by the specification's use of the term "diverging," these exemplary lenses produce diverging rays of light (i.e., they produce a diverging output beam).

B. Challenged Claims

The Petition challenges claims 1, 4-6, 8, 9, 31, 39 and 43 of the '162 Patent. Claims 1 and 39 are independent claims. Claims 4-6, 8, 9, and 31 depend from claim 1, and claim 43 depends from claim 39.

The challenged claims reflect embodiments that produce a *diverging* beam. This is evidence from the plain language of the claims. For example, independent claim 1 recites:

1. An irradiance-redistribution lens comprising
a transparent dielectric solid of revolution with external surface area predominantly comprised of an entry surface that receives light of nonuniform irradiance from a nearby compact light source and of an opposing exit surface that forms a *pre-specified diverging output beam*;
said entry surface given a specific profile that refractively deflects said received light into a different solid angle said entry-face deflection spatially distributed such that said exit surface receives said deflected light with predominantly uniform irradiance,
said exit face given a specific shape that refractively deflects said uniform irradiance into said output beam;
said light source being sufficiently compact for said specific shapes to be calculated by mathematical integration of the slope distributions required by said refractive deflections.

‘162 Patent, Ex. 1001 at claim 1 (emphasis added). As shown in annotated Figure 15A, below, lens 150 includes “an entry surface” (shown in green) and an “opposing exit surface” (shown in red), and the light rays emerge in a diverging output beam.

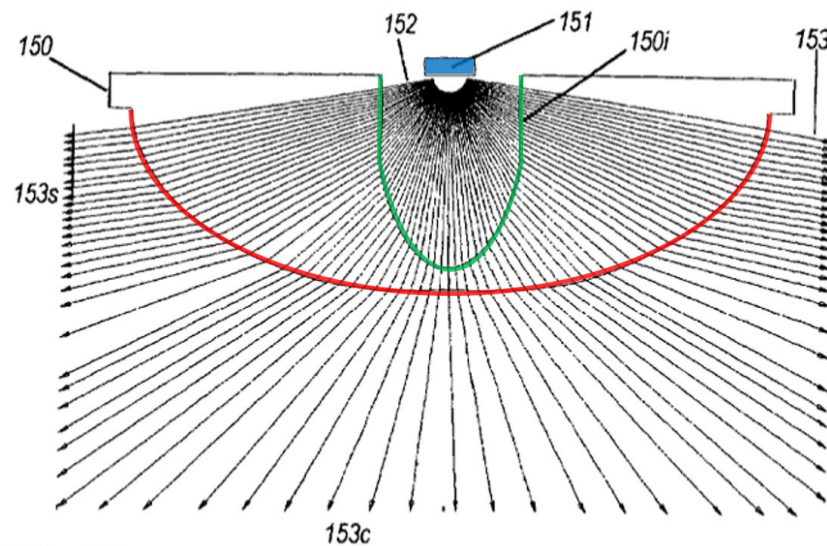


FIG. 15A

Id. at FIG. 15A. Independent claim 39 also includes limitations directed to a diverging lens (i.e., a lens with a diverging output beam).

39. An irradiance-redistribution lens comprising

a transparent dielectric formed as a solid of revolution with an axis about which a planar curved profile-line is swept, with external surface area comprised of an optically active entry surface, an optically active exit surface, and an optically inactive mounting surface;

said entry surface receiving light of nonuniform irradiance from a compact light source situated on said axis in a nearby focal zone;

said entry surface having a specific profile that produces refractive deflection of said received light into interiorly propagating light of a different solid angle;

said exit surface opposing said entry surface and receiving said internally propagating light therefrom;

said exit surface forming *a pre-specified diverging output beam*
from said internally propagating light;

said entry-surface deflection spatially distributed such that said
exit surface receives said deflected light with predominantly uniform
irradiance,

said exit surface given a specific shape that refractively deflects
said uniform irradiance into said output beam;

said light source being sufficiently compact for said specific
shapes to be calculated by mathematical integration of the slope
distributions required by said refractive deflections,

said entry surface having first concavity facing toward said light
source, and second concavity facing toward the entry surface, said
second concavity being substantially greater than said first concavity.

Id. at claim 39 (emphasis added). As is evidenced by the plain language of the
claims, the claimed lenses are directed to lenses that form “a pre-specified diverging
output beam” (i.e., they are not directed to collimated lenses).

III. LEVEL OF ORDINARY SKILL

For the limited purpose of this Preliminary Response, Patent Owner does not
contest Petitioners’ definition of a person of ordinary skill in the art, but it reserves
the right to do so in the event that trial is instituted.

IV. CLAIM CONSTRUCTION

Petitioners’ arguments rely on a faulty claim construction for the term “diverging output beam,” a term found in every challenged independent claim. Consequently, Patent Owner submits that the Board needs to construe “diverging output beam.” *See Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) (“claim terms need only be construed ‘to the extent necessary to resolve the controversy’”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))). Patent Owner expressly reserves the right to address any and all other claim constructions in the Petition whether explicit or implicit if trial is instituted or in any other or subsequent proceedings.

A. “diverging output beam”

The plain meaning of the term “diverging output beam” is easily understood and excludes beams that are collimated. Nonetheless, Petitioners incorrectly contend that the term “diverging output beam” includes collimated beams. *See* Petition at 26 (“the collimated output beam is ‘diverging’”).

Claim terms generally receive their ordinary and customary meaning, which is the meaning that a person of ordinary skill in the art (“POSITA”) would have understood the term to have as of the filing date of the patent application. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed Cir. 2005) (en banc). “[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention[.]” *Id.* Here, as discussed above, the plain meaning of “diverging output beam” is an output beam

with diverging light rays. *See* Merriam-Webster Dictionary, Ex. 2014 at 153 (diverge); McGraw-Hill Dictionary of Scientific and Technical Terms, Ex. 2016 at 633-34 (divergence, diverging lens). A collimated beam, on the other hand, is a beam with parallel light rays. *See* Merriam-Webster Dictionary, Ex. 2014 at 103 (collimate); McGraw-Hill Electronics Dictionary, Ex. 2015 at 82 (collimation, collimator lens). The ordinary meaning of “diverging output beam” excludes collimated beams.

This is consistent with the specification, which uses the term “diverging output beam” consistent with its ordinary meaning (i.e., in a way that excludes a collimated beam). *See Phillips*, 415 F.3d at 1313 (“[T]he person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.”). For example, the specification separately describes embodiments that provide a diverging output beam (*see* Figure 5 and related disclosure) and a collimated output beam (*see* Figure 16 and related disclosure). According to the patent, “[o]ne preferred embodiment ... produces a very tightly *collimated* beam,” and “[a]nother preferred embodiment produces a square *diverging* beam” ’162 Patent, Ex. 1001 at 1:66-2:7 (emphasis added). The specification unquestionably distinguishes between diverging and collimated rays of light and uses the terms to refer to distinct concept. *See, e.g., id.; id.* at 5:15-64.

Thus, as evidenced by the specification, the '162 Patent uses the term “diverging output beam” in its ordinary sense to refer to an output beam with diverging light rays and does not include a collimated beam within its scope.

In support of its improper construction, Petitioners incorrectly argue that the term “diverging” must include collimated (i.e., parallel) because dependent claim 11 recites, “The lens of claim 1 wherein said output beam is collimated and also comprising an associated secondary lens for receiving said output beam and producing a specified diverging beam.” *See* Petition at 26 (citing claim 11).¹ According to Petitioners, this somehow permits expanding the plain meaning of the term “diverging output beam” to also include a collimated beam, a concept that is completely distinct from a diverging beam. But Federal Circuit precedent is clear: “dependent claims cannot broaden an independent claim from which they depend.” *Enzo Biochem, Inc. v. Applera Corp.*, 780 F.3d 1149, 1156-57 (Fed. Cir. 2015). In *Enzo Biochem*, the Federal Circuit held, “as claim 1 is limited to indirect detection by its own plain meaning, it would be inappropriate to use the doctrine of claim differentiation to broaden claim 1 to include a limitation imported from a dependent claim, such as direct detection.” *Id.* at 1157. In reaching its conclusion, the Federal Circuit explained that the doctrine of claim differentiation does not permit broadening the scope of an independent claim contrary to its plain meaning. *See id.*

¹ Claim 11 is not asserted in the parallel district court litigation, and it is not challenged by Petitioners in these proceedings.

Rather, “[i]n the most specific sense, claim differentiation refers to the presumption that an independent claim should not be construed as requiring a limitation added by a dependent claim.” *Id.* (quoting *Curtiss-Wright Flow Control Corp. v. Velan, Inc.*, 438 F.3d 1374, 1381 (Fed. Cir. 2006)). “[C]laim differentiation can not broaden claims beyond their correct scope.” *Curtiss-Wright*, 438 F.3d at 1381 (internal quotes omitted).

Here, Petitioners ask the Board to do exactly what Federal Circuit law prohibits—broaden the scope of the term “diverging output beam” in independent claim 1 to include a “collimated output beam” (i.e., a parallel output beam) based on language in dependent claim 11. This cannot be correct. The term “diverging output beam” should be given its plain meaning, which excludes a collimated output beam. As discussed above, the ordinary meaning of the term and the specification support this construction.

Petitioners also incorrectly argue that the term “diverging output beam” should be broadened to include collimated beams because the ’162 Patent describes an embodiment that outputs a collimated beam. Yet the Federal Circuit has held that “[when] the patent describes multiple embodiments, every claim does not need to cover every embodiment.” *Apple Inc. v. Andrea Elecs. Corp.*, 949 F.3d 697, 708 (Fed. Cir. 2020) (quoting *Pacing Techs., LLC v. Garmin Int’l, Inc.*, 778 F.3d 1021, 1026 (Fed. Cir. 2015)). “This is particularly true [when] the plain language of the claim does not appear to cover that embodiment.” *Id.* Here, the plain language of independent claims 1 and 39 does not cover a “collimated output beam” as is

required by Petitioners' proposed construction. As discussed above, independent claims 1 and 39 are clearly drawn to diverging lenses. For the reasons discussed above, the term "diverging output beam" should be given its plain meaning (i.e., an output beam with diverging light rays), which excludes a collimated output beam.

V. APPLICABLE LEGAL STANDARDS

The Board may only grant a petition for *inter partes* review where "the information presented in the petition ... shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." 35 U.S.C. § 314(a); 37 C.F.R. § 42.108(c). Petitioners bear the burden of showing that this statutory threshold has been met. *See* Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756 (Aug. 14, 2012) ("The Board ... may institute a trial where the petitioner establishes that the standards for instituting the requested trial are met").

A. Anticipation

"Anticipation requires that a single reference disclose each and every element of the claimed invention. [] Prior art that must be modified to meet the disputed claim limitation does not anticipate the claim." *Enplas Display Device Corp. v. Seoul Semiconductor Co.*, 909 F.3d 398, 405 (Fed. Cir. 2018) (citations omitted). "A patent claim is anticipated 'only if each and every element is found within a single prior art reference, arranged as claimed.'" *In re Smith Int'l., Inc.*, 871 F.3d 1375, 1381 (Fed. Cir. 2017) (quoting *Summit 6, LLC v. Samsung Elecs., Co.*, 802 F.3d 1283, 1294 (Fed. Cir. 2015)).

“[I]t is well established that patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the specification is completely silent on the issue.” *Hockerson-Halberstadt, Inc. v. Avia Group Inter., Inc.*, 222 F.3d 951, 956 (Fed. Cir. 2000); *see also Nystrom v. Trex Co., Inc.*, 424 F.3d 1136, 1149 (Fed. Cir. 2005), *cert. denied*, 547 U.S. 1055 (2006) (“Hockerson-Halberstadt indicated our disfavor in reading precise proportions into patent drawings which do not expressly provide such proportions”); *Krippelz v. Ford Motor Co.*, 667 F.3d 1261, 1268 (Fed. Cir. 2012) (“This court has repeatedly cautioned against overreliance on drawings that are neither expressly to scale nor linked to quantitative values in the specification.”)

When a party does not identify any disclosure in a prior art reference demonstrating that a claim element is explicitly present, a party may attempt to demonstrate that the “missing” element is “necessarily present” and is therefore inherently anticipated. *HTC Corp. v. Cellular Commc’ns Equip., LLC*, 877 F.3d 1361, 1368 (Fed. Cir. 2017). A party seeking to establish the inherent disclosure of an element “must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.” *Cont’l Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1268 (Fed. Cir. 1991). “A party must ... meet a high standard in order to rely on inherency to establish the existence of a claim limitation in the prior art in an obviousness analysis.” *Par Pharm., Inc. v. Twi Pharms., Inc.*, 773 F.3d 1186, 1195-96 (Fed. Cir. 2014); *see also HTC Corp.*, 877 F.3d at 1369 (affirming the Board’s finding that IPR

petitioner had failed to show inherent anticipation). To be inherent, “the limitation at issue necessarily must be present, or the natural result of the combination of elements explicitly disclosed by the prior art.” *Par Pharm.*, 773 F.3d at 1196. “Inherency, however, 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.” *Cont’l Can Co.*, 948 F.2d at 1269 (citing *In re Oelrich*, 666 F.2d 578, 581 (C.C.P.A. 1981) (emphasis in original)). The existence of an alternative possibility precludes a finding of inherency. *See HTC Corp.*, 877 F.3d at 1369 (“HTC has only shown that it is possible for the start of a frame preceding an ACK/NACK signal to correspond to the start of a message transmission. This possibility, however, is not enough to find that Baker necessarily discloses [the limitation].”).

B. Obviousness

Section 103 of the Patent Act provides that “[a] patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” 35 U.S.C. § 103(a). The obviousness analysis requires several threshold inquiries: the level of ordinary skill in the art must be established; the scope and content of the prior art must be determined; and any differences between the prior art and the claims at issue must be ascertained. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

1. Claims cannot be found obvious if an element is absent

If a single element of the claim is absent from the prior art, the claim cannot be considered obvious. *See CFMT, Inc. v. YieldUp Int'l Corp.*, 349 F.3d 1333, 1342 (Fed. Cir. 2003) (“Obviousness requires a suggestion of all limitations in a claim.”) (citing *In re Royka*, 490 F.2d 981, 985 (C.C.P.A. 1974)); *In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993) (reversing obviousness rejection where prior art did not teach or suggest all claim limitations); *Garmin Int'l, Inc. v. Patent of Cuozzo Speed Techs. LLC*, IPR2012-00001, Paper 15 at 15 (PTAB Jan. 9, 2013) (refusing to institute an *inter partes* review under 35 U.S.C. § 103 where prior art did not disclose all claim limitations).

Additionally, it is improper to use the challenged claim as a roadmap to piece together disparate disclosure using hindsight bias. *See InTouch Techs., Inc. v. VGo Comm'ns., Inc.*, 751 F.3d 1327, 1351 (Fed. Cir. 2014) (reversing obviousness where “[i]t appears that [the expert] relied on the [] patent itself as her roadmap for putting what she referred to as pieces of a ‘jigsaw puzzle’ together.”); *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007) (“A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning.”).

2. A petition must address the Graham factors

Obviousness is resolved on a number of factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, and (3) the level of ordinary skill in the art. *See Graham*,

383 U.S. at 17-18. Petitions for *inter partes* reviews “must address the Graham factors.” *Eizo Corp. v. Barco N.V.*, IPR2014-00358, Paper 11 at 29-30 (PTAB July 23, 2014).

3. A petition must provide articulated reasoning with rational underpinning to combine and/or modify references

The conclusion of obviousness based on a combination of references must also be supported with explicit analysis of a reason to combine those references. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). The Federal Circuit has stated that such reasons must be more than “mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006); *accord Innogenetics, N.V. v. Abbott Labs.*, 512 F.3d 1363, 1374 (Fed. Cir. 2008) (agreeing with the district court’s reasoning that “some kind of motivation must be shown from some source, so that the jury can understand why a person of ordinary skill would have thought of either combining two or more references or modifying one to achieve the patented method”); *see also LG Elecs., Inc. v. Cellular Commc’ns Equip. LLC*, IPR2016-00197, Paper 7 at 7-11 (PTAB April 29, 2016) (faulting a petition’s obviousness analysis for lack of sufficient articulated reasons with rational underpinnings for modifying references to achieve particular elements required in the claims).

Furthermore, “[d]emonstrating that a reference is analogous art or relevant to the field of endeavor of the challenged patent is not sufficient to establish that one

of ordinary skill would have had reason to combine its teachings with other prior art in the manner set forth in the claim.” *Johns Manville Corp. v. Knauf Insulation, Inc.*, IPR2018-00827, Paper 9 at 10 (PTAB Oct. 16, 2018) (citing *See Securus Techs., Inc. v. Global Tel*Link Corp.*, 701 F. App’x 971, 977 (Fed. Cir. 2017) (“a broad characterization of [prior art references] as both falling within the same alleged field . . . without more, is not enough for [Petitioner] to meet its burden of presenting a sufficient rationale to support an obviousness conclusion”)). “Mere compatibility of the references is likewise not sufficient.” *Id.* (citing *Personal Web Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 993 (Fed. Cir. 2017) (it is not enough to show that “a skilled artisan, once presented with the two references, would have understood that they could be combined”).

VI. SUMMARY OF TAWA AND SHIKAMA

Petitioners primarily rely on Tawa (Ex. 1004) and Shikama (Ex. 1005) in support of their arguments that the independent claims of the ’162 Patent are invalid.² *See* Petition at 4. A brief summary of Tawa and Shikara follows. Notably, and as discussed below, the embodiments primarily relied upon by Petitioners (Figure 1 of Tawa and Figure 13 of Shikama) describe lenses that provide a parallel output beam, as opposed to a diverging output beam as is required by the claims. *Compare* ’162 Patent, Ex. 1001 at claim 1 (“an opposing exit surface that forms from

² The Petition only relies on combinations with Scharf (Ex. 1006) to support its arguments that dependent claim 9 would have been obvious. *See* Petition at 4.

said received light *a pre-specified diverging output beam*”), claim 39 (“said exit surface forming *a pre-specified diverging output beam*”) with Tawa, Ex. 1004 at 4:38-40 (“[t]he light emerges [from] the body 14 from the second curved surface 18 as *parallel light*”) and Shikama, Ex. 1005 at 17:3-4 (“the beam of light emitted from the center of the discharge gap 123 and directly incident on the condenser lens 131 is passed through the condenser lens 131 and emerges as *a parallel beam of light 2*”). Indeed, the Petition acknowledges that the embodiments Petitioners primarily rely on describe lenses that emit a parallel output beam (i.e., a collimated beam). *See* Petition at 13 (quoting Tawa, Ex. 1004 at 4:38-41 (“The light emerges the body 14 from the second curved surface 18 as parallel light”)); Petition at 15 (quoting Shikama, Ex. 1005 at 15:41-45 (“[T]he beam of light ... emerges as a parallel beam of light 2.”)).

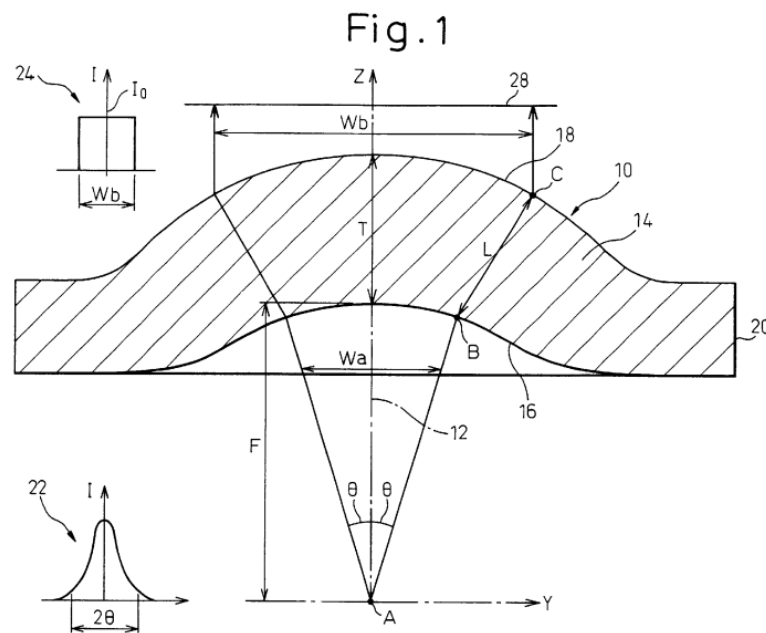
A. Overview of Tawa

Tawa relates to optical devices for use with optical storage systems. *See, e.g.*, Tawa, Ex. 1004 at 1:8-11 (“The present invention relates to a light intensity distribution converting device which converts the intensity distribution of incident light to output the converted light, and to an optical data storage apparatus using the same.”). The patent explains that in optical storage devices, “the diameter of a beam spot is required to be small to enhance the density of an optical disc apparatus, and an increase in the quantity of light is required to improve the transmission speed.” *Id.* at 1:15-18. To that end, Tawa seeks “to provide a light intensity distribution converting device which can convert a given light intensity distribution to a desired

one, so that wave front aberrations and the beam spot diameter can be reduced”

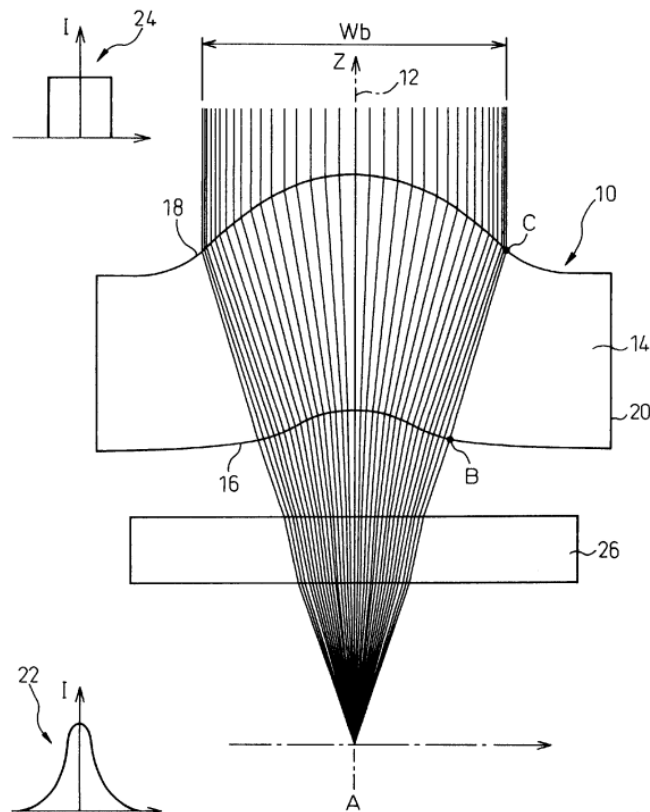
Id. at 2:17-22.

Figure 1 “shows a first embodiment of the light intensity distribution converting device” of Tawa. *Id.* at 3:49-51.



Id. at Fig. 1. Figure 2 “shows a light intensity distribution converting device 10 similar to the light intensity converting device 10 shown in FIG. 1 and a plurality of small optical paths extending therethrough.” *Id.* at 3:51-54.

Fig. 2



Id. at Fig. 2. “In FIGS. 1 and 2, point A represents a radiation point, point B represents an incident point of light onto the first curved surface 16, and point C represents a light merging point on the second curved surface 18.” *Id.* at 3:66-4:2. “The first curved surface 16 is defined by a generally shallow rounded concave surface and the second surface 18 is defined by a generally rounded convex surface.” *Id.* at 4:20-22. “In the embodiment, diverging light having a Gaussian light intensity distribution 22 is made incident to the body 14 at the curved surface 16, and passes through the body 14.” *Id.* at 4:35-38. “The light emerges [from] the body 14 from the second curved surface 18 as *parallel light* having a uniform light intensity distribution 24.” *Id.* at 4:38-40 (emphasis added). “[T]his light intensity distribution

converting device 10 not only converts the light intensity distribution at the point A, but also serves **as a collimator lens.**” *Id.* at 4:48-50 (emphasis added).

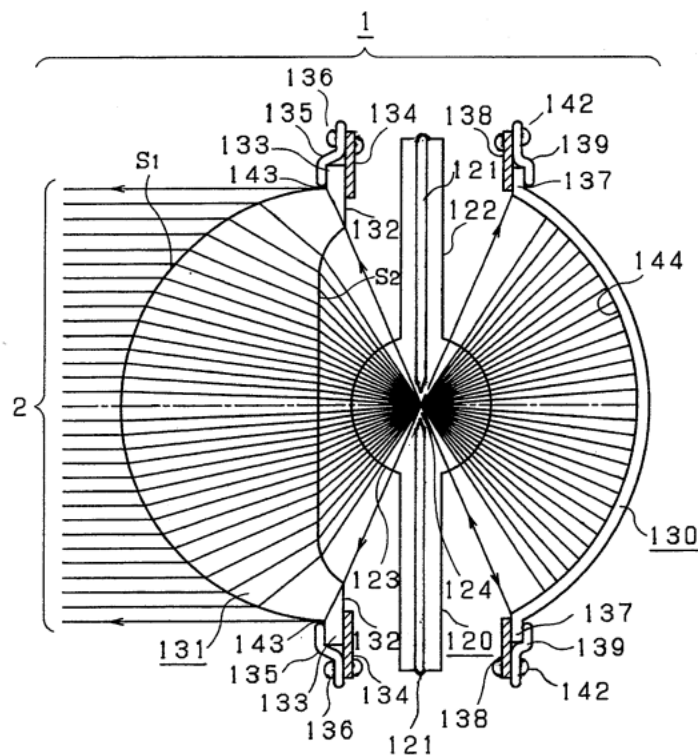
According to Tawa, “[t]he light intensity distribution device 10 of the present invention can convert a given light intensity distribution into an optional continuous light intensity distribution, so that the wave front aberration caused by an axial misalignment or a manufacturing error, such as an irregular thickness, can be reduced.” *Id.* at 7:6-11. “Also, if the device 10 has a lens function, it can be used as a collimator lens and, hence, the number of the elements of an optical apparatus can be reduced.” *Id.* at 7:11-14. Tawa also asserts that the embodiment of Figures 1 and 2 minimize “light absorption or reflection loss” and reduce “spot diameter,” which (as discussed above) Tawa discloses is an objective of the invention and improves the performance optical storage devices. *Id.* at 7:17-21; *see also id.* at 1:15-18, 2:17-22.

B. Overview of Shikama

Shikama (Ex. 1005) discloses “a condenser lens with large aperture ... which consists of a bi-aspherical single lens having a first surface of convex form facing the larger conjugate side and a second surface facing the smaller conjugate side and whose outermost circular zone is formed concave” Shikama, Ex. 1005 at Abstract. Petitioners rely primarily on the embodiment illustrated by Figure 13 of Shikawa. *See* Petition at 13-15, 44-45, 48-49, 54, 56-57, 74-75. “FIG. 13 shows the construction of a light source apparatus ... wherein the reference numeral 131 is a condenser lens, 143 is a first plane face formed around the periphery of the effective

diameter of the first surface S1 of the condenser lens 131, 132 is a second plane face formed around the periphery of the second surface S2 of the condenser lens 131, and 133 is a flange consisting of the first and second plane faces 143 and 132 on both sides and formed integrally with the condenser lens 131.” Shikama, Ex. 1005 at 14:58-68.

Fig. 13



Id. at Fig. 13. “The numeral 120 indicates a discharge lamp; in practical application, a metal halide lamp, a xenon lamp, or the like, is used.” *Id.* at 15:1-3. “The lamp 120 is mounted facing the second surface S2 of the condenser lens 131 in such a manner that the position of the discharge gap 124 coincides with the image plane Si on the

smaller conjugate side in Embodiment 1 (FIGS. 4 and 5) with the shaft 122 being placed perpendicularly to the optical axis (indicated by a dashed line) of the condenser lens 131.” *Id.* at 15:12-19. “The numeral 130 is a spherical mirror whose concave surface 144 is a mirrored surface finished with a reflective coating.” *Id.* at 15:20-22.

As noted by Petitioners, the lens disclosed and relied upon by Petitioners (i.e., the condenser lens of Figure 13) emits “a parallel beam of light.” *See* Petition at 15. According to Shikama, “The center of the discharge gap 124 is positioned at the focal point on the second surface, S2, side of the condenser lens 131, so that *the beam of light* emitted from the center of the discharge gap 124 and directly incident on the condenser lens 131 is passed through the condenser lens 131 and *emerges as a parallel beam of light 2.*” Shikama, Ex. 1005 at 15:41-45 (emphasis added). In other words, the disclosed lens is a collimator lens. It does not produce a diverging output beam.

VII. THE PETITION DOES NOT ESTABLISH A REASONABLE LIKELIHOOD OF SUCCESS

To justify the institution of an *inter partes* review, a petitioner must establish that there is a “reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a). Petitioners have not met their burden of establishing a reasonable likelihood of success at least because the Petition fails to show that a single reference discloses each and every limitation of a challenged claims or that one of ordinary skill would have chosen to

combine the cited elements to achieve the claimed inventions of the '162 Patent. Consequently, the Board should deny the Petition and decline to institute the *inter partes* review.

Petitioners have failed to demonstrate that independent claims 1 and 39 are anticipated or obvious in view of the references cited in Grounds I-V. Because the remaining challenged claims depend from these independent claims, should the Board agree with Patent Owner that trial should not be instituted on independent claims 1 and 39, it necessarily follows that trial should not be instituted on the dependent claims. Accordingly, Patent Owner focuses on the independent claims in this Patent Owner Preliminary Response.

A. Ground I: The Challenged Claims Are Not Obvious in View of Tawa in Combination with Shikama

Petitioners are unlikely to prevail on Ground I. Ground I challenges claims 1, 4-6, 8, 31, 39, and 43 based on the combination of Tawa (Ex. 1004) with Shikama (Ex. 1005). As discussed below, Ground I fails at least because Petitioners have not shown (1) that the combination of Tawa with Shikama teaches the portion of independent claim 1 that requires “an opposing exit surface that forms from said received light a pre-specified diverging output beam” or the portion of independent claim 39 that requires “said exit surface forming a pre-specified diverging output beam from said internally propagating light,” (2) that any proposed modification or combination satisfies the claim language as a whole, or (3) that a POSITA would

have had a reason to modify or combine the references as proposed. Accordingly, the Board should deny institution based on Ground I.

1. Petitioners have not shown that any proposed modification of, or combination with, Tawa satisfies the challenged claims.

Petitioners point to the lens disclosed by Figure 1 of Tawa (Ex. 1004) as allegedly satisfying the portion of claim 1 that recites “an opposing exit surface that forms from said received light a pre-specified *diverging output beam*” and the portion of claim 39 that recites “said exit surface forming a pre-specified *diverging output beam* from said internally propagating light.” See Petition at 25-26, 78. Yet in the lens disclosed and relied upon by Petitioners in Tawa, “[t]he light emerges the body 14 from the second curved surface 18 as *parallel light* [and] *serves as a collimator lens*.” Tawa, Ex. 1004 at 4:35-50 (emphasis added). As discussed above, a collimator lens is a lens that changes diverging light into a parallel beam. See, e.g., Merriam-Webster Dictionary, Ex. 2014 at 103 (collimate); McGraw-Hill Electronics Dictionary, Ex. 2015 at 82 (collimation, collimator lens). This is antithetical to the lenses of the challenged claims, which provide a “diverging output beam” (properly construed as an output beam with diverging light rays). The collimator lens disclosed by Tawa and relied upon by the Petition does not satisfy the portion of challenged claims 1, 4-6, 8, 9, or 31 that requires “an opposing exit surface that forms from said received light a *pre-specified diverging output beam*” or the portion of challenged claims 39 and 43 that recites “said exit surface forming a *pre-specified diverging output beam* from said internally propagating light” when those phrases are properly

construed. Consequently, Petitioners' reliance on Tawa Figure 1 cannot support a finding of obviousness.

Indeed, the Petition implicitly acknowledges that the embodiment disclosed by Tawa Figures 1 and 2 does not actually disclose a lens with a “*diverging* output beam.” *See* Petition at 27. Petitioners seek to address Tawa's shortcomings by pointing to disparate disclosure concerning Figures 18A and 18B, which “shows another embodiment of an optical disc apparatus 50 ...,” and arguing that the claims would have been obvious in view of this disclosure. *See* Tawa, Ex. 1004 at 9:39-40; Petition at 27-28. Although Petitioners suggest that the light intensity distribution converting device 10 in the embodiments of Figures 18A is the same as the device in Figure 1, the disclosure confirms that they are not. As discussed above, the patent explains that light emerges from the “light intensity distribution converting device” of Figure 1 “as parallel light” and that it “serves as a collimator lens.” Tawa, Ex. 1004 at 4:35-50. In the embodiments of Figures 18A and 18B the light intensity distribution converting devices 10 are configured differently so that they emit light at a divergent (18A) or diverged (18B) angle and then a collimator lens 54 collimates the light. *Id.* at 9:41-65.

Although there is no written disclosure concerning the specific configuration of the light intensity distribution converting device 10 of Figures 18A and 18B, they do appear visibly different from one another, as well as the light intensity distribution converting device 10 of Figure 1, in the respective Figures. *Compare id.* at Fig. 1 *with id.* at Fig. 18A *and id.* at Fig. 18B.

Notably, Petitioners make no effort to show how the proposed modification of any lens in Tawa would allegedly satisfy the claim language *as a whole*. See, e.g., *Sanofi-Synthelabo v. Apotex, Inc.*, 550 F.3d 1075, 1086 (Fed. Cir. 2008) (“The determination of obviousness is made with respect to the subject matter as a whole, not separate pieces of the claim”). The Petition relies primarily on the embodiment of Tawa Figure 1 (and related figures and disclosures); yet, the Petition does not explain how the purported “entry surface” and “exit surface” of Tawa Figure 1 (or any other Tawa embodiment) might be modified to provide “a pre-specified diverging output beam,” as is required by the challenged claims. Nor does the Petition explain how any embodiments might be combined to achieve the entirety of

the claimed invention. For instance, Petitioners have not shown that any modification or combination (e.g., changing the shape of a lens entry surface, changing the shape of a lens exit surface) would result in a lens that satisfies other limitations of the challenged claims (e.g., “said entry surface spatially distributed such that said exit surface receives said deflected light with predominantly uniform irradiance” (claims 1, 4-6, 8, 9, 31), “said entry surface having first concavity facing toward said light source, and second concavity facing toward the entry surface, said second concavity being substantially greater than said first concavity” (claims 1, 4-6, 8, 9, 31, 39, 43), “said entry-surface deflection spatially distributed such that said exit surface receives said deflected light with predominantly uniform irradiance” (claims 39 and 43)). Petitioners’ failure to specifically identify the modifications/combinations it proposes and explain how the resulting lens satisfies the claim language as a whole highlights that Petitioners improperly “use the challenged patent as a roadmap to reconstruct the claimed invention using disparate elements from the prior art—i.e., the impermissible *ex post* reasoning and hindsight bias that *KSR* warned against.” *TQ Delta, LLC v. Cisco Sys.*, 942 F.3d 1352, 1361 (Fed. Cir. 2019); *see also ActiveVideo Networks, Inc. v. Verizon Communs., Inc.*, 694 F.3d 1312, 1327-28 (Fed. Cir. 2012) (holding no obviousness where “[t]he expert failed to explain how specific references could be combined, which combination(s) of elements in specific references would yield a predictable result, or how any specific combination would operate or read on the asserted claims”).

2. Petitioners have not shown that a POSITA would have modified Tawa to achieve the claimed invention.

The Petition also fails to show that a POSITA would have been motivated to modify or combine any lens disclosed by Tawa “in the way the claimed invention does.” *ActiveVideo*, 694 F.3d at 1328. The Petition first improperly argues,

A POSITA would have been able to readily modify the first curved surface 16 and the second curved surface 18 of Tawa. A POSITA would have been able to make numerous modifications while maintaining Tawa’s intended goal of converting the non-uniform light received from a point light source and redistributing the light to achieve a uniform distribution of light that exits the lens surface to project them onto a target surface.

Petition at 57-58. This argument fails for several first reasons. First, an expert’s belief that a POSITA *could* modify or combine references is not evidence that they *would* have been motivated to do so. *See TQ Delta*, 942 F.3d at 1359-60 (explaining that an expert’s belief that one of ordinary skill in the art could combine references, not that they would have been motivated to do so, does not support a finding of obviousness). What is more, Petitioners have not shown that any proposed modifications or combinations would have “maintain[ed] Tawa’s intended goal of converting the non-uniform light received from a point light source and redistributing the light to achieve a uniform distribution of light that exits the lens surface to project them onto a target surface” as argued by Petitioners.

The Petition also argues as a “reason to combine” that “a POSITA would have recognized that any one of the embodiments of Tawa can be combined with each other.” Petition at 58. After explaining that Tawa teaches various shapes and curvatures, the Petition argues “[a]ll of these variations would have been readily possible to a POSITA based on application of Tawa’s teachings.” *Id.* at 58-59. This argument also fails to provide a motivation to modify or combine different embodiments or references. Again, that a POSITA *could* modify or combine references is not evidence that they *would* have been motivated to do so. *See TQ Delta*, 942 F.3d at 1359-60.

Similarly, the Petition also improperly argues “a POSITA would have recognized that any one of the embodiments of Tawa can be further modified according to the teachings of Shikama.” Petition at 59. According to Petitioners, “[a] POSITA would have readily recognized that other exemplary curvatures and shape of the lens, such as those taught by Shikama, are just other obvious variants that would have been readily obtained based on specific goals and dimensions,” and “making such a modification would have entailed nothing more than routine calculations that a POSITA would have been able to carry out based on the iterative calculation methods taught by Tawa.” *Id.* at 60. There are several flaws with this argument. First, the Petition does not identify specifically what modifications to Tawa are proposed or show that those modifications would result in the claimed invention as a whole (i.e., that the modified lens proposed would satisfy every limitation of the claims). Moreover, Petitioners again merely argue that the

embodiments of Tawa *could* be modified in view of Shikama, but it offers no reason for *why* a POSITA would in fact modify Tawa. In other words, the Petitioners fail to indicate “precisely how and why a skilled artisan would have combined the references,” a predicate for finding obviousness. *See, e.g., Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784, 797 (Fed. Cir. 2021) (explaining a finding obviousness requires a showing of how and why a skilled artisan would have combined references in the way the claimed invention does).

The Petition next argues that “the modification amounts to nothing more than applying a known technique to a known device ready for improvement to yield predictable results.” Petition at 61. Petitioners’ argument is conclusory and unsupported by fact. To begin with, the Petition does not identify any particular modification. (What modification are Petitioners actually proposing?) Moreover, as discussed above, Petitioners provide no evidence that modifying a lens disclosed by Tawa to incorporate curvatures or shapes disclosed by Shikawa (or other embodiments in Tawa) would result in the claimed invention as a whole. For that matter, Petitioners have not shown that any particular modification would result in an improved device. Although the Petition quotes language from Shikama describing purported improvements arising from the device disclosed in Shikama, Petitioners offer no explanation for how these improvements would allegedly result from their indeterminate modification of Tawa. Once again, Petitioners offer only generic and conclusory argument that bears “no relation to any specific combination of prior art elements” and “fails to explain why a person of ordinary skill in the art

would have combined elements from specific references *in the way the claimed invention does.*” *ActiveVideo*, 694 F.3d at 1328 (emphasis in original). Petitioners’ arguments are legally and factually insufficient to support a finding of obviousness.

The Petition finally argues that “a POSITA would have been able to make the modification with a reasonable expectation of success because the modification merely entails carrying out simple optical calculations that were well known in the art ... to obtain a slightly different lens shape,” and concludes “[t]he modification would have led to the same predictable results of a lens that emits light having a uniform intensity distribution.” Petition at 62-63. Once again, Petitioners offer only generic and conclusory argument that bears “no relation to any specific combination of prior art elements” and “fails to explain why a person of ordinary skill in the art would have combined elements from specific references *in the way the claimed invention does.*” *ActiveVideo*, 694 F.3d at 1328 (emphasis in original). To begin, with Petitioners fail to indicate “precisely how ... a skilled artisan would have combined the references.” *Intel*, 21 F.4th at 797. The Petition baldly asserts a POSITA would have been able to make an unidentified modification using “simple optical calculations” “to obtain a slightly different lens shape,” but it does not identify what “simple optical calculations” are used or what “different lens shape” is obtained. As a result, Petitioners have not shown, and the Board cannot evaluate, whether any proposed modification of, or combination with, Tawa could be combined “in the way that the claimed [] invention does,” as is required by *KSR*. *KSR*, 550 U.S. at 418. For the same reason (the Petition does not identify any specific

modification or combination), Petitioners have not shown that their unidentified modification would have resulted in “a lens that emits light having uniform intensity distribution,” as argued by the Petition. And, finally, Petitioners offer no explanation for *why* a POSITA would have made any purported modification to a lens disclosed by Tawa. Tawa discloses lenses configured to emit light having uniform intensity distribution; consequently, a POSITA would not have any need to modify Tawa to achieve a lens that emits light having uniform intensity distribution (the purported reason offered by the Petition for modifying Tawa).

Even assuming some embodiment of Tawa could have been modified in a way that satisfied each element of claims 1 and 39, a POSITA would not have been motivated to modify Tawa as argued by Petitioners. To begin with, and as noted above, Tawa itself discloses a solution for uniformly distributing light from a nonuniform light source. Petitioners have not identified any problems with the solution proposed by Tawa that might compel a POSITA to make any proposed modification, evidencing that the Petition’s analysis is nothing more than improper hindsight reconstruction.

Moreover, modifying Tawa as proposed by Petitioners would undermine the teachings of Tawa and render it unsuitable for its intended purpose. As discussed above, Tawa discloses an optical apparatus intended for use in an optical storage system. To that end, Tawa seeks to provide a solution that reduces “spot diameter.” *See* Tawa, Ex. 1004 at 1:15-67, 2:17-22, 7:19-21. In the embodiment of Tawa Figure 1, spot diameter is reduced by producing a collimated (i.e., parallel) output beam.

Modifying the embodiment of Tawa Figure 1 to provide a “diverging output beam” (as is required by the challenged claims) rather than a collimated beam (as provided by the embodiment of Tawa Figure 1) would result in an increased “spot diameter.” Consequently, a POSITA would not have considered modifying Tawa Figure 1 to produce a diverging output beam. Indeed, Tawa suggests that using a collimator lens is preferable to diverging lenses. *See id.* at 7:11-14 (“Also, if the device 10 has a lens function, it can be used as a collimator lens and, hence, the number of the elements of an optical apparatus can be reduced.”).

Petitioners’ failure to specifically identify how it proposes modifying any embodiment of Tawa, explain how any proposed modification would have satisfied the claims as a whole, or explain why a POSITA would have been motivated to make any modification is fatal to their obviousness challenges. Because the Petition does not explain specifically how and why a POSITA would have modified any lens disclosed by Tawa, much less that such a modification would have satisfied the claim language as a whole, Petitioners have not met their burden. The Petition offers only generic and conclusory argument that bears “no relation to any specific combination of prior art elements” and “fails to explain why a person of ordinary skill in the art would have combined elements from specific references *in the way the claimed invention does.*” *ActiveVideo*, 694 F.3d at 1328 (emphasis in original). Petitioners’ purported motivations to combine are wholly generic and divorced from any specific reason why a POSITA would be motivated to make the proposed combination of prior art references. In other words, Petitioners have failed to offer “some articulated

reasoning with some rational underpinning to support the legal conclusion of obviousness,” as is required by the law of obviousness. *KSR*, 550 U.S. at 418. Based on the lack of explanation and analysis in the Petition, it should be obvious that Petitioners’ obviousness challenges are factually and legally deficient, and the result of improperly using the challenged claim as a roadmap to piece together disparate disclosure using hindsight bias. *See InTouch Techs*, 751 F.3d at 1351.

For at least the reasons discussed above, Petitioners have not satisfied their burden of showing a reasonable likelihood that any challenged claims are obvious under § 103 in view of Tawa in combination with Shikama. Consequently, the Board should deny institution based on Ground I.

B. Ground II: Claim 9 Is Not Obvious in View of Tawa in Combination with Shikama and Scharf

Petitioners are unlikely to prevail on Ground II. Ground II challenges dependent claim 9, which depends from claim 1, based on the combination of Tawa (Ex. 1004) with Shikama (Ex. 1005) and Scharf (Ex. 1006). Petitioners rely on the combination of Tawa and Shikama (Ground I) as support for their argument that the portions of claim 9 inherited from claim 1 are obvious in view of Tawa in combination with Shikama and Scharf (Ground II). *See* Petition at 81-86. Ground II fails for at least the same reasons discussed above with respect to Ground I. Petitioners have not shown that the combination of Tawa with Shikama and Scharf teaches the portion of claim 9 that requires “an opposing exit surface that forms from said received light a pre-specified diverging output beam” (inherited from claim 1),

that any proposed modification/combination satisfies the claim language as a whole, or that a POSITA would have had a reason to modify or combine the references as proposed. Accordingly, the Board should deny institution based on Ground II.

C. Grounds III and IV: The Challenged Claims Are Not Anticipated by or Obvious in View of Tawa

Grounds III and IV, which challenge independent claims 1 and 39, as well as claims depending therefrom, are based on Tawa (Ex. 1004). The Petition points to its arguments for Ground I as support for the position that “Tawa teaches and/or renders obvious” the portion of the challenged claims that recite “an opposing exit surface that forms from said received light a pre-specified diverging output beam” (independent claim 1 and claims depending therefrom) and “said exit surface forming a pre-specified diverging output beam from said internally propagating light” (independent claim 39 and claims depending therefrom). Thus, Grounds III and IV suffer from the same shortcomings as Ground I.

Petitioners have not shown that any single embodiment of Tawa discloses every limitation of independent claims 1 and 39. Petitioners primarily rely on the embodiment of Tawa Figure 1 as satisfying the requirements of the challenged independent claims. *See generally* Petition at 17-57, 96-98. As discussed above, however, the embodiment of Tawa Figure 1 does not disclose a lens that provides a “pre-specified diverging output beam”; it provides a collimated output beam. And although Figure 18 purportedly shows a lens that emits light at a “divergent angle,” the Petition does not rely on the embodiments of Figure 18 as satisfying other

limitations of independent claims 1 and 39. Indeed, as discussed above, Tawa discloses no details about the design and configuration of the optical elements shown in Figure 18. Thus, neither the embodiment of Figure 1 nor the embodiments of Figures 18 anticipates claims 1 and 39 (or the claims depending therefrom). The Petition does not rely on any other embodiments as allegedly anticipating the challenged claims.

The Petition also fails to show there is a reasonable likelihood that the Petitioners will prevail on Ground IV—obviousness based on Tawa. To begin with, Petitioners have not identified any particular modification or combination of different embodiments that allegedly satisfy each and every element of the claims. Instead, the Petition merely points to disparate disclosure and leaves Patent Owner and the Board to guess what modification Petitioners propose. For example, for the claim limitations “an opposing exit surface that forms from said received light a pre-specified diverging output beam” (claim 1) and “said exit surface forming a pre-specified diverging output beam from said internally propagating light” (claim 39), the Petition merely points to a disclosure from Tawa that states:

In FIG. 18A, the light intensity distribution converting device 10 is arranged so that the diverging light, which enters the light intensity distribution converting device 10, is emitted therefrom at an increased divergent angle. In FIG. 18B, the light intensity distribution converting device 10 is arranged so that the diverging light, which enters the light

intensity distribution converting device 10, is emitted therefrom at a reduced diverged angle.

Petition at 27-28 (citing Tawa, Ex. 1004 at 9:39-55). Notably, the Petition does not specify what specific modifications to the embodiment of Tawa Figure 1 (or any other embodiment) it proposes making that would allegedly satisfy the claimed invention as a whole (i.e., every limitation of the challenged claims). Petitioners' failure to indicate "precisely how and why a skilled artisan would have combined" different embodiments is fatal to their challenge. *Intel*, 21 F.4th at 797 (explaining a finding obviousness requires a showing of how and why a skilled artisan would have combined references in the way the claimed invention does).

Indeed, as discussed above, Tawa provides no explanation for how the "light intensity distribution converting device 10" of Figures 18A and 18B is configured to emit diverging light. In other words, Tawa does not explain the differences between the lens of Figure 1 and the lens of Figure 18 that cause the former to produce a parallel, or collimated, output and the latter to produce a diverging output. Given the lack of disclosure in Tawa and the Petition's failure to identify any specific modifications to any embodiment from Tawa, there is insufficient evidence to support a finding of obviousness. Without more, there is no way for the Board to evaluate whether a POSITA could have combined the embodiments of Figures 1 and 18 "in the way the claimed invention does" (i.e., in a way that satisfies every limitation of the challenged claims). *ActiveVideo*, 694 F.3d at 1328.

The Petition also fails to “explain why a skilled artisan would have combined [different embodiments] in the way the claimed invention does.” *See Intel*, 21 F.4th 784 (Fed. Cir. 2021). The Petition baldly asserts, “a POSITA would have recognized that any one of the embodiments of Tawa can be combined with each other.” *See* Petition at 93 (referring to reasons to combine in Ground I); *id.* at 58. In support of this position, the Petition makes the following statements:

- (1) “Tawa teaches that numerous other shapes of the first curved surface 16 and the second curved surface 18 are possible.”
- (2) “Tawa explicitly shows many different exemplary shapes and curvatures that can output a uniform distribution of light intensity depending on the specific geometry of the system” and
- (3) “All of these variations would have been readily possible to a POSITA based on application of Tawa’s teachings.”

Id. at 58. Ultimately, the Petition concludes, “[a]ll of these variations would have been readily possible to a POSITA based on application of Tawa’s teachings.” *Id.* at 59. Notably, and as discussed above, the Petition offers no explanation for how or *why* a POSITA would have combined different embodiments in Tawa or modified the collimated lens of Tawa Figure 1 to provide a diverging output. *See* Section VII(A).

At best, Petitioners argue that a POSITA *could* have modified Tawa in a way that purportedly satisfies the claims (although it fails to identify specifically how it proposes modifying Tawa). But, as discussed above, that a POSITA *could* modify

or combine reference is not evidence that a POSITAT *would* have been motivated to do so. *See TQ Delta*, 942 F.3d at 1359-60. Consequently, the Petitioners have not met their burden of showing that a POSITA would have had a reason to modify or combine Tawa. Indeed, as discussed above, a POSITA would not have been motivated to modify Tawa because (1) Tawa itself discloses a solution for uniformly distributing light from a nonuniform light source and, thus, a POSITA would not have been motivated to modify Tawa to produce a uniform distribution of light intensity (the purported motivation identified by Petitioners) and (2) modifying Tawa to produce a diverging output beam would undermine the teachings of Tawa and render it unsuitable for its intended purpose. *See* Section VII(A)(2).

For at least the reasons discussed above, Petitioners have not satisfied their burden of showing a reasonable likelihood that any challenged claims are anticipated by or obvious in view of Tawa. Consequently, the Board should deny institution based on Grounds III and IV.

D. Ground V: Claim 9 Is Not Obvious in View of Tawa in Combination with Scharf

Petitioners are unlikely to prevail on ground V. Ground V challenges dependent claim 9, which depends from claim 1, based on the combination of Tawa (Ex. 1004) with Scharf (Ex. 1006). Petitioners appear to rely on their arguments from Ground IV (anticipation or obviousness in view of Tawa) as support for their argument that the portions of claim 9 inherited from claim 1 are obvious in view of Tawa and Scharf (Ground V). *See* Petition at 81-86, 100. Ground V fails for at least

the same reasons discussed above with respect to Grounds IV. Petitioners have not shown that Tawa and Scharf teaches the portion of claim 9 that requires “an opposing exit surface that forms from said received light a pre-specified diverging output beam” (inherited from claim 1), that any proposed modification/combination satisfies the claim language as a whole, or that a POSITA would have had a reason to modify or combine the references as proposed. Accordingly, the Board should deny institution based on Ground V.

VIII. PATENT OWNER’S FINAL COMMENTS

Patent Owner does not concede the legitimacy of any arguments in the Petition that are not specifically addressed herein and expressly reserves the right to rebut any such arguments in its Patent Owner Response if *inter partes* review is instituted. Similarly, Patent Owner also does not concede any underlying contentions in the Petition and reserves the right to rebut them later. Additionally, Patent Owner is not limited to the arguments presented here in this Preliminary Response, but expressly reserves the right to raise further arguments, including claim construction arguments, not presented in this Preliminary Response.

IX. CONCLUSION

For the foregoing reasons, Patent Owner respectfully requests that the Board decline to institute *inter partes* review of the ’162 Patent.

Dated: June 6, 2025

By: /s/ Brandon G. Moore
Brandon G. Moore
Registration No. 77,885
NELSON BUMGARDNER
CONROY P.C.
2727 North Harwood Street,
Ste. 250
Dallas, Texas 75201
Telephone: (214) 208-3684
Email: brandon@nelbum.com

David T. DeZern
Registration No. 60,117
NELSON BUMGARDNER
CONROY P.C.
2727 North Harwood Street,
Ste. 250
Dallas, Texas 75201
Telephone: (214) 446-4950
Email: david@nelbum.com

Attorneys for Patent Owner

CERTIFICATE OF COMPLIANCE WITH WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), I certify that this Preliminary Response complies with the type-volume limits of 37 C.F.R. § 42.24(b)(1) because it contains 9,641 words, excluding the parts of this Patent Owner's Preliminary Response that are exempted by 37 C.F.R. § 42.24(a), according to the word processing system used to prepare this Patent Owner's Preliminary Response.

Dated: June 6, 2025

By: /s/ Brandon G. Moore
Brandon G. Moore
Registration No. 77,885
NELSON BUMGARDNER
CONROY P.C.
2727 North Harwood Street,
Ste. 250
Dallas, Texas 75201
Telephone: (214) 208-3684
Email: brandon@nelbum.com

David T. DeZern
Registration No. 60,117
NELSON BUMGARDNER
CONROY P.C.
2727 North Harwood Street,
Ste. 250
Dallas, Texas 75201
Telephone: (214) 446-4950
Email: david@nelbum.com

Attorneys for Patent Owner

CERTIFICATE OF SERVICE

I hereby certify that on June 6, 2025, a copy of Patent Owner's Preliminary Response has been served in its entirety via email on the following:

Email: tcho@desmaraisllp.com

lavena@desmaraisllp.com

yha@desmaraisllp.com

Samsung-Sinotechnix-IPR@desmaraisllp.com

Dated: June 6, 2025

By: /s/ Brandon G. Moore
Brandon G. Moore
Registration No. 77,885
NELSON BUMGARDNER
CONROY P.C.
2727 North Harwood Street,
Ste. 250
Dallas, Texas 75201
Telephone: (214) 208-3684
Email: brandon@nelbum.com

David T. DeZern
Registration No. 60,117
NELSON BUMGARDNER
CONROY P.C.
2727 North Harwood Street,
Ste. 250
Dallas, Texas 75201
Telephone: (214) 446-4950
Email: david@nelbum.com

Attorneys for Patent Owner