

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CAIHONG DISPLAY DEVICES CO., LTD.,
Petitioner

v.

CORNING INCORPORATED,
Patent Owner

Case IPR2025-01040
U.S. Patent No. 9,512,025

PATENT OWNER'S DISCRETIONARY DENIAL BRIEF

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PATENT OWNER'S EXHIBIT LIST

Exhibit No.	Description
2001	<i>Certain Glass Substrates for Liquid Crystal Displays, Products Containing the Same, and Methods for Manufacturing the Same II</i> , Inv. No. 337-TA-1441, Order Setting the Procedural Schedule (ITC March 31, 2025)
2002	Display of the Year Award Archive, accessed at https://www.sid.org/Awards/Display-Industry-Awards/DIAAwardsArchive (last accessed Apr. 9, 2025)
2003	“Corning wins awards for EAGLE XG(TM),” accessed at: https://www.glassonline.com/corning-wins-awards-for-eagle-xgtm/ (last accessed Apr. 9, 2025) (May 23, 2007)
2004	Bocko, Peter L., “Handbook of Visual Display Technology,” Chapter 5.1.1: Glass Substrates for AMLCD, OLED and Emerging Display Platforms, pp. 599-623 (2012)
2005	Prosecution History of U.S. Patent Application No. 11/478,493 (now U.S. Patent No. 7,851,394)
2006	<i>See Certain Glass Substrates for Liquid Crystal Displays, Products Containing the Same, and Methods for Manufacturing the Same</i> , Inv. No. 337-TA-1441, Order 2 (ITC March 7, 2025)
2007	<i>Gestures Tech. Partners LLC. v. Apple Inc. et al.</i> , Petition for Writ of Certiorari, Case. No. 24- (filed June 11, 2025)
2008	<i>Intentionally Left Blank</i>
2009	<i>Intentionally Left Blank</i>
2010	Interim Processes for PTAB Workload Management Memorandum (March 26, 2025)
2011	Guidance on USPTO's rescission of “Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation” (March 24, 2025)

I. INTRODUCTION

U.S. Patent No. 9,512,025 (“the ’025 patent”) claims industry-recognized innovative, non-obvious improvements to the production of glass. The ’025 patent is related to four other patents that have been challenged in IPRs and are asserted in the ITC. *See Certain Glass Substrates for Liquid Crystal Displays, Products Containing the Same, and Methods for Manufacturing the Same II*, Inv. No. 337-TA-1441. Those related patents (and IPRs) are U.S. Patent Nos. 7,851,394 (“the ’394 patent”) (challenged in IPR2025-00439), 8,640,498 (“the ’498 patent”) (challenged in IPR2025-00937), 8,642,491 (“the ’491 patent”) (challenged in IPR2025-01017), and 8,627,684 (“the ’684 patent”) (challenged in IPR2025-01137). Based on the ITC investigation and age of the patent, the ’394 patent IPR was discretionarily denied. *See Caihong Display Devices Co. Ltd. v. Corning Inc.*, IPR2025-00439, Paper 18 (PTAB July 10, 2025). As each of these five IPRs have the same procedural issues identified as requiring discretionary denial in the ’394 patent IPR, each should also be discretionarily denied for at least the same reasons, as well as the reasons presented in their respective briefs.

The ’025 patent claims recite apparatuses and methods for making glass ribbons, and more specifically, to apparatuses and methods for making glass ribbons with edge directors and replaceable heating cartridges that direct heat to the edge directors and thermally shield the edge directors from a plurality of edge

rollers to reduce devitrification of glass for certain sophisticated glass applications (like LCD screens). The Petition purports to present a single invalidity Ground that does not present any prior-art methods for making glass ribbons to reduce devitrification of glass. Moreover, the Petition suffers from numerous flaws that compel discretionary denial under 35 U.S.C. §§ 314(a), 325(d), and 312(a)(3).

First, the *Fintiv* Factors and recent Acting Director guidance on discretionary denial weigh strongly in favor of denial. The parallel ITC litigation between the same parties, and involving the challenged patent, cannot be stayed and will be completed several months before a Final Written Decision in this proceeding. The challenged patent issued over a decade ago and relates to a market-leading product that has been well known for even longer, such that settled expectations, economic and public-interest considerations, and judicial economy all favor denial.

Second, the Petition itself fails to identify its challenge with particularity, jumping back and forth among three references without presenting any rationale for why a POSA would look from the teachings of the primary reference (El Kahlout) to the secondary references (CN'869 and Tsuda). The Petition thus omits essential parts of the *KSR* and *Graham* analyses. The technical arguments are largely conclusory and rely heavily on an expert declaration to fill gaps in the prior-art disclosures and in the argumentation.

Finally, the sole Ground of obviousness presented relies almost entirely on El Kahlout, a reference that was considered during prosecution, applied in an obviousness rejection, and overcome. The secondary reference, Tsuda, which is nominally cited for its teaching of a replaceable heating cartridge, was also listed in an IDS and initialed by the Examiner. The Petition does not identify any error in this prosecution, and does not explain why the addition of CN'869—which is redundant with the other references and cited only for limited teachings—would have changed the Examiner's finding of patentability. On balance, instituting review of the Petition would not be a good use of the Board's limited resources.

II. STATEMENT OF PRECISE RELIEF REQUESTED

Pursuant to 35 U.S.C. §§ 314(a), 325(d), and 312(a)(3), and the Memorandum on Interim Processes for PTAB Workload Management issued March 26, 2025 (EX2010, "Memo Factors"), Patent Owner Corning Incorporated respectfully requests that the Board exercise its discretion to deny institution of *inter partes* review of the '025 patent.

III. FACTUAL BACKGROUND

The '025 patent is directed to an apparatus and methods of producing glass ribbons that can be used for displays, such as LCDs. EX1001, 1:8-17. The '025 patent teaches that devitrification (i.e., crystallization) of glass during manufacturing may cause defects in glass ribbons, leading to manufacturing losses

and increased production costs. EX1001, 1:22-26. The heater described by the claims of the '025 patent reduces devitrification of glass by directing heat towards an edge director of a glass manufacturing apparatus and shielding the edge director from heat loss. EX1001, Abstract.

A. Overview of the Technology

The '025 patent identifies an apparatus and process for producing glass that solves a critical problem: the production of nearly defect-free glass. During glass manufacturing, molten glass is directed over a forming wedge to form a continuous glass ribbon. Edge directors are frequently provided at opposed ends of the forming wedge to help achieve a glass ribbon with a desired width and edge characteristics. However, the edge directors may also act as heat sinks, leading to devitrification of molten glass in proximity to the edge directors. This devitrification may lead to defects in the glass ribbon.

One key innovation of the '025 patent is the use of a heating apparatus to mitigate heat loss near the edge directors. The inventors of the '025 patent discovered that devitrification of the glass could be reduced by placing a heating apparatus at an angle near the edge directors. This effectively applies heat to the desired location while shielding the edge directors from further heat loss.

Commercially, key innovations of the '025 patent led to the success of Corning® EAGLE XG® glass, a best-selling product for Corning Incorporated

(“Patent Owner”), the manufacturing process for which is covered by the claims of the ’025 patent.

B. Overview of ’025 Patent Claims

The ’025 patent, entitled “Methods and Apparatuses for Reducing Heat Loss from Edge Directors,” issued on December 6, 2016 to Chung et al. *See* EX1001, (54), (45), (72). It issued from U.S. Patent Application No. 14/278,582, filed on May 15, 2014. The claims of the ’025 patent are directed towards a heating apparatus that, when positioned at an angle in a glass-forming apparatus, reduces heat loss from edge directors to reduce devitrification of glass.

C. Prosecution History of the ’025 Patent

The ’025 patent examination considered and found the claims patentable over the prior art cited in the Petition. The Petition readily admits that cited art El Kahlout (EX1004) and Tsuda (EX1006) were before the Office during prosecution, with El Kahlout being cited in a rejection. Pet., 7-9 (citing EX1002, 00048). The Petition does not identify any error or inadequacy in this prosecution, other than to observe that secondary reference CN’869 was not considered, and therefore the “combination” of references in the Ground was not considered. But the Petition identifies nothing material about CN’869 that would have changed the Office’s patentability determination.

Indeed, the Office already performed a thorough examination and considered the same arguments made in the Petition. The primary reference cited in the Petition, El Kahlout, was cited against the '025 patent during prosecution. In the notice of allowance, the Examiner identified patentable features of independent claim 1 as “the heating cartridge comprising an enclosure having a heat directing surface that is inclined at an angle of less than about 90° with respect to a bottom surface of the enclosure, the heat directing surface comprising at least one heating element positioned on or adjacent to a face thereof, wherein the heating cartridge is oriented such that the heat directing surface faces the edge director, a view factor from the heat directing surface is greater at the edge director than at the plurality of edge rollers.” EX1002, 22.

For independent claim 8, the Office found that “[t]he prior art does not teach[] the replaceable heating cartridge comprising: an enclosure having a heat directing surface that is inclined at an angle of less than about 90° with respect to a bottom surface of the enclosure, the heat directing surface comprising at least one heating element positioned on or adjacent to a face thereof.” EX1002, 23.

For independent claim 15, the Office found that “[t]he prior art does not teach[] heating the edge director with a replaceable heating cartridge located in a port in the housing wherein the replaceable heating cartridge is positioned between the plurality of edge rollers and the edge director, the replaceable heating cartridge

comprising an enclosure having a heat directing surface that is inclined at an angle of less than about 90° with respect to a bottom surface of the enclosure, the heat directing surface comprising at least one heating element positioned on or adjacent to a face thereof.” EX1002, 23.

The Office also previously observed that El Kahlout does not teach a housing enclosing the forming wedge, edge director, and the plurality of rollers. EX1002, 49.

The differences between the claims and the primary reference cited in the present Petition were therefore quantitatively and qualitatively extensive.

Additionally, the Petition’s secondary reference, Tsuda, is cited in an IDS received July 21, 2016 and considered by the Examiner on August 4, 2016. EX1002, 9. With only ten references total cited in the IDS, it is likely the Examiner was able to give each adequate attention. The Notice of Allowance mailed on August 10, 2016 states that the IDS filed on July 21, 2016 is considered and does not raise questions regarding the previous allowance. EX1002, 6.

IV. PERSON OF ORDINARY SKILL IN THE ART (“POSA”)

Only for the purposes of this Discretionary Denial Brief, Patent Owner does not dispute Petitioner’s level of skill for a person of ordinary skill in the art (POSA) as articulated in the Petition.

V. CLAIM CONSTRUCTION

The Board need not construe any term in order to determine that institution should be discretionarily denied. Patent Owner reserves the right to contest Petitioner's implicit or explicit constructions during any further proceedings.

VI. REASONS THE BOARD SHOULD EXERCISE ITS DISCRETION TO DENY INSTITUTION.

The facts and circumstances here warrant denying review under at least one of §§ 314(a), 325(d), and 312(a)(3). The Petition contains several procedural defects that make its ultimate success on the merits unlikely, and various facial flaws on the merits that make institution an inefficient use of the Board's limited resources. All of the reasons that supported discretionary denial in *Caihong*, IPR2025-00439, Paper 18 apply with at least equal force to this proceeding.

A. The Director should use discretion under § 314(a) to deny the Petition.

At least *Fintiv* factors 1-3, 5, and 6 weigh in favor of discretionary denial and factor 4 is neutral. *Cf. Caihong*, IPR2025-00439, Paper 18. Furthermore, Memo Factors concerning the settled expectations of the parties, economic and public health interests, and the Petition's reliance on testimony of an unreliable expert further favor discretionary denial. *Cf. id.* Overall, institution would not reflect an efficient use of the Board's resources.

1. *Fintiv* factors weigh in favor of Patent Owner and denial in view of parallel ITC investigation.

On March 24, 2025, the Office issued new guidance clarifying how the Board will apply the precedential *Fintiv* and *Sotera* decisions to parallel proceedings, including those before the ITC (EX2011, “*Fintiv* Guidance”). See *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (articulating six non-exclusive factors for determining whether to institute an AIA post-grant proceeding where there is parallel litigation).

Here, the Director should exercise discretion to deny the Petition both because (i) at least factors 1-3 and 5 support discretionary denial, and (ii) the Petition does not provide a strong meritorious challenge (factor 6). The facts here align with those in related proceeding IPR2025-00439, which was discretionarily denied by the Acting Director under *Fintiv* in view of the parallel ITC proceeding. See *Caihong*, IPR2025-00439, Paper 18. If anything, the facts here more strongly support denial under *Fintiv* because the projected FWD date is later than that in IPR2025-00439.

Fintiv factor 1: Factor 1 weighs in favor of denying institution. The ITC is under a congressional mandate to conclude its investigations and make determinations “at the earliest practicable time.” 19 U.S.C. § 1337(b)(1). The ITC does not stay its proceedings based on a pending IPR.

Fintiv factor 2: Factor 2 weighs in favor of discretionary denial. The projected statutory deadline for issuing a FWD in this IPR would be December 16, 2026. Trial in the co-pending ITC litigation is scheduled to be completed the week of January 6, 2026—over eleven months before the FWD deadline. EX2001, 3. Further, a final initial determination in the co-pending ITC litigation is scheduled to issue on April 7, 2026 (over 8 months before the FWD deadline) and the target date for completion of the ITC investigation is August 7, 2026 (over 4 months before the FWD deadline). EX2001, 3. The ITC’s trial schedule thus weighs strongly in favor of denial. *See* EX2011, 2 (“[I]nstituting an IPR or a PGR where the ITC has set a target date for completing its investigation (i.e., the full Commission’s final determination) to occur earlier than the Board’s deadline to issue a final written decision in a challenge involving the same patent claims means that multiple tribunals may be adjudicating validity at the same time, which may increase duplication and expenses for the parties and the tribunals.”). This factor weighs in favor of denial even more heavily than in IPR2025-00439, which was discretionarily denied.

Fintiv factor 3: Factor 3 weighs in favor of denying institution. In factor 3, the Board “consider[s] the amount and type of work already completed in the parallel litigation by the court and the parties at the time of the institution decision.” *Apple*, IPR2020-00019, Paper 11 at 9. The deadline for issuing a

Decision on Institution (DI) in this IPR is December 16, 2025. By that time, the parties will have completed fact discovery (August 26th), exchanged expert reports on all issues, including any invalidity defenses (September 10th and 30th), and exchanged trial exhibits (October 22nd through November 12th). EX2001, 1-2.

Because the parties and the ITC will have expended significant resources by the December 16, 2025 DI deadline, factor 3 weighs heavily in favor of denying institution. Because the timing of this Petition is even more delayed than that in IPR2025-00439, which was discretionarily denied, this factor weighs even more heavily in denying this Petition as well.

Fintiv factor 4: Factor 4 is—at best for Petitioner—neutral with respect to denying institution. All 20 claims of the patent are challenged in this IPR, while only claims 15-20 are being asserted against Respondents in the ITC Investigation. The mere fact that the claims at issue between the two proceedings are not identical, without more, does not warrant institution. It is common in ITC investigations that the patent owner will (and often must) reduce the number of claims that are ultimately adjudicated. *See* EX2006. As a practical result, there will never be substantial correspondence between the claims that the ITC adjudicates and the claims challenged in a co-pending IPR. Accordingly, if differing claim sets between an IPR and an ITC investigation presented a valid reason for granting institution, then co-pending ITC investigations could never weigh in favor of

discretionary denial. That result would flatly conflict with the Board's *Fintiv* Guidance.

Moreover, there is not *Sotera* stipulation stopping Petitioner from asserting obviousness combinations of system prior art in the ITC together with prior-art references relied on in its Petition, and other invalidity theories. *See Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 at 18–19 (PTAB Dec. 1, 2020) (precedential as to § II.A). As the Acting Director recently recognized, such duplicative arguments does not ensure that the IPR proceedings would be a “true alternative” to litigation. *See Motorola Sol’ns, Inc. v. Stellar, LLC*, IPR2024-01205, Paper 19 at 3–4 (PTAB March 28, 2025) (finding that a *Sotera* stipulation was unlikely to moot the petitioner’s combination of IPR art with unpublished system prior art in district court proceedings, and therefore could not outweigh other factors favoring denial). Factor 4 favors denial.

Fintiv factor 5: Factor 5 weighs in favor of denying institution. Petitioner is the first-named respondent in the co-pending ITC litigation.

Fintiv factor 6: Factor 6 weighs in favor of denying institution. The sole Ground presented in the Petition is fatally flawed, as discussed in detail below. *See* Section VI.D. Petitioner provides nothing more than cursory rationale and arguments for why claims of the ’025 patent are allegedly obvious without specifying a motivation to combine references or an expectation of success in

doing so. In many instances, Petitioner fails to even discuss all of the references allegedly relied upon for each limitation.

In sum, the ITC's trial is scheduled to commence eleven months before the FWD deadline in this IPR, with the ITC's initial determination expected on April 7, 2026 and the proceeding expected to conclude on August 7, 2026 (over four months before the FWD deadline). Institution would lead to unnecessary duplication and the potential for inconsistent results. Based on these facts and Petitioner's weak, unsupported unpatentability arguments, the Director should exercise discretion to deny the Petition under § 314(a), consistent with IPR2025-00439.

2. The settled expectations of the parties weigh against institution.

The '025 patent was filed May 15, 2014 (over 11 years ago), published November 19, 2015 (almost 10 years ago), and issued December 6, 2016 (almost 10 years ago). The Office has indicated that it is not a good use of resources, and upsets the settled expectations of patent owners and the marketplace, to review patentability challenges for patents that have been in force for many years. *See, e.g., Dabico Airport Sol's Inc. v. AXA Power ApS*, IPR2025-00408, Paper 21 at 2 (PTAB June 18, 2025) (discretionarily denying review for a patent that had been in force for "almost eight years"); *Intel Corp. v. Proxense LLC*, IPR2025-00327, Paper 12 at 2 (PTAB Jun. 26, 2025) ("[T]he challenged patents have been in force

over nine years, creating settled expectations, and Petitioner does not provide any persuasive reasoning why an *inter partes* review is an appropriate use of Board resources.”). The patent challenged here has been in force for even longer.

During that time, Corning has been practicing its patent and the industry has been well aware of its groundbreaking commercial product, EAGLE XG Glass. *See* Section VI.A.3 (discussing economic and public health considerations). Corning’s EAGLE XG Glass has been lauded in the field and Corning’s New York-based innovation team has received praise in the industry related to the inventive work. EAGLE XG Glass has become the industry standard among the world’s leading panel makers. Corning has produced more than 25 billion square feet of EAGLE XG Glass—enough to pave the Great Wall of China 25 times or cover nearly 390,000 football fields.

Petitioner Caihong Display Devices Co., Ltd. (“Caihong”) has been competing with Corning’s EAGLE XG Glass for years. Competitors and customers alike have been well aware of both Corning’s and Caihong’s products, and the market reflects Corning’s established superiority. After using a different glass composition that the market recognized as inferior, Caihong copied Corning’s EAGLE XG Glass and began using Corning’s patented compositions. Accordingly, the settled expectation of the parties (and the industry at large) is that Corning’s

'025 patent protects Corning's proprietary method of manufacturing EAGLE XG Glass, as it has for many years.

3. Compelling economic and public-health interests weigh against institution.

Corning has spent decades and invested approximately one billion dollars in developing the fusion-draw glassmaking process discussed in the '025 patent (and other Corning patents). The patented methods of making glass compositions of the '025 patent, were developed at Corning's upstate New York research center and its Harrodsburg, Kentucky, manufacturing facility. Corning has facilities and employees in the United States where it makes the machinery, develops the technologies, and provides support for the production of EAGLE XG Glass. For example, Corning produces, manufactures, and assembles components for its fusion manufacturing systems that make EAGLE XG Glass at a manufacturing facility in Erwin, New York, near its headquarters in Corning, New York.

Corning has invested and continues to invest in U.S.-based research, development, manufacturing, and engineering to make EAGLE XG Glass and its next-generation fusion-draw products. Those investments paid off in the form of EAGLE XG Glass' popularity in the marketplace. EAGLE XG Glass has also won multiple industry awards. *See, e.g.*, EX2002, 0014 (2007 Display Component of the Year; Gold Award: Corning Inc. Eagle XG™ Glass Substrate); EX2003 (Advanced Display of the Year (ADY) award).

Corning continues to reinvest the proceeds from EAGLE XG Glass in significant research and development, including composition-related work, attribute improvements, equipment manufacturing, cost-reduction programs, and process improvements for its next generation of LCD fusion-draw glass. Those investments are threatened by Caihong's importation of infringing glass from China and its retaliatory challenges to Corning's patents (like the present Petition).

In addition to economic investments, there are also important public health concerns at stake. Corning developed its patented EAGLE XG Glass in response to a long-felt need in the art for non-toxic glass LCD panels, i.e., glass LCD panels without significant amounts of added heavy metals or halides. EX2004, 612, 616. In the 1990s, the only feasible way to make glass smooth enough and high-quality enough for LCD screens was to use highly toxic materials like arsenic in the manufacturing process. *Id.* Corning's customers wanted an alternative that was free from this hazardous material. "The elimination of heavy metals from the glass composition was seen as necessary in the long term because of emerging environmental regulations worldwide." EX2004, 616. So in 2006, Corning commercialized EAGLE XG Glass, which offers incredible flatness and dimensional stability, all while being amazingly defect-free and free of added arsenic and antimony. *Id.* Through these properties, EAGLE XG Glass enables

manufacturers of display panels to provide thinner, lighter, and more environmentally friendly products.

Corning worked extensively to design a defect-free glass composition suitable for use in LCD panels that was free of added arsenic, and did not merely substitute arsenic for a similarly toxic component like antimony or a halogen. The methods of producing the glass compositions covered by the '025 patent overcame the problems with toxic elements and manufacturing defects. But they did not come cheap. It took nearly four years of diligent work, hundreds of experiments, and a cost of about \$3 million every six months (not including raw material costs) to develop EXG glass. The only way to recoup that kind of investment is through patent protection. It is also the only way Corning can continue to fund research into the next generation of fusion-draw glass that remains free of toxic chemicals.

Accordingly, instituting review of the '025 patent will not serve the fundamental purpose of the IPR process—eliminating counterproductive patents that stifle innovation. *See* 37 C.F.R. § 42.100 (2017) (observing the purpose of IPR as streamlining the patent system, improving patent quality, and thereby promoting innovation). Corning is a leading American innovator, and the '025 patent reflects its contributions to research and development. The Director should exercise discretion to deny institution.

4. The Petition relies heavily on an expert declaration that is used to fill gaps in the teachings of the prior art and to allege a motivation to modify and combine the references that is not otherwise found in the evidence.

Petitioner's obviousness arguments in the Petition are largely conclusory and rely heavily on the say-so of Petitioner's supporting expert declaration. There are multiple problems with Petitioner's approach.

First, aside from Petitioner's expert's *ipse dixit*, the Petition has no evidentiary support for a POSA's alleged knowledge and motivation to combine. *See* Pet., 12. The Federal Circuit has made clear that the *ipse dixit* of an expert is not sufficient to support obviousness challenges at the PTAB. *See, e.g., TQ Delta, LLC v. Cisco Sys., Inc.*, 942 F.3d 1352, 1362 (Fed. Cir. 2019) (reversing PTAB obviousness finding regarding motivation to combine based only on conclusory expert testimony as not supported by substantial evidence).

Second, the expert declaration is used for a purpose better suited to litigation with more factual development and live cross-examination. Specifically, Dr. Tsugunobu fills gaps in the prior art, observes that the methods claimed reflect a finite number of means and would have an expectation of success, and jumps among the three cited references based on assumptions not found in the references themselves. *See* 37 C.F.R. § 42.104(b)(4). The Petition provides no corroboration or analysis, effecting asking the Board to take the expert's word for it. That kind of deference to authority and credibility is better suited for traditional litigation, and

not the kind of limited fact-finding available in an IPR. *See* EX2010, 2-3

(explaining the Acting Director's concern about reliance on expert reports that would benefit from the kind of live cross-examination available in the co-pending litigation but not in the PTAB).

Mr. Tsugunobu presents various opinions that lack explanation or credibility. For instance, he states that there are a finite number of means for processing glass, but never substantiates that claim. EX1003, ¶47. He opines that the fact that there are a finite number of means as the motivation to combine but does not explain that reasoning. *Id.* The mere fact that there are allegedly a finite number of means for processing glass is not a reason one would combine two different means. Also, his analysis fails to identify the claimed housing in the prior art, and points to an *external* heater as disclosure for a replaceable (internal) heating cartridge. EX1003, ¶¶60-64.

Moreover, the Petition purports to rely on Tsuda for disclosure of a replaceable heater, Pet., 18, but Mr. Tsugunobu does not appear to rely on it for his opinion of that limitation. *See, e.g.*, EX1003, ¶¶68, 72, 76, 81, 84, 86, 88, 91, 120, 127, 129, 132, 134, 136, 140-142, 144, 160, 165, 167, 170, 172, 174, 176, 179, 181. He also claims that certain missing limitations (like the precise angles claimed) are obvious or optimizations, but does not explain why or which teaching is being optimized. *See, e.g.*, EX1003, ¶¶72 88, 120, 127, 132, 136, 174.

Finally, the declaration discusses various limitations that Mr. Tsugunobu purportedly finds in the prior art, but never actually identifies what structure in the prior art allegedly satisfies those limitations. *See, e.g.*, EX1003, ¶¶78-79 (alleging that the “view factor” recited in the claim is in the prior art without actually identifying it, and without showing how the heater is oriented relative to the other components or describing how angles alpha and beta relate to the view factor), 85-86 (failing to define the claimed facets), 92-96 (citing a disclosure that does not teach replacing the heater during the glass forming process), 108-110 (citing an enclosure that surrounds the motor and clearly does not enclose the forming wedge, edge director, and edge rollers), 124 (refers to 1[e] above to give motivation to combine CN’869 and El Kahlout, despite 1[e] not using CN’869, and also does not explain what he considers to be the heating element). The collective effect of these opinions is a declaration that relies heavily on the expert’s own authority and say-so, and provides little corroborating evidence.

B. The Director should use discretion under § 325(d) to deny the Petition.

The facts here support denial under § 325(d) because the sole Ground of the Petition relies almost entirely on art and argument that was expressly considered and overcome during prosecution. The Board has discretion to deny review where “the same or substantially the same prior art or arguments previously were

presented to the Office.” 35 U.S.C. § 325(d). The Board’s two-part framework considers:

- (1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and
- (2) if either condition of [the] first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.

Advanced Bionics, LLC v. Med-El Elektromedizinische Geräte GmbH, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential March 24, 2020). The Board considers the *Becton, Dickinson* factors when applying the framework.

Advanced Bionics, IPR2019-01469, Paper 6 at 9; *see also Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 at 17–18 (PTAB Dec. 15, 2017) (informative).

Under the second part of the *Advanced Bionics* framework, Petitioner carries the burden of demonstrating material error: “If a condition in the first part of the framework is satisfied and the petitioner fails to make a showing of material error, the Director generally will exercise discretion not to institute *inter partes* review.”

Advanced Bionics, IPR2019-01469, Paper 6 at 8–9; *see also Becton, Dickinson*, IPR2017-01586, Paper 8 at 17–18 (explaining that factor (e) asks “whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of

the asserted prior art”). Notably, “[i]f reasonable minds can disagree regarding the purported treatment of the art or arguments, it cannot be said that the Office erred in a manner material to patentability. At bottom, this framework reflects a commitment to defer to previous Office evaluations of the evidence of record unless material error is shown.” *Advanced Bionics*, IPR2019-01469, Paper 6 at 9.

Here, the Examiner fully considered the primary reference El Kahlout (EX1004) and applied it in an obviousness rejection of the claims. The Applicant overcame this rejection by explaining that El Kahlout fails to teach (1) a heating cartridge having an enclosure, (2) a heat directing surface that is inclined at an angle of less than about 90° with respect to the bottom of the enclosure, (3) a heating element positioned on or adjacent to a face of the heat directing surface, (4) the heating cartridge being oriented such that the heat directing surface faces the edge director, and (5) a replaceable heating cartridge. EX1002, 38-40. The Examiner rightly accepted those arguments, including after consideration of an IDS that listed Tsuda, which Petitioner now cites for that missing teaching. The Petition therefore fails to present any art or argument for the teaching of a replaceable heating cartridge that the Office has not already considered and found insufficient.

Furthermore, the Petition does not identify any error in the prior prosecution, or explain how the addition of CN’869 would have changed the Examiner’s

patentability analysis. Indeed, it would not. While the Petition is not clear as to the role of CN'869 in the obviousness analysis, CN'869 appear to be cited only for the limited teaching of the angles, which would not have changed the Examiner's conclusion that the replaceable hearing cartridge is not found in the prior art. The Petition therefore presents substantially the same art and argument that the Office has already considered and rejected, at least for that key limitation. That alone is a reason to discretionarily deny the Petition.

C. The Director should use discretion under § 312(a)(3) to deny the Petition.

The sole Ground presented fails to identify each claim challenged with particularity due to the numerous failures in the Petition and supporting Declaration. Under the governing statute, a petition must identify “with particularity, each claim challenged, the grounds on which the challenge to each claim is based, and the evidence that supports the grounds for the challenge to each claim.” 35 U.S.C. § 312(a)(3). Indeed, “[i]t is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify with particularity the evidence that supports the grounds for the challenge to each claim.” *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (internal quotes omitted). That is because “the expedited nature of IPRs bring with it an obligation for petitioners to make their case in their petition to institute.” *Id.* at 1369–70.

Petitioner here has not identified “with particularity” the evidence relied upon in each challenge. At a high level, the Petition fails to explain the rationale or motivation for its combination of references and fails to follow the *KSR* or *Graham* framework. The entirety of the Petition’s motivation combine discussion is a single conclusory paragraph that merely repeats the legal standard with no analysis. Pet., 12-13. The sole factual argument—that the cited references are “analogous”—cites to the expert opinion with no paragraph number. *See* Pet., 12-13 (citing “EX1003, xx”). While the Petition claims that it will “set forth below in more detail” the specific motivation to combine with respect to “specific relevant limitations,” Pet., 12, it never does. While the expert declaration provides more analysis on the combination of references for *some* limitations, that analysis is never provided in the Petition.

Additionally, a series of gaps, ambiguities, and other deficiencies in the Petition leave the reader guessing what exactly is the basis and rationale for the obviousness challenge. The Board should not use its limited resources to fill gaps and resolve ambiguities in the Petitioner’s favor. For instance, the Petition identifies the motivation to combine all three references as the unfounded allegation that the challenged claims are one of a finite number of identified means for the desired process of glass manufacturing applicable to substrates in display technologies. Pet., 12. There is no further analysis and the expert declaration does

not expand on this premise. It does not say what the finite number is, or why a POSA would have chosen the claimed means with an expectation of success.

Petitioner also states, in conclusory fashion, that many of the missing limitations would be obvious to modify from the combined prior art or are the product of optimization, without ever explaining or providing evidence for those propositions. *See, e.g.*, Pet., 20-21 (citing CN'869 to teach limitation 15[g], without explanation, and despite relying on Tsuda for that limitation elsewhere), 21 (stating that the claimed angle is simply optimizing the inclination depicted and described in CN'869 without providing any evidentiary support or explanation), 22 (citing references for limitations 15[h] and 15[i] with no *Graham* or *KSR* analysis), 25-27 (relying on CN'869 for claims 17-19 without explaining the obviousness combination), 37-41 (citing art for limitations 1[e]-1[h] without explaining the combination or motivation to combine), 50-54 (same for limitations 8[a]-8[e]). Petitioner similarly relies on CN'869 for claim 11, and then El Kahlout for claim 12 (which depends on claim 11) without ever explaining how the references would be combined for those claims. Pet., 58-59.

Additionally, throughout the Petition, Petitioner argues that one would have combined Tsuda with El Kahlout, but never identifies what is missing from El Kahlout or why a POSA would look to Tsuda to remedy that shortcoming. *See, e.g.*, Pet., 19 (combining Tsuda with El Kahlout so that the heater can be replaced

to facilitate equipment maintenance, but without identifying which feature is missing or supplied by which reference). The Petition nominally relies on Tsuda to teach the replaceable heater limitation, but never mentions Tsuda in its application of the prior art to the claims.

In other words, the entire premise for including Tsuda in the Ground is to teach the replaceable heater limitation (which the Examiner found missing from El Kahlout), and then the Petition only cites El Kahlout for those limitations. *See, e.g.*, Pet., 17-21 (limitations 15[e], [f], [g]), 22 (limitation 15[i]), 23-24 (limitation 15[j]), 24-25 (claim 16), 38-42 (limitations 1[g], [f], [h], [i]), 42-43 (claim 2), 43-44 (claim 3), 44 (claim 4), 44-46 (claim 5), 46 (claim 6), 46-47 (claim 7). For claim 8, the Petition actually does mention Tsuda for limitation 8[a], *see* Pet., 52, but then returns to relying on El Kahlout for this limitation throughout the remainder. *See* Pet., 53-55 (limitations 8[b], [c], [d], [e]), 55-56 (claim 9), 56-57 (claim 10), 57-58 (claim 11), 58-59 (claim 12). It is therefore impossible to decipher what role Tsuda actually plays in the obviousness analysis, and what Petitioner contends is missing from El Kahlout. This intractable ambiguity dooms the sole Ground of the challenge.

D. The weakness of Petitioner's unpatentability arguments weighs against institution under § 314(a).

The sole Ground presented in the Petition is facially and fatally flawed on the merits. The Ground purports to combine El Kahlout, Tsuda, and CN'869 for

every one of the claims. It purports to rely on “at least” El Kahlout for every limitation, but sometimes cites the other references without explaining why. *E.g.*, Pet., 32. The Petition never identifies anything that is missing from El Kahlout or why a POSA would look to the other references. The Petition freely jumps from reference to reference throughout the discussion of the claims, again without providing any reason or motivation to do so.

The Petition is also inconsistent as to which references are relied upon for which limitations, with that reliance changing among independent claims 1, 8, and 15, and between the independent claims and their respective dependent claims. Finally, the Petition’s analysis of the prior art is so deficient on substance, that it results in no less than *ten* claim limitations missing across the 20 challenged claims. There is no way this Petition has shown a likelihood of success on the merits.

In an IPR, “the burden of proving a proposition of unpatentability” is borne by (and remains at all times with) the petitioner. 35 U.S.C. §§ 314(a), 316(e); *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1375 (Fed. Cir. 2016). Defects in establishing a ground of unpatentability in a petition are not curable during trial since the petition cannot be corrected or enhanced during trial. *Magnum Oil Tools*, 829 F.3d at 1375; *Sirona Dental Sys. GmbH v. Institut Straumann AG*, 892 F.3d 1349, 1356 (Fed. Cir. 2018). The Board makes its determination regarding

institution based on what the petition actually presents and not what it could have reasonably contained had it been drafted differently. *Magnum Oil*, 829 F.3d at 1381 (holding that the Board is not “free to adopt arguments on behalf of petitioners that could have been, but were not, raised by the petitioner during [a post-grant proceeding]”). The Board cannot “deviate from the grounds in the petition and raise its own” theories of invalidity. *Sirona Dental*, 892 F.3d at 1356.

For obviousness, a petitioner must “articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness”—“mere conclusory statements” will not suffice. *Magnum Oil*, 829 F.3d at 1380. Indeed, “[i]t is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify ‘with particularity’ the ‘evidence that supports the grounds for the challenge to each claim.’” *Intelligent Bio-Sys.*, 821 F.3d at 1369 (quoting 35 U.S.C. § 312(a)(3)).

“An obviousness determination requires finding that [a Skilled Artisan] would have been motivated to combine or modify the teachings in the prior art *and* would have had a reasonable expectation of success in doing so.” *Regents of the Univ. of Cal. v. Broad Inst., Inc.*, 903 F.3d 1286, 1291 (Fed. Cir. 2018); *Intelligent Bio-Sys.*, 821 F.3d at 1367–68; *see also, e.g., NJOY, LLC v. JUUL Labs, Inc.*, IPR2024-00536, Paper 17 (PTAB Aug. 12, 2024) (denying institution where petitioner did not show a reasonable expectation of success in combining the

asserted references); *Honeywell Int'l Inc. v. DSM IP Assets, B.V.*, IPR2024-00493, Paper 7 (PTAB Aug. 21, 2024) (same).

Here, Petitioner falls far short of carrying its burden of establishing a reasonable likelihood of showing that any of the challenged claims are obvious. The Petition presents a series of one-sentence conclusions for each of the claim limitations. When bringing in a secondary reference, the Petition fails to explain what features were not taught by the primary reference or why one would look elsewhere. Moreover, the Petition never presents a single coherent theory about which reference is relied upon for which teaching or which element. For example, Tsuda is nominally relied upon for teaching the replaceable heating element—that is its only discernable role in the obviousness analysis—but Tsuda's teachings are never actually used in the Petition's or expert's analysis for that claim element.

Moreover, the Petition repeatedly cites references that fail to teach the claim limitation for which they are cited. As a result, there are 10 claim limitations conspicuously absent from the cited prior art across the 20 challenged claims, with most of these deficiencies impacting multiple or all claims. Specifically, there are five limitations missing from the independent claims, and an additional five limitations missing from various dependent claims.

1. There are five limitations missing from the independent claims, precluding any likelihood of showing obviousness.

There are five limitations missing from the independent claims, which prevents the Petition from showing a likelihood of obviousness for any claim challenged multiple times over. First, the Petition fails to cite art that teaches “a replaceable heating cartridge located in a port in the housing.” EX1001, claims 1, 15. As a preliminary matter, the Petition never purports to actually define the housing in any prior-art reference. The ambiguous color coding (component names highlighted in orange) and underling/bold text that seem to identify the housing are unclear as to their actual alleged boundaries. *See* Pet., 17-19, 35-38. The “port” is also not defined. *Id.* Moreover, the “replaceable heater” for which the Petition nominally relies on Tsuda is an *exterior* heater, which is therefore not located in a port in the housing, and even appears to be outside what the Petitioner identifies as the “housing.” *Compare* EX1006, FIG. 6, *with* Pet., 17-19, 35-38. While there is another heater cited in Tsuda in paragraph 90, it does not appear to be replaceable. EX1006, ¶90. This limitation is therefore missing from the cited art combination.

Second, the Petition fails to cite art that teaches “an enclosure having a heat directing surface that is inclined less than about 90° with respect to a bottom surface of the enclosure.” EX1001, claims 1, 8, 15. The petition does not define the enclosure and thus cannot recite the angle with respect to the bottom of the enclosure. The angle cited is with respect to the horizontal plane. *See* Pet., 20-22

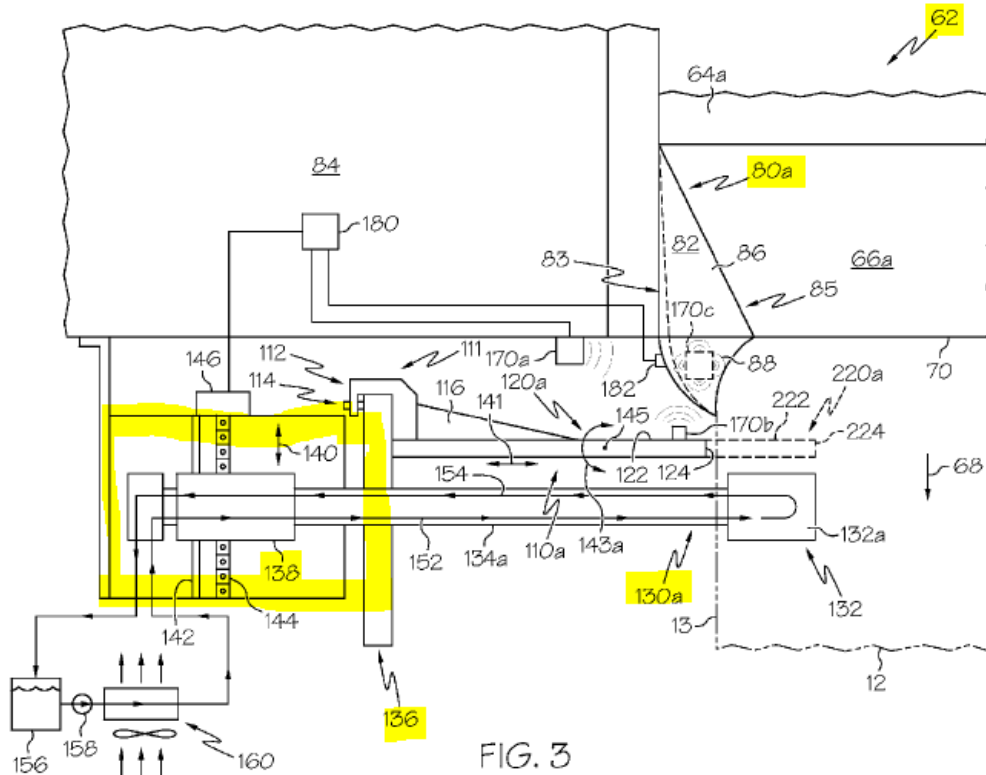
(discussing claim limitation 15[g]), 38-39 (discussing claim limitation 1[f]), 51-52 (discussing claim limitation 8[a]). None of the cited art teaches this limitation and the Petition makes no attempt to overcome the lack of a bottom of the enclosure, and the resultant lack of disclosure of any particular angle with respect to that surface, much less an angle inclined less than 90°.

Third, the Petition fails to cite art that teaches or suggests “wherein the heating cartridge is oriented such that the heat directing surface faces the edge director, a view factor from the heat directing surface is greater at the edge director than at the plurality of edge rollers.” EX1001, claims 1, 8, 15. Instead, the Petition cites the angles alpha and beta and gives no further explanation. Pet., 22-23, 40-41, 54. The mere existence of those angles does nothing to establish the orientations of these multiple structures with respect to each other and their relative view factors. This limitation is therefore missing from the cited art combination.

Fourth, the Petition fails to cite art that teaches or suggests “a lower edge of the heat directing surface and the bottom surface of the replaceable heating cartridge are at least partially positioned between the edge director and the plurality of rollers.” EX1001, claims 1 and 15. The analysis in the Petition describes where the heater is with respect to glass forming body (lower portion), but does not relate this orientation back to the edge director and edge rollers mentioned in the claim limitation. The Petition relies on El Kahlout to teach the

edge directors generally, but that reference is not mentioned in the analysis for this limitation. Pet., 23-24, 41-42. The Petition therefore fails to explain each element within this limitation, fails to explain the proposed combination of references, and fails to explain how or why they would be combined to result in the precise orientation claimed. This limitation is therefore missing from the cited art combination.

Fifth, the Petition fails to cite art that teaches or suggests the housing configurations of claims 1 and 8. It fails to teach “a housing enclosing the forming wedge, edge director, and the plurality of edge rollers.” EX1001, claim 1. Instead, the Petition cites a housing that encloses a motor. *See* Pet., 34-35 (annotating EX1004, FIG. 3, cited for claim limitation 1[d] to show that the prior-art housing encloses a motor (138) rather than the forming wedge (62), edge director (80), and plurality of edge rollers (132)).



EX1004, FIG. 3 (annotated).

It similarly fails to cite art that teaches or suggests “refractory material positioned within the enclosure behind the heat directing surface.” EX1001, claim 8. The Petition simply cites a platinum heater that is *not* behind the heat directing surface. Pet., 53-54. The Petition makes no attempt to fill the gap in the prior art for this claim limitation—it simply states that the limitation is present, provides no analysis, and cites a portion of the prior art that does not disclose the limitation. The collective effect of these failures across the independent claims leaves no plausible showing of obviousness for any claim.

2. There are five more limitations missing from various dependent claims, further showing that the Petition will not show any claim unpatentable.

In addition to missing multiple limitations by virtue of the independent claims from which they depend, each of the dependent claims is missing at least one more limitation. First, the Petition fails to cite art that teaches “wherein the angle of the heat directing surface is about 45° to about 75° relative to the bottom surface of the enclosure.” EX1001, claims 2, 9, 16. It cites to CN’869, which does show angles, but the translation provided simply mentions that the use of inclined surfaces effectively compensates for the temperature at two ends of the isopipe. EX1005, ¶9. That is not a teaching of a particular numeric angle of the heat directing surface relative to the bottom surface of the enclosure. The Petition simply dismisses this gap in the prior art by stating that the precise angles mentioned in the claim optimize an existing structure. Pet., 24-25, 42-43, 56. It provides no substantiation for that proposition and no explanation for how a POSA would arrive at those precise angles through routine optimization. This limitation is therefore missing from the cited art combination.

Second, the Petition fails to cite art that teaches or suggests an “angle between each of the two side facets relative to the center facet is from about 145° to about 175°.” EX1001, claims 4, 11, 18. Once again, CN’869 does show an angle, but it does *not* give numeric values. The Petition provides no evidentiary

support for its proposition that the precise angles claimed were optimizing an existing structure. Pet., 26, 44, 57-58. That is particularly problematic where the same “optimizing” argument is used regardless of the angle and regardless of the prior-art teaching. This limitation is therefore missing from the cited art combination.

Third, the Petition fails to cite art that teaches or suggests “wherein the heat directing surface comprises a curved surface.” EX1001, claims 5, 13, 19. The Petition admits that this feature is not present in the art and then simply states in conclusory fashion that it would be obvious to modify CN’869 to have a curved surface. Pet., 27, 45, 59-60. While the expert Declaration provides a little explanation, *see* EX1003, ¶139, it still does not explain why one would look from El Kahlout to CN’869 for the heat-directing surface in the first place, why one would then modify CN’869’s heat directing surface to be curved, and how one would have an expectation of success in the combination in doing so. This limitation is therefore missing from the cited art combination.

Fourth, the Petition fails to cite art that teaches or suggests “the at least one heating element comprises a coil having an elongated cross section.” EX1001, claim 6. The Petition appears to rely on CN’869 for this limitation, but that reference does not teach a coil having an elongated cross section. Pet., 46. The Petition readily admits that this limitation is missing from CN’869, but states in

conclusory fashion that the elongated cross section claimed is an obvious design choice. It gives no explanation for why that choice would be obvious, despite CN'869 not making that choice. *Id.* This limitation is therefore missing from the cited art combination.

Fifth, the Petition fails to cite art that teaches or suggests “wherein the replaceable heating cartridge is replaceable as the glass ribbon is being formed.” EX1001, claim 20. The cited portions of Tsuda do not disclose when the heater is or can be replaced. No analysis is provided to explain why it would be obvious to replace the heater specifically during ribbon forming. Pet., 28-30. Indeed, doing so would go against conventional wisdom because ribbon forming is a delicate process that a POSA would not want to disrupt with heater replacement. This limitation is therefore missing from the cited art combination.

It will not be a good use of the Board’s resources to institute review where so many claim limitations are missing from the prior art, and the Petition fails to provide a proper *Graham* or *KSR* analysis for the three-way combination of references—references that the Office already found lacking for the very same limitations for which the Petition now cites them. The weakness of the Petition on the merits, especially in view of the Petition’s numerous other failures, the parties’ and the public’s settled expectations, and the status of the parallel litigation strongly support discretionary denial.

VII. CONCLUSION

The Director should exercise discretion to deny institution of *inter partes* review of the '025 patent.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX PLLC

/Jason D. Eisenberg/

Jason D. Eisenberg (Reg. No. 43,447)
Kristina Caggiano Kelly (Reg. No. 58,164)
Counsel for Patent Owner

Date: August 15, 2025

1101 K Street, NW, 10th Floor
Washington, DC 20005
(202) 371-2600

CERTIFICATE OF WORD COUNT (37 C.F.R. § 42.24(d))

1. This Patent Owner Preliminary Response complies with the type-volume limitation of 14,000 words, comprising 8,236 words, excluding the parts exempted by 37 C.F.R. § 42.24(a)(1).

2. This Patent Owner Preliminary Response complies with the general format requirements of 37 C.F.R. § 42.6(a) and has been prepared using Microsoft® Word 2016 in 14-point Times New Roman font.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX PLLC

/Jason D. Eisenberg/

Jason D. Eisenberg (Reg. No. 43,447)
Counsel for Patent Owner

Date: August 15, 2025

1101 K Street, NW, 10th Floor
Washington, DC 20005
(202) 371-2600

CERTIFICATE OF SERVICE (37 C.F.R. § 42.6(e))

I certify that the above-captioned **PATENT OWNER'S
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2010-2011 were served in their entireties on August 15, 2025, upon the following
parties via electronic mail:

Daniel J. Pereira (Lead Counsel) dpereira@merchantgould.com
Donald McPhail (Back-Up Counsel) dmcphail@merchantgould.com
John F. Presper (Back-Up Counsel) jpresper@merchantgould.com
MERCHANT AND GOULD PC

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX PLLC

/Jason D. Eisenberg/

Jason D. Eisenberg (Reg. No. 43,447)
Counsel for Patent Owner

Date: August 15, 2025

1101 K Street, NW, 10th Floor
Washington, DC 20005
(202) 371-2600