

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CANADIAN SOLAR INC.,
Petitioner

v.

MAXEON SOLAR PTE. LTD.,
Patent Owner

Case IPR2024-01039
U.S. Patent No. 8,222,516

**PATENT OWNER PRELIMINARY RESPONSE
UNDER 37 C.F.R. § 42.107(a)**

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PATENT OWNER'S EXHIBIT LIST

Exhibit No.	Description
2001	<i>Intentionally Left Blank</i>
2002	Int'l Pub. No. WO 2009/094575 ("Borden-575")
2003	Gan, Jon-Yiew, Polysilicon emitters for silicon concentrator solar cells, Stanford University (July 1990) ("Gan Thesis")
2004	Results charted from DocketNavigator.com Document Search, run on October 8, 2024, for Motion to Stay Pending <i>Inter Partes</i> Review Decided by Judge Rodney Gilstrap
2005	Results charted from DocketNavigator.com Document Search, run on October 8, 2024, for Motion to Stay Pending <i>Inter Partes</i> Review Decided by Judge Rodney Gilstrap with "Stipulated/Agreed" Motions Removed
2006	Federal Court Management Statistics (June 30, 2024)
2007	Order Denying Maxeon Partial Motion to Dismiss (Dkt. 26), <i>Maxeon Solar Pte. Ltd. v. Canadian Solar, Inc.</i> , Case No. 2:24-cv-00210-JRG (E.D. Tex.), July 3, 2024
2008	Docket Control Order (Dkt. No. 33), <i>Maxeon Solar Pte. Ltd. v. Canadian Solar, Inc.</i> , Case No. 2:24-cv-00210-JRG (E.D. Tex.), August 7, 2024
2009	Canadian Solar Inc.'s Invalidity Contentions, <i>Maxeon Solar Pte. Ltd. v. Canadian Solar, Inc.</i> , Case No. 2:24-cv-00210-JRG (E.D. Tex.), Sept. 6, 2024
2010	Feldman, et al., "A Passivated Rear Contact for High-Efficiency n-Type Silicon Solar Cells Enabling High VocS and FF > 82%" (28th European PV Solar Energy Conference & Exhibition, Paris, Sept. 30 – Oct. 4, 2013) ("Feldman")
2011	Chieh-Wa Tsai, et. al, <i>Patent Analysis of High Efficiency Tunneling Oxide Passivated Contact Solar Cells</i> , 13 Energies 3060 (2020)

Exhibit No.	Description
2012	File History of U.S. Patent No. 8,878,053
2013	File History of U.S. Patent Application No. 17/870,268
2014	Acharyya, S., Sadhukhan, S., Panda, T. et al. Performance analysis of different dielectrics for solar cells with TOPCon structure. J Comput Electron 21, 471–490 (2022) (Abstract) (available at: https://link.springer.com/article/10.1007/s10825-022-01866-0).
2015	<i>Intentionally Left Blank</i>
2016	<i>Intentionally Left Blank</i>
2017	<i>Intentionally Left Blank</i>
2018	<i>Intentionally Left Blank</i>
2019	<i>Intentionally Left Blank</i>

I. INTRODUCTION

The Board should deny Petitioner Canadian Solar Inc.’s (“CSI”) Petition for *inter partes* review, which challenges claims 9 through 12 (the “Challenged Claims”) of U.S. Patent No. 8,222,516 (“the ’516 patent”). CSI bears the burden to show the Challenged Claims are unpatentable, and has not met that burden here. CSI’s Petition (1) is based on an improper theory of collateral estoppel, and (2) asserts obviousness combinations using a menagerie of references that disclose contradictory, and, in many cases, unworkable, teachings. Moreover, CSI’s generic and conclusory motivation-to-combine and reasonable-expectation-of-success arguments permeate the Petition, and fail to reconcile the differences in the asserted art, exposing CSI’s failure to carry its burden to show that any of the Challenged Claims are unpatentable.

First, CSI improperly seeks to collaterally estop Patent Owner Maxeon Solar Pte. Ltd. (“Maxeon”) from defending the Challenged Claims based on prior Board decisions in *ex parte* appeals of two later-filed continuation applications of the ’516 patent. CSI has not shown that the requirements for collateral estoppel are met, as the issues, claims, and prior art in those *ex parte* appeals are not identical to those in this IPR, and Maxeon did not have a full and fair opportunity to litigate the validity of the ’516 patent in those *ex parte* proceedings. Neither the Board nor any court appears to have ever adopted CSI’s theory of estoppel based on decisions

made during *ex parte* prosecution of related applications. Tellingly, CSI does not cite a single case where collateral estoppel has been extended in this way, but as discussed below there is ample case law to the contrary.

Second, CSI fails to establish a reasonable likelihood of showing that any of the asserted prior-art combinations would have rendered the Challenged Claims obvious. In each of its five asserted grounds, CSI relies on conclusory assertions, mischaracterizations, and improper incorporations by reference in an attempt to show the Challenged Claims are unpatentable. CSI relies on references that either do not disclose or suggest the claimed “oxide layer” between the substrate and the emitter layer, or teach away from using this layer in a conventional solar cell. CSI also fails to provide adequate motivations to combine the asserted references or show that a Skilled Artisan would have had a reasonable expectation of success in making such combinations. The Petition falls well short of meeting CSI’s burden of identifying with particularity how each of the Challenged Claims is allegedly unpatentable. CSI’s burden cannot be met by simply submitting evidence and leaving it to the Board to determine a cogent theory of unpatentability.

Third, the *Fintiv* factors weigh in favor of exercising discretion to deny institution under 35 U.S.C. § 314(a). CSI’s Petition does not present a compelling unpatentability challenge that would otherwise warrant institution.

Accordingly, Maxeon respectfully requests that the PTAB deny institution of this IPR and preserve the judicial resources of the PTAB and the parties.

II. OVERVIEW OF THE '516 PATENT

A. The '516 Patent

The '516 patent discloses and claims a novel tunnel oxide passivated contact (i.e., "TOPCon") solar cell. As illustrated in one embodiment, the solar cell 100 has a front side facing the sun during normal operation to collect solar radiation and a backside opposite the front side:

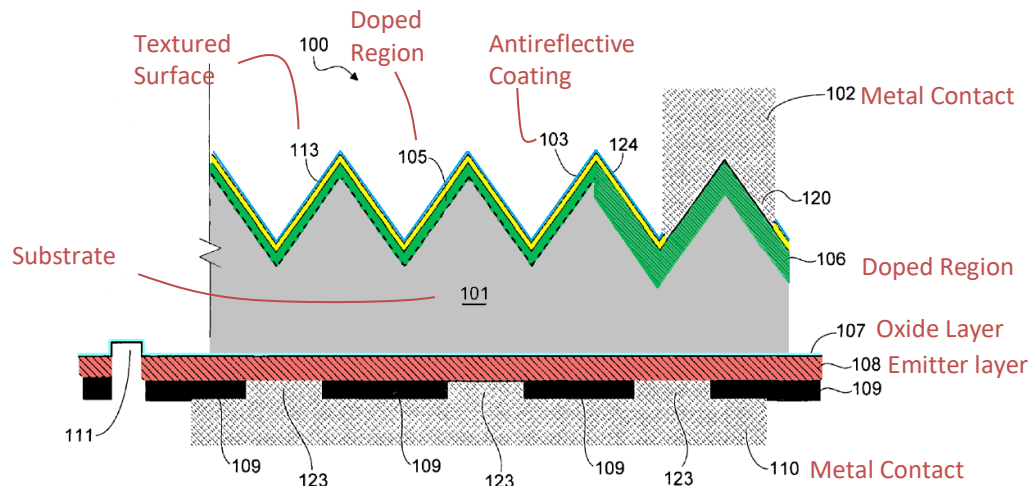


FIG. 1

EX1001, FIG. 1 (annotated).

EX1001, 2:22-27, FIG. 1. The solar cell additionally has a substrate 101 with a textured surface 113, *id.*, 2:28-31, 2:36-38, an antireflective layer 103 over the textured front surface of the substrate, *id.*, 2:50-52, and a metal contact 102 electrically connected to the front side of the substrate, *id.*, 2:24-26. The solar cell

further has an emitter layer 108 over a back surface of the substrate, *id.*, 2:28-31, and a metal contact 110 electrically connected to the emitter layer, *id.*, 2:66-3:2. Critically, the solar cell has a “tunnel” oxide layer 107 between the substrate and emitter layer. *Id.*, 2:57-58. The ’516 patent discloses that the tunnel oxide layer “may comprise silicon dioxide thermally grown to a thickness of about 10 to 50 Angstroms on the backside surface of the substrate 101.” *Id.*, 2:64-66.

The term “TOPCon” appears to have been coined by researchers at the Fraunhofer Institute for Solar Energy Systems (ISE) in 2013. *See* EX2010. SunPower Corporation (the predecessor to Maxeon) (“SunPower”), however, had designed and patented the ’516 patent, which is a front contact solar cell with an oxide layer, years before the “TOPCon” moniker was ever used. In 2020, a group of researchers conducted a patent landscape report related to TOPCon technology and found that “SunPower is the earliest patent assignee among the top six companies” who own the most TOPCon patents, and that SunPower’s “early patents might be the parent applications of the initial structure of the TOPCon solar cell.” EX2011, 10; *see also id.*, FIG. 8 (reproduced below).

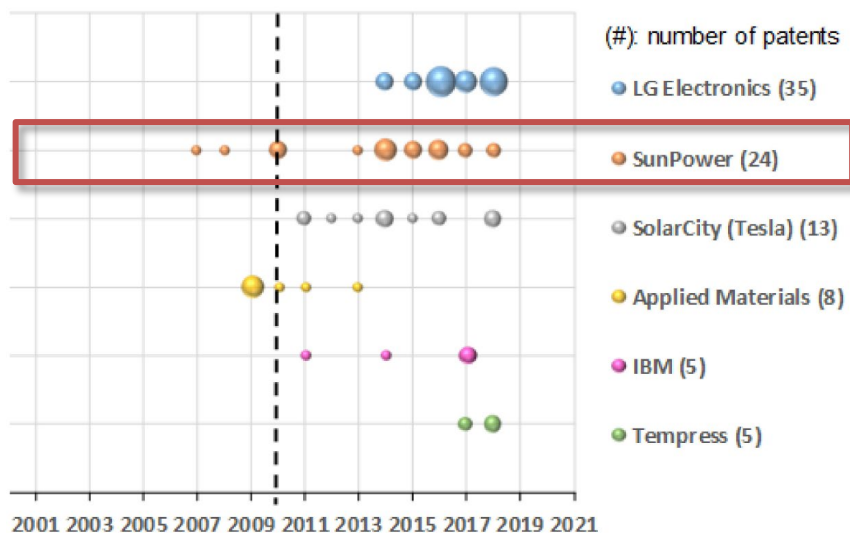


Figure 8. Timeline of technology development of major patent assignees.

EX2011, FIG. 8 (annotated).

B. The '516 Patent Prosecution History and Related Applications

The '516 patent ultimately issued after the Examiner determined that “[t]he prior art of record lacks an oxide layer formed between an emitter and an oppositely doped substrate and a metal contact making an electrical connection to the substrate on the front light incident side of the solar cell.” EX1002, 152 (Notice of Allowance). Notably, asserted references Meier and Jordan were not merely considered, but applied in rejections by the Examiner, and overcome by Applicant, during prosecution of the '516 patent. *Id.*, 76. The rejection in view of Meier and Jordan was overcome when SunPower amended the claims to include the recited “oxide layer.” *Id.*, 135-137, 152.

The Examiner first issued a restriction requirement between the claims “drawn to a solar cell” and those “drawn to a method of making a solar cell.” *Id.*,

61. SunPower elected the solar cell claims and filed a divisional application to pursue the method claims. *See* EX2012. The divisional application issued as U.S. Patent No. 8,878,053 (“the ’053 patent”) after the Examiner determined that “[t]he prior art of record lacks the instantly claimed backside junction formed at the interface of a first material of a silicon substrate comprising one dopant type and a second material of a polysilicon layer of an opposite dopant type.” *Id.*, 0227. After allowance of the ’053 patent, three continuations were filed seeking additional claims of varying scope:

- U.S. Patent Application No. 14/504,771 (“the ’771 application”), filed October 2, 2014, claiming “a doped diffusion region in the substrate” and “a front electrode that is coupled to the doped diffusion region on the front surface of the substrate.” EX1005, 470. This application was abandoned after an appeal of the Examiner’s decision to the Board. *Id.*, 506-20, 522.
- U.S. Patent Application No. 16/460,035 (“the ’035 application”), filed July 2, 2019, claiming “a plurality of dot-shaped N-type doped regions in the N-type silicon substrate under the antireflective layer, each of the plurality of dot-shaped doped regions having a dot shape as seen from a plan view of the solar cell” and “a first metal contact disposed on the front surface of the N-type silicon substrate, wherein

the first metal contact is in electrical contact with the plurality of dot-shaped N-type doped regions.” EX1018, 235. This application was abandoned after an appeal of the Examiner’s decision to the Board. *Id.*, 285-93, 295.

- U.S. Patent Application No. 17/870,268 (“the ’268 application”), filed July 21, 2022, filed with claims directed toward a solar cell including a dielectric layer. EX2013, 0025-27. The ’268 application is currently under examination. *Id.*, 0205-22 (a Final Rejection was issued September 16, 2024).

III. PERSON OF ORDINARY SKILL IN THE ART

CSI’s declarant, Dr. Sanjay Banerjee, asserts that “the person of ordinary skill in the art in the 516 Patent’s field of solar cell design or manufacture in 2008 (‘Skilled Artisan’) would have been someone with an advanced degree in electrical engineering, applied physics, chemistry, or materials science, and at least two years of experience designing, developing, or researching in the field,” and , alternatively “would have had a bachelor’s degree in electrical engineering, applied physics, or materials science, and at least three years of experience designing, developing, or researching in the field.” EX1003, ¶45. For the purposes of this Preliminary Response, Maxeon applies CSI’s level of ordinary skill.

IV. CSI’S ATTEMPT TO EXTEND COLLATERAL ESTOPPEL TO THE REALM OF PATENT PROSECUTION IS IMPROPER AS A MATTER OF LAW.

CSI improperly seeks to estop Maxeon from defending the Challenged Claims based on Board decisions of *ex parte* appeals during prosecution of the ’516 patent’s grandchild and great-grandchild continuation applications. *See* Pet., 13. The Board, however, has rejected similar estoppel arguments because “[t]he prosecution of [a patent] application is an *ex parte* proceeding, not an adversarial proceeding such as a district court litigation or *inter partes* review.” *Medtronic Vascular, Inc. v. TMT Sys., Inc.*, IPR2021-01532, Paper 56 at 41 (PTAB Mar. 7, 2023).

Tellingly, CSI cites no authority applying collateral estoppel in an IPR proceeding based on an *ex parte* appeal in initial examination proceedings of related applications. Rather, CSI relies only on cases applying estoppel based on other *inter partes* proceedings at the Office. *See* Pet., 13 (citing *B&B Hardware, Inc. v. Hargis Indus., Inc.*, 575 U.S. 138, 148 (2015) (TTAB, *inter partes* opposition proceeding); *Google LLC v. Hammond Development Int’l*, 54 F.4th 1377 (Fed. Cir. 2022) (PTAB, *inter partes* review proceeding); *SynQor, Inc. v. Vicor Corp.*, 988 F.3d 1341¹ (Fed. Cir. 2021) (PTAB, *inter partes* reexamination

¹ CSI incorrectly cites “988 F.3d 1344.”

proceeding)). The Supreme Court recognized in *B&B Hardware* that, in that proceeding, the Office was “acting in a judicial capacity and resolve[d] disputed issues of fact properly before it which the parties . . . had an adequate opportunity to litigate.” *B&B Hardware*, 575 U.S. at 148. The same cannot be said for the Board’s decision in an *ex parte* appeal.

To be clear, there has been no prior *inter partes* challenge to the validity of any claim of the ’516 patent upon which CSI can rely for estoppel here. The instant Petition and the parallel district court action are the first proceedings challenging the validity of the ’516 patent.

Thus, CSI’s estoppel theory has no legal footing. Even if the Board were to consider CSI’s collateral estoppel contentions, CSI has not shown that the required elements for collateral estoppel are met here.

A. Collateral estoppel has been found consistently inapplicable to patent prosecution proceedings.

In *B&B Hardware*, relied on by CSI in support of its collateral estoppel theory, Pet., 13, the Supreme Court held that a decision by the TTAB (on the issue of likelihood of confusion in an *inter partes* opposition proceeding) can have preclusive effect in subsequent federal court litigation, provided that the ordinary elements of issue preclusion are met. *B&B Hardware*, 575 U.S. at 160. The Federal Circuit has noted, while acknowledging *B&B Hardware*’s holding, that “there is no suggestion in *B & B Hardware* that an examiner’s decision to register

a mark or to refuse registration [(i.e., *ex parte* prosecution activities)] satisfies the traditional requirements of issue preclusion.” *In re Cordua Restaurants, Inc.*, 823 F.3d 594, 601 n.2 (Fed. Cir. 2016).

The Federal Circuit has also distinguished the “nature of *inter partes* reexamination from the initial examination process,” because the latter lacks an opposing party. *SynQor, Inc.*, 988 F.3d at 1350; *see also In re Craig*, 411 F.2d 1333, 1335-36 (C.C.P.A. 1969) (“[T]he prosecution of patent applications is not exactly either a dispute or litigation in the usual sense of these terms.”). And as noted above, consistent with these cases, the Board has previously rejected estoppel arguments premised on *ex parte* prosecution. *Medtronic Vascular*, IPR2021-01532, Paper 56 at 39-42.

Likewise, here, CSI’s attempt to transform “an ongoing negotiation between the PTO and the applicant,” into an actual full and fair litigation fails to meet the requirements of issue preclusion. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1317 (Fed. Cir. 2005) (recognizing, in the context of claim construction, that the “prosecution history represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation”). The same incentives to litigate an issue simply do not exist in *ex parte* prosecution of a patent application and in *inter partes* litigation of an issued patent.

B. CSI has not shown that the required elements for collateral estoppel are met here.

Even if the Board were to consider CSI's estoppel argument, CSI falls far short of meeting its burden for showing estoppel should apply. Indeed, for CSI to successfully invoke collateral estoppel, it must show each of these four elements:

- (1) the issue is identical to one decided in the first action;
- (2) the issue was actually litigated in the first action;
- (3) resolution of the issue was essential to a final judgment in the first action; and
- (4) [the party against whom collateral estoppel is being asserted] had a full and fair opportunity to litigate the issue in the first action.

Google, 54 F.4th at 1381. But CSI has not shown that *any* of these are met for its challenge to the validity of claims 9-11 of the '516 patent (the "Issue").

1. CSI fails to show that the Issue is the same as the Board's affirmance of the Examiner's rejections in the '771 and '035 applications.

CSI argues that the "prior art is identical" and that the Challenged Claims are "substantially similar" to those at issue in the related '771 and '035 applications. Pet., 15-17. CSI is wrong on both counts. CSI also fails to address the differences between the appellate and adjudicatory functions of the PTAB, which defeats CSI's contention that the issues are the same.

First, regarding the prior art, CSI improperly seeks to meld the analyses performed by the PTAB in two separate proceedings (the '771 and '035

applications) to allege that the “prior art is identical” in the instant Petition. A simple comparison of the grounds asserted here versus in those proceedings shows that the combinations are not the same. *See* Table 1 (below):

	-1039 Pet.	'771 Appl.	'035 Appl.
<i>Ground/ Rejection 1</i>	Meier Okayasu Borden Jordan <i>See</i> Pet., 20.	Meier Okayasu Borden Wenham <i>See</i> EX1005, 512.	Meier Okayasu Borden Wenham Jordan Xi <i>See</i> EX1018, 288 (Cl. 21-23).
<i>Ground/ Rejection 2</i>	Meier Okayasu Foglietti Gan Jordan <i>See</i> Pet., 34.	Meier Okayasu Foglietti Gan Wenham <i>See</i> EX1005, 518.	

In its obviousness argument here, CSI relies on Jordan to supply the “textured” limitation admittedly missing from Meier. Pet., 26 (Ground 1), 34 (Ground 2). But CSI omits any mention of Jordan in its collateral estoppel argument. When attempting to explain away the differences between the language in claim 9 of the ’516 patent and claim 1 of the ’771 application, CSI asserts that “[t]he Examiner, as affirmed by the PTAB, has already found [the textured front surface does] not present a patentable distinction from the prior art relied on here,” citing the

prosecution history for the '035 application for alleged support.² Pet., 16 (citing EX1018, 235). Although that cite merely points to a “CLAIMS APPENDIX” and not to any finding by the Examiner, the Examiner in the '035 application relied on Jordan to disclose a “textured surface.” See EX1018, 248. Thus, CSI’s argument that the issues are the same relies on combining the Examiner’s asserted references in two different *ex parte* appeal proceedings.

Second, regarding the claims, CSI provides no analysis reconciling the differences between the Challenged Claims and the claims in the '035 application apart from their listing in a claims appendix. Pet., 15-17, Attachment D. Thus, CSI has not met its burden to show that the issues of patentability are identical between the instant Petition and the '035 application.

For the '771 application, CSI concedes certain differences between the claims (e.g., a “textured front surface”), but ignores others. Pet., 15-17. For example, claim 1 of the '771 application recited a “tunnel dielectric,” while the Challenged Claims recite an “oxide layer formed between the back surface of the substrate and the emitter layer.” But CSI has not shown or even alleged that all “oxide layers” are “tunnel dielectrics,” or that all “tunnel dielectrics” are “oxide

² Maxeon presumes that CSI mislabeled the “textured front surface” as “claim 1” rather than “claim 9.” See Pet., 16.

layers.”³ A tunnel dielectric may encompass materials other than oxides. *See, e.g.*, EX2014, Abstract. As another example, claim 1 of the ’771 application recited a “doped diffusion region in the substrate” and a “front electrode that is coupled to the doped diffusion region on the front surface of the substrate,” while the Challenged Claims recite a “first metal contact making an electrical connection to the substrate on the front side of the solar cell.” EX1005, 373, 470; EX1001, 6:51-52. That is, the ’771 application claimed an additional element (“doped diffusion region”), which results in a different structural configuration regarding how the “front electrode” is “coupled” to the substrate as compared to how the “first metal contact” is connected to the substrate in claim 9 of the ’516 patent.⁴ This difference

³ CSI seems to ignore this distinction entirely, misquoting the claim language of the ’771 application as “a tunnel *oxide* disposed over the back surface of the substrate,” Pet., 29-30 (emphasis added), when claim 1 recites “a tunnel *dielectric* disposed over the back surface of the substrate,” EX1005, 373, 470 (emphasis added).

⁴ The ’035 application claimed “a plurality of dot-shaped N-type doped regions in the N-type silicon substrate” and the “first metal contact is in electrical contact with the plurality of dot-shaped N-type doped regions.” EX1018, 196, 235.

in configuration necessitated the Examiner adding Wenham to the combination of references in rejecting the '771 claims. *See, e.g.*, EX1005, 481.

Further, claim 12 of the '516 patent recites “wherein the second metal contact comprises silver formed over a layer of silicon dioxide.” The '771 application does not recite a silicon dioxide layer, which is likely the reason that CSI limits its collateral estoppel arguments (and Grounds 1 and 2) to challenging claims 9-11 only.

Third, in *B&B Hardware*, the Supreme Court explained that “issues are not identical if the second action involves application of a different legal standard, even though the factual setting of both suits may be the same.” *B&B Hardware*, 575 U.S. at 154 (quoting 18 C. Wright, A. Miller, & E. Cooper, Federal Practice & Procedure § 4417, p. 449 (2d ed. 2002) (“Wright, Miller & Cooper”)).

“Identification of differences in legal standards and ensuing differences in the issues of law application is apt to be particularly easy when different legal systems are involved” (e.g., federal law versus state law). Wright, Miller & Cooper § 4417. But the same is true when a federal agency’s “first proceeding consider[s] application of a specific administrative regulation” and a second proceeding

Like the '771 application, this results in a different structural configuration regarding how the “first metal contact” is configured as compared to claim 9 of the '516 patent.

“involve[s] application of a statute.” *See id.* at n.56 (citing *Alabama Rivers Alliance v. F.E.R.C.*, 325 F.3d 290, 295–296 n.7 (D.C. Cir. 2003)). Congress prescribed to the PTAB both appellate and adjudicatory roles, which are governed by different statutes and regulations. As relevant here, 35 U.S.C. § 6, which established the PTAB, defines its duties:

DUTIES.—The Patent Trial and Appeal Board shall—

(1) on written appeal of an applicant, review adverse decisions of examiners upon applications for patents *pursuant to section 134(a)*;

. . . and

(4) conduct inter partes reviews and post-grant reviews *pursuant to chapters 31 and 32*.

35 U.S.C. § 6(b) (emphases added). The differences between the PTAB’s appellate and adjudicatory roles and accompanying statutory schemes (i.e., legal standards) further demonstrate that the issues before the PTAB in an *ex parte* appeal and in *inter partes* proceedings (including IPRs) are not the same. So, collateral estoppel does not apply.

Thus, CSI has not shown that the Issue is “identical to” the one decided in the prior proceedings.

2. CSI fails to show that the Issue was actually litigated in either *ex parte* appeal to the PTAB during prosecution of the '771 and '035 applications.

CSI argues that the process of submitting appeal briefs and receiving a decision from the PTAB during the prosecution of *different* claims in *different* applications suffices for “actually litigating” the validity of claims in an already issued patent. Pet., 17-18. But in *Medtronic*, the PTAB rejected a similar collateral estoppel argument because “[t]he prosecution of [a related] application is an *ex parte* proceeding, not an adversarial proceeding such as district court litigation or *inter partes* review,” and thus found that the “same issues were not ‘actually litigated.’” *Medtronic*, IPR2021-01532, Paper 56 at 41. Similar to CSI, the *Medtronic* petitioner argued that an *ex parte* appeal decision by the PTAB in the prosecution of a continuation-in-part application should estop the patent owner from making arguments contrary to the PTAB’s earlier findings. *Id.* at 39-41. In rejecting that argument, the PTAB explained that “although the [patent prosecution] process involves preparation and defense of legal claims in a quasi-adjudicatory forum, the give-and-take of an adversary proceeding is by and large absent.” *Id.* at 41-42 (quoting *Realvirt, LLC v. Lee*, 179 F. Supp. 3d 604, 607 (E.D. Va. 2016) (internal quotation omitted), *aff’d sub nom.*, *Realvirt, LLC v. Iancu*, 734 F. App’x 755 (Fed. Cir. 2018)).

The Federal Circuit (and its predecessor court) have also repeatedly distinguished the nature of patent prosecution from litigation. For example, in *In re Craig*, the court explained that

While res judicata has its proper place in the law as a reflection of a policy invoked to settle disputes and put an end to litigation, *the prosecution of patent applications is not exactly either a dispute or litigation in the usual sense of these terms*. There are additional public policy considerations which have a bearing here, namely, furtherance of the policy inherent in the patent laws to grant patents when the Patent Office finds that patentable inventions have been disclosed and properly claimed so that such inventions are made public through the grant.

In re Craig, 411 F.2d at 1335-36⁵. Similarly, in *Phillips*, the Federal Circuit described the patent prosecution process as “an ongoing negotiation between the PTO and the applicant.” *Phillips*, 415 F.3d at 1317. And in *SynQor*, a case that CSI incorrectly cites for the general proposition that “a final PTAB decision has preclusive effects under *B&B Hardware*,” Pet., 13, the Federal Circuit actually clarified that *inter partes* proceedings are different from *ex parte* patent prosecution because the “participation of the requester to provide both argument and evidence distinguishes the ‘examinational’ nature of inter partes reexamination

⁵ Emphasis added throughout unless otherwise noted.

from the initial examination process or ex parte reexamination.” *SynQor*, 988 F.3d at 1350; *see also In re Cordua*, 823 F.3d at 601 n.2 (stating that examiners’ decisions during trademark prosecution do not “satisf[y] the traditional requirements of issue preclusion” and citing secondary sources: (1) Restatement (Second) of Judgments § 27 (1982) (requiring that an issue be “actually litigated” between parties for issue preclusion to apply) and (2) 4A Callmann on Unfair Competition, Trademarks and Monopolies § 26:68 (4th ed. 2015) (“A decision in an ex parte registration proceeding does not have preclusive effect in a subsequent inter partes proceeding, though statements made during ex parte proceedings may be considered in later proceedings.”)).

Thus, CSI has not shown that the Issue was “actually litigated” in the prior proceedings.

3. CSI fails to show that the Issue was essential to a final judgement in the *ex parte* appeals to the PTAB during prosecution of the '771 and '035 applications.

CSI asserts that the PTAB decisions on the unpatentability of the claims in the '771 and '035 applications “*became final* when Maxeon did not appeal the PTAB decisions.” Pet., 18; *see also id.*, 1 (“The PTAB decisions became final agency actions when they were not appealed to the Federal Circuit.”), 10 (same). But even if the PTAB *ex parte* appeal decisions are considered “final agency

actions,”⁶ this is not the same as a “final judgement” for purposes of applying collateral estoppel.

Rather, a patent applicant is entitled to further examination of its patent claims, even after an adverse decision from an *ex parte* appeal. MPEP § 1214. For example, an applicant may file a claim amendment with a Request for Continued Examination, MPEP § 706.07(h), or, as SunPower did, an applicant may file a continuation application prior to the deadline to appeal the Board’s decision to the Federal Circuit, MPEP § 201.07.

At the time of the PTAB’s *ex parte* appeal decisions in the ’771 and ’035 applications, MPEP § 201.07 provided:

At any time before the patenting, abandonment, or termination of proceedings on an earlier application, an applicant may have recourse to filing a continuation application under 37 CFR 1.53(b) in order to introduce into the application a new set of claims and *to establish a right to further examination by the Office.*

MPEP § 201.07 (Rev. 08.2017, January 2018); *see also* MPEP (Rev. 10.2019, June 2020) (same language); *Abbott Lab ’ys v. TorPharm, Inc.*, 300 F.3d 1367, 1379 (Fed. Cir. 2002) (“[P]recedent has long supported the right of an applicant to file a

⁶ In this context, “[f]inal means, with regard to a Board action, final for the purposes of judicial review.” 37 C.F.R. § 41.2.

continuation application despite an unappealed adverse Board decision, and to have that application examined on the merits.”).

Here, Applicant SunPower timely filed continuation applications in both the ’771 and ’035 applications:

	PTAB Decision Date	Continuation Filing Date	Appeal Deadline (+63 days)
’771 App.	May 9, 2019 EX1005, 506	July 2, 2019 EX1018, 1 (’035 App.)	July 11, 2019 MPEP § 1214.06
’035 App.	May 24, 2022 EX1018, 285	July 21, 2022 EX2013, 0010-11 (’268 App.)	July 26, 2022 MPEP § 1214.06

This effectively prevented the PTAB’s decision from becoming final such that collateral estoppel could apply. This is consistent with *Application of Kaghan*, where the Court of Customs and Patent Appeals (the Federal Circuit’s predecessor) held that similar language in a prior version of MPEP § 201.07 “establish[ed] the right of an applicant to file a continuation application following an adverse Board of Appeals decision within the time allowed for further appeal” and precluded an examiner from using res judicata alone as a rejection because that “is not an examination on the merits.” *In re Kaghan*, 387 F.2d 398, 400-01 (C.C.P.A. 1967) (citing MPEP § 201.07: “Where an application has been prosecuted to a final rejection an applicant may have recourse to filing a continuation in order to introduce into the case a new set of claims and *to establish a right to further*

examination by the Primary Examiner.” (emphasis in original)). The court explained that its holding was consistent with the MPEP, “which instructs the examiner not to use res judicata unless ‘the earlier decision was a final, appellate one, such as a Board of Appeals decision where the time limit for further remedies has expired.’” *In re Kaghan*, 387 F.2d at 400-01 (quoting MPEP § 706.03(w)). That is, the court agreed that the right to further examination created by filing a continuation within the time for appeal “prevented the Board of Appeals decision from becoming a ‘final, appellate one.’” *In re Kaghan*, 387 F.2d at 400.

Thus, CSI has not shown that either of the PTAB’s prior decisions is a “final judgement” that could give rise to collateral estoppel.

4. CSI fails to show that Maxeon had a full and fair opportunity to litigate the Issue in the *ex parte* appeals to the PTAB during prosecution of the ’771 and ’035 applications.

CSI contends that “SunPower and Maxeon had a full and fair opportunity to litigate the obviousness issue and in fact had done it twice.” Pet., 19. Here, CSI refers to the two *ex parte* proceedings of the later-filed, continuation applications. *Id.* But, as the Board has previously found, there are “procedural distinctions” between “routine examination of patent applications” and *inter partes* reviews that “weigh against applying issue preclusion,” namely that, in the latter there is (1) “the availability of cross-examination of witnesses” and (2) “parties may request discovery.” *BioDelivery Sciences Int’l, Inc. v. Aquestive Therapeutics, Inc.*,

IPR2015-00168, Paper 88 at 16 (PTAB Feb. 7, 2019)⁷. Accordingly, the “significant safeguard” of having “a full and fair opportunity to litigate” was not afforded to Maxeon through routine examination of the later ’771 and ’035 applications. *Blonder-Tongue Lab ’ys, Inc. v. Univ. of Illinois Found.*, 402 U.S. 313, 329 (1971).

Rather, this IPR and the parallel district court action, neither of which have resulted in a final judgment, are the first proceedings to involve the issued claims of the ’516 patent.

Another consideration that courts take into account when determining if a patentee had a full and fair opportunity to litigate the validity of its patent in a prior case is whether the patentee had an incentive to fully litigate in the prior litigation. *Id.* at 333. Considering the prior incentive reflects the principle that a party who has a strong interest in the outcome of a case is more likely to present all relevant and probative evidence and arguments to support its position, and is thus less likely

⁷ The *BioDelivery* petitioner sought to estop the patent owner based on a prior *inter partes* reexamination proceeding, but the Board found that such reexamination proceedings “are conducted essentially by the same procedure as routine examination of patent applications.” *BioDelivery*, IPR2015-00168, Paper 88 at 16. Thus, the distinctions noted apply here as well.

to be prejudiced by a subsequent application of collateral estoppel. In contrast to IPRs and district court litigation, where the accused infringer challenges the validity of *issued* claims, patent examiners review the patentability of *pending* claims. The incentives are not the same.

Under Section 271, issued claims confer upon the patentee a constitutionally-protected, limited monopoly. *See* 35 U.S.C. §§ 271(a), 271(b); *see also* U.S. Const. art. I, § 8, cl. 8 (granting Congress the enumerated power “[t]o promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.”). On the other hand, no rights are conferred upon an applicant merely by filing claims in a patent application. Thus, the incentive to fully litigate pending claims that have been rejected by an Examiner is *significantly less* than the incentive to defend the validity of issued claims. This is particularly true because a patent applicant has multiple avenues by which to continue its negotiation with the Office without undertaking the significant expense of judicial review. For example, here, in response to the Board’s decision, SunPower had the option to timely request continued examination or to file a continuation application, which it did. *See, e.g.*, EX1018 (the ’035 application); EX2013 (the ’268 application). Further, SunPower already had two issued patents in this family (the ’516 and ’053 patents); the incentives and cost/benefits analysis would be different than in a

typical litigation context. Accordingly, SunPower did not have the same incentive to litigate in the prior prosecution proceedings as Maxeon does here.

Thus, CSI has not shown that there was a “full and fair opportunity to litigate” the Issue in the prior proceedings.

* * *

In sum, CSI’s attempt to extend collateral estoppel to the realm of *ex parte* patent prosecution proceedings is fatally flawed. CSI also has not shown that each of the four required elements for applying collateral estoppel is met here.

V. THE PETITION FAILS TO ESTABLISH A REASONABLE LIKELIHOOD OF PREVAILING ON ANY CHALLENGED CLAIM.

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). To satisfy its burden, 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., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (quoting 35 U.S.C. § 312(a)(3)); *see also Parus Holdings, Inc. v. Google LLC*, 70 F.4th 1365, 1371

(Fed. Cir. 2023) (a party’s burden “cannot be met simply by throwing mountains of evidence at the Board without explanation or identification of the relevant portions of that evidence”).

“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).

CSI’s Petition asserts five grounds of unpatentability against the Challenged Claims. Pet., 3. As explained below, CSI has not satisfied its burden with respect to *any* of its obviousness grounds. So the Board should deny institution.

In particular, none of CSI’s grounds establish that it would have been obvious to combine the asserted references to arrive at a solar cell including “an oxide layer formed between the back surface of the substrate and the emitter layer,” as recited by independent claim 9. For each ground, CSI concedes that the primary references (Meier/Okayasu and Froitzheim) do not disclose this oxide

layer arranged as recited in the claim. Pet., 30, 34-35 (Meier/Okayasu), 50, 64, 67 (Froitzheim). And as explained in detail below, CSI's attempts to combine Foglietti, Gan, Kwark, and Borden as secondary and tertiary references only prove that a Skilled Artisan would *not* have been motivated to incorporate the purported "oxide layers" disclosed in those references in the manner described and claimed by the '516 patent.

A. Ground 1: CSI fails to show that a Skilled Artisan would have been motivated to combine Borden with Meier/Okayasu.

CSI fails to meet its burden to show that a Skilled Artisan would have been motivated to combine Borden with Meier/Okayasu to arrive at the claimed invention. In particular, CSI fails to meet its evidentiary burden because it (1) cites only to the prosecution histories for the '771 and '035 applications, (2) omits any explanation about the purported benefits of Borden being negated by Meier's combination with Okayasu, and (3) does not clearly explain which of Borden's "oxide layers" is relied upon.

For its purported motivation to combine, CSI merely points to the PTAB's prior findings that "it would have been obvious to the skilled artisan to modify the interface between polycrystalline layers and a monocrystalline substrate front and back surface by having a tunneling oxide at the interfaces for the benefits expressed by Borden," which were "[(1)] preventing epitaxial growth of amorphous silicon and [(2)] providing a layer to protect the surface from plasma

damage of the deposited emitter layer.” Pet., 23-24⁸, 29-30; EX1005, 513, 518.

First, as a threshold issue, CSI fails to show a motivation to combine Borden with Meier/Okayasu. CSI’s arguments for the combination rely only on citations to the PTAB’s findings in the related ’771 application. Pet., 23-24, 29-30. Despite it being CSI’s burden to show unpatentability *in this proceeding*, CSI does not cite or point to the teachings in the asserted references, as required, when discussing its proposed modification. *Intelligent Bio-Sys.*, 821 F.3d at 1369 (petitioner must identify “*with particularity*” the “*evidence* that supports the grounds for the challenge to each claim.”); 35 U.S.C. § 312(a)(3). Specifically, for the “oxide layer” limitation, CSI only identifies findings of the “’771 Application Examiner” and the PTAB’s affirmance thereof (for *different claims* from a different application). CSI provides no discussion of or citations to Borden itself. Without further explanation, CSI requests that the Board “should again make this finding here.” Pet., 23-24, 29-30. This is insufficient to meet CSI’s burden. *Magnum Oil*, 829 F.3d at 1380; *Intelligent Bio-Sys.*, 821 F.3d at 1369.

⁸ CSI also improperly incorporates by reference Dr. Banerjee’s testimony, citing 10 paragraphs in support of a single conclusory statement that the PTAB’s prior findings were correct. *See* Pet., 24 (citing EX1003, ¶¶86-95). The Board should not consider this testimony, as explained below.

CSI also states without further explanation that “[t]he previous conclusion of the Examiner and the PTAB were correct, and in this proceeding the PTAB should come to the same conclusion for the same reasons.” Pet., 24. But CSI “is master of its complaint” and must “includ[e] a detailed explanation of the significance of the evidence.” *SAS Inst., Inc. v. Iancu*, 584 U.S. 357, 363 (2018); 37 C.F.R.

§ 42.22(a)(2). Here, CSI merely cites a span of ten paragraphs from Dr. Banerjee’s declaration, EX1003, ¶¶86-95, but the Board should not consider this testimony, as this is an improper incorporation by reference. *See* 37 C.F.R. § 42.6(a)(3)

(“Arguments must not be incorporated by reference from one document into another document.”); *Parus Holdings*, 70 F.4th at 1372 (holding that “the ‘prohibition against incorporation of arguments from other documents serves various policy goals, including to “minimize the chance that an argument may be overlooked” and to “eliminate[] abuses that arise from incorporation and combination.””)” (citing *General Access Solutions, Ltd. v. Sprint Spectrum L.P.*,

811 F. App’x 654, 657 (Fed. Cir. 2020))); *see also Cisco Sys., Inc. v. C-Cation Techs., LLC*, IPR2014-00454, Paper 12 at 9 (PTAB Aug. 29, 2014) (informative) (declining to consider “conclusory statements [in an expert declaration] for which the Petition does not otherwise provide an argument or explanation”); *Nearmap US, Inc. v. Eagle View Techs., Inc.*, IPR2024-00716, Paper 9 at 14-15 (PTAB Oct. 9, 2024) (“declin[ing] to sift through [expert’s] declaration in order to find the

arguments that may support Petitioner’s challenge”); *Berkeley Lights, Inc. v. The University of British Columbia*, IPR2021-01249, Paper 38 at 22 n.7, 45 n.12 (PTAB Jan. 19, 2023) (declining to consider declaration testimony cited “in support of [a] conclusory technical assertion, without any additional commentary”).

Second, even if Borden’s purported benefits (preventing epitaxial growth of amorphous silicon and providing a layer to protect the surface from plasma damage of the deposited emitter layer) are considered, CSI fails to explain why those benefits would have motivated a Skilled Artisan to employ Borden’s oxide layer in the Meier/Okayasu combination, which uses low temperature processing steps and not a plasma CVD method (as in Borden) to form the emitter layer.

“The obviousness inquiry does not merely ask whether a skilled artisan could combine the references, but instead asks whether ‘they would have been motivated to do so.’” *Adidas AG v. Nike, Inc.*, 963 F.3d 1355, 1359 (Fed. Cir. 2020). CSI fails to show a Skilled Artisan would have been motivated to combine Borden with Meier and Okayasu. Rather, any purported benefit taught by Borden is negated by CSI’s prior modification of Meier in view of Okayasu.

In discussing the Meier/Okayasu combination, CSI points to the PTAB’s prior findings that a Skilled Artisan would have been motivated to replace Meier’s “thermal diffusion” method with Okayasu’s “method of depositing doped

polysilicon layers,” allegedly to “prevent[] epitaxial growth of the emitter layer” and “protect[] the surface from plasma damage.” Pet., 23-24. CSI does not provide *any* explanation as to *why* Borden’s purported benefit of “prevent[ing] epitaxial growth of amorphous silicon” would apply to the Meier/Okayasu combination. *See id.* Mere conclusory statements are insufficient to meet CSI’s burden. *Magnum Oil*, 829 F.3d at 1380. CSI has not shown that a Skilled Artisan would have been motivated to add Borden’s oxide layer for such a benefit.

As to protecting the surface from plasma damage, the Meier/Okayasu combination does not use a plasma CVD process from which the surface would need protecting. Meier describes forming an emitter layer by a high-temperature aluminum-silicon alloying process. EX1011, 6:35-7:3. But Okayasu teaches that by using such a “thermal diffusion method,” as in Meier, “it is difficult to control the thickness” of the resulting layer, “the layer thickness tends to be large,” and the high temperatures cause “thermal degradation of the substrate.” EX1012, ¶¶6-8. Instead of Meier’s “thermal diffusion method,” Okayasu’s film-forming method “can be performed at lower temperatures, preventing damage to the substrate.” Pet., 23 (citing EX1005, 512, 479-81).

Moreover, Okayasu directly teaches away from using plasma CVD to form an emitter layer. In particular, Okayasu appreciates the “difficulty in forming a good quality n⁺ silicon layer or p⁺ silicon layer” “using the plasma CVD method.”

EX1012, ¶12. Okayasu teaches replacing that method with one using “low temperature film forming conditions.” EX1012, ¶¶9-13. Meier does not disclose or describe using plasma CVD to form an emitter layer and Okayasu specifically teaches away from the plasma CVD method in favor of a low-temperature film-forming method. Thus, there would have been no reason to modify the Meier/Okayasu combination with a layer that protects the substrate from damage caused by forming the emitter layer using plasma CVD, as taught by Borden, because there is no plasma CVD process in the relevant steps of the Meier/Okayasu combination. *See Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1052 (Fed. Cir. 1988) (reversing obviousness finding where prior art disclosed “antithetical principles of operation”).

Third, Borden discloses two different oxide layers: (1) a “masking oxide” (or “buried oxide”) patterned with holes, and (2) a “thin tunnel oxide” layer. *See* EX1009, Abstract, ¶8. In mapping Borden to the claims, CSI (relying on the Board’s explanation of the Examiner’s findings) argues “it would have been obvious to the skilled artisan to modify the interface between polycrystalline layers and a monocrystalline substrate front and back surface by having a tunneling oxide at the interfaces for the benefits expressed by Borden.” Pet., 24 (citing EX1005, 513); *see* Pet., 30. The only teaching in Borden, however, of using an oxide layer on “front and back surfaces” is related to the “masking oxide layer.” *See* EX1005,

Abstract, ¶8. Borden does not discuss details of the “masking oxide,” but Borden-575 (EX2002), incorporated by reference therein, describes the masking oxide. EX1005, ¶26; *see, e.g.*, EX2002, ¶¶7-9. What is clear from Borden-575’s disclosure is that Borden’s masking oxide layer is *not* a tunnel oxide layer because it is designed to prevent “leakage through tunnel currents.” EX2002, ¶25. CSI, however, does not appear to recognize this discrepancy, let alone provide any explanation as to the relevance of the two different oxide layers disclosed in Borden. Further, CSI fails to identify any benefit for forming a “tunnel oxide” on the back side of the solar cell. Thus, CSI fails to show why a Skilled Artisan would have been motivated to combine the relevant “oxide layer” in Borden with Meier/Okayasu to arrive at the claimed invention. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (“[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.”); *TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1066 (Fed. Cir. 2016) (“[T]he Board ‘must still be careful not to allow hindsight reconstruction of references . . . without any explanation as to *how or why the references would be combined to produce the claimed invention.*’”) (quoting *KSR*, 550 U.S. at 421); *Samsung Elecs. Co. v. KAIST IP US LLC*, IPR2017-01046, Paper 14 at 7 (PTAB Jan. 22, 2018) (“Petitioner was required to identify the particular teachings of each reference that it proposed to combine and

explain how and why a POSA would have combined the teachings to produce the claimed invention.”) (citing *TriVascular*, 812 F.3d at 1066).

For these reasons, CSI fails to meet its burden of showing a reasonable likelihood of prevailing as to claim 9. Claims 10 and 11 depend from claim 9 and, thus, CSI also fails to meet its burden as to those claims.

B. Ground 2: CSI fails to show that a Skilled Artisan would have been motivated to combine Foglietti and Gan with the combination of Meier/Okayasu.

CSI fails to meet its burden to show that a Skilled Artisan would have been motivated to combine Foglietti and Gan with Meier/Okayasu to arrive at the claimed invention. In particular, CSI fails to meet its evidentiary burden for this combination because it (1) cites only to the prosecution history for the ’771 application (similar to Borden above), (2) omits any attempt to reconcile the differing “oxide layer” disclosures between Foglietti and Gan, and (3) fails to provide sufficient explanation as to why a Skilled Artisan would have applied art relating to a bipolar transistor device (Foglietti) or concentrator solar cell (Gan) to Meier.

CSI again relies only on the PTAB’s prior findings and improperly incorporates Dr. Banerjee’s testimony, arguing that “[b]oth Foglietti and Gan, like Borden taught the benefits of having an oxide layer in between the polysilicon emitter and the substrate, and Gan specifically taught the benefits in the solar cell

context.” Pet., 38-39 (citing EX1003, ¶¶131-135). Specifically, the Examiner of the ’771 application found that (1) “Foglietti discloses that polycrystalline growth directly on crystalline silicon results in partial realignment of the polycrystalline grains and this effect can be suppressed by growth of a thin oxide” and (2) “Gan teaches that [t]he presence of a stable thermal oxide between a polysilicon emitter and CZ layer.” Pet., 38 (quoting EX1005, 519). However, these findings do not reflect the actual teachings of Foglietti and Gan. As explained below, Gan does *not* disclose a thermally stable oxide and expressly contradicts the stated benefit of Foglietti in the context of a concentrator solar cell. Instead, Gan discloses a “broken up” oxide layer to eliminate reliance on the tunneling effect. CSI does not address this inconsistency between the thermal stability of the oxide layers in Foglietti and Gan.

First, similar to Borden above, CSI fails to show a motivation to combine Foglietti and Gan with the Meier/Okayasu combination. Again, CSI’s arguments for the combination rely only on citations to the PTAB’s findings in the related ’771 application. Pet., 38-39. Again, despite it being CSI’s burden to show unpatentability *in this proceeding*, CSI does not cite or point to any teachings in the asserted references, as required, when discussing its proposed modification. *Intelligent Bio-Sys.*, 821 F.3d at 1369 (petitioner must identify “*with particularity*” the “*evidence* that supports the grounds for the challenge to each claim”);

35 U.S.C. § 312(a)(3). Specifically, for the “oxide layer” limitation, CSI only identifies findings of the PTAB related to the Foglietti and Gan references. CSI provides no discussion of or citations to the actual references. Without further explanation, CSI argues that the Board “should rule the same in this IPR.” Pet., 38-39. This is insufficient to meet CSI’s burden. *Magnum Oil*, 829 F.3d at 1380; *Intelligent Bio-Sys.*, 821 F.3d at 1369.

CSI also provides citations to Dr. Banerjee’s declaration for “the benefits of having an oxide layer,” and as alleged support (for its otherwise unsupported conclusion) that “[t]he PTAB prior findings and conclusions were correct.” Pet., 38-39 (citing EX1003, ¶¶131-135). CSI, however, does not include any further explanation of those benefits in its Petition, nor does it explain *why* it believes the PTAB’s prior obviousness findings regarding different claims were correct. CSI was required to do so to meet its burden, but did not. Further, the Board should not consider Dr. Banerjee’s testimony here because it is improperly incorporated by reference under 37 C.F.R. § 42.6(a)(3). *Cisco Sys.*, IPR2014-00454, Paper 12 at 9; *Nearmap*, IPR2024-00716, Paper 9, at 14-15; *Berkeley Lights*, IPR2021-01249, Paper 38, at 22 n.7, 45 n.12.

Second, CSI fails to recognize and reconcile disparities in the disclosures of Foglietti and Gan related to the “oxide layer.” In particular, while Foglietti focuses on stabilizing an interfacial oxide layer (EX1014, ¶10), Gan focuses on breaking

up the same interfacial oxide layer (EX1007, 245).

CSI points to the '771 Examiner's finding that "Gan teaches that he [sic] presence of a stable thermal oxide between a polysilicon emitter and a CZ layer." Pet., 38 (quoting EX1005, 519). While the word "stable" is used as a descriptor in relation to an oxide layer in both Foglietti and Gan, these references are in fact both studies of an *unstable* oxide layer. Gan, for example, teaches that the "thin oxide (interfacial oxide)" found "between the polysilicon and the substrate" in a high speed bipolar transistor "is *not thermally stable*; i.e., it tends to break up during high temperature anneals." EX1007, 245. In other words, a "thermally stable" oxide is one that does *not* "break up during high temperature anneals." Foglietti confirms this understanding by contrasting a "stable oxide" with one that is "fractured or becomes discontinuous." EX1014, ¶¶7-8.

As explained below, Foglietti teaches "a method of forming an interfacial oxide with good control which *maintains its integrity* during subsequent thermal processing" (i.e., a stable thermal oxide). EX1014, ¶10. Gan, on the other hand, teaches how to *break up* the interfacial oxide to achieve desirable characteristics for concentrator solar cells. EX1007, 245 ("In this paper, detailed calibrations for the polysilicon emitter with a thermally grown interfacial oxide is presented ... Consequently, this lends more controllability on the oxide breakup process"). CSI offers no explanation to reconcile why a Skilled Artisan would have been

motivated to combine Foglietti and Gan, where the two disclosures have opposite aims. Indeed, the teachings in the references themselves demonstrate why a Skilled Artisan would *not* have been motivated to combine their disclosures.

In particular, Foglietti discloses forming an “oxide layer” between a polysilicon emitter and monocrystalline silicon substrate to improve the gain of a bipolar transistor. EX1014, ¶¶2-3. In a bipolar transistor, gain is the ratio of the collector current to the base current. *Id.*, ¶3. By employing the tunneling “phenomena” in a thin oxide layer, Foglietti teaches that a continuously formed interfacial oxide layer can be used to maintain the collector current and reduce the base current. *Id.*, ¶5. But “if the interfacial oxide is fractured or becomes discontinuous, resulting in oxide islands,” the base current will increase due to partial realignment of the polysilicon grains and the transistor gain will decrease. *Id.*, ¶¶7-9. Foglietti teaches that a further problem with fracturing is “such fractures will be random and not repeatable from device to device,” so the gain for each transistor will not be consistent. *Id.*, ¶7. Thus, Foglietti teaches using a continuous, unfractured oxide layer.

Gan, however, discourages using a continuous oxide layer, explaining that “[w]hen the interfacial oxide is intact, tunneling is the only process available for the majority carriers to pass through the interfacial oxide” causing “a high contact

resistance because of low tunneling probability.” EX1007, 249; *see also* EX2003⁹, 69 (“When the interfacial oxide is intact, the carrier transport is determined by tunneling. Despite the great uncertainty of the transmission probability, it appears that a useful polysilicon SIS emitter with intact interfacial oxide is difficult to make.”). Gan proposes a controlled “breakup process” of the interfacial oxide layer to reduce the contact resistance using a high temperature step that “serves to break the oxide” and then a lower temperature step that “aims for the dopant drive-in.” EX1007, 245 (“The first-step anneal, which serves to break the oxide, was performed at a higher temperature than that for the second-step anneal which aims for the dopant drive-in”). Gan Thesis further explains that

When the interfacial oxide is broken, the carrier transport shows a completely different characteristic. This is attributed to the epitaxial realignment of the polysilicon to the substrate in the broken region. For majority carrier transport, the broken region represents a highly conductive channel through the interfacial oxide. Naturally, most current tends to flow through the channel, and the resistance along the channel determines the specific contact resistivity.

EX2003, 50.

⁹ Gan Thesis includes a more in-depth discussion of the experiment described in the cited Gan reference (*see, e.g.*, EX2003, 70-106 (Chapter 5)), and provides significantly more details about its theory, experiment, and conclusions.

Thus, whereas Foglietti discloses *maintaining an intact oxide layer* to prevent epitaxial growth, Gan discloses *purposefully breaking up the oxide layer* to allow for (not to suppress) epitaxial realignment to reduce the emitter contact resistance, which is the driving recombination mechanism for concentrator solar cells. EX2003, 3-5. Given the stark difference between an intact oxide layer (Foglietti) and a broken up oxide layer (Gan), a Skilled Artisan would not view Gan as supporting Foglietti's teachings, but rather would understand that Gan contradicts Foglietti's teachings.

At minimum, it is CSI's burden to provide an explanation reconciling these disparate teachings of the two references in its combination. *Magnum Oil*, 829 F.3d at 1380 ("mere conclusory statements" will not suffice to support a legal conclusion of obviousness); *cf. Intel Corp. v. PACT XPP Schweiz AG*, No. 2022-1038, 2023 WL 2198649, at *3 (Fed. Cir. Feb. 24, 2023) (non-precedential) ("To be sure, evidence that the teachings and concepts of the prior art were (either actually or apparently) incompatible such that a skilled artisan would not have reasonably expected to succeed in combining those teachings is relevant to the obviousness analysis."). CSI, thus, fails to carry its burden to show that a Skilled Artisan would have been motivated to combine Foglietti and Gan with Meier and Okayasu.

For these reasons, CSI fails to meet its burden of showing a reasonable

likelihood of prevailing as to claim 9. Claims 10 and 11 depend from claim 9 and, thus, CSI also has not met its burden as to those claims.

C. Ground 3: CSI fails to show that a Skilled Artisan would have had a reasonable expectation of success to incorporate Gan’s “oxide layer” into Froitzheim.

CSI fails to meet its burden to show that a Skilled Artisan would have had a reasonable expectation of success in combining Gan with Froitzheim to arrive at the claimed invention. Rather, CSI’s argument for reasonable expectation of success is expressly contradicted by the authors of Gan.

In particular, CSI’s claim that “[c]ombining Froitzheim/Gan as described here would have been well within the level of ordinary skill in the art and would not have resulted in any unpredictable results,” Pet., 47, is inconsistent with the teachings in the art. For example, Gan Thesis contradicts CSI’s claim that its combination is a “simple substitution of prior art elements according to known methods to yield predictable results,” Pet., 48. Instead of supporting CSI’s theory, Gan Thesis catalogs a variety of failures, including a “non-reliable oxide-growth recipe [giving] rise to the mishap of [their] solar-cell runs” and that thickness variations may have resulted from oxidation proceeding at unexpected times (e.g., “when the furnace was still at the ramp-up stage” or during a “stand-by period” prior to the polysilicon deposition step). EX2003, 111-12. Gan Thesis also teaches that even “[w]ith the same oxidation schedule, a wide variation of oxide

thicknesses have been found for different times.” *Id.*, 117. Clearly, Gan Thesis provides no assurances that a consistent oxide layer thickness could be achieved and instead suggests “a more reliable way of growing the thin oxide is needed.” *Id.*, 119. Rather, Gan Thesis confirms that, contrary to CSI’s contentions, a Skilled Artisan would not have understood substituting Gan’s oxide layer into Froitzheim’s solar cell to be a “simple substitution” yielding predictable results. Thus, CSI fails to carry its burden to show a Skilled Artisan would have had a reasonable expectation of success in incorporating the oxide layer from Gan into Froitzheim.

For these reasons, CSI fails to meet its burden of showing a reasonable likelihood of prevailing as to claim 9. Claims 10-12 depend from claim 9 and, thus, CSI also fails to meet its burden as to those claims.

D. Ground 4: CSI fails to show that a Skilled Artisan would have been motivated to combine Kwark with Froitzheim and have a reasonable expectation of success in doing so.

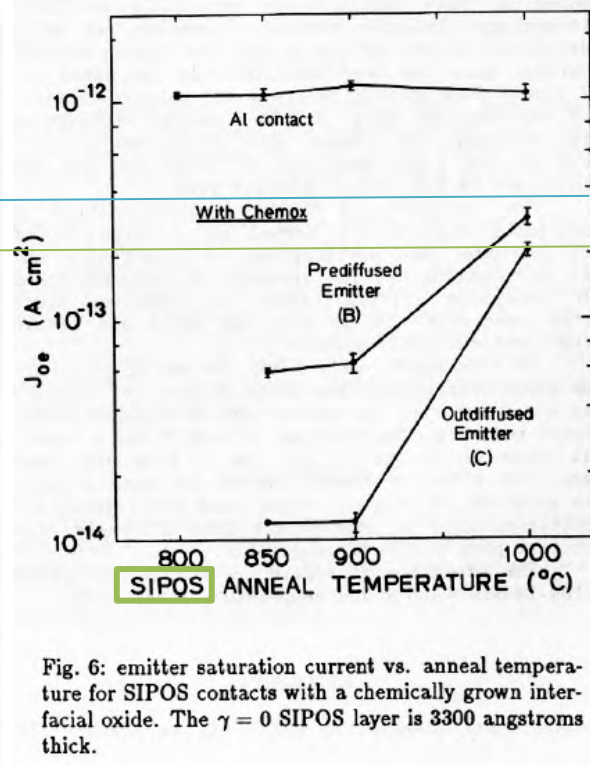
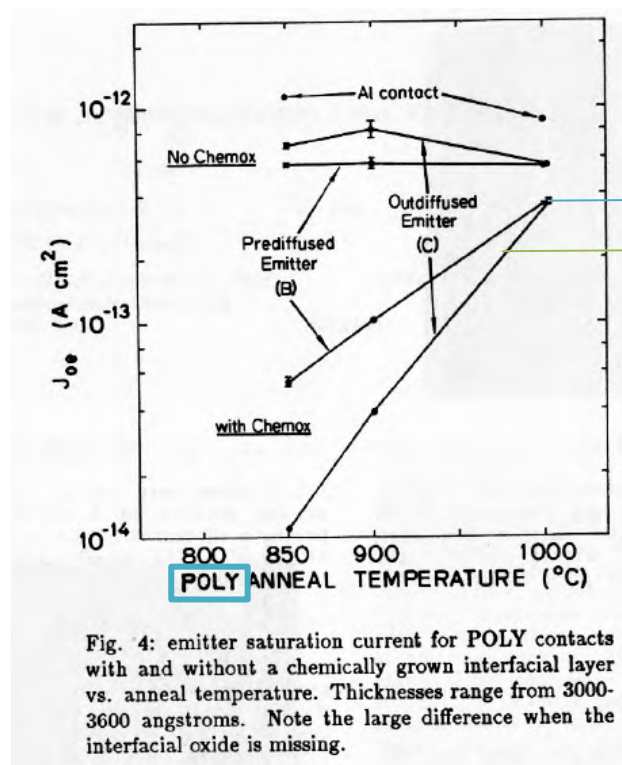
CSI fails to meet its burden to show that a Skilled Artisan would have been motivated to combine Kwark with Froitzheim to arrive at the claimed invention, nor that they would have had a reasonable expectation of success in doing so. In particular, a Skilled Artisan would have appreciated that Kwark’s high temperature annealing would actively break down an interfacial oxide layer, so that modifying Froitzheim in view of Kwark would not reasonably result in a combination having

an oxide layer disposed between a substrate and a polysilicon emitter layer, as claimed.

Contrary to CSI's claim, Kwark does not teach that "modify[ing] Froitzheim's emitter [(i.e., a diffused in-substrate emitter)] to be a polysilicon emitter with an oxide layer would be an improvement." Pet., 60. In fact, Kwark makes no mention of diffused in-substrate emitters at all. Moreover, Kwark only analyzed polysilicon emitters to test its hypothesis that "lower oxygen content SIPOS¹⁰ films" could be used in "VLSI bipolar devices and high concentration point contact solar cells." EX1008, 742. CSI incorrectly attributes the "potential improvements" and "good results" that Kwark found for SIPOS emitter contacts to a polysilicon emitter. *See id.* ("Incorporation of [SIPOS] films into the emitter structure of an NPN bipolar transistor had been found to reduce the emitter saturation current fifty fold (3); this translates into potential improvements of energy conversion efficiency for solar cells"), ("That the $\gamma=0$ films [(aka $\gamma = 0$ SIPOS contacts)] produced such good results was surprising since POLY films of comparable thickness should yield a J_{oe} an order of magnitude larger."). In particular, Kwark showed that in the "SIPOS contact structure[,]. . . the increase in J_{oe} at higher temperature is not as severe as for the devices in Fig. 4," which shows

¹⁰ Semi-Insulating Polycrystalline Silicon

the polysilicon emitter.” *Id.*, 743, FIGs. 4, 6 (below).



EX1008, 745 (annotated).

In other words, Kwark recognized that polysilicon emitters with chemox rapidly lose performance in saturation current density after high temperature anneal steps (whereas the SIPOS was more resilient). As previously explained, Gan, which published later than Kwark and meticulously studied the effects of annealing on an interfacial oxide layer (such as Kwark’s chemox layer), concludes that such a high temperature annealing step actually *breaks down* the oxide layer. EX1007, 245. In fact, Figure 4 of Kwark is entirely consistent with Gan, showing that higher temperature annealing *eliminates* the effects of the oxide. EX1008, 745. Thus, by the filing date of the ’516 patent in 2008, a Skilled Artisan would have

been well aware that modifying Froitzheim based on Kwark's method of forming a polysilicon emitter, disposing a chemox layer, and then annealing the device at high temperature, would *not* result in a device having an oxide layer disposed between substrate and a polysilicon emitter layer.

CSI's conclusory argument regarding a reasonable expectation of success of the combination does not address this issue. Pet., 62. As explained above, Gan teaches that Kwark's chemox layer breaks down after high temperature annealing. Gan Thesis explains further and conclusively demonstrates that CSI's argument is ill-founded and incorrect. Gan Thesis specifically looked at Figure 4 from Kwark (highlighted at Pet., 61; EX2003, FIG. 3.6) and explained how Kwark's findings were consistent with its own, namely, that "[t]he rapid increase of J_o upon the anneal temperature is due to the breakup of the interfacial oxide." EX2003, 33-34, FIG. 3.6 (annotated below).

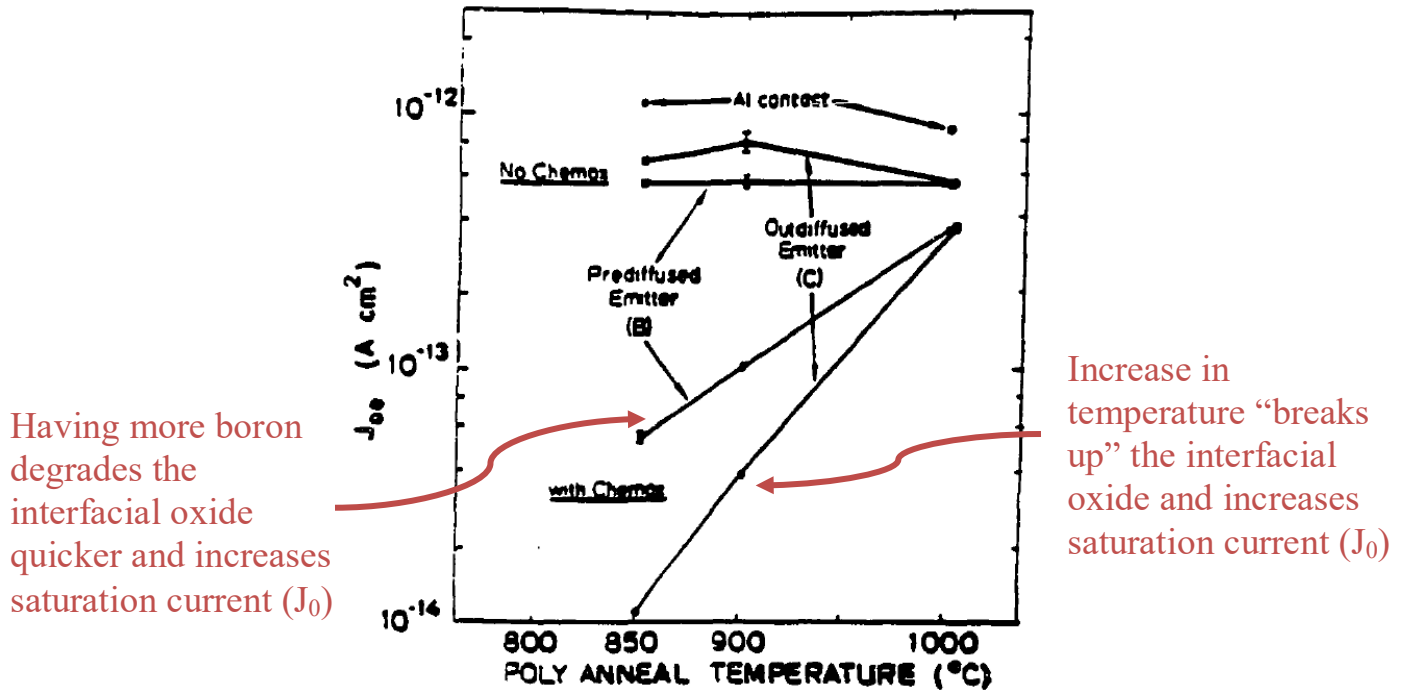


Figure 3.6: $J_{0,e}$ for n-type polysilicon emitters with and without a chemically grown interfacial oxide.

EX2003, FIG. 3.6 (annotated).

Gan Thesis also examined the impact that dopant type (n-type or p-type) has on interfacial oxide layers and found that “boron [(p-type)] degrades the oxide interface more rapidly than phosphorus” (n-type), which is why the Prediffused Emitter B has a higher J_0 . EX2003, 37. Ultimately, Gan Thesis found “that the interface quality of the chemical oxide [(the process disclosed in Kwark)] is not good enough to make the p-type polysilicon SIS emitter with low J_0 .” EX2003, 70-71; *see also id.*, 78 (“[T]he high emitter recombination of as-deposited samples can be entirely attributed to the high interface defect state density of such a thin

chemical oxide.”). Accordingly, contrary to CSI’s conclusory claims, Gan Thesis plainly shows that a Skilled Artisan would *not* have a reasonable expectation of success to combine the p-type polysilicon emitter and chemox-formed interfacial oxide layer disclosed in Kwark with Froitzheim. CSI fails to carry its burden to show otherwise.

For these reasons, CSI fails to meet its burden of showing a reasonable likelihood of prevailing as to claim 9. Claims 10-12 depend from claim 9 and, thus, CSI also fails to meet its burden as to those claims.

E. Ground 5: CSI fails to show that a Skilled Artisan would have been motivated to combine Borden with Froitzheim.

CSI fails to meet its burden to show that a Skilled Artisan would have been motivated to combine Borden with Froitzheim to arrive at the claimed invention. In particular, CSI does not explain how Borden’s alleged benefits would apply to Froitzheim, and, as above, does not clearly explain which of Borden’s “oxide layers” is relied upon.

CSI’s motivation to combine arguments for Borden and Froitzheim rely on the same alleged “benefits” and teachings discussed for Ground 1, which are plagued by the same holes and contradictions identified above. Pet., 66; *supra* Section V.A. Namely, for Borden, CSI contends that “prevent[ing] epitaxial growth” and “provid[ing] a layer to protect the surface form plasma damage” supply adequate motivation for a Skilled Artisan to combine Borden with

Froitzheim. Pet., 66. But, similar to the combination of Meier/Okayasu, Froitzheim does not form p-doped layer 10 via plasma CVD or plasma-enhanced CVD. Like Meier, Froitzheim uses a high-temperature anneal to “drive-in” dopants from a spun-on doping layer. EX1006, ¶¶40-42. Borden only teaches using PE-CVD for forming an amorphous silicon (a-Si) layer, which even Borden itself recognizes possesses distinct physical properties from a polysilicon layer. EX1009, ¶¶16 (“The present inventors further recognize that tunnel oxides can be used between a heavily doped or insulating layer of polysilicon and a crystal silicon substrate, forming a polysilicon emitter solar cell However, such cells do not provide the heterojunction and its benefit of a higher cell voltage due to the higher bandgap of [amorphous silicon (a-Si)].”), 24 (describing the formation of an amorphous silicon two layer stack using PE-CVD). Converting Borden’s amorphous silicon into polysilicon would require an additional high temperature annealing step that would undermine the very oxide layer that CSI seeks to introduce from Borden. *See* EX1007, 245 (explaining that a higher temperature anneal “serves to break the oxide”); EX2003, 41-42 (explaining that even a short anneal at a temperature of just 900-950 °C causes the oxide layer to begin breaking up). Thus, there would have been no reason to “protect” Froitzheim’s substrate from damage during a plasma CVD process, as taught by Borden.

Moreover, as discussed above, CSI’s identification of Borden’s “oxide

layers” and explanation of the benefits thereof, does not provide any explanation as to the mixing and matching between citations related to Borden’s “masking oxide” and citations related to Borden’s “tunnel oxide.” In particular, CSI fails to identify any benefit for forming a “tunnel oxide” on the back side of the solar cell. Thus, CSI fails to show why a Skilled Artisan would have had a motivation to combine the relevant “oxide layer” in Borden with Froitzheim to arrive at the claimed invention. *See KSR*, 550 U.S. at 418.

CSI additionally relies on “[t]he teachings of Gan, Foglietti, Kwark, and Borden . . . [t]o have motivated the Skilled Artisan to integrate a polysilicon emitter with interfacial oxide.” Pet., 66. But CSI leaves questions unanswered about how a Skilled Artisan could combine Foglietti’s teaching regarding an *intact* oxide layer with Gan’s teaching “to break the oxide.” *Compare* EX1014, ¶10, with EX1007, 245. In the same way, Gan Thesis teaches that when “the interfacial oxide is broken the carrier transport shows a completely different characteristic . . . [because of] the epitaxial realignment of the polysilicon to the substrate in the broken region,” which is contrary to Borden’s teaching about “prevent[ing] epitaxial growth.” *Compare* EX2003, 50, with EX1009, ¶8. And Kwark never suggests the use of a polysilicon emitter, but points out the problem of “severe” increases in saturation current density at higher anneal temperatures used with an oxide layer EX1008, 743. Gan Thesis also confirms that Kwark’s polysilicon

emitter with chemox would not have been workable because of the breakup of the oxide layer. *See* EX2003, 33-34. Again, CSI makes no attempt to explain how a Skilled Artisan would have reconciled these contradictions with its proposed combination.

CSI's argument is conclusory and fails to identify with particularity any evidence to support its obviousness argument. *Intelligent Bio-Sys.*, 821 F.3d at 1369; *TriVascular, Inc.*, 812 F.3d at 1066 (“[T]he Board ‘must still be careful not to allow hindsight reconstruction of references . . . without any explanation as to *how or why the references would be combined to produce the claimed invention.*’”) (quoting *KSR Int’l Co.*, 550 U.S. at 421); *Samsung*, IPR2017-01046, Paper 14 at 7 (“Petitioner was required to identify the particular teachings of each reference that it proposed to combine and *explain how and why a POSA would have combined the teachings to produce the claimed invention.*”) (citing *TriVascular*, 812 F.3d at 1066).

For at least these reasons, CSI fails to meet its burden to show a Skilled Artisan would have combined Gan with Froitzheim. Thus, CSI fails to meet its burden of showing a reasonable likelihood of prevailing as to claim 9. Claims 10-12 depend from claim 9 and, thus, CSI also fails to meet its burden as to those claims.

VI. THE BOARD SHOULD EXERCISE ITS DISCRETION TO DENY INSTITUTION UNDER § 314(A) AND *FINTIV*.

Under 35 U.S.C. § 314(a), the Director has discretion to deny institution. In determining whether to exercise that discretion on behalf of the Director, the PTAB considers the status of parallel litigation. *NHK Spring Co. v. Intri-Plex Techs., Inc.*, IPR2018-00752, Paper 8 (PTAB Sept. 12, 2018). The '516 patent is involved in a parallel district court action in the United States District Court for the Eastern District of Texas. *See Maxeon Solar Pte. Ltd. v. Canadian Solar, Inc.*, No. 2:24-CV-00210-JRG (E.D. Tex. Mar. 25, 2024). The PTAB considers six non-exclusive factors in making its determination. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 6 (PTAB Mar. 20, 2020) (precedential).

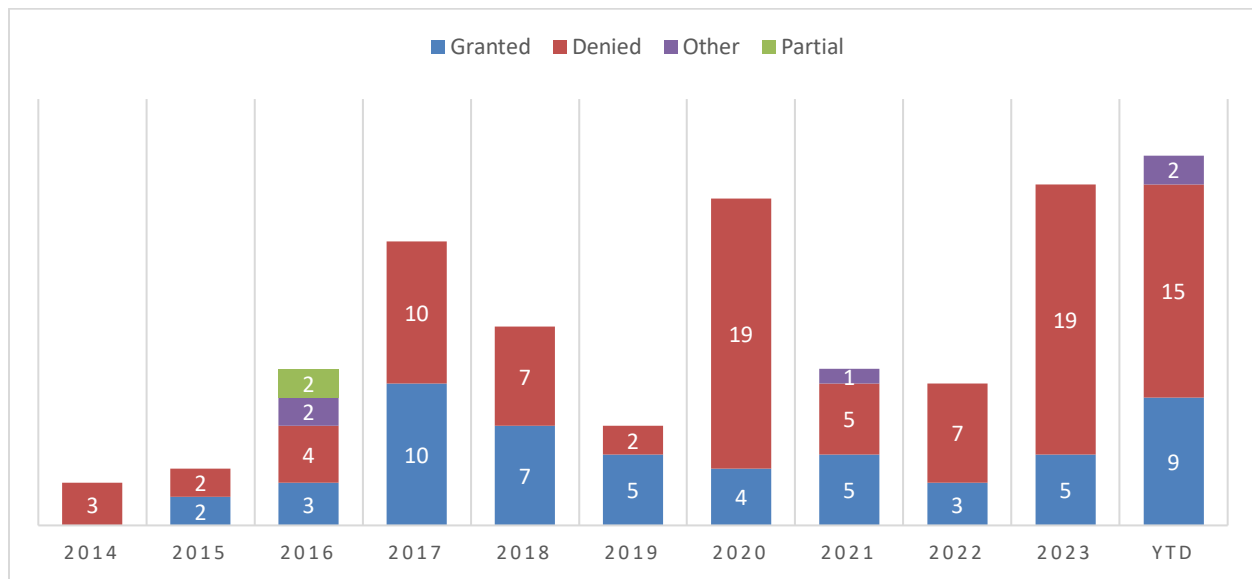
Balancing these six factors (the “*Fintiv* Factors”) demonstrates that efficiency and integrity of the America Invents Act are best served by denying institution of this Petition, as each factor is either neutral or weighs in favor of denial. Thus, evaluating the *Fintiv* factors as a whole, the Board should deny institution.

A. *Fintiv* Factor 1 is neutral: No stay has been requested or granted in the district court proceeding.

Fintiv Factor 1 examines whether the district court in the parallel litigation has granted a stay or if there is evidence suggesting that a stay might be granted if a proceeding is instituted. *Fintiv*, IPR2020-00019, Paper 11 at 6. Neither party has

filed a motion to stay with the district court. Consequently, this factor remains neutral.

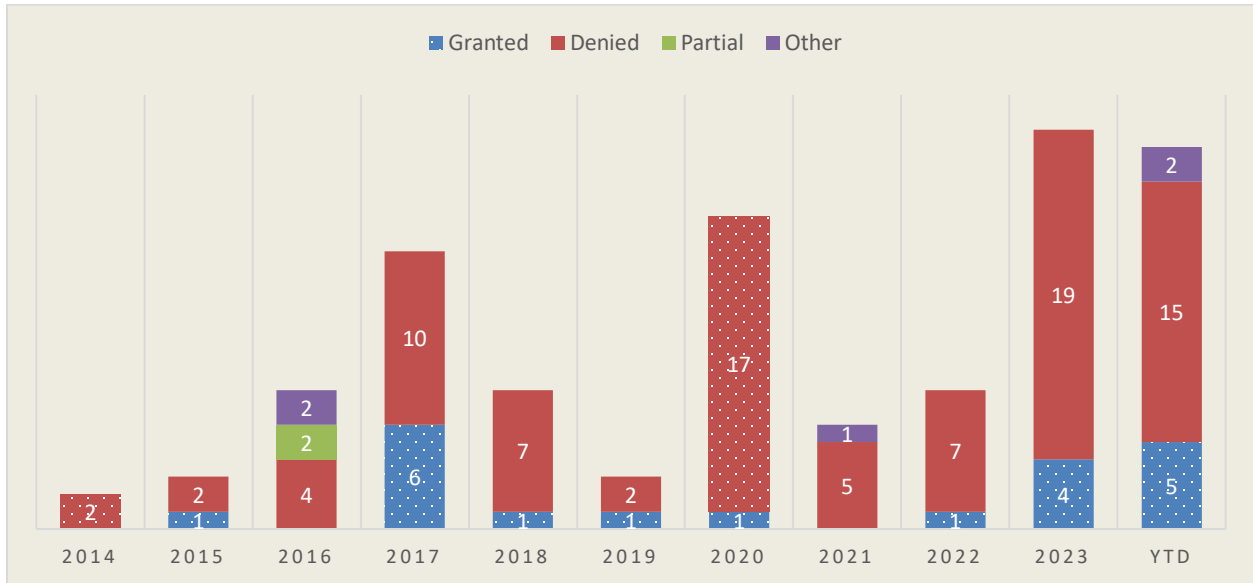
CSI suggests that a stay is likely, which is wrong and, in fact, misleading. CSI states that “Judge Gilstrap has frequently granted stays based on instituted IPRs, with at least 48 stays granted and only 41 denied *with prejudice*.” Pet., 11. But CSI’s statistics cherry-pick only certain decisions (e.g., leaving out motions denied without prejudice). Taking *all* of Judge Gilstrap’s denials (i.e., both those that are denied with and without prejudice) into consideration, a party’s success rate on a motion to stay pending IPR is only about 36%.



Motion to Stay Pending *Inter Partes* Review Success by Year
(Gilstrap, J. – E.D. Tex.)¹¹

¹¹ Results charted from DocketNavigator.com Document Search, run on October 8, 2024, for Motion to Stay Pending *Inter Partes* Review decided by Judge

Further, if motions to stay that were agreed or stipulated to by the parties are omitted from the data set, a party's success rate before Judge Gilstrap plummets to 16%.



Opposed Motion to Stay Pending *Inter Partes* Review
Success by Year
(Gilstrap, J. – E.D. Tex.)¹²

Thus, CSI's implication that a stay is likely in Judge Gilstrap's court is not supported by the data.

Regardless, the PTAB should “decline to infer, based on actions taken in

Rodney Gilstrap. *See* EX2004.

¹² Results charted from DocketNavigator.com Document Search, run on October 8, 2024, for Motion to Stay Pending *Inter Partes* Review decided by Judge Rodney Gilstrap with “Stipulated/Agreed” motions removed. *See* EX2005.

different cases with different facts, how the District Court would rule should a stay be requested by the parties in the parallel case here.” *Fintiv*, IPR2020-00019, Paper 15 at 12 (informative). Nor could the PTAB infer how the district court would rule in this particular case, as CSI provided no facts or analysis alleging to show that it would prevail under the district court’s three-factor test for determining whether to grant a stay. *See NFC Tech. LLC v. HTC Am., Inc.*, No. 2:13-cv-1058-WCB, 2015 WL 1069111, at *2 (E.D. Tex. Mar. 11, 2015) (analyzing “(1) whether the stay will unduly prejudice the nonmoving party, (2) whether the proceedings before the court have reached an advanced stage, including whether discovery is complete and a trial date has been set, and (3) whether the stay will likely result in simplifying the case before the court”).

At bottom, this factor is neutral.

B. *Fintiv* Factor 2 is neutral: Trial is scheduled within two weeks of the PTAB’s final written decision deadline.

This factor assesses the proximity of the district court’s trial date to the PTAB’s projected statutory deadline for a final written decision. *Fintiv*, IPR2020-00019, Paper 11 at 6. Here, the district court issued a Docket Control Order setting trial for January 26, 2026. *See* EX2008. The projected statutory deadline for the PTAB’s final written decision is only eleven days earlier on

January 15, 2026. Although the Director’s Guidance Memo¹³ acknowledges that a court’s scheduled trial date may not be “a good indicator of whether the district court trial will occur before the statutory deadline for a final written decision,” the median time from filing to trial in the Eastern District of Texas averages 19.7 months over the last 6 years, and the most recent data shows 21.6 months.¹⁴ See EX2006 (Federal Court Management Statistics (June 30, 2024)) (excerpts below).

			12-Month Periods Ending					
			Jun 30 2019	Jun 30 2020	Jun 30 2021	Jun 30 2022	Jun 30 2023	Jun 30 2024
Median Time (Months)	From Filing to Disposition	Criminal Felony	9.6	11.6	13.1	14.7	20.6	23.9
		Civil ²	8.6	9.2	8.1	8.8	8.5	7.6
	From Filing to Trial ² (Civil Only)		17.5	17.7	20.4	24.5	16.7	21.6

United States District Court – Judicial Caseload Profile (EDTX),
EX2006, 35 (excerpts).

¹³ Director’s Memorandum, Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation (June 21, 2022) (“Guidance Memo”), available at https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621.pdf.

¹⁴ Although the court had not yet set a trial date at the time of the Petition, CSI also ignores the median time to trial data.

This median timing is consistent with the current trial date set in the EDTX proceeding. Maxeon filed its case on March 25, 2024, making the currently set trial date more than twenty-two months from filing. Accordingly, there is no reason to believe that this trial date will not hold. Given the close proximity between the district court's trial date and the projected deadline for the PTAB's Final Written Decision, *Fintiv* factor 2 is neutral. *See Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 at 15 (PTAB Dec. 1, 2020) (precedential) (finding factor 2 neutral because "trial [was] scheduled to begin around the same time as [the PTAB's] deadline to reach a final decision").

C. *Fintiv* Factor 3 favors denial: The parties have and will continue to expend significant effort in the district court litigation.

Factor 3 considers "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." *Fintiv*, Paper 11 at 9. Here, the Board also looks to the timing of the petition. *Fintiv*, Paper 11 at 11.

By the time the PTAB issues its Institution Decision in January 2025, the parties will have spent considerable resources in the parallel district court action. As of the filing of this paper, the parties have already exchanged infringement and invalidity contentions, served and responded to written discovery requests, and served substantial document productions. Specifically regarding discovery, the parties have exchanged over fifteen letters and emails concerning various issues,

including issues related to CSI's invalidity claims. Each party has also served a third-party subpoena on Maxeon's corporate predecessor, SunPower Corporation, seeking documents and testimony related to CSI's invalidity claims. Maxeon also filed a combined motion to dismiss CSI's inequitable conduct counterclaim and to strike CSI's inequitable conduct defense, which the court denied as moot after CSI amended its counterclaims and defenses to withdraw its counterclaim and defense. *See* EX2007.

The facts here are similar to those in *Sand Revolution II, LLC v. Continental Intermodal Group — Trucking LLC*, where *Fintiv* factor 3 did not weigh against exercising discretion to deny institution despite that “fact discovery [was] still ongoing, expert reports [were] not yet due, and substantive motion practice [was] yet to come.” IPR2019-01393, Paper 24 at 10-11 (PTAB June 16, 2020) (informative). There, the parties had exchanged infringement and invalidity contentions, and the district court had invested resources “relat[ing] to ancillary matters untethered to the validity issue itself,” such as setting and amending the case schedule and granting several *pro hac vice* motions. *See id.* at 10.¹⁵ Recognizing that “the district court and the parties have not invested substantially

¹⁵ To date, the district court has granted three *pro hac vice* motions filed by CSI.

in the merits of the invalidity positions,” the PTAB held that *Fintiv* factor 3 “weighs only marginally, if at all, in favor of exercising discretion to deny institution.” *Id.* at 11. Accordingly here, *Fintiv* factor three likewise weighs in favor of the PTAB exercising its discretion to deny institution, or is at least neutral.

D. *Fintiv* Factor 4 is neutral: The issues raised in the Petition and in the district court overlap completely, and CSI’s stipulation does not prohibit denial.

“*Fintiv* factor four looks at the overlap between the issues raised in the IPR petition and in the parallel proceeding in order to evaluate ‘concerns of inefficiency and the possibility of conflicting decisions.’” Guidance Memo, 7; *Fintiv*, IPR2020-00019, Paper 11 at 12. CSI asserts the same grounds in its Petition here that it asserts in the district court action. *Compare* Pet., 3, with EX2009 (“Invalidity Contentions”), 11-28. In fact, the bulk of CSI’s document production accompanying its Invalidity Contentions (as required by (P.R. 3-4 (E.D. Tex.)) comprised the very documents and exhibits filed in this proceeding. Alone, this complete overlap of issues strongly weighs in favor of denial. *Fintiv*, IPR2020-00019, Paper 11 at 12; *see also* Guidance Memo (“[I]f the petition includes the same or substantially the same claims, grounds, arguments, and evidence as presented in the parallel proceeding, this fact has favored denial.”).

The overlap is mitigated only slightly by CSI’s stipulation. CSI has not provided a *Sotera* stipulation. The Guidance Memo states that the PTAB “will not

discretionarily deny institution in view of parallel district court litigation where a petitioner presents a stipulation not to pursue in a parallel proceeding the same grounds or any grounds that could have reasonably been raised before the PTAB.” Guidance Memo at 3; *see also id.* at 7-8. But here, CSI only stipulates that, “if this IPR is instituted, it will not assert in any district court or ITC litigation that *any claim at issue in this IPR* is invalid on the basis of any ground raised or that reasonably could have been raised during this IPR.” Pet., 11. The PTAB has previously determined that this type of stipulation “leaves open the possibility that Petitioner might still raise in the parallel District Court proceeding a ground that it asserted or reasonably could have asserted in the Petition with respect to a claim that is not subject to an instituted *inter partes* review.” *Duplo USA Corp. v. MGI Digital Tech.*, IPR2023-00936, Paper 8 at 14 (PTAB Dec. 5, 2023). The ’516 patent contains 12 claims in total and CSI challenges only claims 9-12. *See* EX1001, 6:4-65. There is significant overlap between the limitations of the non-challenged claims and the Challenged Claims.

Exemplary Non-Challenged Claim	Challenged Claims
1. A solar cell having a front side facing the sun to collect solar radiation during normal operation and a backside opposite the front side, the solar cell comprising: an N-type silicon substrate;	9. A solar cell having a front side facing the sun to collect solar radiation during normal operation and a backside opposite the front side, the solar cell comprising: a substrate having a textured front surface;

a textured surface on the **N-type silicon** substrate on the front side of the solar cell;

an antireflective layer over the textured surface of the **N-type silicon** substrate;

a **P-type polysilicon** emitter formed over the **N-type silicon** substrate and forming a backside junction with the **N-type silicon** substrate;

an oxide layer formed between the **P-type polysilicon** emitter and the **N-type silicon** substrate;

a negative polarity metal contact making an electrical connection to the **N-type silicon** substrate from the front side of the solar cell; and

a positive polarity metal contact making an electrical connection to the **P-type polysilicon** emitter from the backside of the solar cell.

an emitter layer formed over a back surface of the substrate, the emitter layer forming a backside junction with the substrate;

an oxide layer formed between the back surface of the substrate and the emitter layer;

a first metal contact making an electrical connection to the substrate on the front side of the solar cell; and

a second metal contact making an electrical connection to the emitter layer on the backside of the solar cell, the first metal contact and the second metal contact being configured to allow an external electrical circuit to be powered by the solar cell.

10. The solar cell of claim 9 further comprising an **antireflective layer over the textured front surface of the substrate**.

11. The solar cell of claim 9 wherein the **substrate comprises an N-type silicon substrate** and the **emitter layer comprises a P-type doped polysilicon**.

12. The solar cell of claim 9 wherein the second metal contact comprises silver formed over a layer of silicon dioxide.

Compare EX1001, 6:4-42, *with id.*, 6:42-65. CSI provides no evidence or argument that these claims not “at issue in this IPR” could not, or would not, be added to the parallel district court action. Indeed, fact discovery remains open, and it is possible that discovery will reveal facts (e.g., the existence of additional accused products) that enable Maxeon to add these claims to the parallel district court action. As such, CSI’s stipulation “does not mitigate the risk of duplicative proceedings and conflicting decisions to the same degree as the stipulation in *Sotera*.” *Duplo*, IPR2023-00936, Paper 8 at 14. Accordingly, CSI’s narrower stipulation does not implicate the Guidance Memo’s prohibition against discretionary denial where a *Sotera*-type stipulation is presented, and this factor does not weigh in favor for or against the PTAB exercising its discretion to deny institution pursuant to § 314(a). *Id.* at 15, 18.

E. *Fintiv* Factor 5 favors denial: CSI and the defendant in the parallel proceeding are the same party.

CSI is the defendant in the parallel district court action, which is all that is required to show *Fintiv* factor 5 weighs in favor of denial. *Fintiv*, IPR2020-00019, Paper 11 at 13-14; *Id.*, Paper 15 at 15; *Sotera*, IPR2020-01019, Paper 12 at 19; *Sand Revolution II*, IPR2019-01393, Paper 24 at 12-13.

CSI nevertheless argues, contrary to prior Board precedent, that this fact “should weigh against denial because it permits CSI to provide the §315 [sic] stipulation . . . thereby avoiding any possibility of duplication.”¹⁶ Pet., 11; *see Sotera*, IPR2020-01019, Paper 12 at 19 (weighing this factor in favor of discretionary denial despite petitioner’s stipulation); *see also Sand Revolution II*, IPR2019-01393, Paper 24 at 12-13 (same). But CSI’s stipulation does not mitigate the risk of duplicative proceedings and conflicting decisions to the same degree as the stipulation in *Sotera*. *See* Section VI.D (*Fintiv* factor 4) *supra*. Further, the Guidance Memo explains that “[p]arallel district court and AIA proceedings involving the same parties and invalidity challenges can increase, rather than limit, litigation costs[, given] . . . the potential for inefficiency and gamesmanship in AIA proceedings.” Guidance Memo at 1.

Thus, this factor favors denial.

¹⁶ Maxeon assumes CSI intended to cite § 314, which provides that institution is discretionary. The statute, however, does not provide for the ability of petitioners to stipulate and avoid a discretionary denial under *Fintiv*. The effect of stipulations on the PTAB’s exercise of discretion to deny institution is provided solely by Board precedent (e.g., *Sotera*) and the Director’s Guidance Memo.

F. *Fintiv* Factor 6: No other circumstances, including the merits, warrant institution.

Fintiv factor 6 considers any other circumstances that impact the PTAB's exercise of discretion, including the merits of the petition. *Fintiv*, IPR2020-00019, Paper 11 at 14. The Guidance Memo clarifies that with regard to the merits:

Where the information presented at the institution stage is merely sufficient to meet the statutory institution threshold, the PTAB has the authority, where warranted, to exercise discretion to deny institution in view of the other *Fintiv* factors. In contrast, where the PTAB determines that the information presented at the institution stage presents a compelling unpatentability challenge, that determination alone demonstrates that the PTAB should not discretionarily deny institution under *Fintiv*.

Guidance Memo at 4-5. In *Commscope Techs. LLC v. Dali Wireless, Inc.*, the Director clarified that PTAB panels should “only consider compelling merits if they first determined that *Fintiv* factors 1–5 favored a discretionary denial.” IPR2022-01242, Paper 23 at 4 (Feb. 27, 2023) (precedential). As explained above, here *Fintiv* factor 1–5 do favor discretionary denial.

The Director also explained that “*the compelling merits standard is a higher standard* than the standard for institution set by statute” as it requires a showing that “it is *highly* likely that the petitioner would prevail with respect to at least one challenged claim,” rather than being “more likely than not.” *Id.* at 3-4 (citing

Opensky Indus., LLC v. VLSI Tech. LLC, IPR2021-01064, Paper 102 at 49 (PTAB Oct. 4, 2022) (precedential)). Here, CSI’s Petition fails to meet this higher standard, as it does not present a compelling unpatentability challenge based on the asserted prior art combinations. As explained in detail above, CSI’s Petition suffers from multiple flaws, including improperly invoking collateral estoppel based on *ex parte* appeal decisions in prosecution of related applications—a legal theory that has no basis in case law and fails to meet the standards for collateral estoppel. CSI also asserts insufficient motivations to combine an “oxide layer” from Borden, Foglietti, and Gan, particularly in view of those references providing contradictory and irreconcilable teachings. CSI’s attempt to show that Kwark discloses an “oxide layer” fares no better, as Gan soundly demonstrates that a Skilled Artisan would not have been motivated to combine the references in the manner CSI proposes, nor would they have had a reasonable expectation of success in doing so.

For at least these reasons, CSI’s Petition does not present a compelling unpatentability challenge that would warrant institution despite the other *Fintiv* factors, on balance, weighing in favor of denial. Accordingly, the Board should exercise its discretion to deny institution under § 314(a).

VII. CONCLUSION

For the reasons above, CSI fails to show a reasonable likelihood that any of the Challenged Claims is unpatentable as obvious in view of the cited art. Maxeon, therefore, respectfully requests that the Board deny institution.

Respectfully submitted,

VINSON & ELKINS LLP

A handwritten signature in black ink, reading "Eric J. Klein". The signature is written in a cursive, flowing style.

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Date: October 15, 2024

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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 13,916 words, excluding the parts exempted by 37 C.F.R. § 42.24(a)(1).

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Respectfully submitted,

VINSON & ELKINS LLP

A handwritten signature in black ink, appearing to read "Eric J. Klein". The signature is fluid and cursive, with the first name "Eric" and last name "Klein" clearly distinguishable.

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

I certify that the above-captioned **PATENT OWNER PRELIMINARY
RESPONSE UNDER 37 C.F.R. § 42.107(a)** and associated **Exhibits 2002-2014**
were served in their entireties on October 15, 2024, upon the following parties via
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