

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HANWHA SOLUTIONS CORPORATION,
Petitioner,

v.

MAXEON SOLAR PTE. LTD.,
Patent Owner.

IPR2024-01203
Patent 8,822,516 B2

Before JO-ANNE M. KOKOSKI, JEFFREY W. ABRAHAM, and
AVELYN M. ROSS, *Administrative Patent Judges*.

ROSS, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Hanwha Solutions Corporation (“Petitioner”) filed a Petition (Paper 3, “Pet.”) requesting an *inter partes* review of claims 1–12 of U.S. Patent No. 8,222,516 B2 (Ex. 1001, “the ’516 patent” or “challenged patent”). Maxeon Solar Pte. Ltd. (“Patent Owner”) filed a Preliminary Response to the Petition. Paper 9 (“Prelim. Resp.”). With Board authorization, Petitioner filed a Preliminary Reply (“Prelim. Reply,” Paper 10), and Patent Owner filed a Preliminary Sur-reply (“Prelim. Sur-reply,” Paper 11).

We have authority to determine whether to institute an *inter partes* review. 35 U.S.C. § 314 (2012); 37 C.F.R. § 42.4(a). The standard for instituting an *inter partes* review is set forth in 35 U.S.C. § 314(a), which provides that an *inter partes* review may not be instituted “unless the Director determines . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least [one] of the claims challenged in the petition.”

For the reasons set forth below, upon considering the Petition, Preliminary Response, Reply, Sur-reply, and evidence of record, we determine that Petitioner has established a reasonable likelihood of prevailing with respect to at least one challenged claim. Accordingly, we grant the Petition and institute an *inter partes* review.

A. *Real Parties-in-Interest*

Petitioner identifies itself as the real parties-in-interest. Pet. 2. Patent Owner identifies itself as the real party-in-interest. Paper 6, 2.

B. *Related Proceedings*

The parties identify the following legal proceedings as involving the ’516 patent:

Maxeon Solar Pte. Ltd. v. Canadian Solar Inc. 2-24-cv-00210 (E.D. Texas) (“*Canadian Solar*”)

Maxeon Solar Pte. Ltd. v. Hanwha Solutions Corp., 2-24-cv-00262 (E.D. Texas) (“parallel litigation”)

Maxeon Solar Pte. Ltd. v. REC Solar Holdings AS, 2-24-cv-00260 (E.D. Texas)

Pet. 2–3; Paper 6, 2.

Patent Owner further identifies IPR2024-01039 (U.S. Patent No. 8,222,516) as a related matter. Paper 6, 2.

C. The ’516 patent

The ’516 patent, titled “Front Contact Solar Cell with Formed Emitter,” issued on July 17, 2012. Ex. 1001, codes (45), (54). The ’516 patent discloses “structures for a relatively efficient and cost-effective front contact solar cell and processes for manufacturing [the] same.” *Id.* at 1:40–42. The ’516 patent explains that a solar cell includes P-type and N-type diffusion regions that form a junction, and metal contacts that allow an external circuit to be coupled to and powered by the solar cell. *Id.* at 1:22–30. In a backside solar cell, both the diffusion regions and the metal contacts coupled to them are on the backside of the solar cell. *Id.* at 1:26–28. In a front contact solar cell, at least one of the metal contacts is on the front side of the solar cell, which is the side that faces the sun to collect solar radiation. *Id.* at 1:31–35. The ’516 patent shows one embodiment of its solar cell in Figure 1, reproduced below.

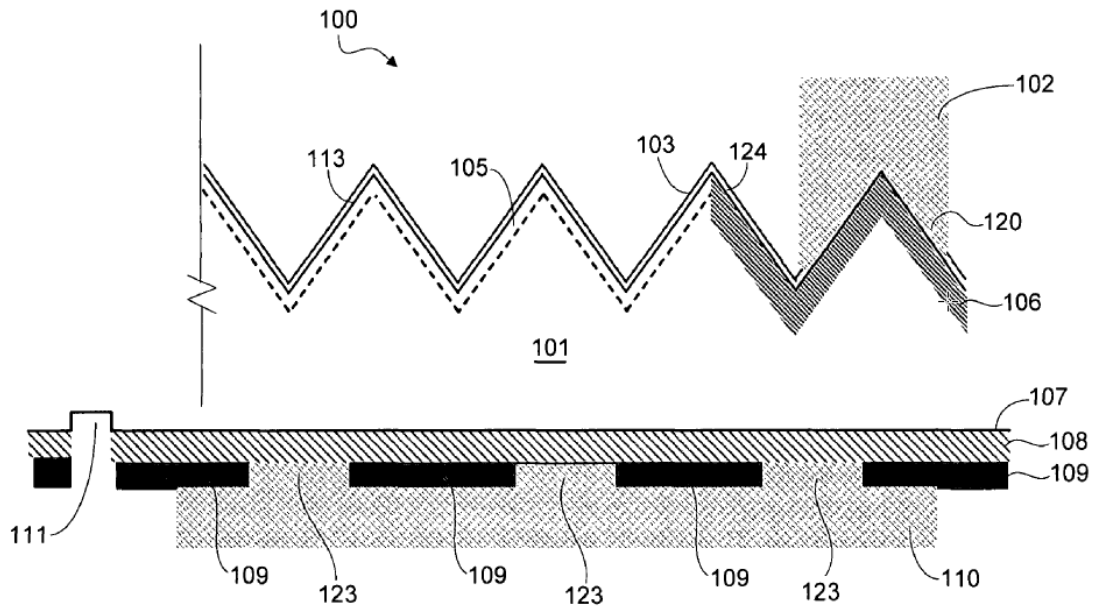


Figure 1 shows a cross-section of a front contact solar cell 100 having metal contact 102 on its front side, which faces the sun during normal operation, and metal contact 110 on its backside. *Id.* at 2:22–27. Solar cell 100 also includes N-type silicon substrate 101, tunnel oxide layer 107, polysilicon emitter 108, silicon dioxide layer 109, contact holes 123, and edge isolation trench 111. *Id.* at 2:28–31, 2:57–58, 2:66–3:2, 3:22–25. The front side of silicon substrate 101 is randomly textured (labeled as 113) and includes N-type doped regions 105 and 106, contact hole 120, and passivating oxide layer 124. *Id.* at 2:36–38, 2:53–56, 3:28–30.

D. Illustrative Claim

Petitioner challenges claims 1–12 of the '516 patent. Independent claims 1 and 9 are representative of the challenged claims and are reproduced below with Petitioner's annotations¹:

¹ For convenience, we adopt Petitioner's annotated claim format.

9. [pre] 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:

[9.a] a substrate having a textured front surface;

[9.b] an emitter layer formed over a back surface of the substrate, the emitter layer forming a backside junction with the substrate;

[9.c] an oxide layer formed between the back surface of the substrate and the emitter layer;

[9.d] a first metal contact making an electrical connection to the substrate on the front side of the solar cell; and

[9.e] a second metal contact making an electrical connection to the emitter layer on the backside of the solar cell,

[9.f] the first metal contact and the second metal contact being configured to allow an external electrical circuit to be powered by the solar cell.

Ex. 1001, 6:42–57.

1. [pre] 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:

[1.a] an N-type silicon substrate;

[1.b] a textured surface on the N-type silicon substrate on the front side of the solar cell;

[1.c] an antireflective layer over the textured surface of the N-type silicon substrate;

[1.d] a P-type polysilicon emitter formed over the N-type silicon substrate and forming a backside junction with the N-type silicon substrate;

[1.e] an oxide layer formed between the P-type polysilicon emitter and the N-type silicon substrate;

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

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

Id. at 6:4–22.

E. The Asserted Unpatentability Challenges

Petitioner asserts that claims 1–12 would have been unpatentable based on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–4, 6–12	103	Froitzheim, ² Gan ³
5	103	Froitzheim, Gan, Sheats ⁴
1–4, 6–12	103	Froitzheim, Borden ⁵
5	103	Froitzheim, Borden, Sheats
1, 2, 8–11	103	Li ⁶ and Gan

² EP 1732142 A1, published Dec. 13, 2006 (Ex. 1004, “Froitzheim”).

³ J.Y. Gan et al., *Polysilicon Emitters for Silicon Concentrator Solar Cells*, The Conference Record of the Twenty First IEEE Photovoltaic Specialists Conference–1990, Vol. 1, pp. 245–250 (Ex. 1005, “Gan”).

⁴ US Pub. No. US 2006/0157103 A1, issued July 20, 2006 (Ex. 1012, “Sheats”).

⁵ WO 2009/094575 A2, published July 30, 2009 (Ex. 1006, “Borden”). Petitioner alleges that Borden claims priority to a provisional application and is prior art as of January 24, 2008. Pet. 6.

⁶ CN 1949545 A, published April 18, 2007 (Ex. 1008 (translation), “Li”).

Pet. 7. Petitioner also relies on declaration testimony of Dr. Zachary Holman (Ex. 1003).

II. ANALYSIS

A. *Principles of Law*

In an *inter partes* review, “the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (2012) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to the patent owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

Obviousness is a question of law based on underlying determinations of fact. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966); *Richardson-Vicks, Inc. v. Upjohn Co.*, 122 F.3d 1476, 1479 (Fed. Cir. 1997). A claim is unpatentable as obvious, under 35 U.S.C. § 103, if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time of the invention to a person having ordinary skill in the art. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence

of nonobviousness.⁷ *Graham*, 383 U.S. at 17–18. Consideration of the *Graham* factors “helps inform the ultimate obviousness determination.” *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1048 (Fed. Cir. 2016) (en banc), *cert. denied*, 138 S. Ct. 420 (2017). Subsumed within the *Graham* factors are the requirements that all claim limitations be found in the prior art references and that the skilled artisan would have had a reasonable expectation of success in combining the prior art references to achieve the claimed invention. *Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1361 (Fed. Cir. 2007). “Obviousness does not require absolute predictability of success . . . all that is required is a reasonable expectation of success.” *In re O’Farrell*, 853 F.2d 894, 903–04 (Fed. Cir. 1988) (citations omitted). But, a petitioner cannot satisfy its burden of proving obviousness by employing “mere conclusory statements.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

We analyze the challenges presented in the Petition in accordance with the above-stated principles.

B. Level of Ordinary Skill in the Art

We review the grounds of unpatentability in view of the understanding of a person of ordinary skill in the art at the time of the invention. *Graham*, 383 U.S. at 17.

Petitioner contends that a person of ordinary skill in the art had (i) an advanced degree in electrical engineering, mechanical engineering, applied physics, chemistry, materials science, or a related discipline and (ii) at least one year of experience designing, developing, or researching the design and/or

⁷ At this time, neither Petitioner nor Patent Owner address objective indicia of nonobviousness.

manufacture of solar cells or related technologies. Alternatively, a POSITA would have had (i) a bachelor's degree in the aforementioned disciplines and (ii) at least two years of experience designing, developing, or researching the design and/or manufacture of solar cells or related technologies. Less work experience may be compensated by a higher level of education, and vice versa.

Pet. 17 (citing Ex. 1003 ¶¶ 36–41).

Patent Owner also states that “[f]or purposes of this Preliminary Response, [Patent Owner] applies [Petitioner’s] level of ordinary skill.” Prelim. Resp. 6.

In light of the record before us, and for purposes of this Decision, we adopt Petitioner’s proposal regarding the level of ordinary skill in the art. Based on our review of the ’516 patent and the prior art of record, we determine that the definition offered by Petitioner comports with the qualifications a person would have needed to understand the ’516 patent and the prior art. We will make any final determination pertaining to the level of ordinary skill in the art, however, on the full trial record.

C. Claim Construction

We construe claim terms according to the standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–17 (Fed. Cir. 2005) (en banc); 37 C.F.R. § 42.100(b). Under *Phillips*, we give claim terms “their ordinary and customary meaning.” *Phillips*, 415 F.3d at 1312. “[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.” *Id.* at 1313. “Importantly, the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular

claim in which the disputed term appears, but in the context of the entire patent, including the specification.” *Id.*

Petitioner contends that “[t]he claims should be given their plain and ordinary meaning to resolve the issues in this proceeding.” Pet. 18 (citing Ex. 1003 ¶¶ 99–102).

Patent Owner does not address claim construction at this time. *See generally* Prelim. Resp.

For purposes of this Decision, we need not expressly construe any claim terms. *See Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (holding that “only those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy”); *see also Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs.* in the context of an *inter partes* review).

*D. Discretion Under 35 U.S.C. § 314(a)*⁸

We have discretion to deny a petition for *inter partes* review under § 314(a). *See* 35 U.S.C. § 314(a) (stating “[t]he Director may not authorize an *inter partes* review to be instituted unless”); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2140 (2016) (“[T]he agency’s decision to deny

⁸ Petitioner also preemptively argues that “[d]iscretionary denial under §325 is unwarranted because each *Advanced Bionics* weighs against denial.” Pet. 96. Specifically, Petitioner argues that “the Petition presents prior art and arguments that were not previously considered” and the Petitioner presents evidence—i.e., Dr. Holman’s declaration and other evidence relating to the knowledge of a person of ordinary skill in the art—that was not previously considered by the Patent Office. *Id.* at 96–97. Because Patent Owner does not address the applicability of § 325(d) (*see generally* Prelim. Resp.), we do not consider whether § 325(d) applies.

a petition is a matter committed to the Patent Office’s discretion.”); *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016) (“First of all, the PTO is permitted, but never compelled, to institute an [inter partes review] proceeding.” (citing 35 U.S.C. § 314(a))). “[E]vents in other proceedings related to the same patent, either at the Office, in district courts, or the ITC,” may favor “denying a petition even though some claims meet the threshold standards for institution under 35 U.S.C. §§ 314(a).” Consolidated Trial Practice Guide (“Practice Guide”)⁹ at 58 n.2 (citing *NHK Spring Co., Ltd. v. Intri-Plex Techs., Inc.*, IPR2018-00752, Paper 8 at 11–21 (PTAB Sept. 12, 2018) (precedential) (footnote omitted)). In weighing whether to exercise discretion, we balance, *inter alia*, the following factors:

1. whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted;
2. proximity of the court’s trial date to the Board’s projected statutory deadline for a final written decision;
3. investment in the parallel proceeding by the court and the parties;
4. overlap between issues raised in the petition and in the parallel proceeding;
5. whether the petitioner and the defendant in the parallel proceeding are the same party; and
6. other circumstances that impact the Board’s exercise of discretion, including the merits.

Apple Inc. v. Fintiv, IPR2020-00019, Paper 11 at 6 (PTAB Mar. 20, 2020). “These factors relate to whether efficiency, fairness, and the merits support the exercise of authority to deny institution in view of an earlier trial date in the parallel proceeding.” *Id.* In evaluating these factors, we take “a holistic

⁹ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

view of whether efficiency and integrity of the system are best served by denying or instituting review.” *Id.* (citing Practice Guide 58).

Patent Owner argues the Board should exercise its discretion and deny the Petition under 35 U.S.C. § 314(a). Prelim. Resp. 32–34.

We address the application of the *Fintiv* factors below.

1. *whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted*

The first *Fintiv* factor requires consideration of whether the district court has stayed or will stay the proceeding pending *inter partes* review. “A district court stay of the litigation pending resolution of the PTAB trial allays concerns about inefficiency and duplication of efforts.” *See Fintiv*, Paper 11 at 6. Where a stay has been entered, we weigh this factor strongly against exercising discretion to deny instituting review. *Id.*

As of the date of the Preliminary Response, neither party filed a motion to stay. Prelim. Resp. 34. Petitioner represents that it “intends to request a stay after institution, and Judge Gilstrap often grants such requests where institution predates *Markman* and the IPR is likely to simplify, the issues in the district court.” Prelim. Reply 1. Petitioner explains that “[b]oth circumstances apply here.” *Id.* Petitioner’s recently updated Mandatory Disclosures indicate that it filed a motion to stay the parallel litigation on February 7, 2025. Paper 15, 4.

Patent Owner asserts that “the result of any . . . motion is pure speculation. And where IPRs are instituted for less than all asserted patents, Judge Gilstrap regularly denies a stay, increasing the speculative nature of Petitioner’s assertion.” Prelim. Sur-reply 1. Patent Owner urges the Board to “decline to infer . . . how the District Court would rule” on any such motion to stay. *Id.*; Prelim. Resp. 34.

We agree with Patent Owner and decline to speculate on how Judge Gilstrap may rule on a motion for a stay. Accordingly, we determine that *Fintiv* factor 1 is neutral.

2. *proximity of the court’s trial date to the Board’s projected statutory deadline for a final written decision*

Under the second *Fintiv* factor, “[i]f the [district] court’s trial date is earlier than the projected statutory deadline, the Board generally has weighed this fact in favor of exercising authority to deny institution.” *See Fintiv*, Paper 11 at 9.

Patent Owner argues that trial for the parallel district court litigation is scheduled for May 4, 2026, but, “trial in the *Canadian Solar* proceeding is scheduled for January 26, 2026, more than a month prior to the Board’s projected statutory deadline here.” Prelim. Resp. 35. Patent Owner asserts that the timeline of the *Canadian Solar* trial favors denial of institution in this case. *Id.*

Petitioner contends that the final written decision in this *inter partes* review is “more than two months **before** trial.” Prelim. Reply 2. Petitioner argues that Patent Owner’s reliance on the *Canadian Solar* trial date is misplaced because the instant Petition includes references and grounds not present in *Canadian Solar* and therefore that trial “will **not** address the non-overlapping grounds presented” here. *Id.*

The Guidance Memorandum¹⁰ states that “[t]he PTAB will weigh this factor against exercising discretion to deny institution under *Fintiv* if the

¹⁰ USPTO Memorandum, Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation, 2 (June 21, 2022) (“Guidance Memorandum”). The Interim Procedure is available under the “Guidance Memorandum” heading on the “Resources and

median time-to-trial is . . . after the projected statutory deadline for the PTAB’s final written decision.” Guidance Memorandum at 9. Because the evidence demonstrates that the companion trial date of May 4, 2026, supported by the median time-to-trial data, is more than two months after projected deadline for the Final Written Decision in this proceeding, we determine that *Fintiv* factor 2 weighs against exercising our authority to deny institution.

We acknowledge Patent Owner’s arguments relating to the *Canadian Solar* trial date but are not persuaded.¹¹ The Petitioner in the instant *inter partes* review is not a party in the *Canadian Solar* litigation. Further, unlike the *TCO AS*¹² proceeding cited by Patent Owner, the *Canadian Solar* litigation will not resolve all issues in the instant *inter partes* review as there is not complete overlap of claims or issues.

Accordingly, factor 2 weighs against exercising our authority to deny institution.

guidance” page for the Patent Trial and Appeal Board, located at <https://www.uspto.gov/patents/ptab/resources>.

¹¹ We note that the Board instituted trial in the companion *inter partes* review to the *Canadian Solar* litigation. See *Canadian Solar Inc. et al. v. Maxeon Solar Pte. Ltd.*, IPR2024-01039, Paper 13 (PTAB Jan. 14, 2025). The final written decision in IPR2024-01039 will issue before the *Canadian Solar* trial date of January 26, 2026.

¹² *TCO AS v. NCS Multistage Inc.*, PGR2020-00077, Paper 16 at 11–12 (PTAB Feb. 18, 2021) (“Petitioner does not dispute that the trial in the Nine litigation will address the invalidity challenges that are presented in the Petition.”).

3. *investment in the parallel proceeding by the court and the parties*

Under this factor, we first consider Petitioner’s timing in filing the Petition. If a petitioner, “faced with the prospect of a looming trial date, waits until the district court trial has progressed significantly before filing a petition,” that decision “may impose unfair costs to a patent owner.” *Fintiv*, Paper 11 at 11. On the other hand, “[i]f the evidence shows that the petitioner filed the petition expeditiously, such as promptly after becoming aware of the claims being asserted, this fact has weighed against exercising the authority to deny institution.” *Id.* We then consider “the amount and type of work already completed in the parallel litigation by the [district] court and the parties at the time of the institution decision. Specifically, if at the time of the institution decision, the district court has issued substantive orders related to the patent at issue in the petition, this fact favors denial.” *See Fintiv*, Paper 11 at 9–10 (footnote omitted). Thus, the more advanced the parallel proceeding, the less likely we are to institute an *inter partes* review. *Id.* at 10.

Petitioner argues that it “diligently filed its petition fewer than four months after Maxeon filed its complaint—before receiving Maxeon’s infringement contentions and entry of a scheduling order—and the district court has not issued any substantive orders relating to the [challenged patent].” Prelim. Reply 3. According to Petitioner, the Markman hearing is scheduled for November 2025, fact discovery closes in November 2025, expert discovery concludes in January 2026, and dispositive motions are scheduled to be briefed in February 2026—long after institution. *Id.* Petitioner further contends that “none of the completed or ongoing work identified by [Patent Owner] . . . relates to invalidity” and Patent Owner’s

reliance on the *Canadian Solar* litigation “is again inapposite because the [Canadian Solar] trial will not ‘involve[] the same . . . arguments’ as [Petitioner’s] petition.” *Id.*

Patent Owner states that the district court proceeding “is in its early stages but the parties have already been substantially engaged prior to [Petitioner’s] answer/response deadline.” Prelim. Resp. 36. For example, Patent Owner contends that Petitioner “sought early dismissal of one of the named defendants,” a motion to transfer venue has been filed, limited discovery on the issue of venue has been granted, and Patent Owner has served its infringement contentions. *Id.* Patent Owner contends that in *Sand Revolution*,¹³ “*Fintiv* factor 3 did not weigh against exercising discretion to deny institution despite the fact that ‘fact discovery [was] still ongoing, expert reports [were] not yet due, and substantive motion practice [was] yet to come.’” Prelim. Sur-reply 3. In addition, Patent Owner alleges that discovery is proceeding in the *Canadian Solar* litigation. Prelim. Resp. 37. Patent Owner argues that the *Canadian Solar* litigation is relevant because “there is significant overlap in the asserted grounds.” Prelim. Sur-reply 3. Thus, Patent Owner reasons that this factor favors denial of institution or is neutral. *Id.*; Prelim. Resp. 37.

We disagree with Patent Owner. In *Sand Revolution*, the Board considered facts including that the parties exchanged infringement and invalidity contentions, and the district court decided a motion to dismiss, conducted a *Markman* hearing and entered a related order, and determined that “the parties have not invested substantially in the merits of the invalidity

¹³ See, e.g., *Sand Revolution II, LLC v. Cont’l Intermodal Grp. – Trucking LLC*, IPR2019-01393, Paper 24 at 10-11 (P.T.A.B. June 16, 2020).

position.” *Sand Revolution*, Paper 24 at 10. The Board explained that aside from the “*Markman* Order, much of the district court’s investment relates to ancillary matters untethered to the validity issue itself” and determined that “this factor *weighs only marginally, if at all*, in favor of exercising discretion to deny institution.” *Id.* at 10–11 (emphasis added). Here, the *Markman* hearing is not scheduled to occur until November 2025. And although the parties have invested some resources, none of the ongoing work identified relates to invalidity and much work remains to be done in the district court case. The district court litigation appears to be in an early stage, there is no evidence that the district court has issued any substantive orders related to the ’516 patent or the prior art set forth in the Petition, and there is evidence that Petitioner filed its Petition expeditiously. Prelim. Reply 1–2; *see Fintiv*, Paper 11 at 9–11. On this record, we are also not persuaded that the status of the *Canadian Solar* litigation is relevant to our determination here. Thus, we determine that *Fintiv* factor 3 weighs strongly against exercising our authority to deny institution.

4. *overlap between issues raised in the petition and in the parallel proceeding*

The fourth *Fintiv* factor requires consideration of “inefficiency and the possibility of conflicting decisions.” *See Fintiv*, Paper 11 at 12. Therefore, “if 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.” *Id.* (footnote omitted). The *Fintiv* panel acknowledged that “the degree of overlap is highly fact dependent” and encouraged the parties to “indicate whether all or some of the claims challenged in the petition are also at issue in [the] district court.” *Id.* at 13. This concern, however, may be mitigated where a petitioner agrees not to

pursue in the parallel district court litigation the grounds advanced in the petition. *Sand Revolution*, Paper 24 at 11. The breadth of the stipulation affects the weight given in the discretionary denial analysis. For example, a petitioner stipulating not to pursue the “same grounds” presented in a petition only *marginally* favors not exercising our discretion to deny institution whereas a petitioner stipulating not to pursue “any ground raised or that could have been raised” weighs *strongly* in favor of not exercising discretionary denial. *Id.* at 11–12; *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 at 18–19 (PTAB December 1, 2020) (precedential as to § II.A) (“*Sotera*”).

Petitioner contends this *inter partes* review “include[s] claims that do **not** overlap with the claims asserted in [Patent Owner’s] complaint and infringement contentions” in the parallel litigation. Prelim. Reply 4. Petitioner further argues that Patent Owner’s “reliance on [Petitioner’s] invalidity counterclaim to show alleged overlap is premature and not informative of the identity of issues because [Petitioner’s] invalidity contentions are not due for nearly two months.” *Id.*

Patent Owner argues that even though invalidity contentions have not been submitted, “all but one secondary reference (U.S. Patent Appl. Pub. No. 2006/0157103 to Sheats; EX1012) have been identified by [Petitioner] in its counterclaim for invalidity” in the parallel litigation. Prelim. Resp. 37–38. Furthermore, Patent Owner contends that there is “significant overlap with the asserted ground here and those presented in the *Canadian Solar* district court proceeding and the co-pending IPR filed by Canadian Solar.” *Id.* at 38; Prelim. Sur-reply 3. Patent Owner explains that the fact there is not complete overlap of claims is not dispositive. Prelim. Sur-reply

4 (citing *Samsung Display Co., Ltd. v. Pictiva Displays Int’l Ltd.*, IPR2024-00855, Paper 12 at 10–11 (PTAB Nov. 19, 2024)). According to Patent Owner, “substantially the same substantive issues apply to both the asserted claims 9–12 and unasserted claims 1–8” because Petitioner incorporates the analysis for claim 9 when discussing claim 1. *Id.* Lastly, Patent Owner asserts that Petitioner “could have, but did not, provide any stipulation here, *Sotera* or otherwise.” Prelim. Resp. 38; Prelim. Sur-reply 4.

While some overlap of issues may exist, complete overlap does not exist and resolution of the companion trial will not address the non-overlapping claims. Furthermore, that Petitioner did not provide any stipulation is not determinative here as a stipulation is not required. *Fintiv*, Paper 11 at 13 (“the degree of overlap is highly fact dependent”); Guidance Memorandum 7. Accordingly, we determine that *Fintiv* factor 4 weighs slightly against exercising our authority to deny institution.

5. *whether the petitioner and the defendant in the parallel proceeding are the same party*

According to the fifth *Fintiv* factor, “[i]f a petitioner is unrelated to a defendant in an earlier [district] court proceeding, the Board has weighed this fact against exercising discretion to deny institution.” *See Fintiv*, Paper 11 at 13–14.

When the petitioner and the defendant in the parallel proceeding are the same, this tends to support discretionary denial. *See Sotera* at 19. Based on the present record, we consider *Fintiv* factor 5 to favor discretionary denial.

6. *other circumstances that impact the Board's exercise of discretion, including the merits*

Lastly, “all the relevant circumstances,” including the merits, are considered in assessing whether to exercise discretion to deny institution of *inter partes* review. *Fintiv*, Paper 11 at 14. “[A]ll the relevant circumstances” may include the merits of Petitioner’s underlying challenges. *Id.* at 14–15.

For example, if the merits of a ground raised in the petition seem particularly strong on the preliminary record, this fact has favored institution. In such cases, the institution of a trial may serve the interest of overall system efficiency and integrity because it allows the proceeding to continue in the event that the parallel proceeding settles or fails to resolve the patentability question presented in the PTAB proceeding.

Id. (footnotes omitted).

The Director has instructed “PTAB panels to only consider compelling merits if they first determined that *Fintiv* factors 1–5 favored a discretionary denial.” *CommScope Techs. LLC v. Dali Wireless, Inc.*, IPR2022-01242, Paper 23 at 4–5 (PTAB Feb. 27, 2023) (decision on Director review) (precedential). Here, we determine that *Fintiv* factor 1 is neutral, factors 2 through 4 all weigh against exercising our discretion to deny institution, and factor 5 weighs in favor of discretionary denial. Accordingly, when considered in combination, *Fintiv* factors 1–5 do not favor discretionary denial, and we do not consider the question of compelling merits.

7. *summary*

We consider the above factors and take “a holistic view of whether efficiency and integrity of the system are best served by denying or instituting review.” *Fintiv*, Paper 11 at 6; Guidance Memorandum. On this

record, after weighing all of the factors and taking a holistic view, we determine that the facts presented weigh against exercising our discretion to deny institution under 35 U.S.C. § 314(a).

E. Challenges Based on Froitzheim and Gan

Petitioner alleges that claims 1–4 and 6–12 of the ’516 patent would have been obvious over the combination of Froitzheim and Gan. Pet. 7, 27–60. In addition, Petitioner contends that claim 5 of the ’516 patent would have been obvious over the combination of Froitzheim and Gan in further view of Sheats. Pet. 7, 60–63.

1. Overview of Froitzheim (Ex. 1004)

Froitzheim is directed to solar cells and a method of manufacturing solar cells that addresses light induced degradation of boron doped base layers in solar cells. Ex. 1006 ¶¶ 1, 3. Froitzheim discloses a solar cell comprising an Si layer of n-type bulk doping having a front side and a rear side, a non-alloyed p-type doped region at the rear side of the body layer and forming a p/n-junction with the rear side, a rear side contact in electrical connection with the p-type doped region, and a front side contact in electrical connection with the n-type silicon body layer. *Id.* ¶ 10. According to Froitzheim, “the use of n-type Si as [the] body layer overcomes the degradation problem of conventional solar cells with a boron doped body layer.” *Id.* ¶ 13. Froitzheim also teaches that “etching can be used to texture the surface in order to improve the geometry of incidence of light in order to prevent reflection.” *Id.* ¶ 39.

2. *Overview of Gan (Ex. 1005)*

Gan is directed to a study of polysilicon emitters with a thermally grown interfacial oxide layer. Ex. 1005, 245. Gan explains that the oxide is not thermally stable, and “tends to break up during high temperature anneals,” which has a “direct impact on both majority and minority carrier transport in the polysilicon emitter.” *Id.* Gan was interested in the performance of polysilicon emitters “when only a small fraction of the interfacial oxide is broken,” and determined that “the cell performance can be improved” under certain circumstances. *Id.* Gan concluded that polysilicon emitters with improved performance “can be obtained with a very small fraction of interfacial oxide breakup,” and that “polysilicon emitters with these qualities can be quite useful for silicon concentrator solar cells.” *Id.* at 249.

3. *Overview of Sheats (Ex. 1012)*

Sheats is directed to an optoelectronic device, such as a solar cell, developed with electrically isolated conductive contacts. Ex. 1012 ¶ 2. Sheats teaches a solar cell having “an isolation trench 516” “formed through the transparent conductive layer and the active layer to the bottom electrode 506.” *Id.* ¶ 59. Isolation trenches are taught to electrically isolate undesirable short circuits formed on an outside wall of the trench. *Id.* The isolation trench surrounds the closed-loop trench and electrically isolates the short circuits on the outside wall of the trench from the rest of the structure. *Id.*

4. *Analysis of Claim 9*

Petitioner alleges that the combination of Froitzheim and Gan renders claim 9 of the ’516 patent obvious. Pet. 27–54. According to Petitioner,

Froitzheim “teaches a solar cell with a front and rear side opposite one another,” and “that ‘[d]uring normal operation of the solar cell 1 the front side 6 faces the sun and light is received through the area of the front surface that is not covered by the front contact 16.’” *Id.* at 38 (citing Ex. 1004 ¶¶ 24, 32–33, Figs. 1, 3, Abstr., claim 1; Ex. 1003, ¶¶ 146–147). Petitioner alleges that Froitzheim “includes ‘a silicon body layer 3 of n-type bulk doping’ that ‘is made from crystalline silicon’” and that “alkaline crystal-oriented etching can be used to texture the surface [of the n-type silicon layer] in order to improve the geometry of incidence of light in order to prevent reflection.” *Id.* at 38–39 (citing Ex. 1004 ¶¶ 10–13, 23–24, 39, 56, 87, Abstr.; Ex. 1003 ¶¶ 148–152). Petitioner further contends that “Froitzheim teaches a ‘rear junction solar cell’ that contains a ‘p-doped layer 10’ on the rear side of the n-type silicon layer to form ‘a p/n-junction’ and that a person of ordinary skill in the art “would have understood that the p-type doped region is the emitter, including because it forms ‘a p/n-junction’ with the n-type silicon layer.” *Id.* at 40 (citing Ex. 1004 ¶¶ 10–13, 24–26, 33, Figs. 1, 3, Abstr., claim 1; Ex. 1003 ¶¶ 153–157). Petitioner further contends that Gan also teaches “a P-type polysilicon emitter that is formed over a silicon substrate to create a junction” and replacing “a diffused emitter with a P-type polysilicon emitter” to improve performance. *Id.* at 41 (citing Ex. 1005 ¶¶ 245–246; Ex. 1003 ¶ 156). Petitioner asserts that Gan describes “a solar cell structure that includes a ‘polysilicon emitter with a thermally grown interfacial oxide’ (i.e., *oxide layer*) over a silicon substrate” located “between a p-type emitter and silicon substrate” to improve efficiency. *Id.* at 42 (citing Ex. 1005 ¶¶ 245–246, 249; Ex. 1003 ¶¶ 158–160). Petitioner also argues that “Froitzheim’s solar cell includes ‘screen-

printed front side contacts 16 [(purple) (i.e., first metal contact) that are] in electrical connection with the n-type silicon body layer” and “screen-printed ‘rear side contact 35 [(red)]’ (i.e., second metal contact) that is ‘arranged in electrical connection with the p-doped layer 10’ (i.e., emitter).” *Id.* at 43–44 (citing Ex. 1004 ¶¶ 10, 27–28, 33–34, 48–49, 60, Figs. 1, 3, Abstr.; Ex. 1003 ¶¶ 102–166). Petitioner explains that a person of ordinary skill in the art would understand that Froitzheim’s screen-printed front and backside contacts are metal contacts formed of a paste that contains silver and aluminum. *Id.* at 45 (citing Ex. 1004 ¶¶ 20, 49; Ex. 1003 ¶ 167; Ex. 1045, 234–239). Lastly, Petitioner alleges that “[a]s Froitzheim explains, its ‘[f]ront and rear side contacts are arranged that are in electrical connection with the n-doped layer and the p-doped base layer, respectively, to **withdraw a photocurrent from both sides of the p/n-junction**’ and thus power an external electrical circuit.” *Id.* at 46 (citing Ex. 1004 ¶¶ 2, 61–93; Ex. 1003 ¶¶ 169–172; Ex. 1016, 14).

According to Petitioner, Froitzheim and Gan are analogous art because “[b]oth are in the same field as the Challenged Claims (solar cells) and are reasonably pertinent to solving the problems addressed in the Challenged Claims (increasing efficiency) with the same types of solutions (optimizing solar cell configuration).” Pet. 28 (citing Ex. 1004 ¶¶ 1–9; Ex. 1005, 245–249; Ex. 1003 ¶ 123); *see also id.* at 62 (arguing Sheats is analogous art for similar reasons). Petitioner alleges that a person of ordinary skill in the art would have had reason to combine the teachings of Froitzheim and Gan to achieve a more efficient solar cell, even if additional manufacturing steps or components were needed to incorporate Gan’s oxide layer and polysilicon emitter in Froitzheim’s solar cell. *Id.* at 35.

Specifically, Petitioner contends that “Gan teaches that a solar cell’s ‘performance can be improved if [a] diffused-emitter [(like Froitzheim’s diffused-emitter)] is replaced with [a] polysilicon emitter.” *Id.* at 30 (citing Ex. 1005, 245) (emphasis omitted). According to Petitioner, Gan “observes that the combination of a polysilicon emitter and oxide layer structure had lower recombination and contact resistance as compared to diffused-emitters,” and, therefore, solar cell efficiency is improved, which is “quite useful for silicon solar cells.” *Id.* at 30–31 (citing Ex. 1005, 245–246, 248–249, Fig. 6; Ex. 1003 ¶¶ 127–128, 131). Petitioner explains that Gan states its teachings are applicable to p-type emitters and silicon substrates as well as backside PN junctions like Froitzheim. *Id.* at 32 (citing Ex. 1005, 246, 248–249; Ex. 1004 ¶¶ 10–11; Ex. 1003 ¶ 130). Therefore, a person of ordinary skill in the art “would have understood that replacing Froitzheim’s diffused emitter with a polysilicon emitter and oxide layer structure as taught by Gan was simply applying a known technique to a similar device ready for improvement to yield predictable results.” *Id.* at 33 (citing Ex. 1005, 246, 248–249; Ex. 1003 ¶¶ 130–132).

Additionally, Petitioner contends that the ordinarily skilled artisan would have had reason to combine Froitzheim and Gan because: (1) both “teach similar and compatible solar cells” (*id.* at 34 (citing Ex. 1004 ¶¶ 10–11, 42; Ex. 10005, 246; Ex. 1003 ¶ 135)); (2) including the polysilicon emitter and oxide structure of Gan in Froitzheim would have been a “simpl[e] substitut[ion of] one known element for another to obtain predictable results” (*id.* at 34, 36 (citing Ex. 1005, 246; Ex. 1006 ¶¶ 26–27; Ex. 1004 ¶ 30; Ex. 1015, 2:50–53; Ex. 1003 ¶ 136)); (3) “implementing a polysilicon emitter and oxide structure in Froitzheim was a simple design

choice” (*id.* at 35 (citing Ex. 1003 ¶ 137)); and (4) “numerous prior art references similarly teach the benefits of using an oxide layer with a polysilicon emitter” (*id.* (citing Ex. 1006 ¶¶ 16, 22; Ex. 1034; Ex. 1046, 1125; Ex. 1023, 3:61–64; Ex. 1042 ¶ 46; Ex. 1039, 463; Ex. 1003 ¶¶ 138–141)).

Petitioner asserts that a reasonable expectation of success exists in the combination of Froitzheim and Gan. Pet. 36. In particular, Petitioner states that a person of skill in the art would have known how to replace the diffused emitter in Froitzheim with the polysilicon emitter and oxide layer described in Gan using known methods. *Id.* at 37. For example, Petitioner contends that a person of ordinary skill in the art

would have understood that instead of diffusing boron into the substrate’s back side as taught by Froitzheim, a POSITA would instead follow the manufacturing technique taught by Gan. That is, a POSITA would have grown an interfacial oxide layer on the substrate’s back side, created a polysilicon layer over the oxide layer on the substrate’s back side, and then doped the polysilicon layer instead of the substrate to form the polysilicon emitter.

Id. at 37 (citing Ex. 1005, 246; Ex. 1003 ¶ 142; Ex. 1006 ¶ 22; Ex. 1046, Abstr., 1121). Petitioner explains that because both Froitzheim and Gan describe a “thermal drive-in diffusion process and overlapping ranges,” a person of ordinary skill in the art “would have thus appreciated the references have compatible manufacturing steps.” *Id.* at 36 (citing Ex. 1004 ¶ 42; Ex. 1005, 246; Ex. 1003 ¶ 143).

Patent Owner, at this time, does not challenge many of Petitioner’s allegations regarding the teachings of Froitzheim and Gan. *See generally* Prelim. Resp. Instead, Patent Owner argues that Petitioner

(1) fails to establish why a [person of ordinary skill in the art] would have applied art relating to a concentrator solar cell (i.e., Gan) to Froitzheim’s conventional solar cell, and (2) fails to establish that a [person of ordinary skill in the art] would have

had a reasonable expectation that Gan's polysilicon emitter and oxide layers could be successfully incorporated into Froitzheim's conventional solar cell in the manner proposed.

Prelim. Resp. 9.

On this preliminary record, Petitioner's unchallenged arguments and evidence are sufficient for purposes of institution. We address Patent Owner's arguments below.

a) Whether Petitioner has shown a reason to combine Froitzheim and Gan

Patent Owner contends that Petitioner fails to show that a person of ordinary skill in the art would have had reason to combine the teachings of Froitzheim and Gan because Petitioner's position rests on a purported mischaracterization of "Gan as 'broadly suggest[ing] that its polysilicon emitter and oxide layer structure are generally 'useful for silicon solar cells.'" Prelim. Resp. 10. Patent Owner asserts that Gan's teachings are limited to "concentrator solar cells" and not solar cells generally or "conventional solar cells," taught by Froitzheim. *Id.* at 10–16. Patent Owner explains that "the structure of Gan's "concentrator" solar cells differs significantly from "conventional" solar cells (i.e., Froitzheim)" and "instead of explaining *why* the structure of a concentrator solar cell is in any way applicable to Froitzheim's conventional solar cell structure," Petitioner and its declarant "rely[] only on the same single sentence of Gan, that 'a person of ordinary skill in the art would have understood that Gan's teachings are equally relevant for non-concentrator solar cells.'" *Id.* at 12 (citing Ex. 1005, 249; Ex. 1003 ¶ 131). Patent Owner alleges that a person of ordinary skill in the art would not have had reason to combine Gan's teachings with Froitzheim, which addresses conventional solar cells. Prelim. Resp. 10. According to Patent Owner, a person of ordinary skill in the art

“reading Gan as a whole” and in context, would not have understood that its teachings are generally applicable to all solar cells because “Gan concludes that ‘[from] the cell modeling, polysilicon emitters with these qualities can be quite useful for *silicon concentrator solar cells*.’” *Id.* at 13 (citing Ex. 1005, 249).

As additional support, Patent Owner contends that *another* Gan reference—the Gan Thesis¹⁴—“confirms that the authors of Gan were focused on improvements specific to concentrator solar cells (that is, without regard to conventional solar cells).” *Id.* at 14 (citing Ex. 2003, 1). Patent Owner argues that the “Gan Thesis thus confirms that Gan’s suggested replacement of a diffused emitter with a polysilicon emitter layer and an oxide layer is confined to the problem of addressing emitter recombination in concentrator solar cells, which are distinct in both structure and challenges from ‘conventional’ solar cells.” *Id.* at 15 (citing Ex. 2003, 1, 10; Ex. 1003 ¶ 131). Patent Owner reasons that because neither Petitioner nor its declarant explain why Gan’s teachings would apply to non-concentrator solar cell structures, their assertions are conclusory and insufficient to meet Petitioner’s burden of showing why a person of ordinary skill in the art would have had reason to combine the teachings of Froitzheim and Gan. *Id.* at 15–16.

On this record, we disagree and determine that Petitioner has established a reasonable likelihood that the skilled artisan would have modified Froitzheim in view of Gan’s teachings. Petitioner may rely on Gan

¹⁴ Jon-Yiew Gan, Polysilicon Emitters for Silicon Concentrator Solar Cells (July, 1990) (Ph.D. dissertation, Stanford University) (Ex. 2003, “the Gan Thesis”).

for all that it teaches to show obviousness, which is “consistent with the longstanding principle that the prior art must be considered for all its teachings, not selectively.” *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d. 1324, 1332 (Fed. Cir. 2019). Here, Gan appears to broadly suggest that replacing a diffused-emitter with a polysilicon emitter improves solar cell performance. For example, Gan states that “[t]he cell performance can be improved if the diffused-emitter is replaced with the polysilicon emitter, of which the J_o is less than $4.5 \times 10^{-13} \text{ A/cm}^2$ and the p_c is low enough.” Ex. 1005, 1. Patent Owner does not direct us to anything in Gan that suggests its teachings are inapplicable to conventional solar cells. *See generally* Prelim. Resp. In contrast, Gan’s introduction states that “[p]olysilicon emitters, because of their important applications in high speed bipolar transistors, have been widely studied,” which indicates broad applicability. Ex. 1005, 245. Further, Dr. Holman testifies that “although Gan references a concentrator solar cell—a category of solar cells that uses lenses, mirrors, and other components to focus (i.e., concentrate) sunlight on a cell (Ex.1016-Komp, 56–58)—a person of ordinary skill in the art would have understood that Gan’s teachings are equally applicable to non-concentrator solar cells.” Ex. 1003 ¶ 131. Dr. Holman declares that Gan’s “polysilicon emitter and oxide layer structure is ‘useful for silicon solar cells’” and “[p]ersons of ordinary skill in the art frequently looked at various solar cell designs and related technologies when evaluating how to improve a solar cell’s efficiency, which is exactly what Gan did when evaluating how to improve a cell’s design.” *Id.*

Patent Owner further contends that Petitioner’s replacement of a diffused emitter with a polysilicon emitter layer and an oxide layer is

contradicted *by another* Gan reference—the Gan Thesis. As an initial matter, Patent Owner has not made a sufficient showing, much less even alleged, that the Gan Thesis was publicly available at the time of invention. A person of ordinary skill in the art is presumed to know the teachings of “all the prior art in the field of his endeavor” at the time the invention was made. *Airbus S.A.S. v. Firepass Corporation*, 941 F.3d 1374, 1380 (Fed. Circ. 2019) (quoting *In re Wood*, 599 F.2d 1032, 1036 (CCPA 1979)). A reference is considered publicly accessible only if it was “disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art exercising reasonable diligence, can locate it.” *Kyocera Wireless Corp. v. Int’l Trade Comm’n*, 545 F.3d 1340, 1350 (Fed. Cir. 2008) (quoting *SRI Int’l, Inc. v. Internet Sec. Sys. Inc.*, 511 F.3d 1186, 1194 (Fed. Cir. 2008)). At best, Patent Owner presents some evidence that the Gan Thesis may be publicly available but no evidence to suggest *when* the Gan Thesis became publicly available.

For example, the Gan Thesis states that it was “submitted to the Department of Materials Science and Engineering and the Committee on Graduate Studies of Stanford University in partial fulfillment of the requirements for the degree of Doctor of Philosophy,” and bears a date of “July 1990.” Ex. 2003, 5. The Gan Thesis also bears a copyright notice “Copyright 1990, by Jon-Yiew Gan.” *Id.* at 6. The Gan Thesis also suggests that it has been reproduced by University Microfilms International (UMI) and has an “order number 9108821.” *Id.* at 1, 3. The copyright date of 1990 suggests that the document existed as of 1990, but does not indicate when the document became accessible to persons of ordinary skill in the art. This

is because a copyright notice *may* be evidence of publication¹⁵, but generally such a notice does not “establish when a document was publicly accessible under patent law.” *Stryker Corp. v. Karl Storz Endoscopy-Am., Inc.*, IPR2015-00677, Paper 15 at 18–19 (PTAB Sept. 2, 2015); *see also* *Microsoft Corp. v. Corel Software, LLC*, IPR2016-01083, Paper 14 at 13–14 (PTAB Dec. 1, 2016) (“The copyright notice, alone, however, sheds virtually no light on whether the document was publicly accessible as of that date, therefore additional evidence is typically necessary to support a showing of public accessibility.”). Furthermore, reproduction by UMI, without more, does not indicate when the Gan Thesis was received, published, or made accessible to the public.

Further, even assuming that the Gan Thesis would have been known to the skilled artisan at the time of invention, the Gan Thesis similarly suggests broad applicability of polysilicon emitters to conventional solar cells. The Gan Thesis states that “it appears that the cell efficiency can be increased more than one absolute percentage by eliminating the emitter recombination” and “[i]n order to do this, the emitter saturation current density (J_o), which characterizes the dopant-diffused region recombination, of both n- and p- type emitters has to be kept around 2×10^{-14} A/cm².” Ex. 2003, Abstr. But, according to the Gan Thesis “such low J_o cannot be obtained by the diffused emitters formed in the single-crystal silicon. Polysilicon emitters, n-type in particular, have been reported to have very low J_o ($\sim 1 \times 10^{-14}$ A/cm²); therefore, they can be a very useful substitute

¹⁵ “Whenever a work protected under this title is published in the United States . . . a notice of copyright . . . *may* be placed on publicly distributed copies from which the work can be visually perceived.” 17 U.S.C. § 401(a) (emphasis added).

for the diffused emitters for high efficiency solar cells.” *Id.* The Gan Thesis then states that additional issues need to be taken into account for use in silicon concentrator solar cells. *Id.* Thus, the Gan Thesis indicates that the usefulness of polysilicon emitters is not limited to concentrator solar cells.

Therefore, on this record, we are persuaded that Petitioner’s showing that the skilled artisan would have had reason to combine the teachings of Froitzheim and Gan as suggested is sufficient for purposes of institution.

b) Whether Petitioner has shown a reasonable expectation of success in the combination of Froitzheim and Gan

Patent Owner also argues that Petitioner “fails to establish that a [person of ordinary skill in the art] would have had a reasonable expectation that such a modification would be successful.” Prelim. Resp. 17. Patent Owner contends that Petitioner’s “assertions that ‘the manufacturing technique taught by Gan was ‘well-known and routine’ and ‘a known, successful technique’ run counter to the nature of Gan’s study and are expressly contradicted by the authors of Gan.” *Id.* at 18. Indeed, Patent Owner asserts that “rather than being ‘well-known and routine,’ the formation of Gan’s oxide layer is *unpredictable*” because “the chemical or thermal oxide layer ‘is not thermally stable’ and ‘tends to break up during high temperature anneals,’ which affects ‘the specific contact resistivity’ ρ_c and ‘the emitter saturation current density’ J_o .” *Id.* (citing Ex. 1005, 245, 247, Fig. 2). Patent Owner further contends that the Gan Thesis confirms that “the oxide layer is highly experimental and prone to unpredictability.” *Id.* For example, Patent Owner states that the “Gan Thesis explains that ‘[a]lthough a thermally grown interfacial oxide seems essential for a polysilicon emitter to have both low J_o and ρ_c , the breakup process is still

difficult to control. On several occasions, we have encountered *reproducibility problems.*” *Id.* (citing Ex. 2003, 107). Thus, Patent Owner reasons that Petitioner failed to carry its burden of showing that a person of ordinary skill in the art would have had a reasonable expectation of success in the combination of Froitzheim and Gan. *Id.* at 20.

We are persuaded, on this record, that Petitioner has adequately shown a reasonable expectation of success in its proffered combination of Froitzheim and Gan. Petitioner explains that the combination of Froitzheim and Gan simply replaces one emitter for the polysilicon emitter of Gan.

Pet. 34. According to Petitioner, a person of ordinary skill in the art

would have also readily understood how to replace a diffused emitter with a polysilicon emitter and oxide layer [and] would have understood that instead of diffusing boron into the substrate’s back side as taught by Froitzheim, a [person of ordinary skill in the art] would instead follow the manufacturing technique taught by Gan.

Id. at 37 (citing Ex. 1005, 246). Petitioner explains that the Gan processes are well-known and routine, and Dr. Holman states that “modifying Froitzheim in view of Gan simply involves using Gan’s known technique of a polysilicon emitter and oxide layer with Froitzheim’s known solar cell to improve Froitzheim’s solar cell in a similar way.” *Id.* (citing Ex. 1003 ¶ 144). For example, Petitioner directs our attention to “multiple instances” in which oxide layers and polysilicon emitters have been implemented. *Id.* (citing Ex. 1005, 246; Ex. 1006 ¶ 22; Ex. 1046, Abstr., 1121; Ex. 1003 ¶ 145). Furthermore, Gan’s statement that “cell performance can be improved if the diffused-emitter is replaced with the polysilicon emitter” and “polysilicon emitters . . . with a very small fraction of interfacial oxide breakup” suggest an expectation of some success. Ex. 1005, 245, 249.

Thus, we are persuaded that Petitioner has demonstrated sufficiently, for purposes of institution, that a person of ordinary skill in the art would have had a reasonable expectation of success in combining Froitzheim and Gan.

Patent Owner's additional arguments that Petitioner's contentions are expressly contradicted by the Gan Thesis, at this time, are similarly unpersuasive.¹⁶ Prelim. Resp. 18. Patent Owner's arguments that "the breakup process is still *difficult to control*" and "*reproducibility problems*" exist (*id.*) appears to advocate for a heightened standard for success. However, under the proper inquiry, "obviousness cannot be avoided by a showing of some degree of unpredictability in the art so long as there was a reasonable probability of success." *Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1364 (Fed. Cir. 2007). Furthermore, though the Gan Thesis acknowledges inconsistent oxide growth during "ramp-up" and "stand-by" periods, the Gan Thesis also explains that "it is possible that the thin-oxide growth can be improved by performing the oxidation at lower temperatures such that the oxidation rate can be controlled more precisely." Ex. 1005, 112. Finally, Patent Owner's argument relies on the Gan Thesis, *not* Gan itself. Prelim. Resp. 18–19 (citing Ex. 2003).

Accordingly, we are persuaded that Petitioner has shown sufficiently at this stage of the proceeding that an ordinarily skilled artisan would have had a reasonable expectation of success in the combination of Froitzheim and Gan.

¹⁶ Patent Owner again presents arguments based on the Gan Thesis. We note, however, that Patent Owner fails to demonstrate the teachings of the Gan Thesis were publicly available to a person of ordinary skill in the art at the time of the invention.

5. *Remaining Claims 1–8 and 10–12*

Petitioner asserts that claims 1–4, 6–8, and 10–12 would have been obvious over the combination of Froitzheim and Gan and that that claim 5 would have been obvious over the combination of Froitzheim, Gan, and Sheats. Pet. 7, 47–63. Patent Owner does not separately address remaining claims 1–8 and 10–12 beyond what is argued for independent claim 9. *See generally* Prelim. Resp.¹⁷ Having determined that Petitioner satisfies the threshold showing under 35 U.S.C. § 314(a) for institution of trial with respect to at least one challenged claim of the ’516 patent, we order that trial shall proceed on all claims and all challenged grounds. *SAS Institute Inc. v. Iancu*, 584 U.S. 357, 360–361 (2018).

F. *Challenges Based on Froitzheim and Borden*

Petitioner alleges that claims 1–4, and 6–12 of the ’516 patent would have been obvious over the combination of Froitzheim and Borden. Pet. 7, 64–77. In addition, Petitioner contends that claim 5 of the ’516 patent would have been obvious over the combination of Froitzheim and Borden in further view of Sheats. Pet. 7, 77–78.

We incorporate our overview of Froitzheim and Sheats here.

1. *Overview of Borden (Ex. 1006)*

Borden is directed to an improved structure for solar cells that includes forming a masking oxide layer on the front and back of the cell and patterning holes in the oxide layer. Ex. 1006, Abstract. The invention in Borden places a buried oxide under the emitter of a polysilicon emitter solar

¹⁷ Patent Owner does not directly address the teachings of Sheats and instead asserts that Sheats does not address the failures of the Froitzheim and Gan combination. Prelim Resp. 9 n.3.

cell. *Id.* ¶ 7. Borden teaches the use of oxide to “[p]rovide passivation between the substrate 200 and the polysilicon emitter 210.” *Id.* ¶ 22. Borden discloses the use of holes in the oxide layer to provide contact areas and increase current density to enhance efficiency by “allow[ing] current flow therethrough.” *Id.* ¶¶ 7, 8.

2. *Analysis of Claim 9*

Petitioner alleges that the combination of Froitzheim and Borden renders claims 1–4 and 6–12 of the ’516 patent obvious. For this challenge, similar to its challenge based on Froitzheim and Gan, Petitioner contends Froitzheim discloses all elements of these claims except for the oxide layer formed between the back surface of the substrate and the polysilicon emitter layer. Pet. 67. According to Petitioner, Froitzheim and Borden are analogous art because “[b]oth are in the same field as the Challenged Claims (solar cells) and are reasonably pertinent to solving the problems addressed in the Challenged Claims (increasing efficiency) with the same types of solutions (optimizing solar cell fabrication and resulting configuration).” *Id.* at 64 (citing Ex. 1006, Abstract, ¶¶ 2–8, 16–33; § X.A.1.; Ex. 1003 ¶ 223). Petitioner contends that Borden discloses additional teachings, such as, “adding an oxide layer between a substrate and polysilicon emitter [which] ‘provides passivation between the substrate and the polysilicon, while allowing for tunnel current flow.’” *Id.* at 66 (citing Ex. 1006 ¶ 22).

Petitioner argues that a person of ordinary skill in the art would have been motivated to “[i]mplement Borden’s polysilicon emitter and tunnel oxide layer to the backside configuration taught by Froitzheim,” in addition to the considerations taken from the teachings of Gan and others regarding the benefits of a polysilicon emitter and tunnel oxide layer, as applied to a

backside configuration. Pet. 65 (citing *id.* at 27–36 (Section X.A.i)). Additionally, Petitioner contends Borden, like Gan, teaches that solar cell efficiency can be increased through the use of oxide layers which reduces recombination and contact resistance. *Id.* at 66 (citing Ex. 1003 ¶¶ 228–229).

Petitioner contends a person of ordinary skill in the art would have been motivated to implement the polysilicon emitter and oxide layer structure of Borden with the solar cell of Froitzheim with reasonable expectation of success because of the similarity and compatibility of solar cells, and disclosure of the basic configuration of a solar cell. Pet. 67. As discussed above, Petitioner contends a person of ordinary skill in the art would have been motivated to modify Froitzheim to implement a P-type polysilicon emitter and oxide layer as taught by Borden with a reasonable expectation of success; the addition of the P-type emitter as taught by Borden implemented with Froitzheim’s design would align such that the rear contact of Froitzheim would be connected to the P-type emitter. *Id.* at 68–71.

At this stage, Patent Owner does not dispute that Froitzheim and Borden teach or suggest all limitations of claim 9. *See generally* Prelim. Resp. Additionally, Patent Owner, at this time, does not dispute whether a person of skill in the art would have a reasonable expectation of success in the combination of Froitzheim and Borden. *See generally id.* Instead, Patent argues that a person of ordinary skill in the art would not have had reason to combine the teachings of Froitzheim and Borden. *Id.* at 20.

On this preliminary record, Petitioner’s unchallenged arguments and evidence are sufficient for purposes of institution. We address Patent Owner’s arguments below.

Patent Owner argues Petitioner failed to meet its burden to show that a person of ordinary skill in the art would have had reason to combine Borden with Froitzheim because Petitioner fails to sufficiently explain how a person of ordinary skill in the art would have modified Froitzheim’s solar cell in view of Borden. Prelim. Resp. 20. Patent Owner argues that Borden discloses two different oxide layers, a masking oxide layer and a tunnel oxide layer, that Petitioner mixes and matches between citations to the two different oxide layers, and that Petitioner fails to identify any benefit from forming a tunnel oxide on the backside of a solar cell. *Id.* at 21–23.

According to Patent Owner, Petitioner “ignores the stark structural and functional differences” between the two oxide layers and instead attempts to motivate the combination by “intermingl[ing] discussion of the two oxide layers.” *Id.* at 23. Patent Owner asserts Petitioner only identifies benefits and motivations of Borden’s tunnel oxide layer when referencing the combination of Froitzheim and Borden, and fails to provide any motivation for the buried oxide layer, alone or in combination with Borden. *Id.* at 23–24. Additionally, Patent Owner asserts the “extension of either of [Borden’s] oxide layers into a continuous layer [] would be inconsistent with [its] teachings,” because Borden’s tunnel oxide layer would not be provided in a continuous layer. *Id.* at 26. Further, the buried oxide layer, which blocks all electric current, would render Froitzheim’s device inoperable. *Id.* at 26.

On this record, Patent Owner’s arguments may have merit, and raise questions of material fact best left for resolution at trial. Clarification or further explanation of Borden’s disclosure of masking oxides and tunnel oxides would be helpful to the resolution of this challenge, to the extent Petitioner maintains it.

3. *Remaining Claims 1–8 and 10–12*

Petitioner asserts that claims 1–4, 6–8, and 10–12 would have been obvious over the combination of Froitzheim and Borden, and that claim 5 would have been obvious over the combination of Froitzheim, Borden, and Sheats. Pet. 7, 72–78. Petitioner asserts that Sheats teaches the limitations of claim 5 and that a person of ordinary skill in the art would have had a reason to combine the isolation trench of Sheats with Froitzheim and Borden, for the same reasons as discussed above—i.e., because “it is in the same field as the Challenged Claims (solar cells) and [is] reasonably pertinent to solving the problems addressed in the Challenged Claims (increasing efficiency) with the same types of solutions (optimizing solar cell configuration).” Pet. 77–78 (citing *id.* at 64–67 (Section X.C.1), 75–76 (Section X.C.8); Ex. 1006, Abstract, ¶¶ 2–8, 16–33; Section X.A.1; Ex. 1003 ¶ 223). Patent Owner does not separately address claims 1–8 and 10–12 beyond what is argued for claim 9. *See generally* Prelim. Resp. Having determined that Petitioner satisfies the threshold showing under 35 U.S.C. § 314(a) for institution of trial with respect to at least one challenged claim of the ’516 patent, we order that trial shall proceed on all claims and all challenged grounds. *SAS*, 584 U.S. at 360–361.

G. Challenges Based on Li and Gan

Petitioner alleges that claims 1, 2, and 8–11 of the '516 patent would have been obvious over the combination of Li and Gan. Pet. 7, 78–93.

1. Overview of Li (Ex. 1008)

Li is directed to a “crystalline silicon solar cell with novel structure.” Ex. 1008, Title. Li explains that its purpose “is to overcome the disadvantages of existing cell structures so as to obtain a crystalline silicon solar cell having an emitting region on a back surface with a high conversion efficiency and a simple manufacturing process.” *Id.* at 4. One embodiment of Li, Figure 1, is reproduced below.

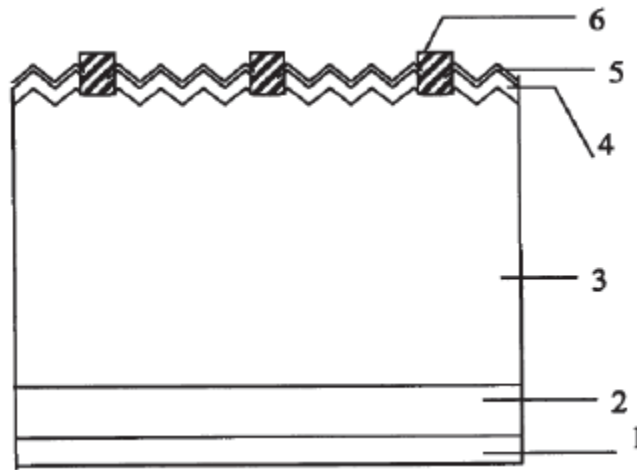


Figure 1 is a schematic diagram of a solar cell with a novel structure. *Id.* at 4. Figure 1 depicts “(1) back electrode; (2) silicon thin film prepared by a deposition method; (3) N-type crystalline silicon; (4) highly doped N+ layer; (5) anti-reflection layer; [and] (6) positive electrode.” *Id.* According to Li, “[b]y adopting the cell structure of the present invention, cell efficiency can reach 20% or above.” *Id.* Li states that “the silicon thin film deposited on the back surface of the silicon wafer, whether it is amorphous silicon, microcrystalline silicon, or nanocrystalline silicon, can achieve a

passivation effect on the back surface, thereby improving the cell efficiency.” *Id.*

2. *Analysis of Claim 9*

Petitioner alleges that the combination of Li and Gan renders claim 9 of the ’516 patent obvious. Pet. 78–93. Petitioner contends that Li “teaches a solar cell having a front side facing the sun to collect solar radiation during normal operation and a backside opposite.” Pet. 81 (citing Ex. 1008, 4, Abstr., claims 1–6, Fig. 1; Ex. 1003 ¶¶ 290, 298). Petitioner contends that “Li teaches that the surfaces of the ‘high-quality N-type monocrystalline [substrate] 3...[are] textured by a standard industrial process’ and “that the ‘texturing treatment [is used] to reduce light reflection and improve a light trapping effect, which is conducive to improving the photoelectric conversion efficiency of the cell.’” *Id.* at 82 (citing Ex. 1008, 4, Fig. 1 (jagged edges), claim 2; Ex. 1003 ¶¶ 280–282). According to Petitioner, Li teaches a backside emitter where it describes “[a p-type] layer of silicon thin film [2] is deposited on a back surface of N-type monocrystalline silicon to form an emitting region” and that a person of ordinary skill in the art would have understood “that depositing the emitter region on the ‘back surface’ forms a *backside junction*” with the substrate. *Id.* at 83–84 (citing Ex. 1008, 3–4, Fig. 1, Abstr., claims 1, 3, 5, 6; Ex. 1003 ¶¶ 283–284). Petitioner contends that “Gan teaches a solar cell that includes a ‘polysilicon emitter with a thermally grown interfacial oxide’ over a silicon substrate.” *Id.* at 84–85 (citing Ex. 1005, 245–246, 249; Ex. 1003 ¶¶ 285–287). In addition, Petitioner argues that Li describes a front electrode that is “electrically connected to the N-type crystalline silicon substrate (i.e., *substrate*) via the highly doped N+ layer 4” and includes a “rear electrode 1

on the back of a silicon thin film (i.e., *emitter layer*).” *Id.* at 85 (citing Ex. 1008, Figs. 1, 4; Ex. 1003 ¶ 288). Petitioner alleges that the first and second contacts are metal because Li states that its “*metal* electrode layer [1] on the back surface can re-reflect light that penetrates the cell back into the cell” and because a person of ordinary skill in the art would have understood that “metal electrodes were common because conductive electrodes like metal are required to transfer generated energy to external circuits.” *Id.* at 86 (citing Ex. 1008, 3, 4; Ex. 1003 ¶ 289). Further, Petitioner asserts that Gan describes use of metal contacts.” *Id.* (citing Ex. 1005, 246; Ex. 1003 ¶ 289). And lastly, Petitioner asserts that Li “explains that its solar cell pertains to ‘solar energy applications’” and that “its design sought to improve ‘efficiency’ over other cells, reaching efficiency of ‘20% or above,’” which “is an indicator of how much power a solar cell can deliver to an external electrical circuit.” *Id.* at 87 (citing Ex. 1008, 2–4; Ex. 1016, 14, 154–155; Ex. 1006 ¶¶ 291–292).

According to Petitioner, Li is analogous art for the same reasons discussed above—i.e., because “it is in the same field as the Challenged Claims (solar cells) and is reasonably pertinent to solving the problems addressed in the Challenged Claims (increasing efficiency) with the same types of solutions (optimizing solar cell configuration).” Pet. 78–79 (citing *id.* at 27–36 (Section X.A.1); Ex. 1008, 1–4; Ex. 1003 ¶ 279). Petitioner further alleges that the skilled artisan would have had reason to combine the teachings of Li and Gan because the combination “amounts to use of a known technique and feature (Gan’s polysilicon emitter and oxide layer between the PN junction) to improve a similar device (Li’s backside junction solar cell) to achieve goals common to both references and the industry

(increasing efficiency).” *Id.* at 79; *see also id.* at 79–80 (citing Sections X.A.1 and X.C.1; Ex. 1008, Fig. 1; Ex. 1005, 245–249; Ex. 1003 ¶¶ 270–277). Petitioner alleges that a person of ordinary skill in the art would have had a reasonable expectation of success in the combination of Li and Gan because “Li teaches fabricating solar cell structures having a backside PN junction with an n-type substrate and p-type emitter to improve a cell’s efficiency,” like Froitzheim, and a person of ordinary skill in the art “would have considered and applied the teachings of Gan, [Borden], and others regarding the benefits of a polysilicon emitter and tunnel oxide layer, as applied to a backside configuration.” Pet. 80 (citing Ex. 1008, 4; Pet. 27–36 (Section X.A.1)).

Patent Owner, at this time, does not challenge many of Petitioner’s allegations regarding the teachings of Li and Gan. *See generally* Prelim. Resp. Instead, Patent Owner argues that

- (1) [Petitioner] merely references back to its earlier, flawed discussion of the Froitzheim-Gan combination, and thus similarly fails to provide a motivation to combine Gan with Li or provide a reasonable expectation of success for the combination,
- (2) [Petitioner] also fails to establish that a [person of ordinary skill in the art] would have been motivated to, or had a reasonable expectation of success in, modifying Li to implement Gan’s polysilicon emitter and oxide layers.

Prelim. Resp. 28.

On this preliminary record, Petitioner’s unchallenged arguments and evidence are sufficient for purposes of institution. We address Patent Owner’s arguments below.

a) Whether Petitioner has shown a reason to combine the teachings of Li and Gan

Patent Owner contends that “Li, like Froitzheim, is directed to a *conventional* solar cell, whereas Gan’s teachings are directed to remedying problems in solar *concentrator* cells,” and Petitioner’s combination based on “Li and Gan fails for at least the same reasons discussed above.” Prelim. Resp. 29.

Patent Owner’s arguments with respect to Li and Gan are similar to its arguments for Froitzheim and Gan—which we found unpersuasive in the face of Petitioner’s evidence and testimonial support from Dr. Holman. Therefore, for similar reasons discussed above, we are also persuaded, on this record, that Petitioner has sufficiently shown a person of ordinary skill in the art would have had a reason to combine the teachings of Li and Gan.

b) Whether Petitioner has shown a reason to combine and a reasonable expectation of success in the combination of Li and Gan

Patent Owner asserts that in addition to the reasons advanced above for the Froitzheim and Gan combination, Petitioner fails to show a reason to combine and a reasonable expectation of success because “[u]nlike Froitzheim, which includes a diffused-emitter layer, Li teaches a silicon, thin-film emitter layer. [Petitioner] fails to articulate why it would have been obvious to a [person of ordinary skill in the art] to replace Li’s silicon, thin-film emitter layer with Gan’s polysilicon emitter layer and an oxide layer.” Prelim. Resp. 30. According to Patent Owner, Gan does not broadly teach adding a polysilicon emitter and oxide layer to improve efficiency; rather, Gan “describes the benefits of *replacing a diffused* emitter with a polysilicon layer and an oxide layer in solar concentrator cells.” *Id.* Patent

Owner argues that Li describes a “deposited emitter” and “the purported benefits of Gan are limited... to the replacement of a diffused-emitter with a polysilicon emitter.” *Id.* at 31. In fact, Patent Owner alleges that “Li discourages such a modification” where it “teaches a single layer of amorphous silicon that achieves the passivation of an oxide layer *without* creating the problems of a doped polycrystalline emitter layer (as in Gan).” *Id.* Patent Owner argues that because Petitioner fails to acknowledge these differences Petitioner fails to establish a person of ordinary skill in the art “would have had a reasonable expectation that Li’s silicon, thin-film emitter layer could be replaced with Gan’s polysilicon emitter and oxide layer structure.” *Id.* at 32.

We are persuaded, on this record, that Petitioner has adequately shown a reasonable expectation of success in the combination of Li and Gan. Petitioner relies on its reasoning for the combination of Froitzheim and Gan and additionally asserts that a reasonable expectation of success exists “because Li and Gan teach similar and compatible solar cells.” Pet. 80; Ex. 1003 ¶ 288. Dr. Holman testifies that “the combination of Li’s back-junction solar cell and Gan’s polysilicon emitter and oxide layer simply amounts to using a known structural feature.” Ex. 1003 ¶ 271. Dr. Holman explains further explains that “a person of ordinary skill in the art would have understood that Li and Gan’s deposited emitters were easily interchangeable without needing additional equipment.” *Id.* ¶ 276.

We acknowledge Patent Owner’s argument that Li and Froitzheim are different—that is, Li describes a thin-film emitter and Froitzheim describes a diffused-emitter—and that a person of ordinary skill in the art would have understood that Gan “narrowly describes the benefits of *replacing a diffused*

emitter [like Froitzheim, not Li] with a polysilicon emitter layer and oxide layer in solar concentrator cells.” Prelim. Resp. 30. But, Patent Owner does not direct our attention to any language in Gan that its teachings are “limited.” *Id.* at 30–31. And, while Patent Owner’s argument that “Li discourages such a modification” as its thin-film emitter “avoid[s] problems that occur upon boron doping (such as the doping in Gan’s polysilicon emitter layer)” (*id.* at 31) may have some merit, Patent Owner’s arguments raise factual questions best resolved over the course of trial.

Accordingly, on this record, we are persuaded by Petitioner’s arguments and evidence, and determine that Petitioner has demonstrated sufficiently for purposes of this Decision that a person of ordinary skill in the art would have had a reason to combine the teachings of Li and Gan, and would have had a reasonable expectation of success in achieving the claimed invention.

3. *Remaining Claims 1, 2, 8, 10, and 11*

Petitioner asserts that claims 1, 2, 8, 10, and 11 would have been obvious over the combination of Li and Gan. Pet. 7, 88–93. Patent Owner does not separately address remaining claims 1, 2, 8, 10, and 11 beyond what is argued for independent claim 9. *See generally* Prelim. Resp. Having determined that Petitioner satisfies the threshold showing under 35 U.S.C. § 314(a) for institution of trial with respect to at least one challenged claim of the ’516 patent, we order that trial shall proceed on all claims and all challenged grounds. *SAS*, 584 U.S. at 360–361.

III. CONCLUSION

For the foregoing reasons, we determine that Petitioner has demonstrated a reasonable likelihood that it would prevail with respect to at

least one of the claims challenged in the Petition. Accordingly, we institute an *inter partes* review of the '516 patent.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–12 of U.S. Patent No. 8,222,516 B2 is instituted with respect to all grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial, which will commence on the entry date of this Decision.

IPR2024-01203
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