

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
SAMSUNG ELECTRONICS AMERICA, INC.,
SAMSUNG SEMICONDUCTOR, INC., and
SAMSUNG AUSTIN SEMICONDUCTOR, LLC,
Petitioner,

v.

CHIEN-MIN SUNG,
Patent Owner.

IPR2024-00534
Patent 9,138,862 B2

Before BARRY L. GROSSMAN, GEORGE R. HOSKINS, and
FRANCES L. IPPOLITO, *Administrative Patent Judges*.

GROSSMAN, *Administrative Patent Judge*.

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

I. INTRODUCTION

Petitioner Samsung¹ has filed a Petition (Paper 5, “Pet.”) pursuant to 35 U.S.C. §§ 311–319 to institute an *inter partes* review of U.S. Patent No. 9,138,862 B2 (Ex. 1001, “the ’862 patent”), claims 1–20. Patent Owner Chien-Min Sung has filed a Preliminary Response (Paper 9, “Prelim. Resp.”) opposing institution of review.

We authorized additional briefing to address whether we should deny institution under 35 U.S.C. § 314(a) and *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv*”). See Paper 11, 3–5. Accordingly, Petitioner filed a Preliminary Reply (Paper 12, “Prelim. Reply”), and Patent Owner filed a Preliminary Sur-reply (Paper 13, “Prelim. Sur-reply”). For reasons provided below, we decide not to exercise our discretion to deny institution.

On the merits, to justify institution of review, the Petition must demonstrate a reasonable likelihood that Petitioner would prevail with respect to at least one challenged claim. See 35 U.S.C. § 314(a). Applying

¹ Petitioner, collectively, is a group of four entities: Samsung Electronics Co., Ltd.; Samsung Electronics America, Inc.; Samsung Semiconductor, Inc.; and Samsung Austin Semiconductor, LLC. See Pet. 1. See also *Cradlepoint, Inc. et al. v. 3G Licensing S.A.*, IPR2021-00639, Paper 12, 2 (PTAB May 13, 2021) (“[F]or each ‘petition’ there is but a single party filing the petition, no matter how many companies are listed as petitioner or petitioners and how many companies are identified as real parties-in-interest. . . . Even though the separate sub-entities regard and identify themselves as ‘Petitioners,’ before the Board they constitute and stand in the shoes of a single ‘Petitioner’ . . . they must speak with a single voice, in both written and oral representation.”).

that standard on behalf of the Director (37 C.F.R. § 42.4(a)), we institute the petitioned *inter partes* review.

II. BACKGROUND

A. *Real Parties-in-Interest and Related Proceedings*

Petitioner identifies itself (i.e., the four Samsung entities identified above) as the real party-in-interest. *See* Pet. 1. Patent Owner identifies himself, an individual and “owner of the patent under review,” as the real party-in-interest. *See* Paper 6, 1.

The parties identify three district court litigations involving the ’862 patent as related proceedings. *See* Pet. 1; Paper 6, 1; Prelim. Reply 1–2.

The first related proceeding is *Sung v. Kinik Co.*, No. 1:20-cv-00247 (D. Del.) (“the Kinik Litigation”). The Kinik Litigation has been dismissed based upon a settlement. *See* Ex. 3007.

The second related proceeding is *Sung v. Samsung Electronics Co. Ltd., et al.*, No. 4:23-cv-00752 (E.D. Tex.) (“the Samsung Litigation”). *See* Ex. 3004 (the Complaint filed in the Samsung Litigation). The third related proceeding is *Sung v. Texas Instruments, Inc.*, No. 4:23-cv-00753 (E.D. Tex.) (“the TI Litigation”). *See* Ex. 3002 (the Complaint filed in the TI Litigation). The Samsung and TI Litigations were filed on the same day, and are pending before the same Judge in the Eastern District of Texas. *See* Exs. 3002, 3004.

Petitioner also filed IPR proceedings to challenge two other patents owned by Patent Owner that are related to the ’862 patent. *See* Pet. 1. They are IPR2024-00533 (challenging claims in U.S. Patent No. 8,974,270 B2)

IPR2024-00534
Patent 9,138,862 B2

and IPR2024-00535 (challenging claims in U.S. Patent No. 9,724,802 B2). These two patents also are alleged to be infringed in each of the Samsung and TI Litigations. *See* Exs. 3002 ¶¶ 19–25; 3004 ¶¶ 23–29.

B. The '862 Patent

The '862 patent is a continuation-in-part of U.S. Patent Application No. 13/479,148, filed on May 23, 2012, which in turn claims priority to U.S. Provisional Application No. 61/489,074, filed on May 23, 2011. Ex. 1001, codes [63], [60]. “For the purposes of this IPR only, Petitioner applies the earliest claimed priority date of May 23, 2011.” Pet. 13; *see also* Ex. 1001, 1:6–10 (claiming a priority date of May 23, 2011). Patent Owner does not contest, nor comment on, the priority date asserted by Petitioner or asserted in the '862 patent. *See generally*, Prelim. Resp.

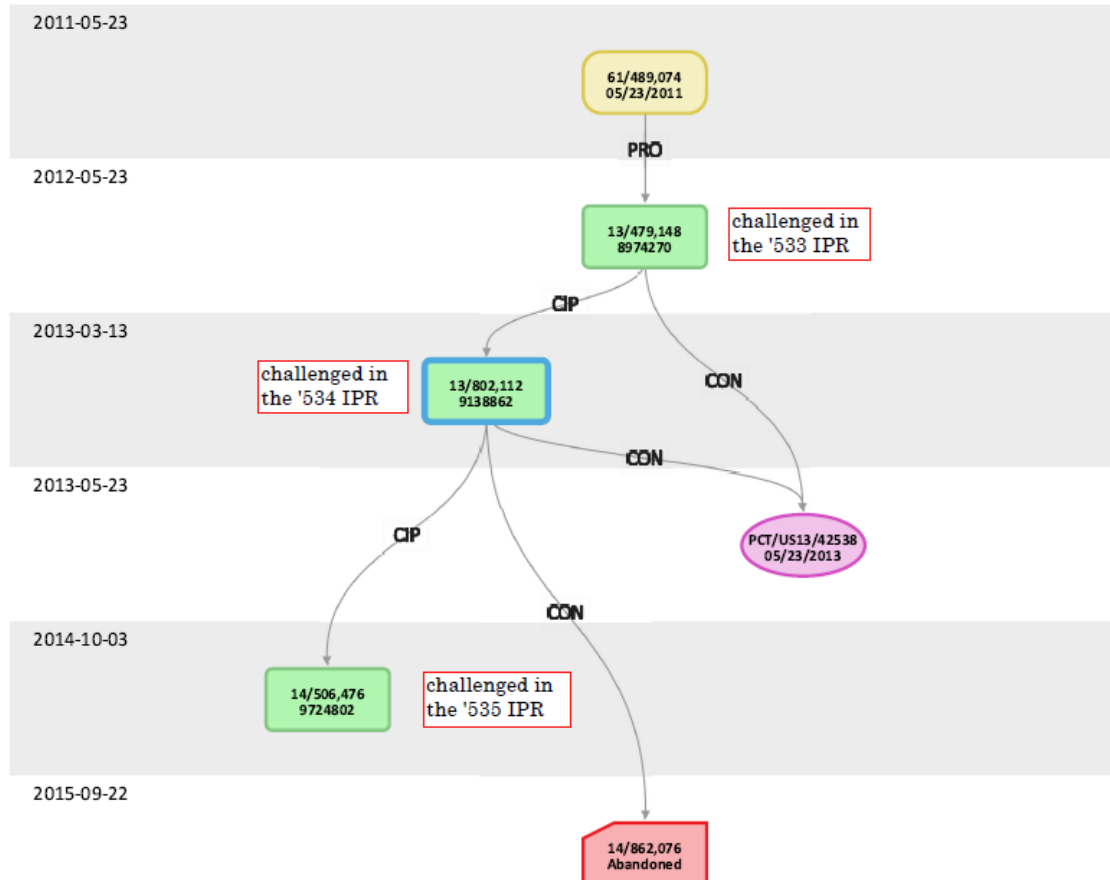
Moreover, as shown below in the abbreviated, annotated family tree for the '862 patent, the '862 patent also is directly related to the two patents challenged in the related, pending '533 and '535 IPRs.

Application: 13/802,112 (08/19/2024)

Total: 65 nodes

Filter Total: 6 nodes

Filter: (Continuity of 13/802,112)



Annotated excerpt of '862 patent family tree.

The '862 patent discloses and claims a “method of conditioning a CMP [Chemical Mechanical Polishing] pad.” *See, e.g.*, Ex. 1001, 20:17–30; *id.* at 1:18–21 (defining the acronym CMP); 1:29–30. As disclosed in the written description,

The semiconductor industry currently spends in excess of one billion U.S. dollars each year manufacturing silicon wafers that must exhibit very flat and smooth surfaces. Known techniques to manufacture smooth and even-surfaced silicon wafers are plentiful. The most common of these involves the process known as Chemical Mechanical Polishing (CMP) which includes the use of a polishing pad in

combination with an abrasive slurry. Of central importance in all CMP processes is the attainment of high performance levels in aspects such as uniformity of polished wafer, smoothness of the IC circuitry, removal rate for productivity, longevity of consumables for CMP economics, etc.

Ex. 1001, 1:14–25.

Petitioner’s expert, Dr. Stanley Shanfield, Ph.D., testifies that CMP “is a common, widely-used process that has been around since the late 1980s/early 1990s.” Ex. 1002 ¶ 37 (citing Ex. 1011). According to Dr. Shanfield, a typical setup for this process is shown in the Figures below.² *Id.*

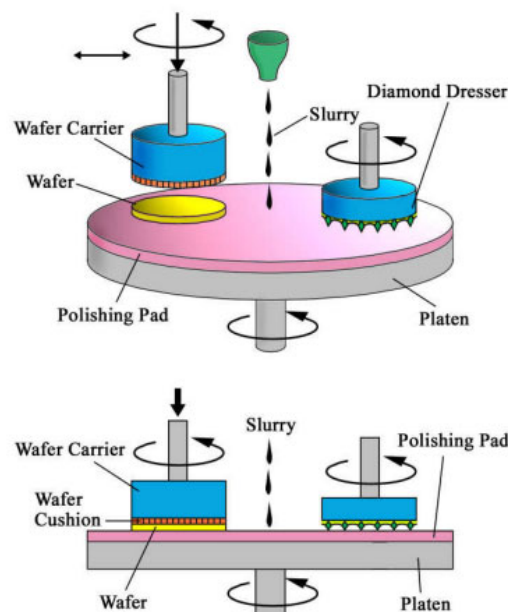


Fig. 2: The CMP layout includes a rotating pad, a feeding slurry, and a rotating pad conditioner.

Figure 2 from Ex. 1011 shows two views of a conventional CMP machinery

² Dr. Shanfield’s testimony includes only the top figure from Figure 2 of the cited document. Figure 2, however, includes two views, as shown above. We have included for completeness both views that are included in the cited Figure 2. *See also* Pet. 7–8 providing a similar description of CMP procedures.

Dr. Shanfield testifies that the “semiconductor wafer (labeled ‘wafer’ in the Figure) is pressed against a rotating polishing pad, also known as a CMP pad.” Ex. 1002 ¶ 37. “Additionally, a chemical slurry is introduced onto the polishing pad.” *Id.* (citations omitted). The chemical slurry typically includes abrasive particles that assist in polishing the wafer surface. *Id.* ¶ 38 (citations omitted).

The disclosed method also includes pressing a CMP pad dresser against a CMP pad, where the dresser includes a monolayer of a plurality of superabrasive particles protruding from a matrix layer. Ex. 1001, 1:30–33. A “dresser” is a “a tool used to condition or dress a pad, such as a CMP pad.” *Id.* at 3:9–11. The method can further include rotating the dresser against the CMP pad such that “asperities,” providing a rough surface, are cut into the CMP pad “having a maximum cutting depth of about 60 microns.” *Id.* 1:39–42. Other specific embodiments are disclosed that relate to the protrusion distance of the abrasive particles, the number of abrasive particles, and other specific details of the disclosed method.

Figure 1 of the ’862 patent is reproduced below.

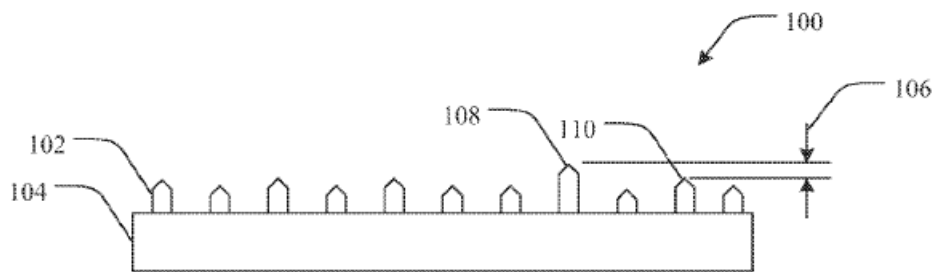


FIG. 1
Figure 1 is a schematic side view
of a CMP pad dresser. Ex. 1001, 2:29–30.

As shown in Figure 1, CMP pad dresser 100 includes a monolayer of superabrasive particles 102 embedded in matrix layer 104 such that each

superabrasive particle in the monolayer protrudes from matrix layer 104. Ex. 1001, 8:33–37. The difference in protrusion distance 106 between the highest protruding tip 108 and the next highest protruding tip 110 of the monolayer of superabrasive particles is the “protrusion difference.” *Id.* at 8:37–40. Various specific embodiments are disclosed. For example, in one embodiment, the protrusion difference can be less than or equal to about 50 microns. *Id.* at 8:40–42. In another embodiment, the protrusion difference can be less than or equal to about 20 microns. *Id.* at 8:42–43. In another embodiment, the protrusion difference can be less than or equal to about 10 microns. *Id.* at 8:43–45. The written description states the term “protrusion difference” can also be used to describe “the difference in protrusion distance between any two or more superabrasive particles.” *Id.* at 8:45–47.

The ’862 patent includes twenty claims, all of which are challenged in the Petition. *See* Ex. 1001, 20:17–21:20; Pet. 3 (“Petitioner requests *inter partes* review and cancellation of claims 1–20 of the ’862 Patent.”).

C. Illustrative Claim

Claim 1 is the sole independent claim, and is reproduced below.

A method of conditioning a CMP pad, comprising:

pressing a CMP pad dresser against a CMP pad, the dresser including a monolayer of a plurality of superabrasive particles protruding from a matrix layer, wherein the difference in protrusion distance between the highest protruding tip and the second highest protruding tip of the monolayer of superabrasive particles is less than or equal to about 10 microns and the difference in protrusion distance between the highest 10 protruding tips of the monolayer of superabrasive particles are within about 20 microns or less; and

rotating the dresser against the CMP pad such that asperities are cut into the CMP pad having a maximum cutting depth of about 60 microns.

Ex. 1001, 20:17–30.

D. Prior Art and Asserted Grounds

Petitioner asserts that the Challenged Claims are unpatentable based on following grounds (Pet. 6):

	Claim(s) Challenged	35 U.S.C. §³	References/Basis
1	1–6, 9–12, 20	102/103	Sung '026 ⁴ (2 grounds)
2	5–10	103	Sung '026, Sung ICPT ⁵
3	13, 17–19	103	Sung '026, Nishioka ⁶
4	14	103	Sung '026, Lin ⁷
5	15	103	Sung '026, Kim ⁸

³ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 296–07 (2011), took effect on September 16, 2011. The changes to 35 U.S.C. §§ 102 and 103 in the AIA do not apply to any patent application filed before March 16, 2013. Because the application for the patent at issue in this proceeding has an effective filing date before March 16, 2013, we refer to the pre-AIA version of the statutes.

⁴ US 2007/0060026 A1 (Ex. 1004, “Sung '026”).

⁵ “The Organic Diamond Disk (ODD) for dressing of Polishing Pads of Chemical Mechanical Planarization,” International Conference on Planarization / CMP Technology, 25-27 October 2007 (Ex. 1005 “SungICPT”).

⁶ US 2008/0087644 (Ex. 1006 “Nishioka”).

⁷ WO 2008/049019 A2 (Ex. 1007 “Lin”).

⁸ US 2009/0001581 A1 (Ex. 1008 “Kim”).

	Claim(s) Challenged	35 U.S.C. § ³	References/Basis
6	16	103	Sung '026, Koyama ⁹

Petitioner also relies on the declaration testimony of Dr. Shanfield (Ex. 1005) in support of these grounds.

III. DISCRETIONARY DENIAL UNDER 35 U.S.C. § 314(a)

Patent Owner asserts we should exercise our discretion and deny institution under 35 U.S.C. § 314(a) based on the status of the Samsung Litigation. *See* Prelim Resp. 3–13; Prelim. Sur-reply 1–5. Petitioner disagrees. *See* Pet. 72–78; Prelim. Reply 1–5. For the following reasons, we decide not to deny institution on this basis.

A. *Legal Authority*

Institution of an *inter partes* review is discretionary. *See* 35 U.S.C. § 314(a) (authorizing institution of an *inter partes* review under particular circumstances, but not requiring institution under any circumstances); *Cuozzo Speed Techs., LLC v. Lee*, 579 U.S. 261, 273 (2016) (“[T]he agency’s decision to deny a petition is a matter committed to the Patent Office’s discretion.”); *SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1356 (2018) (“[Section] 314(a) invests the Director with discretion on the question whether to institute review.” (emphasis omitted)); *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016) (“[T]he PTO is permitted, but never compelled, to institute an IPR proceeding.”)).

⁹ US 2009/0117692 A1 (Ex. 1009 “Koyama”).

When determining whether to exercise discretion to deny institution in view of a parallel district court proceeding, we consider the following six 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, Inc., IPR2020-00019, Paper 11, 5–6 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv*”). 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 the *Fintiv* factors, we take “a holistic view of whether efficiency and integrity of the system are best served by denying or instituting review,” recognizing that “there is some overlap among these factors” and that “[s]ome facts may be relevant to more than one factor.” *Id.* at 6.

On June 21, 2022, the Director of the United States Patent and Trademark Office issued a Memorandum setting forth an “Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel

District Court Litigation” (hereafter, “Guidance Memo”).¹⁰ The Guidance Memo states that “to benefit the patent system and the public good, the PTAB will not rely on the *Fintiv* factors to discretionarily deny institution in view of parallel district court litigation where a petition presents compelling evidence of unpatentability.” *Id.* at 2. The Guidance Memo explains that “[c]ompelling, meritorious challenges are those in which the evidence, if unrebutted in trial, would plainly lead to a conclusion that one or more claims are unpatentable by a preponderance of the evidence.” *Id.* at 4.

In the analysis that follows, we first consider whether *Fintiv* factors 1–5 weigh in favor of denying institution, and, if so, we must also determine whether the Petition presents compelling merits. *See CommScope Techs. LLC v. Dali Wireless, Inc.*, IPR2022-01242, Paper 23 at 5 (PTAB Feb. 27, 2023) (precedential) (“In circumstances where . . . the Board’s analysis of *Fintiv* factors 1–5 favors denial of institution, the Board shall then assess compelling merits.”).

B. Analysis of the *Fintiv* Factors

We consider each of the *Fintiv* factors. We then weigh the factors and take a holistic view of whether efficiency and integrity of the patent system are best served by denying or instituting review.

¹⁰ Available at:
https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf.

1. Factor 1:
whether a stay exists or is likely to be granted if a proceeding is instituted

“A district court stay of the litigation pending resolution of the PTAB trial allays concerns about inefficiency and duplication of efforts,” which “has strongly weighed against exercising the authority to deny institution under [*NHK Spring Co. v. Intri-Plex Techs., Inc.*, IPR2018-00752, Paper 8 at 20 (PTAB Sept. 12, 2018) (precedential)].” *Fintiv*, at 6. On the other hand, “[i]f a court has denied a defendant’s motion for a stay pending resolution of a PTAB proceeding, and has not indicated to the parties that it will consider a renewed motion or reconsider a motion to stay if a PTAB trial is instituted, this fact has sometimes weighed in favor of exercising authority to deny institution under [*NHK Spring*].” *Id.* at 7–8.

Petitioner notes that on July 26, 2024, the Court *sua sponte* stayed the parallel, District Court *Samsung* Litigation pending the Court’s resolution of Petitioner’s motion for transfer from the Eastern District of Texas to the Northern District of California. *See* Prelim. Reply 1 (citing Ex. 1028) (“It is therefore ORDERED that all proceedings in this case are STAYED pending the Court’s resolution Defendants’ Motion for Inter-District Transfer to the Northern District of California.”) (the “Transfer stay”). As of the date of mailing this Decision, this Transfer stay is still in effect. Petitioner asserts this stay weighs strongly against discretionary denial under *Fintiv*. *See id.* at 1–2.

Patent Owner takes a different view of the Transfer stay. Patent Owner argues that the Transfer stay “is *unrelated to the Petition* and instead concerns a Motion for Inter-District Transfer.” Prelim. Sur-reply 1. According to Patent Owner, the *Fintiv* Factor 1 considers stays ***related to the***

substance of the Petition, not completely unrelated stays. Id. (citing *Fintiv*, Paper 11, at 6–9) (all emphases in original cited text). We disagree with Patent Owner’s premise and conclusion.

There can be no reasonable dispute, and Patent Owner raises none, that Patent Owner’s Samsung complaint in the District Court asserts infringement of three patents – U.S. Patent Nos. 9,138,862 (the “’862 patent”), 9,724,802 (the “’802 patent”), and 8,974,270 (the “’270 patent”) (collectively, the “Asserted Patents”). *See* Ex. 3004 ¶¶ 23–29; *see also id.* at pgs. 10 (Count I), 18 (Count II), 26 (Count III). The ’862 patent is the subject of the IPR proceeding before us. The ’270 patent is the subject of IPR2024-00533. The ’802 patent is the subject of IPR2024-00535. Thus, contrary to Patent Owner’s argument, the Samsung complaint, and the entered stay of proceedings to resolve the dispute created by the complaint, clearly relate directly to the substance of these three IPR proceedings.

We recognize that the Transfer stay was put in place *sua sponte* by the District Court. *See, e.g.*, Prelim. Reply 1. We have not been directed to any evidence of a request for a stay by any party nor was there briefing concerning the stay. The District Court did not provide any specific reason for instituting the stay. The entirety of the Transfer stay Order states:

Defendants’ Motion for Inter-District Transfer to the Northern District of California, (Dkt. #38), is pending and fully briefed.

It is therefore **ORDERED** that all proceedings in this case are **STAYED** pending the Court’s resolution Defendants’ Motion for Inter-District Transfer to the Northern District of California. (Dkt. #38). Following the Court’s ruling on the motion to transfer, and as may be necessary, the Court shall

enter a separate order providing a new trial date^[11] and any necessary pretrial deadlines.

Ex. 1028.

We decline to speculate on the reason or reasons why the Transfer stay was entered.¹² Like all stays, however, as a matter of efficiency, it preserves the current status of the proceeding until a decision regarding the basis of the stay, here, a motion to transfer the case to a California court, is decided.

In addition to the Transfer stay currently in effect, two other requests for stays are, or will be, pending in the parallel Samsung Litigation in the Texas District Court.

(i) The Texas Instruments Case and Stay

In the Texas District Court, Patent Owner filed a similar patent infringement complaint against Texas Instruments, Inc. (“TI”). Ex. 3002. The same three patents at issue in the Samsung Litigation also are at issue in the TI Litigation. *Id.* The District Court granted TI’s motion for a stay of the TI Litigation based on TI’s Motion for Summary Judgment of Invalidity.

¹¹ We have not been directed to any evidence in the proceeding before us that a specific trial date has been established in the District Court. The District Court Scheduling Order submitted in this IPR proceeding (*see* Exs. 1018; 1029 (duplicate copies of the Scheduling Order)) states that “Jury Selection and Trial” are at a date “[t]o be determined.” Ex. 1018, 5. Thus, a reference to a “new trial date” more accurately should be a reference to a “trial date.”

¹² There are many reasons why a stay may have been entered. *See, e.g.,* Rachel Bayefsky, Administrative Stays: Power and Procedure, *Notre Dame Law Review*, Vol. 97, No. 5, 1941–1984 (2022).

Ex.1031. As of the date of mailing this Decision, this TI Litigation stay is still in effect.

In the parallel Samsung Litigation, Petitioner has filed Motion to Stay Pending Resolution of TI's Motion for Summary Judgment of Invalidity.

Ex. 1032. This motion is pending. Petitioner also states that, even if the Transfer motion is denied, a stay of the Samsung Litigation is highly likely "because the parties have agreed that a stay would be proper until resolution of" TI's Motion for Summary Judgment of Invalidity. Prelim. Reply 1–2; Ex. 1033, 8 (Patent Owner stating "Dr. Sung [Patent Owner] has already conceded by agreeing to stay these [Samsung] proceedings at the end of Markman briefing" [in the Samsung case])."

The TI complaint was filed the same day, in the same Court, as the Samsung complaint, August 21, 2023. *Compare* Ex. 3002, 35 (the TI complaint, dated August 21, 2023) and Ex. 3004, 35 (the Samsung complaint, also dated August 21, 2023). This TI case is pending before Judge Sean Jordan, the same Judge who is assigned to the parallel *Samsung* case. The same '862 patent that is the subject of the IPR Petition now before us in IPR2024-00534, also is the subject of the alleged infringement in the TI case. *See, e.g.*, Ex. 3002 ¶ 19; Count I, p. 10. The same patents that are involved in the related '533 and '535 IPRs also are involved in the TI Litigation. *Id.* at ¶¶ 21–25; *see also* Count II, p. 18; Count III, p. 26.

In the TI case, Judge Jordan granted TI's Motion to Stay the Case Pending Resolution of TI's Motion for Summary Judgment of Invalidity of the Asserted Patents. Ex. 1031, 2 ("The Court concludes that this core question is ripe for adjudication and can be resolved without the need for further discovery or claim construction.").

Petitioner asserts “Patent Owner acknowledged that the stay [in the Samsung case] would be proper, but argued that such stay should be entered at the end of Markman briefing,” which occurred on July 17, 2024. Prelim. Reply 2 (citing Ex. 1032; Ex. 1033¹³, 8¹⁴); *see also* Ex. 1036, 15 (Patent Owner stating to the District Court it “is not opposed to staying [the Samsung] proceedings at the right time, even prior to the Markman hearing, but believes that the proper stopping point is at the completion of claim construction briefing.”).

Patent Owner disputes that it has agreed to stay the Samsung Litigation pending resolution of the TI Litigation’s summary judgment motion, because “no such agreement was reached and Petitioner incorrectly interpreted a proposal, which Petitioner rejected, as an agreement.” Prelim. Sur-reply 2 (citing “Ex. 1031 [sic] at 8”)¹⁵; *see also* Prelim. Resp. 57 (“The parties met and conferred on a proposed stay related to a motion for summary judgment but no agreement was reached.”).

***(ii) Petitioner’s Intent to File a Motion to Stay
Upon Institution of the IPRs***

Petitioner further argues there is a “very high” likelihood that the Court in the Samsung Litigation will extend the current stay pending resolution of the three related IPR proceedings (IPR2024-00533, IPR2024-00534, and IPR2024-00535). Prelim. Reply 3. Petitioner has

¹³ Ex. 1033 is a duplicate of Ex. 1038.

¹⁴ Here and elsewhere, we cite to the Exhibit page number (page 8), not the document page number (page 5).

¹⁵ The citation to Ex. 1031 is an error. Ex. 1031 is a 3-page Order from the District Court granting TI’s Motion for a Stay pending resolution of TI’s Motion for Summary Judgement of Invalidity.

notified the Court of its intent to file a motion for such a stay if the Board institutes review. *See id.* at 2 (citing Ex. 1034).

According to Patent Owner, a stay in the Eastern District of Texas pending the outcome of the three related IPR proceeding “is extremely unlikely,” as that Court has denied such motions more than 60% of the time since August 2019. Prelim. Resp. 5–6 (citing Ex. 2006). Based on the data in the record before us, however, in patent cases involving the Asserted Patents in the Samsung and TI Litigations, Judge Jordan has granted stays 100% of the time.

**(iii) Conclusion for
Factor 1**

As described above, the current stay involves a motion to transfer the Samsung Litigation. We have not been directed to any persuasive evidence that suggests the stay will expire or be decided soon. Moreover, based on the record before us as discussed above, Judge Jordan is inclined to grant stays where appropriate, even when not asked to do so, such as the *sua sponte* stay entered pending a decision on the Transfer motion and still in effect in the Samsung Litigation. Judge Jordan also granted a requested stay in the related TI Litigation involving the validity of the same patents involved in this IPR proceeding and related IPR proceedings.

We determine that a stay exists and the likelihood of a future or continuing stay is reasonably high. Thus, Factor 1 weighs against exercising our discretion to deny institution.

**2. Factor 2:
*proximity of the court’s trial date to the Board’s projected statutory
deadline***

In the Petition, Petitioner asserts “no trial date is currently scheduled” in the Samsung Litigation, although “the Final Pretrial Conference is scheduled for September 3, 2025.” Pet. 76 (citing Ex. 1018, 5). Petitioner also argues the median time from filing to trial in the Eastern District of Texas is about 21 months. *See id.* Petitioner cites no evidence to support this assertion. This 21 month estimate is consistent with Court statistics for the Eastern District of Texas. Ex. 3005. Thus, Petitioner expects that trial in the Samsung Litigation will begin either “around” the Board’s statutory deadline for issuing a Final Written Decision in September 2025, or more likely “*after*” that deadline. *Id.* at 85 & n.13. Based on the mailing date of this Decision and the related Scheduling Order (Paper 15), our Final Written Decision in the proceeding before us and the two related IPR proceedings likely will be in mid-September, 2025.

Patent Owner responds that the Court’s stay Order only “indicated that its previously-scheduled pretrial dates will remain and could change only as ‘*may be* necessary.’” Prelim. Sur-reply 1 (citing Ex. 1021 [sic “1031”]). Patent Owner’s view is that *Fintiv* Factor 2 “favors discretionary denial (or is neutral at worst),” because the Samsung Litigation trial date is “at or around the same time as the [September 2025] statutory deadline” for the Board’s Final Written Decision in this proceeding. *Id.* at 1–2 (citing *Fintiv*, 9); *see* Prelim. Resp. 7–8. Patent Owner also disputes the data underlying Petitioner’s speculation as to when the judge handling the TI Litigation might rule on the motion for summary judgment pending there. *See* Prelim. Sur-reply at 3 & n.1.

A specific trial date has not been scheduled in the Samsung Litigation. However, as discussed above, the trial will likely conclude after any final decision in this IPR proceeding. This fact weighs against exercising our discretion to deny institution.

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

Petitioner argues the Samsung Litigation “is in its early stages, and the investment in it has been minimal.” Pet. 85 (citing Ex. 1019). As discussed above, the Samsung Litigation was stayed on July 26, 2024, and continues to be stayed at the time of issuing this Decision.

Patent Owner asserts in opposition that there has been “[i]mmense” investment in the parallel District Court case(s), by the Court and the parties, weighing “strongly in favor of denying institution.” Prelim. Resp. 8–10. In particular, according to Patent Owner, there has been “extensive” third-party discovery already obtained, and continuing to be obtained, by both parties. *Id.* Patent Owner asserts that the Board has previously denied institution under *Fintiv*, on facts “very similar” to those presented here. *See* Prelim. Resp. 8–9 (citing *Cisco Sys., Inc. v. Ramot at Tel Aviv Univ. Ltd.*, IPR2020-00122, Paper 15, at 8–9 (PTAB May 15, 2020)).

Petitioner replies that the discovery disputes referenced in the Preliminary Response were “[s]ignificant” only in the TI Litigation, not in the Samsung Litigation. Prelim. Reply 4–5 (citing Exs. 1042–1045 (documents relating to Patent Owner’s attempt to obtain third party discovery from the 3M Company in Minnesota in connection with the TI Litigation)). Petitioner concludes “Patent Owner’s purportedly significant expense in a different litigation involving a different party has limited

bearing, if any, in the instant IPR.” Prelim. Reply 5. Petitioner further asserts “Patent Owner’s point is now moot” because the “parties are no longer ‘entrenched’ in any discovery due to the stay.” *Id.* at 4.

We find that the parties have engaged in preliminary discovery in the Samsung Litigation. This preliminary discovery includes briefing on claim construction. Petitioner’s argument is persuasive that significant discovery occurred in the related TI Litigation, but there has been less discovery in the Samsung Litigation. We therefore conclude that factor 3 weighs against exercising our discretion to deny institution.

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

In the Petition, “Petitioner stipulates that if the IPR is instituted, Petitioner will not pursue the same grounds in the” Samsung Litigation. Pet. 86 (citing *Sand Revolution II LLC v. Continental Intermodal Group – Trucking LLC*, IPR2019-01393, Paper 24 at 7 (PTAB June 16, 2020) (informative)). Petitioner argues *Fintiv* Factor 4 therefore “favors institution.” *Id.*

Patent Owner responds that the Samsung Litigation is “between the same parties (Petitioners and Patent Owner) regarding the same ’862 Patent,” and the Petition includes the same or substantially the same grounds, arguments, and evidence as in the Samsung Litigation. Prelim. Resp. 10–12. Patent Owner further asserts “Petitioner has not presented a

complete *Sotera*-type stipulation^[16] and is thus free to assert substantially the same grounds of invalidity” in both proceedings. *Id.*

Based on the status of the Samsung Litigation, we have not been directed to any persuasive evidence that Samsung has filed a substantive Answer in the Samsung Litigation. Samsung has filed a Motion to Dismiss under Federal Rule of Civil Procedure 12(b)(6), or in the alternative, a Motion for a More Definite Statement under Federal Rule of Civil Procedure 12(e). Ex. 3006. Thus, on the record before us, there is no persuasive evidence of what substantive defenses Samsung will raise in the Samsung Litigation. There is no persuasive evidence that Petitioner will present the same theories in the District Court as in this IPR proceeding, as asserted by Patent Owner. Prelim. Sur-reply 5

The failure of any evidence of an overlap in the substantive invalidity issues in the District Court Samsung Litigation and in this IPR proceeding under Factor 4 weighs against exercising our discretion to deny institution.

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

Petitioner is the Defendant in the Samsung Litigation. *See* Pet. 86; Prelim. Resp. 12. Petitioner contends “[t]his factor should not be a basis for denying institution.” Pet. 86. Patent Owner contends this factor “favors discretionary denial.” Prelim. Resp. 63–64 (citing *Apple Inc. v. Fintiv Inc.*, IPR2020-00019, Paper 15 at 15 (PTAB May 13, 2020)).

¹⁶ *See Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 at 13 (PTAB Dec. 1, 2020) (precedential).

The fact that Petitioner is the same as the defendant in the Samsung Litigation weighs in favor of exercising our discretion to deny institution.

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

Petitioner argues *Fintiv* Factor 6 “favors institution” because the evidence of unpatentability presented in the Petition “is compelling.” Pet. 86. Petitioner cites the Guidance Memo, which states “PTAB will not deny institution . . . under *Fintiv* . . . when a petition presents compelling evidence of unpatentability.” Pet. 86 (quoting Guidance Memo, at 9).

Patent Owner responds that “there are substantial issues with Petitioners’ analysis of” claim 1 of the ’862 patent, such that “even if the Board were to determine that Petitioners met the lower threshold for instituting IPR, the evidence does not rise to the level of being ‘compelling’” per the Guidance Memo. Prelim. Resp. 13.

Based on our review of the arguments and evidence on the merits, we determine that Petitioner has demonstrated a reasonable likelihood that it would prevail in this IPR proceeding on at least one claim. We do not find, however, that Petitioner presents “compelling” evidence of unpatentability per the Guidance Memo.

Accordingly, factor 6 is neutral in deciding whether to exercise our discretion to deny institution.

7. Conclusion

As noted in *Fintiv*, we 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. The Samsung Litigation has been stayed. Based on

the evidence of the other *Fintiv* factors, as discussed above, we determine that efficiency and integrity of the patent system are best served by *not* exercising our discretion to deny institution based on the Samsung Litigation.

IV. PETITIONER’S GROUNDS OF UNPATENTABILITY

A. Legal Standards — Petitioner’s Burden

“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*, 815 F.3d at 1363 (citing 35 U.S.C. § 312(a)(3) (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).

B. Legal Standards — Anticipation

“To anticipate a claim, a prior art reference must disclose each and every element of the claim, either explicitly or inherently.” *Adasa Inc. v. Avery Dennison Corp.*, 55 F.4th 900, 910 (Fed. Cir. 2022) (citing *Eli Lilly & Co. v. Zenith Goldline Pharms., Inc.*, 471 F.3d 1369, 1375 (Fed. Cir. 2006)). “While those elements must be arranged or combined in the same way as in the claim, the reference need not disclose the elements in the very same terms used by the patent.” *Id.* (citing *In re Gleave*, 560 F.3d 1331, 1334 (Fed. Cir. 2009) (“[T]he reference need not satisfy an *ipsissimis verbis* test.” (citing *In re Bond*, 910 F.2d 831, 832–33 (Fed. Cir. 1990)))). “And ‘[e]ven if a reference’s teachings are insufficient to find anticipation, that same

reference’s teachings may be used to find obviousness’ *where it suggests some reason to modify the prior art to obtain the claimed limitations.*” *Id.* (citing *CRFD Rsch., Inc. v. Matal*, 876 F.3d 1330, 1345 (Fed. Cir. 2017) (emphasis added)). “The question of what a reference teaches and whether it describes every element of a claim is a question for the finder of fact.” *Id.* (citing *Med. Instrumentation & Diagnostics Corp. v. Elekta AB*, 344 F.3d 1205, 1221 (Fed. Cir. 2003)). In an *inter partes* review, the Board is the finder of facts.

Also, as explained in *Net MoneyIN*,
unless a reference discloses within the four corners of the document not only all of the limitations claimed but also all of the limitations arranged or combined in the same way as recited in the claim, it cannot be said to prove prior invention of the thing claimed and, thus, cannot anticipate under 35 U.S.C. § 102.
Net MoneyIN, Inc. v. VeriSign, Inc., 545 F.3d 1359, 1371 (Fed. Cir. 2008).
“The requirement that the prior art elements themselves be arranged as in the claim means that claims cannot be treated . . . as mere catalogs of separate parts, in disregard of the part-to-part relationships set forth in the claims and that give the claims their meaning.” *VirnetX Inc. v. Mangrove Partners Master Fund, Ltd.*, No. 2020-2272, slip op. at 14 (Fed. Cir. Mar. 30, 2023) (citing *Therasense, Inc. v. Becton, Dickinson & Co.*, 593 F.3d 1325, 1332 (Fed. Cir. 2010) (internal quotation marks omitted)).

C. Legal Standards — Obviousness

Whether the challenged claims would have been obvious over the cited references also is at issue in this proceeding. Section 103 forbids issuance of a patent when “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole

would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *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) when available, evidence such as commercial success, long felt but unsolved needs, and failure of others.¹⁷ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); *see KSR*, 550 U.S. at 407 (“While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.”). The Court in *Graham* explained that these factual inquiries promote “uniformity and definiteness,” for “[w]hat is obvious is not a question upon which there is likely to be uniformity of thought in every given factual context.” 383 U.S. at 18.

The Supreme Court made clear that we apply “an expansive and flexible approach” to the question of obviousness. *KSR*, 550 U.S. at 415. Whether a patent claiming the combination of prior art elements would have been obvious is determined by whether the improvement is more than the predictable use of prior art elements according to their established functions. *Id.* at 417. To support this conclusion, however, it is not enough to show merely that the prior art includes separate references covering each separate limitation in a challenged claim. *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011). Rather, obviousness additionally requires

¹⁷ Patent Owner does not direct us to any persuasive objective evidence of non-obviousness.

that a person of ordinary skill at the time of the invention “would have selected and combined those prior art elements in the normal course of research and development to yield the claimed invention.” *Id.*

In determining whether there would have been a motivation to combine prior art references to arrive at the claimed invention, it is insufficient to simply conclude the combination would have been obvious without identifying any reason *why* a person of skill in the art would have made the combination. *Metalcraft of Mayville, Inc. v. Toro Co.*, 848 F.3d 1358, 1366 (Fed. Cir. 2017).

Moreover, in determining the differences between the prior art and the claims, the question under 35 U.S.C. § 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 164 (Fed. Cir. 1985) (“It is elementary that the claimed invention must be considered as a whole in deciding the question of obviousness.”); *see also Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1537 (Fed. Cir. 1983) (“[T]he question under 35 U.S.C. § 103 is not whether the differences *themselves* would have been obvious. Consideration of differences, like each of the findings set forth in *Graham*, is but an aid in reaching the ultimate determination of whether the claimed invention as a whole would have been obvious.”).

As a factfinder, we also must be aware “of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning.” *KSR*, 550 U.S. at 421.

Applying these general principles, we consider the evidence and arguments of the parties.

D. Level of Ordinary Skill in the Art

The level of skill in the art is “a prism or lens” through which we view the prior art and the claimed invention. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). “This reference point prevents . . . factfinders from using their own insight or, worse yet, hindsight, to gauge obviousness.” *Id.*

“The *Graham* analysis includes a factual determination of the level of ordinary skill in the art. Without that information, a . . . court cannot properly assess obviousness because the critical question is whether a claimed invention would have been obvious at the time it was made to one with ordinary skill in the art.” *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986); *see also Ruiz v. A.B. Chance*, 234 F.3d 654, 666 (Fed. Cir. 2000) (“The determination of the level of skill in the art is an integral part of the *Graham* analysis.”).

Factors pertinent to a determination of the level of ordinary skill in the art include: (1) educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of workers active in the field. *Best Med. Int’l, Inc. v. Elekta Inc.*, 46 F.4th 1346, 1353 (Fed. Cir. 2022) (citing *Daiichi Sankyo Co. v. Apotex, Inc.*, 501 F.3d 1254, 1256 (Fed. Cir. 2007) (quoting *Env’t Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 696 (Fed. Cir. 1983))). These factors are not exhaustive but merely are a guide to determining the level of ordinary skill in the art. *Daiichi Sankyo*, 501 F.3d at 1256. In determining a level of ordinary skill, we also may look to the prior art, which may reflect an appropriate skill level. *Okajima*, 261 F.3d at 1355.

Petitioner contends a person having ordinary skill in the art pertaining to the '862 patent, as of May 23, 2011, would have had a bachelor's degree "in material science, mechanical engineering, electrical engineering, or physics, and a minimum of two to three years of experience in the field of integrated circuit processing and fabrication techniques." Pet. 22 (citing Ex. 1002 ¶¶ 60–62). The cited Declaration testimony from Dr. Shanfield merely repeats Petitioner's conclusory statement, without any explanation or analysis as to why or how he reached this conclusion. Dr. Shanfield adds the additional caveat to his testimony that "a higher level of education or specific skills in the industry may make up for less experience and vice versa." Ex. 1002 ¶ 60.

We give Petitioner's conclusory argument and Dr. Shanfield's conclusory testimony minimal probative weight. *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9, at 15–17 (PTAB Aug. 24, 2022) (precedential) (holding an expert's declaration testimony is entitled to little weight when it "is conclusory and unsupported, [and] adds little to the conclusory assertion for which it is offered to support"); *see also* 37 C.F.R. § 42.65(a) ("Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.").

Patent Owner states "[f]or the purposes of this Preliminary Response, PO does not contest the definition of POSITA^[18] provided by Petitioner and its expert Dr. Stanley Shanfield." Prelim. Resp. 14 (citations omitted).

¹⁸ "POSITA" is an acronym commonly used in patent law to represent the phrase "a person of ordinary skill in the art."

Patent Owner also asserts, “[h]owever, should trial be instituted, PO contends that Dr. Shanfield is not qualified as a POSITA.” *Id.*

The specific level of skill is important in determining the patentability issues. *See, e.g., Kyocera Senco Industrial Tools Inc. v. I.T.C.*, 22 F.4th 1369, 1375–78 (Fed. Cir. 2022). In *Kyocera*, the adopted level of ordinary skill in the art required “experience in power nailer design.” *Id.* at 1375–76. A proffered expert had “advanced degrees in engineering and extensive experience in the design and manufacture of fastener driving tools” but lacked specific experience in “powered nailer design.” *Id.* at 1376. The Federal Circuit held it was an abuse of discretion to admit testimony from the proffered expert “on any issue that is analyzed through the lens of an ordinarily skilled artisan.” *Id.* at 1377–78.

For purposes of this Decision, based on the disclosure of the ’862 patent, the cited prior art, and giving minimal weight to Dr. Shanfield’s testimony, we determine a person of ordinary skill would have had a bachelor’s degree in material science, mechanical engineering, electrical engineering, physics, or a similar area of science or engineering and a minimum of two years of experience in the field of integrated circuit processing and fabrication techniques. More academic training may offset less experience, and more experience may offset less academic training.

E. Claim Construction

We interpret the ’862 patent claims “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b).” 37 C.F.R. § 42.100(b). This “includ[es] construing the claim in accordance with the ordinary and customary

meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” *Id.*

The ’862 patent has an extensive section of the written description devoted to “Definitions.” *See* Ex. 1001, 3:4–6:59. This Definition section includes more than twenty-five definitions of terms. Some of these terms are *not* specific, scientific terms unique to the ’862 patent. For example, among the listed “definitions” are the words “transverse” (*id.* at 5:7–10), “substantially” (*id.* at 6:9–18), and “about” (*id.* at 6:29–31). Thus, these may not be lexicographic definitions. *Thorner v. Sony Computer Ent. Am. LLC*, 669 F.3d 1362, 1365–66 (Fed. Cir. 2012) (“a patentee sets out a definition and acts as his own lexicographer” by “‘clearly set[ting] forth a definition of the disputed claim term’ *other than its plain and ordinary meaning*” and “‘clearly express[ing] an intent’ to *redefine the term*”) (emphases added).

Petitioner does not propose any specific terms to be construed. Pet. 22–23. Petitioner notes, however, that the ’862 patent provides several lexicographic definitions of terms found in the ’862 patent claims. *See* Pet. 23–25.

Patent Owner also does not propose any specific terms to be construed. Prelim. Resp. 13–14.

Claims must be construed “only to the extent necessary to resolve the controversy.” *AstraZeneca AB v. Mylan Pharms. Inc.*, 19 F.4th 1325, 1345 (Fed. Cir. 2021) (quoting *Vivid Techs., Inc. v. American Science & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)); *see also Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“we need only construe terms ‘that are in controversy, and only to the

extent necessary to resolve the controversy” (citations omitted)). We determine that a specific construction of the claims is not necessary to reach a decision in this Petition to institute an *inter partes* review of the challenged claims.

Any claim discussion in this Decision does not preclude the parties from arguing their proposed constructions of the claims during trial. Indeed, the parties are hereby given notice that final claim construction, in general, is an issue to be addressed at trial. Claim construction will be determined at the close of all the evidence and after any hearing. The parties are expected to assert all their claim construction arguments and evidence in the Petition, Patent Owner’s Response, or otherwise during trial, as permitted by our rules.

We now turn to the merits of Petitioner’s asserted Grounds of unpatentability.

***F. Ground One — Claims 1–6, 9–12, and 20
Anticipation or Obviousness Based on Sung ’026***

Petitioner asserts claims 1–6, 9–12, and 20 of the ’862 patent are unpatentable as anticipated by Sung ’026, or alternatively, that these claims would have been obvious in view of Sung ’026. *See* Pet. 25–37. Patent Owner disagrees. *See* Prelim. Resp. 25–41.

We have reviewed the preliminary record, and we conclude Petitioner has demonstrated a reasonable likelihood of prevailing on its assertions as to at least claim 1. We summarize below the disclosure of Sung ’026, then we consider the parties’ opposing contentions concerning claim 1.

First, however, we clarify the specific grounds asserted by Petitioner.

Ground 1, as stated by Petitioner, is that claims 1–6, 9–12, and 20 are “anticipated or obvious” based on the disclosure in Sung ’026. *E.g.*, Pet. 25. This asserted Ground presents two separate and distinct grounds. We re-label them as Ground 1A, Anticipation, and Ground 1B, Obviousness.

Novelty under 35 U.S.C. § 102 and nonobviousness under 35 U.S.C. § 103 are separate conditions of patentability. *Cohesive Techs., Inc. v. Waters Corp.*, 543 F.3d 1351, 1363 (Fed. Cir. 2008). The tests for anticipation and obviousness are different. *Id.* at 1364. The elements of proof for anticipation and obviousness are different. *Duro-Last, Inc. v. Custom Seal, Inc.*, 321 F.3d 1098, 1107–08 (Fed. Cir. 2003). Thus, “it does not follow that every technically anticipated invention would also have been obvious.” *Cohesive Techs.*, 543 F.3d at 1364; *see also Ericsson Inc. & Telefonaktiebolaget LM Ericsson v. Intellectual Ventures*, IPR2014-01471, Paper 10 at 14 (PTAB Mar. 18, 2015) (“Although Petitioner may assert that all the elements . . . are found in the prior art, we note that not every anticipated claim [would have been] obvious.”); *cf. Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1373 (Fed. Cir. 2019) (“it is well settled that ‘a disclosure that anticipates under § 102 also renders the claim invalid under § 103, for ‘anticipation is the epitome of obviousness.’”).¹⁹

¹⁹ The issue presented in *Realtime Data* was whether the Board erred in its determination that a person of ordinary skill in the art would have been motivated to combine the teachings of two references, O’Brien and Nelson. *Realtime Data*, 912 F.3d at 1372. The Court concluded that the Board was not required to make any finding regarding a motivation to combine because the Board did not rely on Nelson for the disclosure of a particular element or teaching. *Id.* at 1373. The Board relied on Nelson simply to demonstrate that a person of ordinary skill in the art would have understood that the

1. Summary of Sung '026

Sung '026 is a published US patent application titled “Methods of Bonding Superabrasive Particles in an Organic Matrix.” Ex. 1004, code (54). It is our understanding that the sole named inventor in Sung '026, Chien-Min Sung (*id.* at code (76)), is also the sole named inventor of the '862 patent (Ex. 1001, code (72)).

The Sung '026 disclosure, like the disclosure of the '826 patent, relates generally to tools having superabrasive particles embedded in an organic material matrix and associated methods. Ex. 1004, ¶ [0001]. Sung '026 discloses a method for improving retention of superabrasive particles held in a solidified organic material layer of an abrading tool, where a portion of each of the superabrasive particles protrudes out of the solidified organic material layer. *Id.* at ¶ [0009]. Sung '026 teaches that “reverse casting methods may be utilized to manufacture the CMP pad dresser.” *Id.* at ¶ [0083]. Use of this same “reverse casting” method also is disclosed in the '862 patent. Ex. 1001, 17:8–15 (“so-called ‘reverse casting’ methods can be used to accurately orient and attach the dressing segments to the rigid support”).

Petitioner provides the following annotated figures from Sung '026.

string compression disclosed in O'Brien was, in fact, a type of dictionary encoder. *Id.* at 1372–73. Thus, whether anticipation automatically renders a claim invalid under § 103 is dicta in the *Realtime Data* case. *See also, Adasa v. Avery Dennison*, 55 F.4th at 910 (“[e]ven if a reference's teachings are insufficient to find anticipation, that same reference's teachings may be used to find obviousness' where it suggests some reason to modify the prior art to obtain the claimed limitations”).

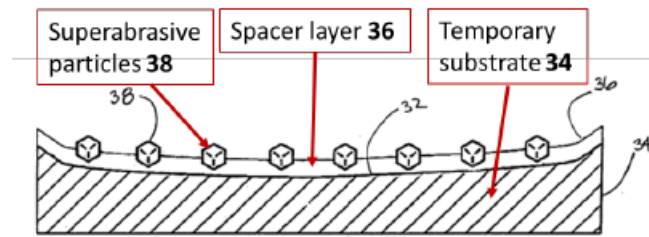


**Figure 2 from Sung '026
annotated by Petitioner.**

Figure 2 from Sung '026 “is a cross-sectional view of superabrasive particles disposed on a temporary substrate.” Ex. 1004 ¶ [0020]. As shown in Figure 2 and in Petitioner’s annotated Figure 2, spacer layer 36 may be applied to working surface 32 of temporary substrate 34. *Id.* at ¶ [0083]. Spacer layer 36 has superabrasive particles 38 “at least partially disposed therein, which protrude at least partially from the spacer layer 36” opposite working surface 32 of temporary substrate 34. *Id.* As further disclosed in Sung '026, any method of disposing superabrasive particles 38 into spacer layer 36 “such that the superabrasive particles protrude to a predetermined height may be utilized.” *Id.* Then, as shown in Figure 5, organic material layer 62 is applied on top of spacer layer 36 and cured to bond at least a portion of each superabrasive particle 38, and permanent substrate 68 is added as well. *Id.* at ¶ [0083]. Temporary substrate 34 and spacer layer 36 are then removed, to leave behind a CMP pad dresser (i.e., permanent substrate 68, organic material layer 62, and superabrasive particles 38). *Id.* at Fig. 6, ¶¶ [0024], [0084].

In order to improve the retention of a superabrasive particle in an organic material layer, Sung'026 also discloses rearranging the superabrasive particles in the organic material layer such that mechanical

stress impinging on any individual superabrasive particle is minimized.

Id. at ¶¶ [0050], [0051].

Sung '026 also discloses that “unequal sizes of superabrasive particles” may be used. *Id.* at ¶ [0084]. Sung '026 further discloses that “while it is intended that the tips of the superabrasive particles align along the designated profile, some level of deviation may occur.” *Id.* at ¶ [0056].

Additionally, Sung '026 discloses that the term “tip” is intended to include the highest protruding point of a superabrasive particle, whether that point be an apex, an edge, or a face. Ex. 1004 ¶ [0056]. Sung '026 then discloses numerous variations and embodiments of where the tips of the superabrasive particles vary among numerous specific ranges. *Id.*

For example, Sung '026 discloses “a majority of the plurality of superabrasive particles are arranged such that their tips vary from the designated profile by from about 1 micron to about 150 microns.” Ex. 1004 ¶ [0056]. Other disclosed configurations include tip variations from about 5 microns to about 100 microns; from about 10 microns to about 75 microns; from about 10 microns to about 50 microns; and several other variations of the range of variations for the tip height. *Id.*

Sung '026 also discloses a benefit of varying particle sizes. Variations in superabrasive particle size between different locations on the tool may also help to more evenly distribute the frictional forces. *Id.* at ¶ [0057]. Additionally, Sung '026 discloses benefits and detriments of “variance in the protrusion of the plurality of superabrasive particles above the solidified organic material layer.” *E.g., see id.* at ¶ [0073].

Petitioner provides a clause-by-clause analysis of independent claim 1, asserting where Sung '026 discloses or suggests each step or

limitation of independent claim 1. Petitioner cites throughout its analysis to both Sung '026 (Ex. 1004) and the Declaration testimony of Dr. Shanfield (Ex. 1002). *See* Pet. 25–37.

Patent Owner takes a different view. Patent Owner asserts that “Sung’026 neither anticipates nor renders obvious claim 1 because Petitioner has failed to show that numerous limitations of claim 1 are disclosed in Sung’026.” Prelim. Resp. 25.

We address the parties’ competing contentions on a limitation-by-limitation basis. We conclude Petitioner has demonstrated a reasonable likelihood of prevailing on its assertions for claim 1.

2. Clause-by-Clause Analysis of Independent Claim 1

(i) [1Pre] — “A method of conditioning a CMP pad, comprising”

Petitioner argues that, assuming the claim preamble [1Pre] is limiting, Sung '026 discloses “superabrasive tools and methods that are, without limitation, suitable to groom the CMP pads used for the delicate polishing applications.” Pet. 25–26 (citing Ex. 1004, ¶ [0009]). Petitioner asserts that Sung '026 “teaches that . . . CMP pad dressers or conditioners, are used to revive the CMP pad surface.” *Id.* (citing Ex. 1004, ¶ [0004] (“A CMP pad dresser can be used to revive the pad surface by ‘combing’ or ‘cutting’ it. This process is known as ‘dressing’ or ‘conditioning’ the CMP pad.”)); Ex. 1002, ¶¶ 85–86.

Patent Owner asserts that the Sung '026 disclosures are “at a high level” and relate to “well-known prior art CMP pad conditioning.” Prelim. Resp. 26. Patent Owner also argues that this disclosure in Sung '026 is “a statement of intended use; it does not disclose any of the dressers taught by

Sung’026 actually being used for CMP pad conditioning.” *Id.* at 27. We disagree, based on the record before us. The cited disclosure from Sung ’026 is in a section titled “Background of the Invention.” The fact that it discusses what is old and well-known does not diminish its probative weight. Moreover, Patent Owner does not cite any controlling, persuasive authority that would require “actual” commercial use of a device described in a printed publication, such as Sung ’026, to establish its probative weight as a printed publication reference.

(ii) [1A] — “*pressing a CMP pad dresser against a CMP pad*”

Petitioner asserts Sung’026 discloses “superabrasive tools and methods that are, without limitation, suitable to groom the CMP pads used for the delicate polishing applications.” Pet. 26 (citing Ex. 1004 ¶ [0009]). As disclosed in Sung ’026, these tools are used to “abrade a work piece.” *Id.* at 27 (emphasis omitted) (citing Ex. 1004 ¶ [0051]). Petitioner also relies on the Declaration testimony of Dr. Shanfield. *Id.* at 28 (citing Ex. 1002 ¶¶ 90–91).

Dr. Shanfield testifies that the CMP pad dresser in Sung ’026 “is used to condition the CMP pad.” Ex. 1002 ¶ 90 (citing Ex. 1004 ¶ [0004] (“A CMP pad dresser can be used to revive the pad surface by ‘combing’ or ‘cutting’ it. This process is known as ‘dressing’ or ‘conditioning’ the CMP pad.”). Dr. Shanfield further testifies that “[t]his conditioning process includes physical contact between the CMP pad dresser and the CMP pad.” *Id.* Dr. Shanfield concludes and opines that because “frictional forces on the CMP pad dresser described by Sung’026 can only be the result of the CMP pad being pressed against another object (e.g., a CMP pad dresser),

Sung’026 discloses pressing a CMP pad dresser against a CMP pad.”

Id. at ¶ 90.

Patent Owner argues that Sung ’026 discloses “only that the CMP pad dresser and CMP pad are in contact.” Prelim. Resp. 28. Patent Owner admits, however, that the “cited portions do imply that the surface of one object is moving relative to the other as a CMP pad dresser and CMP pad are held in contact,” but asserts that the Sung ’026 disclosures “reveal nothing about how the two objects come into contact.” Prelim. Resp. 28. According to Patent Owner, Sung ’026 does not require *pressing two objects against each other*, but instead will result from their remaining in contact as the surface of one moves relative to another, *even if only one of them is pressed against the other*. *Id.* at 29. We disagree, based on the record before us.

Patent Owner mischaracterizes the clause at issue. All that is required by this clause in claim 1 is pressing a CMP pad dresser against a CMP pad. Based on our analysis above, we determine that Sung ’026 discloses this limitation.

(iii) [1B] — “*the dresser including a monolayer of a plurality of superabrasive particles protruding from a matrix layer*”

Petitioner asserts Sung’026 discloses CMP pad dressers having a single layer of superabrasive particles, which meets the claimed “monolayer of a plurality of superabrasive particles.” Pet. 28 (citing Ex. 1004 ¶ [0074] (“One example of a tool incorporating a single layer of superabrasive particles in an organic material matrix is a CMP pad dresser.”)).

Figure 1 from Sung ’026 is reproduced below.

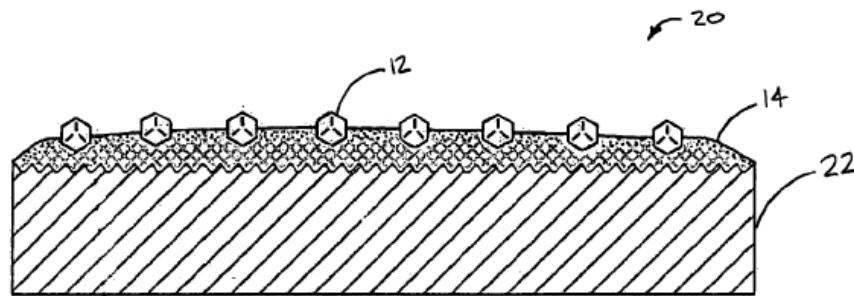


Figure 1 from Sung '026 is a cross-sectional view of a CMP pad dresser made in accordance with one embodiment of the disclosed invention.

As shown in Figure 1, CMP pad dresser 20 may include an organic material layer 14 and superabrasive particles 12 held in organic material layer 14. Ex. 1004 ¶ [0075].

Patent Owner asserts that because Sung'026 fails to disclose “a dresser being pressed against a CMP pad”, as required in clause [1A], Sung '026 “cannot satisfy what [1B] recites: that a monolayer of a plurality of superabrasive particles protruding from a matrix layer is included *the dresser of [1A]*.” Prelim. Resp. 31–32.

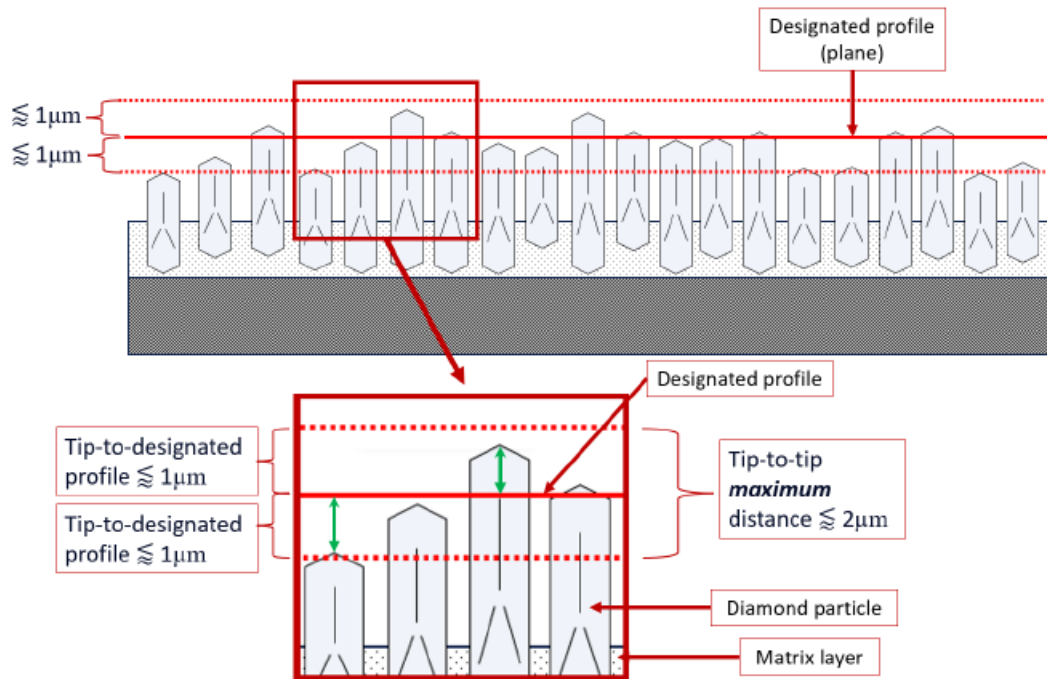
Because we disagree with Patent Owner’s premise, we also disagree with its conclusion.

(iv) [1C] — “*wherein the difference in protrusion distance between the highest protruding tip and the second highest protruding tip of the monolayer of superabrasive particles is less than or equal to about 10 microns and the difference in protrusion distance between the highest 10 protruding tips of the monolayer of superabrasive particles are [sic] within about 20 microns or less; and*”

Petitioner asserts that Sung'026 discloses that “*each* of the plurality of superabrasive particles protrudes to a predetermined height above the solidified organic material layer.” Pet. 30 (citing Ex. 1004 ¶ [0073]; *id.* at claim 31). Petitioner also asserts that Sung '026 discloses that the

particles protrude “along a designated profile,” where “the designated profile is a plane.” *Id.* (citing Ex. 1004, claims 36 and 37; ¶ [0053]).

Petitioner provides the following schematic drawings to illustrate the disclosure of Sung ’026. Pet. 31; *see also* Ex. 1002 ¶ 100 (Dr. Shanfield stating “I have provided a schematic that illustrates this further.”).



**Petitioner’s schematic annotated drawing
of the planar designated profile above a matrix layer.**

Dr. Shanfield testifies that “[t]he diamond particles all protrude to a predetermined height as measured from the designated profile.” Ex. 1002 ¶ 100. As Dr. Shanfield further explains,

I show that the diamond particles do not all protrude to the same height. Sung’026 teaches that in instances where the designated profile is a plane, it is intended that “the highest protruding points of the superabrasive particles are ... level”). EX1004, [0053]. Nevertheless, Sung’026 admits that some height deviation may occur due to limitations inherent in the manufacturing process. EX1004, [0053].

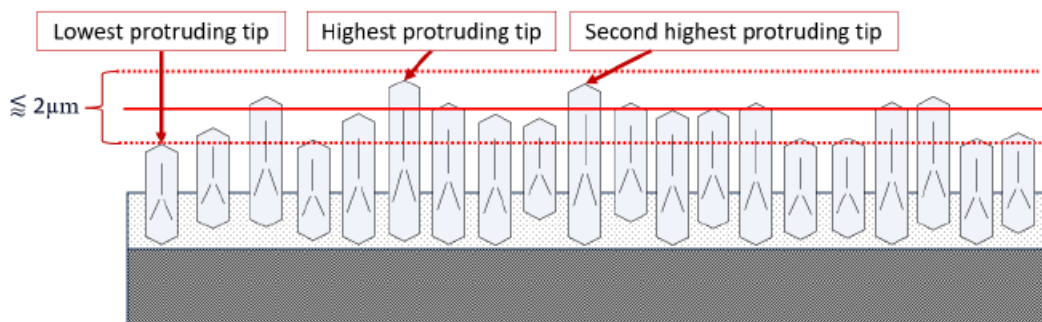
Ex. 1002 ¶ 101.

Additionally, Dr. Shanfield testifies “Sung’026 provides further details about the deviation from the designated profile.” *Id.* at ¶ 102. According to Dr. Shanfield, Sung ’026 “provides an embodiment where ‘*the plurality of superabrasive particles is arranged such that their tips vary from the designated profile by less than about 1 microns.*’” Ex. 1002 ¶ 102 (citing Ex. 1004 ¶¶ [0056], [0073]). Dr. Shanfield testifies that in the maximum tip-to-tip variation of about 1 micron below or within less than about 1 micron above the designated profile, “a maximum tip-to-tip variation (i.e., the difference in protrusion distance between the highest protruding tip and the lowest protruding tip) [is] less than about 2 microns.” *Id.* at ¶ 103.

Dr. Shanfield concludes:

because the maximum tip-to-tip variation between all tips is within 2 microns, the difference in protrusion distance between the highest protruding tip and the second highest protruding tip of the monolayer of superabrasive particles must also be less than about 2 microns, which is within the claimed “less than or equal to about 10 microns.”

Id. at ¶ 104. Dr. Shanfield illustrates this conclusion in the figure below.

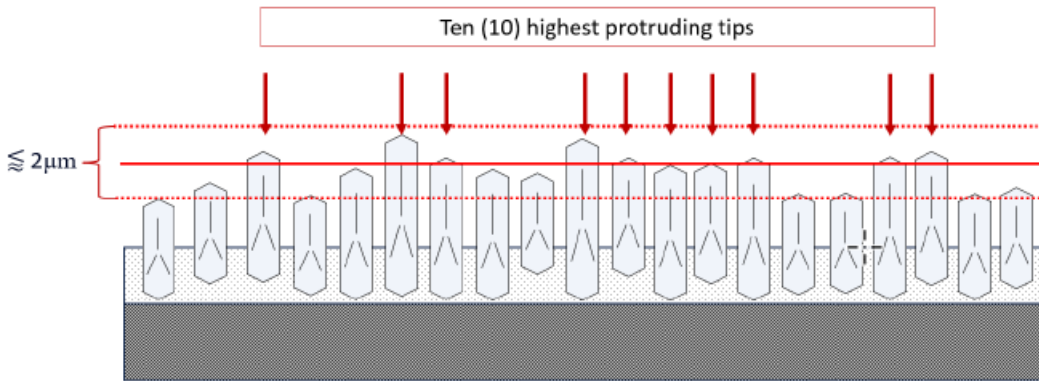


Dr. Shanfield’s illustration of maximum tip-to-tip variation in Sung ’026. Ex. 1002 ¶ 104.

Dr. Shanfield also concludes that because

the maximum tip-to-tip variation for all superabrasive diamond particles is less than about 2 microns, the difference in protrusion distance between the highest 10 protruding tips of the monolayer of superabrasive particles must also be less than about 2 microns. This is within the claimed “about 20 microns or less.”

Id. at ¶ 105. Dr. Shanfield also illustrates this conclusion in the figure below.



Dr. Shanfield’s illustration of maximum tip-to-tip variation in Sung ’026. Ex. 1002 ¶ 105.

Dr. Shanfield also testifies that if not disclosed to anticipate the ’862 patent, it would have been obvious to a person of ordinary skill to modify Sung ’026 to precisely level the particle tips as claimed. The motivation to do this modification, and the reason why a person of ordinary skill would have done this modification is because Sung ’026 recognizes that “the particle tip height must be precisely leveled in order to uniformly dress the pad.” Ex. 1002 ¶ 107 (citing Ex. 1004 ¶ [0006]). Sung’026 also discloses that the “traditional” pad dressers with particle height variations of more than 50 μm are unsuitable for applications where the asperity depth of 20 μm or less is desired. *Id.* (citing Ex. 1004 ¶ [0006]).

Patent Owner disagrees with Petitioner’s analysis. Patent Owner concludes that “Petitioner is simply incorrect that these ranges necessarily “would result” (Pet. at 34–35) from every such attempt.” Prelim. Resp. 35. Patent Owner, however, provides argument, without persuasive evidence to support the argument. As discussed above, Dr. Shanfield provides detailed analyses, on which Petitioner relies, to explain his positions, conclusions, and opinions. Here, we find on the record before us, that the probative weight of the evidence supports Petitioner’s position.

(v) [1D] — “rotating the dresser against the CMP pad such that asperities are cut into the CMP pad having a maximum cutting depth of about 60 microns.”

Petitioner asserts Sung’026 discloses that “pad dressers ... cut asperities in the pad.” Pet. 36 (citing Ex. 1004, ¶¶ [0005], [0004], [0006]). More specifically, Petitioner asserts Sung’026 explains that “*each* of the plurality of superabrasive particles may protrude to a predetermined height above the solidified organic material layer ... [and] the predetermined height may produce a cutting depth of from about 10 micron[s] to about 20 microns when used to abrade a work piece.” *Id.* (citing Ex. 1004 ¶¶ [0010], [0052]).

Patent Owner relies on its arguments concerning clauses 1[A], 1[B], and 1[C] to argue that clause 1[D] also is not disclosed. Prelim. Resp. 37. Because we have not found Patent Owner’s arguments on clauses 1[A], 1[B], and 1[C] persuasive, we also find this argument about 1[D] unpersuasive.

Patent Owner also argues,

Even putting aside that [1D] specifically refers to the use of a pad dresser that satisfies previously-recited elements, Sung’026 also fails to disclose what limitation [1D] additionally recites. *Id.* All

that Petitioner identifies for disclosure of the maximum cutting depth of about 60 microns in Sung’026 is a single line that the predetermined height of the plurality of protruding superabrasive particles “*may* produce a cutting depth of from about 10 micron[s] to about 20 microns when used to abrade a work piece.”

Prelim. Resp. 38 (citing Pet. 36).

Patent Owner also asserts that “this line is not an enabling disclosure because it would not have explained to a POSITA how to achieve *any* cutting depth without undue experimentation, let alone a maximum cutting depth, from a given predetermined height of ‘each’ of the plurality of superabrasive particles.” *Id.*

We recognize that it is well established in the case law that a prior art reference must be enabling in order to anticipate a claim. *Tech. Consumer Prod., Inc. v. Lighting Sci. Grp. Corp.*, 955 F.3d 16, 23 (Fed. Cir. 2020) (citing *Impax Labs., Inc. v. Aventis Pharms. Inc.*, 468 F.3d 1366, 1381 (Fed. Cir. 2006)). Patent Owner provides no persuasive evidence, other than its conclusory argument, to establish that Sung ’026 would not be enabling. We conclude, on the preliminary record presented, that a degreed engineer with two years of applicable experience in the relevant technology would understand how to adjust cutting depth to a desired depth.

(vi) *Conclusion as to Claim 1*

Based on the present record, we conclude Petitioner has provided sufficient argument and evidence in relation to the proposed anticipation and obviousness of claim 1 based on Sung ’026, to demonstrate a reasonable likelihood that Petitioner would prevail with respect to this challenge at trial.

G. Dependent Claims 2–20

In Grounds 1–6, Petitioner provides arguments and evidence in support of contending dependent claims 2–20 are unpatentable as anticipated by Sung ’026 (Ground 1), or alternatively as having been obvious over Sung ’026 either alone or with various other references, including supporting testimony from Dr. Shanfield. *See* Pet. 37–72. Patent Owner opposes. *See* Prelim. Resp.

“When instituting *inter partes* review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.” 37 C.F.R. § 42.108(a). Thus, pursuant to USPTO rules and policy implementing *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348 (2018), we “either (1) institute as to all claims challenged in the petition and on all grounds in the petition, or (2) institute on no claims and deny institution.” Patent Trial and Appeal Board Consolidated Trial Practice Guide (Nov. 2019) (“CTPG”), 5–6, 64.²⁰ We “will not institute on fewer than all claims or all challenges in a petition.” *Id.* at 5, 64; *see also PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1359–60 (Fed. Cir. 2018) (stating a decision to institute is “a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition”).

Thus, because we have decided to grant institution on the sole independent claim, claim 1, we also institute for dependent claims 2–20 on all asserted Grounds.

²⁰ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

V. CONCLUSION

For the above reasons, we determine the information presented in the record establishes there is a reasonable likelihood that Petitioner would prevail with respect to at least one claim of the '862 patent challenged in the Petition. Therefore, we institute an *inter partes* review of all challenged claims 1–20 on all grounds presented in the Petition. *See* 35 U.S.C. § 314(a); 37 C.F.R. § 42.108(a).

At this preliminary stage, the Board has not made a final determination with respect to the patentability of the challenged claims or any underlying factual or legal issue. The Board's final determination will be based on the record as developed during the *inter partes* review. Any arguments not raised by Patent Owner in a timely-filed response may be deemed waived.

VI. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review is instituted for claims 1–20 of the '862 patent on all grounds presented 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 commences on the entry date of this decision.

IPR2024-00534
Patent 9,138,862 B2

FOR PETITIONER:

Yung-Hoon Ha
Laura Avena
Taeg Sang Cho
DESMARAIS LLP
yha@desmaraisllp.com
lavena@desmaraisllp.com
tcho@desmaraisllp.com

FOR PATENT OWNER:

Alex Chan
Joel Glazer
DEVLIN LAW FIRM LLC
achan@devlinlawfirm.com
jglazer@devlinlawfirm.com